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SAMPLE ENTRY

1 ← 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

2 → Paul, P.R.C.; Xavier, F.; Leena, A.

6 → (College of Veterinary and Animal Sciences, Trissur (India), Department, of Livestock Production Management)

3 → Dairysoft: A computer programme for dairy farms.

4 → Indian Journal of Animal Sciences (India). (Mar 2006).v. 76(3) p. 260-262

5 → 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

C20 Extension

001. 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. Animal Health and extension services: perceived effectiveness by livestock farmers under special livestock protection scheme. Indian Journal of Veterinary Researh (India). (Dec 2012) v.21(2)p.56-63 KEYWORDS: ANIMAL HEALTH. SERVICES. EXTENSION ACTIVITIES.
The study was conducted to measure the motivational characteristics of livestock farmers to participate and utilize the animal health services, technical inputs and extension services under the special livestock protection scheme i.e. animal husbandry programme of Tamil Nadu. The study was carried out in four villages, two each from plain and hilly blocks of Erode district. A structured interview schedule was used to investigate the factors which motivated the farmers to avail and utilize the services of the scheme. Free vaccination and deworming at doorstep, accessibility of veterinary and extension services free of cost and ease in transport of animals and birds to camps under the scheme were perceived as major motivating factors to utilize the services of the scheme by the livestock farmers. All beneficiaries invariably utilized the vaccination against the contagious diseases among the animal health services. Majority of them also utilized the services like deworming, treatment of their animals and input facilities like fodder seed, dewormers, mineral mixtures and leaflets regarding livestock farming. Services under the scheme were perceived highly effective by 25 % of the beneficiaries followed by medium level of effectiveness revealed by 52% dairy farmers.

002. Mirajkar, Pallavi P.; Indian Veterinary Research Institute, Izatnagar (India). Sanjay Kumar; Indian Veterinary Research Institute, Izatnagar (India). Singh, Y.P.; Indian Veterinary Research Institute, Izatnagar (India). Preference of service providers for the veterinary service-a case study of Sangli District of Maharastra state, India. Veterinary World (India). (Mar 2011) v.4(3) p. 106-108 KEYWORDS: VETERINARY SERVICES. LIVESTOCK. MAHARASHTRA. SERVICES.
Availability of veterinary services is very important for development of livestock sector in India. In many locations apart from state veterinary services other veterinary services are also available and the veterinary service users have the choice available with them regarding the service providers. The preference of service providers depend upon the location, distance, livestock holding and capacity to pay and quality of services. A study was conducted among the livestock owners of Sangli district in Maharastra to assess the preference of the livestock owners towards a particular veterinary service provider. Majority of large farmers preferred state veterinary services and cooperative veterinary services where it had strong presence. Cooperative veterinary service can be a good alternative to the state veterinary services and the private veterinary service providers are still not preferred in the rural area.

003. Shiv Kumar; National Centre for Agricultural Economics and Policy Research, New Delhi (India). Birthal, Pratap S.; National Centre for Agricultural Economics and Policy Research, New Delhi (India). Chaudhary, K.R.; National Centre for Agricultural Economics and Policy Research, New Delhi (India). Integration of food markets in India: A case of milk markets. Indian Journal of Animal Sciences (India). (May 2011) v. 81 (5) p. 507-511 KEYWORDS: MARKET RESEARCH. MILK. POLICIES. FOOD POLICIES.
Dairy policy in India has undergone a sea change in recent years, creating an ample space for public and private investment in dairy business. This is likely to have influenced inter-regional trade in dairy products and prices there of in different markets. This paper examines integration of milk markets, and concludes that milk markets have moved towards a long–run integration after a course of corrections and adjustments. Some markets are more stable due to existence of strong basics of production and marketing in the regions where they are located. However, the less stable markets are also important to sustain long–run equilibrium or to correct disequilibrium due to short-run exogenous shocks.

E10-Agricultural economics and policies

004. Kathiravan, G.; Tamil Nadu University of Veterinary and Animal Sciences, Namakkal (India). Veterinary College and Research Institute. Selvam, S.; Madras Veterinary College, Chennai (India). Dept. of Animal Husbandry Statistics and Computer Applications. Productivity dynamics of livestock in southern peninsular India: A compound growth rate analysis . Veterinary World (India). (Feb 2011) v.4(2)p. 68-74 KEYWORDS: COWS. CROSSBREDS. WATER BUFFALOES. HENS. PRODUCTIVITY. GROWTH RATE. TAMIL NADU.
Although India possesses the large volume of livestock, their productivity is abysmally low at global level. India, with its wide variation in geo-ecological parameters, elucidates a high variation in the productivity of its livestock, among regions. The compound growth rate of livestock productivity was worked out for the Southern Peninsular state of India, Tamil Nadu. The average productivity of milk in cross bred cows and buffaloes in Tamil Nadu was less than the national average, while the productivity desi cows was a bit a more. The annual compound growth rate of milk productivity among crossbred cows of Tamil Nadu was at meager 0.54 per cent during the period between 1998-1999 and 2006- 2007, whereas the productivity of milk in desi cows had improved from at an annual compound growth rate of 1.29 per cent. Notably, the milk productivity in buffaloes had declined at a rate of 0.29 per cent during the period under study. The annual compound growth of egg productivity in improved hens of Tamil Nadu was 20.87 per cent. The average annual productivity was 109.531 eggs, which improved from 70.623 in 1998-1999 to 197.084 in 2004-2005. Correspondingly, the productivity of desi hens also had a positive swing from the year 2003-2004 onwards. The results implied that the simulation of increased productivity, better farm financing and improved milk marketing could result in enhanced livestock production that would meet the future demands.

005. Kathiravan, G.; Tamil Nadu University of Veterinary and Animal Sciences, Namakkal (India). Veterinary College and Research Institute. Selvam, S.; Tamil Nadu University of Veterinary and Animal Sciences, Namakkal (India). Veterinary College and Research Institute. Crafting Livestock Production Zones: A Principal Components Approach. Indian Journal of Animal Research (India). (Mar 2011) v. 45(1) p. 1-9 KEYWORDS: ANIMAL PRODUCTION. FARMS. STATISTICAL METHODS. TAMIL NADU.
A study was carried out to determine the versatility of different districts of Tamil Nadu state of India for milk and meat production, using secondary data collected from various sources. Factor analysis with principal component extraction was carried out to detect the interrelationship among attributes of livestock production. The component of cow milk was the major factor in the state's milk production, compared to buffalo milk. In mutton and chevon production, high Eigen value indicated the possibility of improvement of mutton producton to larger extent. The district-wise potentials for cow and buffalo milk production, mutton and chevon production were worked out based on resources availability in each district and presented.

E16-Production economics

006. Geethalakshmi, V.; Central Institute of Fisheries Technology, Cochin (India).Nikita Gopal; Central Institute of Fisheries Technology, Cochin (India).Murthy, L.N.; Central Institute of Fisheries Technology, Cochin (India). Capacity Utilization in Fish Processing Industry – A Case Study of Gujarat. Fishery Technology (India). (Jul 2011) v.48(2) p. 171-174 KEYWORDS: FISH PROCESSING. CONSUMER BEHAVIOUR. FISH INDUSTRY. GUJARAT.
Consumer demand for fish is increasing globally and the domestic demand of fish in India by the year 2020 is estimated to be 12 million t. Fish importing countries have been imposing stringent quality standards for fish and fishery product exports in the recent years. To meet these standards, huge investments have been made by the fish processing industry by way of additional equipment and infrastructure. Considering the ever profitable global fish trade, many fish processing plants were established with huge freezing capacity in the past few years. Gujarat is an important hub for fish processing in India, contributing 14% to the total seafood exports in terms of dollar value. Using stratified sampling design, around 35 fish processing plants

were selected in Gujarat and data were collected on installed capacity and monthwise seafood production from 2006-07 to 2008-09. The results show that there is a gross under utilization of capacity installed for fish processing in Gujarat. The capacity utilization pattern by the Gujarat fish processing sector along with the problems faced and possible remedies are discussed in this communication.

E20 Organization, administration and management of agricultural enterprises or farms

007. Nirmal Kumar; National Centre for Agricultural Economics and Policy Research, New Delhi (India).Suhag, K.S.; CCS Haryana Agricultural University, Hisar (India).Shiv Kumar; National Centre for Agricultural Economics and Policy Research, New Delhi (India). Dalip Kumar; National Centre for Agricultural Economics and Policy Research, New Delhi (India).Chaudhary, K.R.; National Centre for Agricultural Economics and Policy Research, New Delhi (India). A study on economic traits, costs and returns of buffalo husbandry in Haryana. Indian Journal of Animal Sciences (India). (May 2011) v. 81(5) p. 512-518 KEYWORDS: ANIMAL HUSBANDRY. WATER BUFFALOES. COST BENEFIT ANALYSIS.
The present study was taken up to study the economic traits of bovines i.e. buffalo, and to work out the cost and returns from buffalo milk production on different categories of herds in Hisar and Karnal. Buffalos are the main milch animals followed by the crossbred cattle to sustain the milk production needs in both districts. The age at first calving has considerable economic significance to the farmers because the cost of rearing heifer from birth to calving and consequently the milk yield are strongly influenced by this character. The average gestation period was almost same in both the selected district. On an average more than one service per conception was required. On an average duration of milk yield was 58 and 63 days in Hisar and Karnal district, respectively. The milk yield decreased with the increase in herd size in both the districts. As a result of economies of large size, labour cost decreased with increase in herd size in both the districts. The net maintenance cost per milch buffalo was highest in winter and lowest in rainy season on all the herd size groups. On an average the net profit of milk production of a buffalo per day was highest on small herd size group followed by medium and large size group in Hisar district. In Karnal district the net or gains per day was highest on small followed by large and medium herd size groups. The net profit per buffalo per day was higher in winter and lowest in summer in small herd size groups in Hisar district and on medium and large herd size groups in rainy season and lowest gain in summer. In Karnal district the trend was slightly different. The net return was highest in rainy season in all the herd size groups but lowest in summer in small, and in winter in medium and large herd size of groups. On an average about 48 and 58% of the total milk produced was sold as fresh milk in Hisar and Karnal district, respectively.

008. Prabu, M.; Madras Veterinary College, Chennai (India).Department of Animal Husbandry Economics.Selvakumar, K.N.; Madras Veterinary College, Chennai (India).Department of Animal Husbandry Economics.Pandian, A. Serma Saravana; Madras Veterinary College, Chennai (India).Department of Animal Husbandry Economics. Kumar, G. Senthil; Madras Veterinary College, Chennai (India).Department of Animal Husbandry Economics.Meganathan N.; Madras Veterinary College, Chennai (India).Department of Animal Husbandry Economics. Profitability Analysis of Goat Farming in Tamil Nadu. Indian Journal of Animal Research (India). (Mar 2011) v. 45(1) p. 32-37 KEYWORDS: GOATS. ANIMAL HUSBANDRY. PROFITABILITY. PROFIT. TAMIL NADU. COST ANALYSIS.
A study was undertaken to analyse the profitability of goat farming by collecting data from 150 goat farmers in Ramanathapuram district of Tamil Nadu. The data were analysed through conventional analytical tools like percentages and averages. The flock size of goat was found to be the highest in landless farmers (26.43) and the lowest in small farmers (20.76) with the overall average flock size of 23.85. The total gross income obtained per farm per annum from goat enterprise was the highest in large farmers followed by landless farmers with the overall gross return of about Rs.45,553.93. The net returns with imputed value of family labour per goat was the highest in marginal farmers (Rs.1123.19) and the lowest in small farmers (Rs.540.14) with the overall value of Rs.816.49. However, the net returns without imputed value of family

labour was found to be highest in marginal farmers (Rs.1,501.31) followed by landless farmers (Rs.1,353.83) with the overall value of Rs.1,216.76. The results revealed that the goat enterprise was observed to be a profitable income generating avenue in the dry land areas of Tamil Nadu. Hence, any improvement in their production level has direct bearing on the socio-economic status of landless, marginal and small farmers and thereby the overall economic development of the region.

008. Pandian, A. Serma Saravana; Madras Veterinary College, Chennai (India). Department of Animal Husbandry Economics.Kumar, G. Senthil; Madras Veterinary College, Chennai (India). Department of Animal Husbandry Economics.Prabu, M.; Madras Veterinary College, Chennai (India). Department of Animal Husbandry Economics.Selvakumar, K.N.; Madras Veterinary College, Chennai (India). Department of Animal Husbandry Economics.Saraswathi, S.; Madras Veterinary College, Chennai (India). Department of Animal Husbandry Economics. Time Series Analysis of Wholesale and Retail Egg Prices in Major Market Centres of South India. Indian Journal of Animal Research (India). (Mar 2011) v. 45(1) p. 38-42 KEYWORDS: TIME SERIES ANALYSIS. EGGS. PRICES. INDIA.

A study was carried out to analyse the trend, seasonal and spatial variations in wholesale and retail egg prices in major market centres of South India. The data on monthly average wholesale NECC prices of egg from major market centres of South India viz., Namakkal, Hyderabad, Nellore, Vijayawada and Mysore and monthly average retail NECC prices of egg from major consumption centres of South India viz., Bangalore, Chennai and Mumbai for the period from August 2000 to July 2009 were collected from various secondary sources. The slope of linear trend equations revealed that the wholesale egg price hiked at rate of four-fifth of a paise per month. The retail egg price trend equation fitted for major consumption centres of South India revealed that the egg price had increased by 0.79 to 0.81 paise per egg. The intercept of trend equations was more (Rs. 99.84 to 107.05) for retail price when compared to the wholesale price (Rs. 92.33 to 96.79). The monthly price indices of egg price in various market centres of South India inferred that the price indices of all the observed centres coincides with each other over various months. The monthly egg price index was observed to be the minimum during the months of March and April and started increasing to reach peak during the month of June. Further, it started decreasing and reached lower value during the months of August and September. The monthly price index was found to increase to reach higher index values during the months of November to January. The seasonal wholesale/retail egg price index was found to be the highest during the month of November and December and the lowest during the month of April.

009. De, Soumya Subhra; Chochin University of Science and Technology, Cochin (India)Ramachandran, A.; Chochin University of Science and Technology, Cochin (India). Marketing Channels in Ornamental Fish Trade in West Bengal. Fishery Technology (India). (Jul 2011) v.48(2) p. 163-170 KEYWORDS: ORNAMENTAL FISHES. TRADE. WEST BENGAL.

A lucrative export market and high domestic demand has made ornamental fish industry in West Bengal a potential source for income generation. The study aimed to identify: (i) the commercially important size groups of main ornamental fish varieties available in the state; (ii) the existing supply chain; (iii) major constraints for development of the industry; (iv) and to anlayse price spread of commercially important varieties; and (v) to evaluate the profitability of operation at different stakeholder levels in the marketing chain. Export market of ornamental fishes in the state followed a single supply channel while three different distribution channels existed in the domestic market. High electricity charges was the major problem faced by breeders (producers/rearers) whereas lack of technical knowledge regarding transportation was the major constraint for wholesalers. Lack of knowledge on proper health management inhibited the growth of retail industry. The fresh water catfish, angel, molly, arowana, gold fish, tetras, and gouramis showed comparatively higher breeders’ share in consumers’ rupee. Wholesalers were earning comparatively higher annual profit than the other stakeholders due to moderate initial investment and also due to the comparatively lower risk involved.

L01 Animal Husbandry

010. Srinivas, B.; Central Sheep and Wool Research Institute, Avikanagar (India).Swain, N.; Central Sheep and Wool Research Institute, Avikanagar (India).Singh, N.P.; Central Sheep and Wool Research Institute, Avikanagar (India). Quantification of nutritional sustenance and microbial protein production of sheep during different physiological stages in semi-arid regions. Indian Journal of Animal Sciences (India). (Mar 2011) v. 81 (3) p. 282-288 KEYWORDS: SHEEP. GROWTH. LACTATION. SUPPLEMENTS. SEMIARID ZONES. INDIA.
Female lambs, yearlings, pregnant and lactating ewes, 24 each, were randomly divided into 2 equal groups of 12 each. All groups were fed guar straw as basal roughage without (control, CG) and with (experimental, EG) concentrate supplement (CS) consisted 18% total CP and 18 MJ/kg of gross energy. CS offered 5 g/kg W0.75. DM intake was recorded daily and compared with the recommendations of ARC (1998). Metabolism trial was conducted during each physiological stage. CS intake was 20 to 25 g/kg W0.75 with an increase of 1 to 2 g/kg W0.75 with age. DM, N and energy were deficient without CS during all physiological stages. Although CS provided deficit nutrients, efficiency of their utilization was far below the standards (ARC 1998). Purine derivatives excreted in the urine of adult sheep was lesser than lambs or yearlings and ascertained their inverse relationship with body size. Inefficiency in microbial protein production (MBP) without CS, ranged between 25 and 50% compared to optimum production of 30 g/kg apparently digested organic matter in rumen. Performance output index (POI) calculated as function of efficiency indicated 60 to 70% below global standards of optimum performance when fed on guar straw alone. CS increased the POI by 5 and 35% more than optimum level in lambs and pregnant ewes. Performance of yearlings and lactating ewes on CS needed 14 and 50% more improvement to make it comparable with standards.

011. Sunil Kumar; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India).Yadav, M.C.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Effect of first lactation profit traits on milk production in Indian buffalo. Indian Journal of Animal Sciences (India). (Apr 2011) v. 81 (4) p. 412-416 KEYWORDS: WATER BUFFALOES. MILK PERFORMANCE. LACTATION NUMBER. INDIA.
The present genetic studies of profit traits in Indian buffaloes were taken on 1753 Murrah, Nili Ravi and graded Murrah buffalo maintained at 6 military dairy farms. The data were collected from history sheets of buffaloes, which were progeny of 185 sires and were calved during 1953–84. The costs of expenditure were calculated as per normal requirement of each buffalo because of group feeding and management. Least squares mean of profit in first lactation, average profit per day of first calving interval, profit in herd life and average profit per day of herd life were 1992.02±370.79, 5.43±0.08, 8698.62±946.49 and 6.98±0.75 rupees, respectively. Profit per unit of investment in the first lactation, profit per unit of investment in herd life, cost per unit of production in the first lactation and cost per unit of production in herd life were 1.06±0.01, 1.04±0.01, 0.98±0.01 and 0.97±0.01 rupees, respectively.

012. Ravindra Kumar; G. B. Pant University of Agriculture and Technology, Pantnagar (India). Department of Livestock Production and ManagementSingh, S.K.; Birsa Agriculture University, Ranchi (India). Department of Animal Breeding and GeneticsPrasad, Sushil; G. B. Pant University of Agriculture and Technology, Pantnagar (India). Department of Livestock Production and Management. Performance of different genetic groups of pigs under village condition of Jharkhand . Pantnagar Journal of Research (India). (Jan-Jun 2010) v.8(1) p.105-107 KEYWORDS: SWINE. VILLAGES. BREEDING METHODS. CROSSBREDS. RURAL DEVELOPMENT.
The study was conducted on 405 weaned piglets of 3 different genetic groups viz. T & D (Tamworth × Desi), H×T & D (Hampshire × T & D) and desi maintained under village condition in Jharkhand with an objective to find out the productive and reproductive performances at farmers door. Each piglet was provided with approx 20 per cent concentrate mixture along with locally available feeding waste material procured by beneficiary. There was non-significant difference between T & D and their crosses with Hampshire, but both the genetic

group had significantly higher body weight at different ages in comparison to desi pig. However the reproductive performance of T & D pigs was found to be better than their crosses with Hampshire followed by desi pigs. On the basis of findings, it was concluded that T & D pigs was found to be better than their crosses with Hampshire followed by desi pigs. Further, it was concluded that T & D pigs are suitable for rearing in villages at farmers door.

013. Bhatnagar, Shiwani; G. B. Pant Univ. of Agriculture and Technology, Pantnagar (India). Department of EntomologyKarnatak, A. K.; G. B. Pant Univ. of Agriculture and Technology, Pantnagar (India). Department of Entomology. Impact of day hours and distance of bee hives on the foraging behaviour of Apis mellifera L. visiting Litchi (Litchi chinensis Sonn.). Pantnagar Journal of Research (India). (Jul-Dec 2010) v.8(2) p.166-169 KEYWORDS: HIVES. APICULTURE. APIS MELLIFERA. LITCHI. LITCHI CHINENSIS. ENTOMOLOGY. FORAGING. APIDAE.
Studies were conducted to observe the impact of day hours and distance of bee hives on the foraging behaviour of Apis mellifera L. The results revealed that there was a negative correlation between the distance of litchi tree and abundance of bees. Visitation of A.mellifera during morning hours was more than in the evening hours. The foraging rate decreased with the increase in temperature. The maximum foraging rate of A. mellifera was at 0900-1100 h (14.92 flower/min/forager).The total time spent per flower per bee forager was highest (5.83 sec.) in the morning 0900-1100 hr.

014. Verma, M.R.; ICAR Research Complex for NEH Region, Umiam (India).Mandal, Subhasis; ICAR Research Complex for NEH Region, Umiam (India).Tripathi, A.K.; ICAR Research Complex for NEH Region, Umiam (India). Dynamics of milch bovine population in Meghalaya. Indian Journal of Animal Sciences (India). (May 2011) v. 81 (5) p. 521-524 KEYWORDS: LACTATION. BOVINAE. DYNAMIC MODELS. STOCKING DENSITY. MEGHALAYA.
We studied the changes in the composition of milch bovine population and their contributions in various livestock byproducts over the years w.e.f. 1983–84 to 2003–04. Our results revealed that over the years, there was an improvement in the milch bovine population. The share of the crossbred milch cows in total milk production is increasing rapidly over the years where as there is sharp decline in the share of indigenous cows and buffaloes over the years in milk production. There is a decline in the lactating efficiencies of the indigenous cows and buffaloes over the years. The stocking density based on the animal man ratio, animal land ratio and animal geographical are clearly indicated that stocking density of milch animals is very less in Meghalaya. So stocking density can be increase to get more profit from milch bovine population. Contribution of the different livestock by-products showed increasing trend over the years.

015. Radder, Shivakumar K.; Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar (India). Veterinary College. Bhanj, S.K.; Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar (India). Veterinary College. Perceptions of dairy farmers of Gadag district in northwestern part of Karnataka state, India regarding clean milk production. Veterinary World (India). (Feb 2011) v.4(2) p. 79-81 KEYWORDS: CONTAMINATION. DAIRY FARMS. MILK PRODUCTION. FARMS. KARNATAKA.
Clean milk production is one important aspect in enhancing the quality of milk. It is important to know farmers' perception about it. With this view, present study was undertaken with the objective of understanding perception of dairy farmers about clean milk production. The study was conducted in six villages of Gadag district of Karnataka state. A total of 180 respondents were interviewed. Perceptions of the farmers regarding family manpower involved in dairy farming, personnel involved in milking, dairy income, intention to produce clean milk, price dependence for following clean milk production, reasons for following cleanliness measures in milk production, sale price received for milk and satisfaction for the price they received for milk were studied. Most of the dairy farmers expressed their willingness to follow clean milk production measures. Further, most of them were ready to follow such measures even if they were not paid more price for milk. Farmers practiced clean milk production measures mainly to follow regulations at

the dairy co-operative society followed by to avoid spoilage of milk. Dairy farmers largely neglected impact of cleanliness on animals' udder and health, about milk contamination causing health hazards. Milking was mainly a domain of women. For over 80 % farmers, dairy farming provided a moderate income as portion of their total family income. Majority of the producers were not satisfied with price they were getting for milk. Hence, the study recommends, requisite facilities and guidelines from the agencies concerned are needed to be provided to the dairy farmers to adopt clean milk production practices. Proper education to the farmers regarding importance of clean milk production from health, marketing and animal health point of views needs to be given. There is need to give more importance to women in dairy farmers' trainings. The study also suggests offering satisfactory price for milk to hasten the process of adoption of clean milk production practices by the dairy farmers.

016. Majumdar, S.; Central Avian Research Institute, Izatnagar (India).Satisha, K.G.; Central Avian Research Institute, Izatnagar (India).Bawachat, V.; Central Avian Research Institute, Izatnagar (India). Effect of goat waste feeding on carcass characteristic and meat quality in broilers. Indian Journal of Veterinary Researh (India). (Dec 2012) v.21(2) p. 23-29 KEYWORDS: CARCASS COMPOSITION. GOATS. WASTES. ENZYMES. SUPPLEMENTS. MEAT. QUALITY. BROILER CHICKENS.
The study assessed the effect of goat waste (faces) feeding on carcass characteristic and meat quality in broilers. Four iso-nitrogenous experimental diets viz. basal diet, D1 (CP, 21.18%; CF, 2.3%; ME, 2865 kcal/kg), dried goat waste replacing energy feed ingredients (rice bran totally and maize partially) viz: D2 (10%), D3 (20%) and D4 (30%) and another four with inclusion of 0.4 g enzyme feed supplement per kg diet and designated as E1, E2, E3 and E4 were formulated, respectively. At the end of 49 days of experimental period 6 birds from each treatment making a total of 48 birds were selected randomly and slaughtered for evaluation of carcass characteristics and meat quality. Addition of dried goat waste to the diet did not cause any adverse effect on the percent evisceration carcass and ready-to-cook carcass yield of broilers. However, significant reduction in carcass yield was observed at higher inclusion level of dried goat waste. Enzyme supplementation did not cause any beneficial effect on eviscerated carcass yield of broilers. Addition of dried goat waste with or without enzyme supplement showed insignificant effect on organs weight. Inclusion of dried goat waste as well as enzyme addition in diets did not cause any significant effect on percent dry matter and crude fat content of meat, although significant increased the protein content of broiler meat.

017. Kathiravan, G.; Veterinary College and Research Institute, Namakkal (India). Department of Animal Husbandry Statistics and Computer ApplicationsSelvam, S.; Veterinary College and Research Institute, Namakkal (India). Department of Animal Husbandry Statistics and Computer Applications. Analysis of Constraints To Livestock Production in Tamil Nadu. Indian Journal of Animal Research (India). (Mar 2011) v. 45(1) p. 56-59 KEYWORDS: LIVESTOCK. ANIMAL HUSBANDRY. CONSTRAINTS. TAMIL NADU.
In order to ascertain the constraints in livestock production, this study was undertaken in Tamil Nadu. A total of 350 farmers, representing all the seven agro-climatic zones were chosen adopting three stage random sampling technique. Garret's ranking technique was adopted to analyze the problems faced by farmers in the study area on rearing cattle of different categories, buffaloes, sheep and goat. The constraints faced in rearing crossbred cows in the order of their importance were excessive feed cost, followed by inadequate price for milk and huge investment. Low productivity in desi cows was the major constraint, followed by excessive feed cost, inadequate price for milk. Lack of fodder and grazing facilities was the prime constraint in buffalo farming followed by labour shortage and infertility problem. The foremost constraint faced by overwhelming majority in sheep production and in goat production was lack of fodder and grazing facilities.

018. Ghosh, N.; Bidhan Chandra Krishi Viswavidyalaya, Mohanpur (India). Department of Animal ScienceMandal, L.; Bidhan Chandra Krishi Viswavidyalaya, Mohanpur (India). Department of Animal Science Biswas, C.K.; Bidhan Chandra Krishi Viswavidyalaya, Mohanpur (India). Department of Animal Science. Income Generation through Broiler Rabbits (Oryctolagus Cuniculus) Rearing in West Bengal. Indian Journal

of Animal Research (India). (Mar 2011) v. 45(1) p. 60-62 KEYWORDS: RABBITS. BREEDS (ANIMALS). MEAT ANIMALS. WEST BENGAL.
Economics of rearing two meat type rabbits in hot humid conditions of West Bengal was undertaken. The animals were maintained in galvanized iron wire cages under routine farm feeding and health care management. Net annual return per doe was estimated with an aim to compare efficiency of the two breeds. Four crops were produced per year in both the breeds. The total numbers of kits born and survived up to the age of slaughter in a year were more in Grey Giant than Soviet Chinchilla. The individual live weight at slaughter was slightly more in Soviet Chinchilla than Grey Giant, but total weight of surviving youngs at this stage was more in Grey Giant than Soviet Chinchilla. This might be due to more number of kits born and survived at this stage in Grey Giant rabbits. Considering the selling price of rabbits on live weight basis and cost of feeds involved, an amount of Rs.221.25 may be expected from a Soviet Chinchilla doe and Rs.295.00 from a Grey Giant doe during a period of one year indicating better economic performance of the latter breed. The rabbit husbandry can be successfully advocated especially for the poorer section of the society for generating their subsidiary income and improving family nutrition status as it calls for low input and easy husbandry practices.

019. Shukla, Sanjay; College of Veterinary Science and A.H., Jabalpur (India).Hirpurkar, S. D.; College of Veterinary Science and A.H., Jabalpur (India). Recovery status of bacteriophages of different livestock farms of veterinary college, Adhartal, Jabalpur, India. Veterinary World (India). (Mar 2011) v.4(3) p. 117-119 KEYWORDS: BACTERIOPHAGES. ANIMAL PRODUCTION. FARMS. WASTEWATER. INDIA.
Study was conducted to know the presence of bacteriophage in sewage material which can play a very important role during therapy against the some antibiotic resistance organisms. During study waste water samples were collected from different depths of the wastewater collection tanks located in livestock farms of different species (Cattle, pig, goat and poultry). These samples were subjected primarily to rapid detection by streak plate method for the detection of lytic activity followed by primary isolation of phage against two most common bacteria of environment, namely, B. subtilis and E. coli by Double agar layer (DAL) method. Recovery of phages was maximum from pig feces (67%) followed by dairy cattle farm waste (63%), buffalo farm waste (50%), goat farm waste (13%).

020. Oruganti, Madhuri; Central Council For Research in Ayurveda & Siddha, New Delhi (India). Department of AYUSH. Organic dairy farming – A new trend in dairy sector. Veterinary World (India). (Mar 2011) v.4(3) p. 128-130 KEYWORDS: DAIRY FARMS. ANIMAL HUSBANDRY. ORGANIC AGRICULTURE.
Organic Dairy farming means raising animals on organic feed (i.e. pastures cultivated without the use of fertilizers or pesticides), have access to pasture or outside, along with the restricted usage of antibiotics and hormones. Products obtained from Organic dairy farm are the organic dairy products. Organic farming is a system of production, a set of goal-based regulations that allow farmers to manage their own particular situations individually, while maintaining organic integrity. In this article, the benefits, conditions required, constraints involved, and managemental practices of organic dairying, along with information about the regulatory authorities concerned with the organic dairy farming were reviewed briefly to make students and farmers aware of organic dairy farming.

021. Rajendran, D.; Tamil Nadu University of Veterinary and Animal Sciences, Chennai (India).Madras Veterinary College.Balakrishnan, V.; Tamil Nadu University of Veterinary and Animal Sciences, Chennai (India).Madras Veterinary College. Diet composition, biomass yield and mineral contents of vegetation in native tract of Mecheri sheep. Animal Nutrition and Feed Technology (India). (Jan 2012) v. 12(1) p. 63-71 KEYWORDS: SHEEP. GRAZING LANDS. MINERAL CONTENT. BIOMASS. TAMIL NADU.
The diet composition, biomass yield, preference index and mineral contents of vegetation in mountain, fallow and waste/roadside land were assessed in native tract of Mecheri sheep during South West monsoon (June-September) season. Biomass yield (g/m2 on DM) was significantly ($P<0.01$) higher in mountain (743.05)

than in fallow land (107.16) and waste/roadside land (187.29). Botanical composition revealed that out of 31 herbage species in mountain land, Acacia planifrons constituted 23.27±6.02%; out of 12 herbage species in fallow land, Cyanodan dactylon constituted 43.28±3.48%; out of 11 herbage species in waste/roadside land, Tephrosia parpuria constituted 19.70±7.47%; and these three were the dominant species in the respective areas. The diet composition of Mecheri sheep consisted of 20, 12 and 10 out of 31, 12 and 11 herbage species in mountain, fallow and waste/roadside land, respectively. Preference index (percentage diet composition/percentage botanical composition) indicated that herbages in the waste/roadside land were more edible than fallow and/or mountain land. Mineral contents of major graze species in the diet composition of mountain as well as fallow land contained Ca, Fe, Cu, Zn, Mn and Co above the critical level of 0.3%, and 50, 8, 30, 40 and 0.1 ppm, respectively but phosphorous was below the critical level of 0.25%. These observations indicates that to balance the phosphorous requirement, sheep that are grazed at mountain land or fallow land needs to be grazed at waste/roadside land at least on rotational basis or may be supplemented with area specific mineral mixture or concentrate feed.

022. Naik, P.K.; ICAR Research Complex for Goa, Old Goa (India). Swain, B.K.; ICAR Research Complex for Goa, Old Goa (India). Chakurka,r E.B.; ICAR Research Complex for Goa, Old Goa (India). Singh, N.P.; ICAR Research Complex for Goa, Old Goa (India). Assessment of potential animal and poultry feed resources in Goa. Animal Nutrition and Feed Technology (India). (Jan 2012) v. 12(1) p. 127-133 KEYWORDS: POULTRY. FEED RESOURCES. GOA DAMAN AND DIU. LIVESTOCK.
A study on the assessment of potential animal and poultry feed resources in Goa was made based on the extrapolation of secondary data from livestock census 2007 and land utilization and crop production pattern of last three consecutive years (2006–07, 2007–08 and 2008–09). Goa had ruminant livestock unit (RLU) of 69295. Goa had potential green forage availability of 128493 tonnes on dry matter (DM) basis including 61213 tonnes from North Goa and 67280 tonnes from South Goa. Similarly, Goa had potential crop residues availability of 84375 tonnes on DM basis including 50395 tonnes from North Goa and 33980 tonnes from South Goa. Annual potential concentrates availability of Goa was 8672 tonnes, out of which 5388 tonnes was from North Goa and 3284 tonnes was from South Goa. Total concentrates consumed annually by pigs and poultry population had been estimated as 36870 tonnes. Potential total DM availability (kg/RLU/day) was 9.874 including 8.362 in North Goa and 9.251 in South Goa against requirement of 10.5 kg/RLU/day. Thus, there was potential deficit of 0.626 kg DM/RLU/day in Goa including deficit of 2.138 kg DM/RLU/day in North Goa and 1.249 kg DM/RLU/day in South Goa. Thus, it could be concluded that there was a potential deficit of concentrate and roughages to fulfill the nutritional requirement of the livestock and poultry population in Goa.

023. Gopinathan, A.; Livestock Research Station, Kattupakkam (India).Usha, A.P.; College of Veterinary and Animal Sciences, Wayanad (India). Comparative evaluation of growth and carcass traits in large white yorkshire, desi and their crossbred pigs. Indian Journal of Animal Research (India). (Sep 2011) v. 45(3) p. 203-206 KEYWORDS: SWINE. LAND RACES. CROSSBREDS. CARCASS COMPOSITION. GROWTH RATE. INDIA.
Data on a total of 24 pigs belonging to different genetic groups viz., Large White Yorkshire, Desi and crossbreds were analysed from weaning to eight month of age to study the effect of genetic group on growth and carcass traits. The effect of genetic group was found to be highly significant for third, fifth and eighth month bodyweights in Large White Yorkshire, Desi and crossbred pigs. No significant difference was observed in third month of age between Large White Yorkshire and crossbred pigs. The growth studies indicated that higher body weight and average daily gain were noticed in Large White Yorkshire and followed by crossbred and Desi pigs in all months. Better feed conversion efficiency (2.77 ± 0.10, 3.75 ± 0.26 and 5.03 ± 0.42) was noticed at fifth month in Large White Yorkshire and crossbred pigs and at fourth month in Desi pigs respectively. The different genetic groups differed significantly with respect to dressing percentage, back fat thickness, loin eye area and carcass length. The Large White Yorkshire exceeded the crossbred and Desi pigs in all the carcass traits.

L02 Animal Feeding

024. Bakshi, M.P.S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India).Singh, M.P.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Wadhwa, M.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India).Singh, B.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Nutritional evaluation of forest tree leaves as livestock feed in sub mountainous region of india. Indian Journal of Animal Sciences (India). (Mar 2011) v. 81 (3) p. 276-281 KEYWORDS: LIVESTOCK. FEEDS. IN SACCO EXPERIMENTATION. DIGESTIBILITY. IN VITRO EXPERIMENTATION. FOREST TREES.

Samples of 7 species of forest tree leaves, fed to livestock in the semi-hilly arid zone of Punjab state in India, were collected at 30-day intervals for 12 months for evaluating their nutritional worth for livestock. The ground samples were pooled for dry hot, hot humid, fall and winter seasons. Irrespective of the season, the chemical composition revealed that the leaves of Acacia modesta (phulahi) and Butea monosperma (dhak) had higher crude protein then other leaves. The ether extract was the highest in Phoenix acaulis (khajur) and a lowest in (kango) leaves. The leaves of khajur and bans were highly fibrous. The leaves of Anogeissus latifolia (chall) had the highest concentration of cell solubles while that of Bambusa arundinace a (bans) had the lowest. Irrespective of the species of tree leaves, the season did not show any significant impact on the CP, OM and total ash content of tree leaves. The NDF, cellulose, hemicellulose and ADL contents were the lowest in summer and the highest concentration of NDF, ADF and ADL content was observed in winter. The relative proportion of globulins and prolamins predominated in most of the leaves. The leaves of kango had the highest Ca content followed by dhak and the lowest in khajur leaves. The leaves of dhak had the highest concentration of Mg, Co and Mn. The leaves of chall had the highest concentration of total tannins, but 98% of these were hydrolysable, while the leaves of Bauhinia variegata (kachnar) had the highest concentration of condensed tannins (77% of total tannins). The digestion kinetic parameters for DM, CP and NDF revealed that irrespective of season, the effective and true degradability were the highest in leaves of chall followed by that of kango leaves, but lowest in khajur, dhak and bans leaves. The leaves of chall had the lowest rumen fill value predicting highest voluntary intake, while reverse trend was observed in khajur, dhak and bans leaves. Irrespective of the species of tree leaves, the degradability of leaves as indicated by most of digestion kinetic parameters was highest in summer followed by that in fall and the lowest in winter. The rumen fill value was the lowest in summer predicting highest voluntary intake followed by fall and highest rumen fill was observed in winter predicting lowest intake. It was concluded that the leaves of chall and kango had great potential as livestock feed, while feeding of khajur, dhak and bans leaves should be avoided.

025. Santosh Kumar; National Dairy Research Institute, Karnal (India). Mehla, R.K.; National Dairy Research Institute, Karnal (India). Gupta, A.K.; National Dairy Research Institute, Karnal (India). Sharma, V.; National Dairy Research Institute, Karnal (India). Meena, R.K.; National Dairy Research Institute, Karnal (India). Dandi, R.L.; National Dairy Research Institute, Karnal (India). Anand Prakash; National Dairy Research Institute, Karnal (India). Effect of herbal feed supplement Shatavari (Asparagus acemosus) on milk production and composition in crossbred cows. Indian Journal of Animal Sciences (India). (Apr 2011) v. 81 (4) p.420-423 KEYWORDS: COWS. CROSSBREDS. SUPPLEMENTS. MILK PERFORMANCE.

The study was undertaken to evaluate the effect of Shatavari supplementation on milk production and its composition. Our results indicated that supplementation of Shatavari root powder prepartum (60 days) @100 mg per kg live body weight to continue postpartum period (90 days)@200 mg per kg live body weight improved milk production, its composition. Besides improving the milk fat content it reduced milk fat (ghee) total cholesterol and increased net return per litre milk significantly in crossbred cows. Therefore, it is concluded that Shatavari supplementation is economically viable and beneficial, and it could serve as potential management tool to improve milk production, composition and net returns from lactating crossbred cows.

026. Ghosh, M.K.; National Research Centre on Yak, Dirang (India). Chatterjee, A.; National Research Centre on Yak, Dirang (India). Nutrient digestibility and live weight change in yaks fed maize stover based complete feed block during winter. Indian Journal of Animal Sciences (India). (Apr 2011) v. 81 (4) p. 427-428 KEYWORDS: YAKS. FEED GRASSES. ZEA MAYS. NUTRITION PHYSIOLOGY. WEIGHT GAIN.
The study was undertaken to see the effect of feeding complete feed block (CFB) on dry matter intake, body weight change and digestibility of proximate nutrients in yak. The values were compared with the control group fed diet supplemented with concentrate mixture. The CFB was prepared using maize stover (60%), concentrate mixture (37%) and molasses (3%) as binding agent. The dry matter intake (DMI) /100 kg body weight were 1.73 kg in control group and 1.52 kg in CFB fed group. Digestibility of DM, CP, CF and EE were recorded as 61.24 and 60.93; 65.13 and 65.44; 51.47 and 50.12 and 66.34 and 65.15 for control group and feed block fed group, respectively. The total live weight gain in control group and the CFB groups were 17.32 kg and 16.52 kg, respectively. There was no statistically significant difference between 2 groups for any of the parameter. The findings of the present experiment had shown that CFB can replace the diet supplemented with concentrate mixture without any adverse effect on voluntary feed intake digestibility and body weight change in yaks during winter.

027. Kumar, D.D.; National Institute of Animal Nutrition and Physiology, Bengaluru (India).Rao, S.B.N.; National Institute of Animal Nutrition and Physiology, Bengaluru (India).Jash, S.; National Institute of Animal Nutrition and Physiology, Bengaluru (India). Elangovan, A.V.; National Institute of Animal Nutrition and Physiology, Bengaluru (India).Hemalatha, S.; National Institute of Animal Nutrition and Physiology, Bengaluru (India). Chemical composition and anti nutritional factors in karanja (Pongamia pinnata) seed kernels and its in vitro evaluation. Indian Journal of Animal Sciences (India). (May 2011) v. 81 (5) p. 478-483 KEYWORDS: PONGAMIA PINNATA. DIGESTIBILITY. IN VITRO EXPERIMENTATION. CHEMICAL COMPOSITION. NUTRITION PHYSIOLOGY. Karanja (Pongamia pinnata) seeds collected from different places of Karnataka were analyzed for morphological measurements, chemical analysis and anti-nutritional factors like karanjin, pongamol, trypsin inhibitors. Variation were observed in seeds size (1.18–1.68 g), CP (14.46–23.09%), fat (30.76–39.99%), and ANF’s like karanjin (0.57 to 1.75%), pongamol (0.25 –1.27%) and trypsin inhibitor activity (790–1278 ìg / g seed meal). Further, karanja seed meal (KSM) and Karanja defatted meal (KDM) were incorporated in concentrate mixtures at graded levels (25, 50, 75 and 100%) to replace standard soybean meal. To this effect, 9 iso-nitrogenous concentrate mixtures were prepared using (C1 to C9) with 4 levels of replacement (25, 50, 75 and 100% on nitrogen basis) with KSM (C2 to C5) KDM (C6 to C8) and C1 as control. IVDMD, IVOMD (%) followed a decreasing trend when KSM was added to concentrate mixtures whereas complete removal of oil (KDM) resulted in similar trend as that of control. However, both KSM and KDM did not exert any effects on rumen fermentation parameters. Results obtained in the study indicated variation in chemical constituents, ANF’s in the seed samples collected across Karnataka and complete removal of oil from karanj seeds caused beneficial effects on nutrient digestibility in vitro.

028. Sharma, Jyoti; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India).Anil Kumar; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India).Tiwari, D.P.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India).Mondal, B.C.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Effect of dietary supplementation of calcium, copper and manganese on nutrient utilization, growth, blood-biochemical and mineral profile in crossbred heifers. Indian Journal of Animal Sciences (India). (May 2011) v. 81 (5) p. 493-497 KEYWORDS: HEIFERS. CROSSBREDS. SUPPLEMENTS. TRACE ELEMENTS. COPPER. MANGANESE. MINERAL NUTRIENTS. PROXIMATE COMPOSITION. NUTRIENT INTAKE. NUTRITION PHYSIOLOGY. GROWTH.
Crossbred growing heifers (16) of an average body weight 149 kg and 12–16 month-old were divided into 4 groups of 4 each to study the effect of dietary supplementation of calcium, copper and/ or manganese on nutrients intake, body weight gain, blood biochemical parameters and mineral profile. The heifers of group 1

(control) were supplemented with 60 g feed mixture without calcium, copper and manganese supplementation as top dress, whereas heifers of group 2 were supplemented with 100 g feed (mineral) mixture containing dicalcium phosphate and copper sulphate to supply 11 g Ca and 60 mg Cu /animal / day. The heifers of group 3 were supplemented with 60 g feed (mineral) mixture containing copper sulphate and manganese sulphate to supply 60 mg Cu and 100 mg Mn/animal/day and of group 4 were supplemented with 100 g feed (mineral) mixture containing dicalcium phosphate, copper sulphate and manganese sulphate to supply 11 g Ca, 60 mg Cu and 100 mg Mn/animal/day, respectively. All the heifers were provided concentrate mixture as per requirements along with mixed fodder (green sorghum + green maize + wheat straw). The feeding trial lasted for 100 days. The average daily dry matter and TDN intakes and daily body weight gain were higher in heifers of groups 2 and 4 supplemented with calcium and copper. The digestibility of dry matter, organic matter, crude protein, ether extract and crude fibre was significantly higher in heifers of groups 2, 3 and 4 as compared to control group. The SGPT, SGOT and ALP activities and concentration of total protein, globulin, phosphorus, copper and manganese in blood serum were significantly improved in groups supplemented with minerals but the values were within normal range, whereas cholesterol and glucose concentrations were significantly lower in mineral supplemented groups as compared to control group. The study showed that dietary calcium, phosphorus, copper and manganese supplementation is beneficial for improving the nutrient utilization and weight gain and to maintain the normal blood-biochemical constituents and mineral status in growing crossbred heifers.

029. Chaturvedi, O.H.; Central Sheep and Wool Research Institute, Avikanagar (India).Sankhyan, S.K.; Central Sheep and Wool Research Institute, Avikanagar (India).Mann, J.S.; Central Sheep and Wool Research Institute, Avikanagar (India).Karim, S.A.; Central Sheep and Wool Research Institute, Avikanagar (India). Production performance of ewes grazing on community rangeland supplemented with concentrate during late gestation and early lactation. Indian Journal of Animal Sciences (India). (May 2011) v. 81 (5) p. 531-533 KEYWORDS: EWES. RANGELANDS. GRAZING. SUPPLEMENTS. CONCENTRATES. GESTATION PERIOD. WEIGHT GAIN.

Malpura and Kheri ewes (20), 3–4 year-old, in their late gestation and weighing 40.99±2.34 kg as an average were randomly selected and divided into 2 groups of 10 each (G1 and G2). Ewes in both the groups were grazed on natural rangeland from 07.00 to 18.00 h. The ewes in G2 were maintained on sole grazing while those in G1, in addition to grazing received pelleted concentrate mixture at the rate of 400 g/ ewe/day during entire late gestation to early lactation. The body weight of ewes at parturition was higher in G1 than that in G2. The birth weight of lambs in G1 (4.02 kg) was higher than that in G2 (3.16 kg). The body weights of lambs at 15, 30, 45 and 60 days of age were also higher in G1 than that in G2. The body weight gain and average daily gain (g) of lambs at 60 days of age was also higher in G1 than that in G2. Milk yield of ewes increased up to 250 g per day due to concentrate supplementation in comparison to that of without concentrate supplementation. The lambs of supplemented ewes were sold at higher rates (Rs 850/lamb) than those of non –supplemented ewes (Rs 700/lamb). The ewes grazing on community rangelands are not able to meet their nutrient requirements during late gestation and early lactation. However, concentrate supplementation 400 g/ ewe/day during these critical stages enhanced their production performance, general condition as well as birth weight and growth rate of lambs.

030. Khare, A.; College of Veterinary Science and A.H., Jabalpur (India).Baghel, R.P.S.; College of Veterinary Science and A.H., Jabalpur (India). Effect of different levels of dietary selenium on growth performance and nutrient utilization of broiler birds. Veterinary World (India). (Apr 2011) v.4(4) p. 173-175 KEYWORDS: BROILER CHICKENS. NUTRIENTS. SELENIUM. GROWTH RATE. NUTRITION PHYSIOLOGY.

Experiment was conducted on 120 broiler chicks for six weeks and their weight gain was taken for consecutive six weeks to observe the effect of different levels of dietary selenium over growth and nutrient utilization of birds. There were three diets prepared with 0.125, 0.15 and 0.175 mg Se/Kg feed for group T1, T2 and T3 respectively. The FCR and performance index at 1st week for T1 were 1.34±0.02 and 21.21±0.36

that for T2 was 1.51±0.01 and 16.56±0.40 and for T3 were 1.29±0.02 and 23.88±0.50, the experiment continues for 6 weeks the FCR and performance index at 6th week in T1, T2 and T3 was 3.42±0.19 and 7.37±0.78, 3.56±0.05 and 6.51±0.25, 3.56±0.15 and 6.85±0.58. The percent retention of nutrients was highest in T3 group as compare to T1 and T2 which was supplemented 17.50 mg Se/kg of feed. Therefore it was concluded that supplementation of selenium 17.50 mg/kg diet of poultry enhances the growth rate as well as nutrient retention in the broiler birds.

031. Beura, T.K.; Orissa University of Agriculture and Technology, Bhubaneswar (India). Faculty of Veterinary Science and Animal Husbandry.Panda, N.; Orissa University of Agriculture and Technology, Bhubaneswar (India). Faculty of Veterinary Science and Animal Husbandry.Mishra, P.K.; Orissa University of Agriculture and Technology, Bhubaneswar (India). Faculty of Veterinary Science and Animal Husbandry.Panigrahi, B.; Orissa University of Agriculture and Technology, Bhubaneswar (India). Faculty of Veterinary Science and Animal Husbandry.Panda, H.K.; Orissa University of Agriculture and Technology, Bhubaneswar (India). Faculty of Veterinary Science and Animal Husbandry.Pati, P.K.; Orissa University of Agriculture and Technology, Bhubaneswar (India). Faculty of Veterinary Science and Animal Husbandry. Effect of vitamin E and C on the growth and immunocompetence of coloured birds during summer. Animal Nutrition and Feed Technology (India). (Jan 2012) v. 12(1) p. 13-24 KEYWORDS: CHICKS. ASCORBIC ACID. VITAMIN E. SUPPLEMENTS. GROWTH RATE. IMMUNE RESPONSE.

The influence of vitamin E and/or vitamin C supplementation on growth, immunity, carcass traits and lymphoid organs of coloured chicks during summer was studied. Coloured broiler chicks (n=540) divided into 9 treatment groups were fed basal diet with supplementation of vitamin E (250 mg or 500 mg) and vitamin C (250 mg or 500 mg) either alone or in combinations from 0–56 days of age. The treatment-wise supplementation to the basal diet was, T1: control without supplementation, T2: E 250 mg, T3: E 500 mg, T4: C 250 mg, T5: C 500 mg, T6: E 250 mg+C 500 mg, T7: E 500 mg+C 250 mg, T8: E 250 mg+C 500 mg, T9: E 500 mg+C 500 mg/kg feed. The average highest temperature and relative humidity during the experimental period was 37.98°C and 87.9%, respectively. The growth rate, feed conversion ratio, humoral, cell mediated immunity and carcass characteristics were determined. Higher body weight and better FCR ($P<0.05$) were seen in groups supplemented with both the vitamins i.e. T6, T7, T8 and T9 than individual vitamin supplementated (T2, T3, T4 and T5) and control group; but no effect on feed intake was observed. Better humoral immunity as shown by higher ($P<0.05$) haemagglutination inhibition titre against Newcastle Disease vaccine and against sheep red blood cells and higher cell mediated as reflected by increased ($P<0.05$) cutaneous basophilic hypersensitivity response was seen in T7 (E 500 mg+C 250 mg) and T8 (E 250 mg+C 500 mg), groups. From the results, it was concluded that supplementation of vitamin E 00 mg/kg and C 50 mg/kg in the diet of coloured broilers improved growth performance, increased both celluar and humoral immune response during summer stress.

032. Santra, A.; National Dairy Research Institute, Kalyani (India).Eastern Regional Station.Konar, S.; National Dairy Research Institute, Kalyani (India).Eastern Regional Station.Chatterjee, A.; National Dairy Research Institute, Kalyani (India).Eastern Regional Station.Das, S.K.; National Dairy Research Institute, Kalyani (India).Eastern Regional Station. Effect of dietary sunflower oil on rumen protozoal population and fermentation characteristics in growing crossbred calves. Animal Nutrition and Feed Technology (India). (Jan 2012) v. 12(1) p. 73-82 KEYWORDS: CALVES. GROWTH RATE. DIGESTIBILITY. SUNFLOWER OIL. PROTOZOA. RUMEN MICROORGANISMS. FEED CONVERSION EFFICIENCY.

A study was undertaken to investigate the effect of dietary sunflower oil supplementation on rumen protozoal population, fermentation charaterestics and enzyme profile in growing calves. Fifteen growing Jersey male crossbred calves were divided in to three equal groups (G1, G2 and G3) of five each. These calves were fed individually under stall feeding on a mixed ration containing green maize fodder and concentrate mixture in 50:50 ratio for 110 days. Sunflower oil was supplemented along with concentrate mixture at 0, 2 and 4% of the daily DM intake for two consecutive days at seven days intervals to the calves of G1, G2 and G3

group, respectively. Daily DM intake and apparent nutrient digestibility were similar among the three groups. Lowest (P<0.01) rumen protozoal number (both holotrich and spirotrich) was observed in the calves of G3 group followed by G2 and G1 group. Rumen pH and ammonia nitrogen concentration became lower (P<0.01) while TVFA and propionate production were higher in G2 and G3 calves. Further, the pH and ammonia nitrogen level were lower (P<0.01) whereas TVFA and propionate concentration were higher (P<0.01) in the rumen liquor of calves fed 4% (G3) than 2% (G2) sunflower oil. Activity of carboxymethyl cellulase, xylanase and ?-glucosidase was not influenced by the dietary supplementation. The results of the study indicated that dietary sunflower oil supplementation drastically reduced the rumen protozoal population and increased ruminal propionate production.

033. Dubey, Manish; Indian Veterinary Research Institute, Izatnagar (India). Centre for Advanced Faculty Training in animal Nutrition. Dutta, Narayan; Indian Veterinary Research Institute, Izatnagar (India). Centre for Advanced Faculty Training in animal Nutrition. Banerjee, P.S.; Indian Veterinary Research Institute, Izatnagar (India). Centre for Advanced Faculty Training in animal Nutrition. Pattanaik, A.K.; Indian Veterinary Research Institute, Izatnagar (India). Centre for Advanced Faculty Training in animal Nutrition. Sharma, K.; Indian Veterinary Research Institute, Izatnagar (India). Centre for Advanced Faculty Training in animal Nutrition.Singh, M.; Indian Veterinary Research Institute, Izatnagar (India). Centre for Advanced Faculty Training in animal Nutrition. Effect of condensed tannin supplementation through a tree leaves mixture on erythrocytic antioxidant status and gastrointestinal nematodes in kids. Animal Nutrition and Feed Technology (India). (Jan 2012) v. 12(1) p. 91-102 KEYWORDS: KIDS. TANNINS. SUPPLEMENTS. GROWTH RATE.
In order to assess the effect of condensed tannins (CT) through tanniferous tree leaves on erythrocytic antioxidant status and GI nematodes, indigenous kids (n=18) were randomly divided into 3 groups of 6 each and fed iso-nitrogenous diets to contain 0 (CT-0), 1.0 (CT-1) and 2.0 (CT-2)% CT through a dried and ground leaf meal mixture of Ficus infectoria, Psidium guajava and Ficus bengalensis. Blood-biochemical profile and erythrocytic antioxidant status was monitored in all the kids at 0, 40, 80 and 120d of feeding. Supplementation of CT upto 2.0% of diet for 120d showed a significant (P0.001) improvement on the performance of kids. Total BW gain and ADG were higher (P0.001) in both CT supplemented groups than control. Feed conversion ratio was higher (P0.001) in CT-2 followed by CT-1 and CT-0, respectively. Haemoglobin, PCV, serum glucose, total protein were similar among the dietary treatments except for a reduction (P<0.01) in serum urea level in CT-fed kids. There was improvement (P<0.05) in erythrocytic antioxidant status n the CT supplemented groups evident from increased concentrations of superoxide dismutase, reduced glutathione, catalase and total thiol groups concomitant to a reduction in lipid peroxidation as compared to the control. Feeding of CT containing diets up to 2.0% level significantly (P<0.05) decreased the faecal egg counts when compared with the control group. It may be concluded that a mixture of tree leaves (containing 1–2% CT) has the potential to improve antioxidant status with an apparent negative impact on GI nematodes in kids.

034. Swain, B.K.; ICAR Research Complex for Goa, Old Goa (India). Naik, P.K.; ICAR Research Complex for Goa, Old Goa (India).Chakurkar, E.B.; ICAR Research Complex for Goa, Old Goa (India).Singh, N.P.; ICAR Research Complex for Goa, Old Goa (India). Effect of combined supplementation of probiotic and yeast on growth, carcass characteristics and economics of production in broiler chickens. Animal Nutrition and Feed Technology (India). (Jan 2012) v. 12(1) p. 103-110 KEYWORDS: BROILER CHICKENS. SUPPLEMENTARY FEEDING. SUPPLEMENTS. PROBIOTICS. YEASTS. CARCASS COMPOSITION. GROWTH RATE.
An experiment was conducted to study the effect of combined supplementation of probiotic and yeast on growth, carcass traits, organ weights and economics of production in commercial broiler chickens from 0 to 6 weeks of age. Basal diets were formulated containing maize, soybean meal and rice polish with 22.8% CP and 2900 kcal ME/kg at starter phase (0–3 weeks) and 19.9% CP and 3000 kcal ME/kg at finisher phase (4–6 weeks). The broiler chicks were fed basal diet supplemented with Improval (mixture of probiotic and yeast)

0 (T0), 0.5 (T0.5), 1.0 (T1.0) and 1.5 (T1.5) g/kg diet. Growth and feed efficiency of broilers fed T1.0 diet were better (P<0.05) than those recorded on control diet. Higher (P<0.05) dressing percent and breast yield were observed in chicks fed T1.0 diet supplemented with 1.0 g/kg supplement. The abdominal fat content was reduced (P<0.05) in the supplementated groups compared to control. The relative weights of liver, heart, spleen and bursa were higher in all the supplemented groups while that of the ceaca was reduced (P<0.05) in the birds fed T1.0 diet. Findings of the present study suggested that supplementation of probiotic and yeast mixture 1.0 g/kg diet was effective in improving performance and economics in broiler chickens.

035. Nagi, P.R.S.; College of Veterinary Science, Hyderabad (India). Department of Animal Nutrition.Reddy, D.N.; College of Veterinary Science, Hyderabad (India). Department of Animal Nutrition. Nagalakshmi, D.; College of Veterinary Science, Hyderabad (India). Department of Animal Nutrition.Ramana Reddy, Y.; College of Veterinary Science, Hyderabad (India). Department of Animal Nutrition.Raghunandan, T.; College of Veterinary Science, Hyderabad (India). Department of Animal Nutrition. Effect of particle size of paddy straw on physical characteristics and performance of lambs fed paddy straw based complete diets. Animal Nutrition and Feed Technology (India). (Jan 2012) v. 12(1) p. 111-119 KEYWORDS: LAMBS. CROP RESIDUES. RICE STRAW. COMPLETE FEEDS. NUTRIENT INTAKE. GROWTH RATE.
Three complete diets were formulated and processed into mash using paddy (Oryza sativa) straw ground through 8, 12 and 16 mm sieve as sole source of roughage at 35% level and were compared with conventional diet (concentrate mixture and chopped jowar straw, fed separately). The four diets were fed to 32 growing Deccani lambs (3–4 months) divided into four equal groups. Incorporating 8 mm or 12 mm ground paddy straw in complete diets (8PS and 12PS, respectively) increased the bulk density by 56.06 and 10.81 per cent, respectively, compared to complete diet with 16 mm (16PS) paddy straw. The average particle size of paddy straw ground through 16, 12 and 8 mm sieve was 1995.3, 1445.4 and 1202.3 m, respectively. Complete diet 16PS had more coarse (60%) and less medium and fine (40%) particle compared to other two complete diets. Complete diet 8PS had only 30% coarse particle due to fine grinding of paddy straw. The modulus of fineness of complete diet increased from 3.34 to 4.80 as the size of screen increased from 8 to 16 mm. Similarly, the average particle size in complete diets increased from 912.1 to 1687.3 with increase in screen size from 8 to 16 mm. The ADG of lambs fed complete diets 8PS and 12PS was higher (P<0.01) compared to those fed conventional diet. The nutrient efficiency was higher (P<0.01) in complete diets compared to conventional diet. It was concluded that grinding of paddy straw with 8 mm or 12 mm sieve were optimum for inclusion in complete diet in order to obtain higher growth rate in lambs. Complete diet system was economical and resulted in higher performance compared to conventional system of feeding in Deccani sheep.

L10 Animal Genetics and Breeding

036. Patel, M.; 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). PCR-RFLP of GH gene and its associations with milk-production traits in Malvi, Nimari and Frieswal cattle. Indian Journal of Animal Sciences (India). (Mar 2011) v. 81 (3) p. 263-266 KEYWORDS: CATTLE.
A study was caried out to detect polymorhism in exon V of the bovine GH gene and to find out association of polymorphism with economic traits in Malvi, Nimari and Frieswal cattle. Association was analyzed between the GH gene polymorphism at exon V (GH1 locus) and milk production traits in Malvi, Nimari and Frieswal cattle. Blood samples along with records of lactation length and lactation yield were collected randomly from 50 Malvi, 25 Nimari and 50 Frieswal lactating cows. PCR-RFLP was performed for genotyping of animals. PCR exposed 427 bp long amplicon whose restriction digestion was performed by using restriction enzyme AluI. Three genotypes, viz AA, AB and BB, were found with frequency of 0.88, 0.10 and 0.02 in Malvi; 0.76, 0.24 and 0.00 in Nimari and 0.26,072 and 0.02 in Frieswal respectively. Frequencies for gene A were 0.93, 0.88 and 0.62 and for gene B were 0.07, 0.12 and 0.38 respectively in Malvi, Nimari and Frieswal

respectively. Least square analysis revealed superiority of genotype AB over AA for lactation length (301.2±6.05 vs 285.17±5.32) and lactation yield (1542.98±77.33 vs 1438.12±68.04) among all the 3 breeds.

037. Rana, R.S. ; Navsari Agricultural University, Navsari (India).Dutt, T.; Navsari Agricultural University, Navsari (India). Amit Kumar; Navsari Agricultural University, Navsari (India).Tomar, A.K.S.; Navsari Agricultural University, Navsari (India).Mukesh Singh; Navsari Agricultural University, Navsari (India). On-farm characterization of vrindavani cattle in india. Indian Journal of Animal Sciences (India). (Mar 2011) v. 81 (3) p. 267-271 KEYWORDS: CATTLE. LAND RACES. PHENOTYPES. REPRODUCTIVE PERFORMANCE. INDIA.
Vrindavani cattle are recently developed synthetic crossbred cattle strain of India. It has the exotic inheritance of Holstein-Friesian, Brown Swiss, Jersey and indigenous inheritance of Hariana cattle. The present study was undertaken to characterize the Vrindavani cattle maintained at cattle and buffalo farm, Indian Veterinary Research Institute, Izatnagar, Bareilly, India. The physical, morphological characteristics and production performances of Vrindavani cattle were studied. The coat colour of Vrindavani was predominantly brown though some animals had black, white and beige coat colour. Head was clean cut well proportionate with prominent poll and concave forehead. The ears were medium sized, laterally orientated with round edge. Hip bone was broad and prominent with wide, smooth and level pin bone. Udder was generally trough type. These animals were docile to moderate in temperament. Morphometric measurements of males were higher than females. The mean birth weight of Vrindavani calves were 22.13±0.12 kg. The mean lactation milk yield, 305 day milk yield and peak yield was 3219.75±41.09, 3047.42±33.8 and 16.58±0.16 kg, respectively. The average age at first successful service, age at first calving, service period and dry period was 746.28±8.94, 1 012.14±9.32, and 149.54±4.55 and 99.65±5.75 days respectively.

038. Kumar, S.; National Bureau of Animal Genetic Resources, Karnal (India).Dixit, S.P.; National Bureau of Animal Genetic Resources, Karnal (India).Gupta, S.C.; National Bureau of Animal Genetic Resources, Karnal (India).Vyas, M.K.; National Bureau of Animal Genetic Resources, Karnal (India).Jagdeep Kaur; National Bureau of Animal Genetic Resources, Karnal (India). Genetic variability of growth hormone gene and its association with growth traits in sirohi breed of goat. Indian Journal of Animal Sciences (India). (Mar 2011) v. 81 (3) p. 272-275 KEYWORDS: GOATS. BREEDS (ANIMALS). GENETIC VARIATION. GROWTH.
Genetic variations in the caprine growth hormone (c-GH. Gene) were investigated by single strand conformation polymorphism (SSCP) analysis of 8 amplified fragments covering almost the entire gene (approx 2.5 kb) in 188 Sirohi goats and was associated with body weights at birth, 3, 6 and 9 months of age. SSCP analysis revealed 4 to 8 unique banding patterns across 8 studied fragments of GH. The promoter and region having exon 3 showed higher level of polymorphism with 8 variants. The fragments consisting of exon 1, exon 4 and exon 5 revealed 6 variants. SSCP patterns in the promoter region had significantly influenced the birth weight. The SSCP variants in fragments consisting of exonic regions had also influenced the body weight at different ages in breed of goat. SSCP analysis has indicated the possibility of marker assisted selection for higher body weight at different ages in Sirohi breed of goat.

039. De, A.K.; National Dairy Research Institute, Karnal (India). Malakar, Dhruba; National Dairy Research Institute, Karnal (India). A simple method of production of interspecies embryos between sheep and goat. Indian Journal of Animal Sciences (India). (Mar 2011) v. 81 (3) p. 254-256 KEYWORDS: IN VITRO FERTILIZATION. INTERSPECIFIC HYBRIDIZATION. SHEEP. GOATS.
The present study was undertaken to produce interspecies embryos between sheep oocytes and goat spermatozoa through simple method of in vitro fertilization. Sheep oocytes were collected from slaughter house derived ovaries and were matured in vitro. Goat semen was collected by artificial vagina method and was processed for removal of seminal plasma and in vitro capacitation. Interspecies embryos were produced by co-incubation of in vitro matured sheep oocytes and in vitro capacitated goat spermatozoa.

Total 89 interspecies blastocysts were produced. The study demonstrates a simple method of production of interspecies embryos between sheep and goat.

040. Kharche, S.D.; Central Institute for Research on Goats, Makhdoom (India).Goel, P.; Central Institute for Research on Goats, Makhdoom (India).Jha, B.K.; 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). Factors influencing in-vitro embryo production efficiency of caprine oocytes: A review. Indian Journal of Animal Sciences (India). (Apr 2011) v. 81 (4) p. 344-361 KEYWORDS: CAPRINAE. FERTILIZATION. IN VITRO. OVA. MATURATION.
Pre-implanted growth and development of embryo is deficient in many aspects as is evidenced by the great difficulty in growing embryos in-vitro, while maintaining viability as shown by development of early embryos in-vitro generally delayed or completely blocked at 8–16 cell stage embryo and hardly small percentage of the in-vitro fertilized embryo develop to morula and blastocyst, which is probably due to minor physio-chemical variation and lack of certain factors in the culture system. In-vitro development of mammalian embryos usually remains inferior to development than invivo produced embryos. The mechanism regulating the in-vitro acquisition of developmental competence of oocytes is still obscure. Therefore it is needed to standardize the culture conditions that mimic in-vivo embryo development. To know the exact mechanism of developing embryos, there should be a defined system that caters the needs of developing embryos. The current review describes the criteria and factors affecting in-vitro maturation, fertilization and embryo development in goa.

041. Abayawansa, W.D.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India).Prabhakar, S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India).Singh, A.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). Effect of climatic changes on reproductive performance of Murrah buffaloes in Punjab: A rertrospective analysis. Indian Journal of Animal Sciences (India). (Apr 2011) v. 81 (4) p. 334-339 KEYWORDS: WATER BUFFALOES. LAND RACES. REPRODUCTIVE PERFORMANCE. CLIMATIC CHANGE. PUNJAB.
The present study was conducted to assess the effect of climatic changes on reproductive performance of Murrah buffaloes in Punjab. Retrospective analysis of farm records of 15 years and climatic data on oestrus expression and conception interval revealed that even though buffalo calved and showed postpartum oestrus throughout the year, their seasonal pattern in postpartum oestrus incidence could be due to seasonal changes in climatic factors. Relative humidity, rainfall and vapour pressure had positive influence and air temperature and number of sunshine hours had negative influence on postpartum ovarian activity. Season of calving influenced the intervals from calving to oestrus and conception. Monsoon calving buffalo had shorter while summer and winter calving buffalo had longer intervals from calving to oestrus and conception. Parity order had negative correlations and lactation yield had positive correlations with intervals from calving to oestrus and conception. The interval from calving to oestrus was shorter than the interval from calving to conception across the season of calving, parity order and lactation yield. Therefore, it appears that climatic factors, parity order and lactation yield together with individual animal variations may have influenced the conception. However, this study suggests that further studies are required to elaborate the impact of these factors on postpartum reproductive physiology of buffalo in relation to their hormonal and metabolic environment, ovarian activity, expression of oestrus and conception during the early postpartum period.

042. Kumar, B.; West Bengal University of Animal and Fishery Sciences, Kolkata (India).Taraphder, S.; West Bengal University of Animal and Fishery Sciences, Kolkata (India).Sahoo, A.K.; West Bengal University of Animal and Fishery Sciences, Kolkata (India).Dhara, K .C.; West Bengal University of Animal and Fishery Sciences, Kolkata (India).Samanta, I.; West Bengal University of Animal and Fishery Sciences, Kolkata

(India).Misra, S.S.; West Bengal University of Animal and Fishery Sciences, Kolkata (India). Haemoglobin polymorphism and its effect on different economic traits of Garole sheep. Indian Journal of Animal Sciences (India). (Apr 2011) v. 81 (4) p. 417-419 KEYWORDS: SHEEP. POLYMORPHISM. HAEMOGLOBIN.
The aim of this study was to determine the influence of polymorph systems of hemoglobin types on prolificacy, age at first lambing and lambing interval in Garole sheep. The haemoglobin type was controlled by 2 alleles (Hb A and Hb B) in Garole sheep. Analysis of variance showed that haemoglobin polymorphism had nonsignificant effect on number of lamb in lambing. The age at first lambing for Hb AA and HB AB were almost similar. The influences of haemoglobin types on lambing interval was significant. The highest lambing interval was obtained from Hb AA types whereas the lowest lambing interval was obtained from Hb AB types. In conclusion, there were polymorphism in haemoglobin types in Garole sheep. According to the haemoglobin system, population was in genetic equilibrium. However, the presence of differences between the frequencies of the 2 alleles by categories could be a source of genetic diversity.

043. Yash Pal; National Research Centre on Equines, Bikaner (India). Arangasamy, A.; National Research Centre on Equines, Bikaner (India). Legha, R.A.; National Research Centre on Equines, Bikaner (India). Singh, J.; National Research Centre on Equines, Bikaner (India). Bansal, R.S.; National Research Centre on Equines, Bikaner (India). Khurana, S.K.; National Research Centre on Equines, Bikaner (India). Tandon, S.N.; National Research Centre on Equines, Bikaner (India). Freezability and fertility of Marwari stallion semen. Indian Journal of Animal Sciences (India). (May 2011) v. 81 (5) p. 445-447 KEYWORDS: STALLIONS. SEMEN. SEMEN PRESERVATION. FREEZING. BIOLOGICAL PRESERVATION.
Variations in freezability of extended raw semen between individual stallions and rate of conception with cryopreserved semen were studied. Semen was collected through artificial vagina (AV) from 14 Marwari stallions (4 collections each) of 4 organized farms. The semen was filtered through a sterilized gauge for removing gel and volume was recorded. Gel free semen was used for evaluation of certain physical and morphological characteristics like initial motility, progressive motility, pH, colour and consistency of semen and total sperm concentration adopting standard methods. Ejaculates with more than 60% progressively motile sperm were further used for freezing using Bio-med planner. Straws were thawed at 37°C for 1 min in water bath and evaluated for post-thaw motility. Out of 14 stallions studied, the freezability of semen was observed as good, moderate and poor on the basis of post-thaw motility in 6, 5 and 3 stallions, respectively. A total of 98 estrus mares were monitored with ultrasonography from third day of estrus to the time of ovulation and inseminated near to ovulation using the frozen semen. One, two, three and four AI per cycle were performed in 32, 59, 4 and 3 mares depending upon the expected time of ovulation with conception rate as 31, 47, 75 and 100%, respectively. It is concluded that semen of all the stallions do not freeze alike and for optimum conception rate at least 2 to 3 AI per cycle in mares is preferred.

044. Tantia, M.S.; National Bureau of Animal Genetic Resources, Karnal (India).Vijh, R.K.; National Bureau of Animal Genetic Resources, Karnal (India).Bhasin, V.; Indian Council of Agricultural Research, New Delhi (India). Animal Science Division,Sikka, P.; Central Institute for Research on Buffaloes, Hisar (India).Vij, P.K.; National Bureau of Animal Genetic Resources, Karnal (India).Kataria, R.S.; National Bureau of Animal Genetic Resources, Karnal (India). Mishra, B.P.; National Bureau of Animal Genetic Resources, Karnal (India).Yadav, S.P.; National Bureau of Animal Genetic Resources, Karnal (India).Pandey, A.K.; National Bureau of Animal Genetic Resources, Karnal (India).Sethi, R.K.; Central Institute for Research on Buffaloes, Hisar (India).Joshi, B.K.; National Bureau of Animal Genetic Resources, Karnal (India).Gupta, S.C.; Indian Council of Agricultural Research, New Delhi (India). Animal Science Division, Pathak, K.M.L.; Indian Council of Agricultural Research, New Delhi (India). Animal Science Division,. Whole-genome sequence assembly of the water buffalo (Bubalus bubalis). Indian Journal of Animal Sciences (India). (May 2011) v. 81 (5) p. 38-00 KEYWORDS: WATER BUFFALOES. GENOMES. NUCLEOTIDE SEQUENCE.
The buffalo is an integral part of agriculture, particularly within the continent of Asia, providing a source of milk, meat, skin, hides, fertilizer, fuel, and draft power. The efficiency of this animal, compared to that of

cattle, is higher in this region, though little is known about genome sequence of buffalo. The first version of assembly of a single female Murrah buffalo was constructed with Illumina paired end and mate pair short read sequencing using the cattle genome (Btau 4.0 assembly) as a reference. The assembly has read depth of 17-19X. The buffalo assembly represents 91%-95% coverage in comparison to the cattle assembly Btau 4.0. The assembly has 185,150 contigs with the median contig length of 2.3 Kb and the largest contig length of 663 Kb. The mitochondrial genome is fully covered by a single contig. Whole genome comparison between this assembly and of cattle revealed 52 million mismatches/indels. The present analysis also unveils about 300 structural variants in the buffalo genome. The buffalo assembly has been integrated into a publically available genome browser with tracks for read pair insert distances, read depth, nucleotide variations, coverage, and the availability of custom tracks for scientific community. This assembly of the Water Buffalo is the first deep sequencing project that provides the resources to better understand the genomic basis of adaptable traits and genetic variation that distinguishes buffalo from cattle.

045. Pandey, A.K.; National Bureau of Animal Genetic Resources, Karnal (India).Sharma, Rekha; National Bureau of Animal Genetic Resources, Karnal (India).Singh, L.V.; National Bureau of Animal Genetic Resources, Karnal (India).Maitra, A.; National Bureau of Animal Genetic Resources, Karnal (India).Mishra, B.P.; National Bureau of Animal Genetic Resources, Karnal (India). Microsatellite based genetic characterization of Motu cattle. Indian Journal of Animal Sciences (India). (May 2011) v. 81 (5) p. 519-520 KEYWORDS: CATTLE. BREEDS (ANIMALS). LAND RACES. MICROSATELLITES. GENETIC VARIATION. INDIA.
The study was conducted to estimate the genetic variability in Motu cattle population by microsatellite markers. Significant level of variability in Motu cattle is indicative of a valuable reservoir of genetic diversity in this breed. High mean number of alleles (10.04) per locus showed sufficient allelic diversity in the population. The mean observed heterozygosity in the population was 0.660, reflecting reasonable within breed genetic diversity. Population showed heterozygote deficiency (F = 0.113).

046. Balasundaram, B.; National Dairy Research Institute, Karnal (India).Dairy Cattle Breeding Division.Gupta, A. K.; National Dairy Research Institute, Karnal (India).Dairy Cattle Breeding Division. Dongre, V. B.; National Dairy Research Institute, Karnal (India).Dairy Cattle Breeding Division.Mohanty, T.K.; National Dairy Research Institute, Karnal (India).Dairy Cattle Breeding Division. Sharma, P.C.; National Dairy Research Institute, Karnal (India).Dairy Cattle Breeding Division.Khat Keviletsu; National Dairy Research Institute, Karnal (India).Dairy Cattle Breeding Division.Singh, R.K.; National Dairy Research Institute, Karnal (India).Dairy Cattle Breeding Division. Influence of Genetic and Non-Genetic Factors on Incidence of Calving Abnormalities in Karan Fries Cows. Indian Journal of Animal Research (India). (Mar 2011) v. 45(1) p. 26-31 KEYWORDS: COWS. CROSSBREDS. DYSTOCIA. REPRODUCTIVE DISORDERS. GENETICS.
In the present investigation, the effect of genetic and non-genetic groups on the incidence of calving abnormalities has been studied. The present study revealed that overall incidence of abortion, still birth and dystocia in Karan Fries cows was 3.31, 4.60 and 3.84%, respectively for first calvers and 7.67, 4.51 and 3.32%, respectively for all calvers. The effect of genetic group was found to be non-significant for all the calving abnormalities in both all calvers and in first calvers. The effect of season of calving on all calving abnormalities was found to be non-significant in both all calvers and first calvers. The cows with abortion had non-significant effect on calving interval, service period and dry period while significant effect was found on 305-days milk yield, total milk yield and lactation length. The effect of still birth on production and reproduction traits was non-significant except lactation length. The effect of dystocia was found to be non-significant for all the production and reproduction traits except on 305 day milk yield.

047. Singh, L. V.; National Bureau of Animal Genetic Resources, Karnal (India).Core labSharma, Rekha; National Bureau of Animal Genetic Resources, Karnal (India).Core labPandey, A. K.; National Bureau of Animal Genetic Resources, Karnal (India).Core labTripathi, V.; M. J. P. Rohilkhand University, Bareilly (India). Department of Animal Science.Maitra, A.; National Bureau of Animal Genetic Resources, Karnal (India).Core

labMishra,B.P.; National Bureau of Animal Genetic Resources, Karnal (India).Core lab. Genetic variation in CAPN1 gene in Sirohi breed goat. Indian Journal of Veterinary Researh (India). (Dec 2012) v.21(2) p. 1-4 KEYWORDS: GENES. GENETIC VARIATION. GOATS.
A fragment of 1586bp of caprine gene, previously associated with meat tenderness in cattle, was analyzed using direct DNA sequencing. A total 45 variations were identified in CAPN1 gene and compared with that of Bos taurus (AF252504S1). These variations can be used in further research for association between gene polymorphisms and goat meat quality traits.

048. Mandal, D. K.; Project Directorate on Cattle, Meerut Cantt (India).Tiwari, S. K.; Project Directorate on Cattle, Meerut Cantt (India).Sharma, Ankur; Project Directorate on Cattle, Meerut Cantt (India).Roy, B. K.; Project Directorate on Cattle, Meerut Cantt (India).Kumar, Mahesh; Project Directorate on Cattle, Meerut Cantt (India).Tyagi, S.; Project Directorate on Cattle, Meerut Cantt (India). Effect of non genetic factors on growth characteristics of Frieswal crossbred bulls. Indian Journal of Veterinary Researh (India). (Dec 2012) 21(2) p. 11-16 KEYWORDS: BULLS.CROSSBREDS. BODY WEIGHT. SURFACE AREA. GROWTH.
The objective of the study was to establish baseline information on body weight, growth rate and body development of Frieswal crossbred bulls and to find out various non-genetic factors effect on growth pattern. The mean body weight of bull calves aged 3, 6 and 12 months were 83.45±4.79, 122.36±2.61 and 206.91±4.56 kg, respectively. At 18 months (age of induction for semen collection) young bulls attained 57% of mature body weight (550 kg). The body weight showed continuous enhancement up to 6.5 years, thereafter declined at 7 years of age, indicating onset of senility between 6.5 to 7 years. Age and season significantly affected average daily body weight gain (ADG in g/d) and average daily increase in body surface area (BSA in cm2/d). In young bulls ADG and daily enhancement in BSA were significantly (P<0.01) higher compared to adult bulls. Body weight and BSA increased with age advancement, however, ratio of BSA to unit body weight (BSA/Kg) gradually decreased. Seasons significantly (P<0.05) influenced growth patterns of young bulls, being significantly higher during winter, followed by summer and rainy seasons. Trends of seasonal influence on ADG and enhancement in BSA in mature bulls (37-92 months) were also similar to that of young bulls. Season of birth of bull calves showed no significant impact on growth rate of young bulls. Age of bull showed significant (P<0.01) positive relationship with body weight and BSA, however, negative relationship with BSA/kg of body weight.

049. Hussain, Jakir; Assam Agricultural University, Guwahati (India). College of Veterinary ScienceRoychoudhury, R.; Assam Agricultural University, Guwahati (India). College of Veterinary ScienceDas, G.C.; Assam Agricultural University, Guwahati (India). College of Veterinary ScienceMili, D.C.; Assam Agricultural University, Guwahati (India). College of Veterinary ScienceGoswami, R.N.; Assam Agricultural University, Guwahati (India). College of Veterinary Science. Age At First Calving of Assam Local Cattle and Their Crosses With Jersey and Holstein Friesian Under Field Condition . Indian Journal of Animal Research (India). (Mar 2011) v. 45(1) p. 70-72 KEYWORDS: CATTLE. CROSSBREDS. AGE. PARTURITION.
The least square means of age at first calving for Jersey X Local, Holstein Friesian X Local and Local cattle of Assam under field condition were 36.526 ± 0.576, 39.972 ± 0.641 and 46.719 ± 0.674 months, respectively. Effect of genetic group on this trait was highly significant (P<0.01). The Jersey X Local cows had significantly lowest age at first calving than Holstein Friesian X Local and Local cows. The effect of season of birth on age at first calving was also highly significant (P<0.01). Cows born in summer monsoon (March to May) and South West monsoon (June to September) seasons had significantly longer age at first calving than those born in post monsoon (October to November) and winter (December to February) seasons.

050. Parmar, V.R.; College of Veterinary Science and Animal Husbandry,Sardarkrushinagar (India).Department of Gynaecology and Obstetrics.Suthar, B.N.; College of Veterinary Science and Animal Husbandry,Sardarkrushinagar (India).Department of Gynaecology and Obstetrics.Nakhashi, H.C.; College of Veterinary Science and Animal Husbandry,Sardarkrushinagar (India).Department of Gynaecology and

Obstetrics.Parikh, S.S.; College of Veterinary Science and Animal Husbandry,Sardarkrushinagar (India).Department of Gynaecology and Obstetrics.Chauhan, P. M.; College of Veterinary Science and Animal Husbandry,Sardarkrushinagar (India).Department of Gynaecology and Obstetrics. Study on physical characteristics of Mehsana buck semen. Indian Journal of Animal Research (India). (Sep 2011) v. 45(3) p. 207-210 KEYWORDS: GOATS. SEMEN. SEMEN COLLECTION.
Seventy eight ejaculates from 3 adult Mehsana bucks were collected twice daily with the help of artificial vagina. Creamy semen color was the characteristic feature throughout the study. The average mean values for physical constituents were: ejaculate volume 0.84 + 0.02 ml, seminal pH 6.82 + 0.01, mass motility (0–5 scale) 4.03 + 0.06, individual motility 85.73 + 0.43 per cent, live sperm count 89.17 + 0.51 per cent, abnormal sperm count 5.52 + 0.22 per cent and total sperm concentration 3099.10 + 59.48 (×106/ml). Overall semen quality of Mehsana breed was found optimum for use in breeding programme.

051. Singh, C. B.; G. B. Pant University of Agriculture and Technology, Pantnagar (India). Department of Genetics and Animal BreedingJilani, M.H; G. B. Pant University of Agriculture and Technology, Pantnagar (India). Department of Genetics and Animal Breeding. Inheritance of six-week body weight, shank length, keel bone length and breast angle in broiler chickens. Pantnagar Journal of Research (India). (Jul-Dec 2008) v.6(2) p.279-280 KEYWORDS: BODY WEIGHT. ANIMAL BREEDING. BROILER CHICKENS. HERITABILITY.
Data on 420 chicks of CARI-DHANRAJA produced from 80 dams and 20 sires were utilized for estimation heritability and correlations. The heritability estimates for early body weight and conformation traits were low but medium for weight at 6 weeks of age. Most of the genetic and phenotypic correlations among the traits were positive and significant.

052. Vijay Kumar; G. B. Pant University of Agriculture and Technology, Pantnagar (India). Department of Livestock Production and ManagementRavindra Kumar; Bihar Veterinary College, Patna (India). Department of Animal Breeding and Genetics. Verma, S. B.; G. B. Pant University of Agriculture and Technology, Pantnagar (India). Department of Livestock Production and ManagementPrasad, Sushil; Bihar Veterinary College, Patna (India). Department of Animal Breeding and Genetics. Praveen Kumar; Ranchi Veterinary College, Kanke, Ranchi (India). Department of Medicine. Study on effect of genetic and non-genetic factors on birth weight in pigs. Pantnagar Journal of Research (India). (Jan-Jun 2010) v.8(1) p.108-111 KEYWORDS: BIRTH WEIGHT. SWINE. GENETICS. MEAT PRODUCTION.
The average birth weights (kg) of Desi, Tamworth and T&D were estimated to be 0.64±0.04, 0.97±0.03 and 1.05±0.03 respectively. Genetic group, season of birth and parity of dam had significant ($P<0.01$) effect on birth weight in pigs. Litter size at birth had also significant ($P<0.05$) effect on it. However, sex did not influence birth weight significantly. T&D and Tamworth breeds had significantly ($P<0.05$) heavier birth weights (0.41 kg and 0.33 kg) than Desi pigs respectively. T&D had also 0.07 kg higher birth weight than Tamworth but the differences were observed to be non-significant. Winter farrowing had the highest birth weight which was significantly ($P<0.05$) higher by 0.213 kg, 0.226 kg and 0.243 kg than rainy, autumn and summer seasons of farrowing, respectively. The heaviest birth weight was observed to be at 4th parity which did not differ significantly with the average birth weight of 7th parity. The mean birth weight at 7th parity was significantly ($P<0.05$) heavier by 0.250 kg, 0.261 kg, 0.213 kg, 0.192 kg, 0.165 kg and 0.222 kg than 1st, 2nd, 3rd, 5th, 6th and 8th parities. Birth weight significantly ($P<0.05$) decreased with increase in litter size at birth in all farrowings.

L20 Animal ecology

053. Roy, Saikat; Orissa University of Agriculture and Technology, Bhubaneswar (India). Faculty of Veterinary Science and Animal Husbandry.Mishra, S.C.; Orissa University of Agriculture and Technology, Bhubaneswar (India). Faculty of Veterinary Science and Animal Husbandry. Effect of antistress agents on haemato-

biochemical profiles of broiler and breeder hen during summer. Veterinary World (India). (Feb 2011) v.4(2) p. 60-63 KEYWORDS: BROILER CHICKENS. HENS. STRESS. BLOOD. BLOOD COMPOSITION.
An experiment was carried out to evaluate the effect of five commonly used antistress agents on haemato-biochemical profiles of broiler and broiler breeder hen. In case of broiler, significant differences were observed between treatment groups for haemoglobin concentration, total RBC and total WBC count, total blood glucose, total serum protein, total serum albumin, total alkaline phosphatase activity and total serum cholesterol level. No definite trend was observed amongst the treatment groups and control for total blood glucose content and total alkaline phosphatase activity. It is apparent that the groups fed with antistress agents like Stress roak and Venlyte had lowest serum cholesterol level compared to other groups. In case of broiler breeder hen difference between treatment groups were significant for haemoglobin content, but not for total RBC and WBC count. Differences between treatment groups although were not significant statistically for total serum protein, however differences between treatment groups were highly significant for total blood glucose.

L40 Animal Structure

052. Rajesh Ranjan; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India).Sharma, A.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Opinder Singh,; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India).Bansal, N.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Histogenesis of thyroid gland in buffalo. Indian Journal of Animal Sciences (India). (Apr 2011) v. 81 (4) p. 377-379 KEYWORDS: WATER BUFFALOES. ANIMAL MORPHOLOGY. THYROID GLAND.
present study was conducted to study histogenesis of thyroid gland in buffalo fetuses (n=11) ranging from 5.2 cm (52 days) to 65.0 cm (220 days) curved crown rump length (CVRL). The parenchyma of thyroid gland comprised randomly arranged undifferentiated mesenchymal cells with large number of blood vessels up to 13.7 cm CVRL (90 days). Initiation of follicular arrangement was observed in some of the developing follicles at 20 cm CVRL (119 days). The resorption vacuoles appeared in the colloid at 28.0 cm CVRL (137 days) and invasion of connective tissue in the parenchyma of gland was observed. Ultimo-bronchial follicles were observed at 25 to 28 cm CVRL (130–137 days) and C-cells at 65 cm CVRL (220 days).

053. Maya, S.; College of Veterinary and Animal Sciences, Mannuthy (India). Department of Veterinary Anatomy and Histology,Chungath, J.J.; College of Veterinary and Animal Sciences, Mannuthy (India). Department of Veterinary Anatomy and Histology,Harshan, K.R.; College of Veterinary and Animal Sciences, Mannuthy (India). Department of Veterinary Anatomy and Histology,Ashok, N.; College of Veterinary and Animal Sciences, Mannuthy (India). Department of Veterinary Anatomy and Histology,. Histological Changes in the Sacral Region of Spinal Cord in Goat Foetuses. Indian Journal of Animal Research (India). (Mar 2011) v. 45(1) p. 18-25 KEYWORDS: GOATS. FOETUS. HISTOPATHOLOGY. ANIMAL MORPHOLOGY. SPINAL CORD.
Prenatal development of sacral region of spinal cord in goat was studied using 52 foetuses of various age groups. The region was with prominent dorsal horn and also presented reticular formation. Sacral nucleus of Stilling and prominent substantia gelatinosa were seen at the first sacral segment. First and second segments showed a lateral horn and wide ventral horn. Fourth segment presented dispersed nuclear aggregations and decreased white matter. Central canal was narrow at the first sacral segment; elongated at the second segment; and wider at fourth segment. White matter of sacral segments exhibited an undivided dorsal funiculus and medial longitudinal fasciculus from second month onwards. Other tracts bordering the ventral median fissure and spinocerebellar tracts were seen from fourth month onwards.

054. Mandal, D. K.; Project Directorate on Cattle, Meerut Cantt (India).Mathur, A. K.; Project Directorate on Cattle, Meerut Cantt (India).Tyagi, S.; Project Directorate on Cattle, Meerut Cantt (India). Prediction of

paired testicular weight in Holstein Friesian X Sahiwal crossbred bulls. Indian Journal of Veterinary Research (India). (Dec 2012) v.21(2) p. 5-10 KEYWORDS: CROSSBREDS. BULLS. TESTES. WEIGHT.
The objective of the study was to develop suitable estimation procedure of testicular weight in Holstein Friesian x Sahiwal crossbred bulls. The best predictive regression model for predicting paired testicular weight (PTW) was Yptw= 12.13*SC+27.22*AvTL-177.57 (R2 =0.58); right testicular weight (Yrtw) was Yrtw=12.41*RL+26.90*RW-41.03 (R2 =0.56) and that of left testicular weight (Yltw) was Yltw = 20.62*LL+24.78 (R2 =0.56), where SC= scrotal circumference, AvTL= average testicular length, RL= right testicular length, RW= right testicular width and LL= left testicular length, respectively. Predictive efficacy of present equations was compared with other available methods/ models and proved better. The average error and average absolute error for prediction of paired testicular weight was 9.49% and 10.68%, respectively. The correlation coefficient between the estimated and actual (observed) testicular weight was 0.87 ($P<0.05$). It was concluded that above equations are effective for predicting testicular weight in Holstein Friesian x Sahiwal crossbred bulls.

056. Kadam, S.D.; College of Veterinary and Animal Sciences, Parbhani (India)Bhosle, N.S.; College of Veterinary and Animal Sciences, Parbhani (India)Kapadnis, P.J.; College of Veterinary and Animal Sciences, Parbhani (India). Comparative Histological Study of Caecum in Cattle, Sheep and Goat. Indian Journal of Animal Research (India). (Mar 2011) v. 45(1) p. 67-69 KEYWORDS: INTESTINES. CATTLE. SHEEP. GOATS. ANIMAL MORPHOLOGY.
Comparative histology of the caecum of adult cattle,sheep and goat was studied. Caecum of all three animals consisted of four layers namely tunica mucosa, tela submucosa,tunica muscularis and tunica serisa. Intestinal glands were mostly located at base region of tunica mucosa. In caecum of goat mucus secreting intestional glands were present in the close vicinity of lamina muscularis and serous secreting glands were present at apical end of tunica mucosa. Tela submucosa was largest in cattle as compared to sheep and goat. Aggregated lymphatic nodules are present in caecum of sheep in the vicinity of lamina muscularis. In caecum of goat tunica serosa was a loose connective tissue.

057. Tomar, M.P.S.; College of Veterinary science and Animal Husbandry, Jabalpur (India).Department of Veterinary Anatomy and Histology.Vaish, R.; College of Veterinary science and Animal Husbandry, Jabalpur (India).Department of Veterinary Anatomy and Histology.Parmar, M.L.; College of Veterinary science and Animal Husbandry, Jabalpur (India).Department of Veterinary Anatomy and Histology.Shrivastav, A. B.; College of Veterinary science and Animal Husbandry, Jabalpur (India).Department of Veterinary Anatomy and Histology.Tiwari, Yogita; College of Veterinary science and Animal Husbandry, Jabalpur (India).Department of Veterinary Anatomy and Histology. Gross morphometrical studies of sternum of pariah kite (Milvus migrans). Veterinary World (India). (Apr 2011) v.4(4) p. 171-172 KEYWORDS: EAGLES. ANIMAL MORPHOLOGY. STERNUM.
The sternum of an adult Pariah kite (Milvus migrans) was studied for its gross morphometry. It was procured from Department of Wildlife Health and Management. The sternum of Pariah Kite was in the form of quadrilateral plate with dorsal, concave surface and ventral, convex surface. It formed the thoracic floor and was directed backwards and downwards in an oblique manner. The length and width of sternum were 6.00 cm and 4.20 cm., respectively. Ventral projection, the carina was in the form of thin curved plate, the height of which decreased from before backwards. It was 6.00 cm long, 1.30cm wide and 0.30cm thick (at anterior end). Anterior border was triangular and had an elongated facet on either side for articulation with distal extremity of the coracoids. The caudolateral angles were prominent. At the medial aspect of caudolateral angles a small oval, translucent area covered with a thin membrane was present.

058. Prabhavathi, M.; Madras Veterinary College, Chennai (India). Department of Veterinary Anatomy and Histology,Basha, Sabiha Hayath; Madras Veterinary College, Chennai (India). Department of Veterinary Anatomy and Histology,Venkatesan, S.; Madras Veterinary College, Chennai (India). Department of

Veterinary Anatomy and Histology, Leela, V.; Madras Veterinary College, Chennai (India). Department of Veterinary Anatomy and Histology,Ramesh, Geetha; Madras Veterinary College, Chennai (India). Department of Veterinary Anatomy and Histology,. Electron microscopical study of adrenal gland in guinea fowl. Indian Journal of Animal Research (India). (Sep 2011) v. 45(3) p. 215-218 KEYWORDS: GUINEA FOWL. MICROSCOPY. ADRENAL GLANDS.
The ultrastructure of adrenal gland of guinea fowl was recorded by using scanning and transmission electron microscopy. The parenchyma of adrenal gland constituted mainly of three components, namely cortical or interrenal tissue, medullary or chromaffin tissue and vascular sinusoids. Four types of cells viz., type-I, II, III and IV were identified in adrenal cortex by transmission electron microscopy. In scanning electron microscopy the cortical cells showed blebs, cords, globules and cord like aggregates on their surface. In transmission electron microscopical observation, three types of cells were identified in medullary tissue of adrenal gland viz., Adrenaline cells, nor adrenaline cells and stellate shaped satellite cells. In scanning electron microscopical observation, the medullary cells were granular filamentous structure and showed prominent microvillus like projection on their surface.

059. Das, S.; G.B. Pant University of Agriculture and Technology, Pantnagar (India). Department of Anatomy. Dhote, B.S; G.B. Pant University of Agriculture and Technology, Pantnagar (India). Department of Anatomy. Singh, G.K.; G.B. Pant University of Agriculture and Technology, Pantnagar (India). Department of Anatomy. Pandey, Mansi; G.B. Pant University of Agriculture and Technology, Pantnagar (India). Department of Anatomy. Gross morphometrical and biometrical studies on the Gizzard of Kadaknath fowl. Pantnagar Journal of Research (India). (Jul-Dec 2010) v.8(2) p.212-215 KEYWORDS: BIOMETRY. GIZZARD. POULTRY. DIGESTIVE SYSTEM. ANIMAL MORPHOLOGY.
The study was conducted on 24 birds of Kadaknath breed of fowl. The birds were divided into four age groups of 0, 7, 28,112 days old birds with 6 birds in each group. Five birds from each group were used for gross and histomorphological studies and one bird was used for ultrastructural studies. Gizzard was dense, thick, muscular, flattened, rounded and biconvex disc shaped organ having two lateral surfaces and a circumference. The inner hard cornified layer was pale, yellowish, in colour with thick, tough, horny lining and was raised into ridges. Gross morphological parameters like length, weight, volume, diameter, cross sectional area and maximum and minimum wall thickness of gizzard were studied. It was found that as the age of the birds advanced all the gross parameters also showed a increasing trend. The transeverse diameter, maximum and minimum wall thickness increased as the age of the birds advanced. Volume and the cross sectional area of gizzard also showed increasing values as the age of the birds advanced due continuous development.

060. Pandey, Mansi; G. B. Pant University of Agriculture and Technology, Pantnagar (India). Department of AnatomyDhote, B.S.; G. B. Pant University of Agriculture and Technology, Pantnagar (India). Department of Anatomy. Gross morphological studies in liver of Kadaknath Fowl. Pantnagar Journal of Research (India). (Jan-Jun 2010) v.8(1) p.97-100 KEYWORDS: ANIMAL MORPHOLOGY. LIVER. POULTRY. POULTRY FARMING.
Gross morphological studies were conducted in four post natal age groups of Kadaknath fowl comprising of day-old, 7, 28, and 112 days old adult birds, with 6 birds in each group. The liver of Kadaknath fowl consisted of a larger right lobe and a smaller left lobe. The live body weight, liver weight and volume and other gross morphometrical observations like longitudinal and transverse diameter, circumference and cross-sectional area were recorded. The liver filled most of the cranial and middle regions of the body cavity. The liver was accommodated in the hepatoperitonial sac. Yellow colour of the liver in day old birds changed to reddish brown as the age advanced. The relative liver weight reached maximum at first week of age and decreased thereafter.

L50 Animal Physiology and Biochemistry

061. Sharma, A.K.; Rajasthan Agricultural University, Bikaner (India).Kataria, Nalini; Rajasthan Agricultural University, Bikaner (India). Effect of extreme hot climate on liver and serum enzymes in marwari goats. Indian Journal of Animal Sciences (India). (Mar 2011) v. 81 (3) p. 293-295 KEYWORDS: GOATS. HEAT STRESS. LIVER. ENZYME ACTIVITY.

A study was conducted to investigate liver and serum enzymes i.e. aspartate amino transferase (AST) and alanine amino transferase (ALT) during moderate (Jan/Feb) and extreme (May/ June) climatic conditions in three hundred Marwari goats. In each climatic condition, 150 animals were taken. They were categorized in to males (70 of 0-1 year, and 30 of above 1 year) and females (30 of 0-1 year, and 20 of above 1 year). Blood samples were collected aseptically using EDTA containing vials and after separation of serum the serum transaminases were determined. Liver tissues were collected after slaughter of the animal and all the analyses were carried out at the same day of collection of fresh sample. Liver AST and ALT (IU/L) ranged from 210.56 to 610.10 (average 579.65±11.33) and from 170.11 to 562.70 (average 402.09±21.34), respectively. Serum AST and ALT ranged from 56.70 to 215.00 (average 186.76±7.87) and from 20.15 to 85.77 (average 57.54±1.24), respectively. Season had significant ($P<0.05$) effect on both liver and serum ALT. Liver ALT showed significant ($P<0.05$) effect on sex in both climatic conditions and age group in moderate climatic condition. Higher values were observed in liver AST and ALT in males in comparison to females in both climatic conditions. Higher values of liver AST and ALT were observed in 0–1 year age group animals than above 1 year age group in both climatic conditions except in extreme climatic condition values of ALT observed higher in above 1 year age group animals. Serum AST showed significant ($P<0.05$) effect of sex in both climatic conditions but mean while, serum ALT showed significant ($P<0.05$) effect on age group in extreme climatic condition only. Higher values of serum AST was observed in male while serum ALT values were higher in female of both climatic conditions.

062. Vohra, V.; National Bureau of Animal Genetic Resources, Karnal (India).Chakravarty, A.K.; National Bureau of Animal Genetic Resources, Karnal (India).Singh, A.; National Bureau of Animal Genetic Resources, Karnal (India).Gupta, I.D.; National Bureau of Animal Genetic Resources, Karnal (India).Chopra, A.; National Bureau of Animal Genetic Resources, Karnal (India).Dubey, P.P.; National Bureau of Animal Genetic Resources, Karnal (India).D Kumar; National Bureau of Animal Genetic Resources, Karnal (India). Association of leptin gene polymorphism with 305 days milk yield in Karan Fries cattle. Indian Journal of Animal Sciences (India). (Apr 2011) v. 81 (4) p. 388-390 KEYWORDS: CATTLE. CROSSBREDS. BLOOD PROTEINS. WEIGHT GAIN. GENETIC POLYMORPHISM. LACTATION DURATION.

Leptin protein is synthesized by adipose tissue and is involved in regulation of milk yield. We investigated the association of genetic polymorphism in the bovine leptin gene with 305 days milk yield for the first 3 lactations. The study was conducted on 209 lactating Karan Fries cattle with known pedigree belonging to 3 genetic groups at an organized herd. All the cattle were genotyped by PCR-RFLP assay, and 3 genotypes, viz. TT, TC and CC were identified in the exon-2 region of leptin gene. Representative PCR products of the genotyped animals were sequenced across the polymorphism. Karan Fries cattle with TT genotype showed significantly higher 305 days milk yield as compared to cattle with CC genotype.

063. Himani Singh; Indian Veterinary Research Institute, Izatnagar (India).Naveen Kumar; Indian Veterinary Research Institute, Izatnagar (India).Sharma, A.K.; Indian Veterinary Research Institute, Izatnagar (India).Kataria, Meena; Indian Veterinary Research Institute, Izatnagar (India).Munjal, Ashok; Indian Veterinary Research Institute, Izatnagar (India). In-vitro study of matrix metalloproteinases in decellularized extracellular matrix of bovine diaphragm. Indian Journal of Animal Sciences (India). (May 2011) v. 81 (5) p. 453-455 KEYWORDS: BOVINAE. DIAPHRAGM. ELECTROPHORESIS. IN VITRO EXPERIMENTATION.

The present study was undertaken for the identification of matrix metalloproteinases (MMPs) in the extracts obtained from a multi-step detergent-enzymatic extraction process involving 2 types of anionic and non-ionic detergents from bovine diaphragm and their possible involvement in the degradation of these biological materials. Anionic biological detergents treated bovine diaphragm expressed no band in SDS-PAGE analysis

but non-ionic treated bovine diaphragm expressed almost similar bands as that of untreated treated bovine diaphragm. In gelatin zymography, anionic treated biomaterial expressed a 25 KDa band of MMPs, but in non-treated and non-ionic treated bovine diaphragm no band of MMPs was expressed. Anionic detergents played an important role in the removal of cells from bovine diaphragm and increasing MMPs activity in biomaterials as compared to non-ionic detergents.

064. Singh, R.; Sher-e-Kashmir University of Agricultural Science and Technology, Jammu (India).Singh, J.; Sher-e-Kashmir University of Agricultural Science and Technology, Jammu (India). Iodine status of crossbred cattle from Shiwalik and middle mountains of north-west Himalayas. Indian Journal of Animal Sciences (India). (May 2011) v. 81 (5) p. 456-458 KEYWORDS: CATTLE. CROSSBREDS. IODINE. TRACE ELEMENTS. THYROID HORMONES. HIMALAYAN REGION.
Base-line survey was conducted in the Jammu division of Jammu and Kashmir state involving 6 districts under different agro-climatic zones to know the iodine status of crossbred (Taurus x indicus) cattle. Plasma blood samples (252) were collected from crossbred cattle of different age groups from 60 villages. Plasma inorganic iodine (PII) along with thyroid hormones estimation was done. Average value of PII, triiodothyronine (T3) and thyroxine (T4) in cattle were 0.63±0.11nmol/l and 58.10±4.21 nmol/l, respectively. Sub-clinical iodine deficiency was observed in 91.66% animals as 44.44% crossbred cattle were marginally deficient having plasma inorganic iodine (PII) levels 50–104.90 ng/l and 47.22% animals were having low levels (50 ng/ml) of PII thus indicating dietary deficiency of iodine. Triiodothyronine and thyroxine levels were poorly related to iodine status thus indicated that thyroid hormones are not the true index of sub-clinical deficiency.

065. R Singh,; Sher-e-Kashmir University of Agricultural Science and Technology, Jammu (India).Singh, R.; Department of Animal Husbandry, Jammu (India).Kumar, T.; Sher-e-Kashmir University of Agricultural Science and Technology, Jammu (India). Macromineral status of buffaloes (Bubalus bubalis) and fodders from Jammu. Indian Journal of Animal Sciences (India). (May 2011) v. 81 (5) p. 527-530 KEYWORDS: WATER BUFFALOES. NUTRIENTS. JAMMU AND KASHMIR. MINERAL CONTENT.
To know the status of calcium, phosphorous, magnesium,sodium and potassium in buffaloes (Bubalus bubalis) a baseline survey was conducted in 3 agro-climatic zones of Jammu division in Jammu and Kashmir having mean height ranging from 300–4000 m above MSL. Blood samples (193) from buffaloes of various age groups were collected and analyzed. The average values of Ca, Pi, Mg, Na and K were 9.45±0.18 mg/dl, 5.06±0.13 mg/dl, 2.69±0.06 mg/dl, 141.09±1.50 mEq/ l and 4.59±0.05 mEq/l, respectively. Based on plasma level Ca, Pi, Mg, Na and K deficiencies were observed in 34.22, 29.72, 3.22, 34.64 and 14.37% buffaloes, respectively. Analysis of fodder samples also revealed that 35.29% of Sorgum spp., 42.85% berseem (Trifolium alexandrium), 52.63% maize (Zea mays. L.), 50% bajra (Pennisatum typhoides), 100% fodder tree leaves, 86.20% local grass, 97.61% wheat straw, 60.86% paddy straw, 25% green oats and 75% green wheat samples were deficient in phosphorous content. Whereas, potassium was deficient in 100% of Sorgum spp., 81.81% berseem, 88.23% maize, 90% bajra, 88.88% fodder tree leaves, 96.15% local grass, 90% wheat straw and 88.23% paddy straw samples. Sodium level of the fodder samples was adequate as per NRC requirements.

L51 Animal physiology – Nutrition

066. Divya; 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 undegradable dietary protein levels and plane of nutrition on feed intake, water metabolism and blood-biochemical constituents in crossbred heifers. Indian Journal of Animal Sciences (India). (May 2011) v. 81 (5) p. 484-487 KEYWORDS: HEIFERS. CROSSBREDS. FEED INTAKE. FEEDING LEVEL. RUMEN DIGESTION. WATER METABOLISM.

An experiment was conducted on crossbred heifers (16), 15 to 19 months old, randomly divided into 4 groups of 4 each in a 2 × 2 factorial completely randomized design. The heifers were fed 4 dietary treatments for 116 days involving 2 levels of UDP (RDP: UDP ratio of 50: 50 and 60: 40) at 2 levels of feeding (100 and 115%, NRC 1989) through concentrate mixtures to assess their effect on feed intake, weight gain, water metabolism and certain blood biochemical parameters. The concentrate mixture containing 50: 50 RDP: UDP ratio (high UDP based on cotton seed cake/ linseed cake and maize) at normal (100%) and higher plane (115%) was fed to heifers in treatment groups 1 and 3, respectively, whereas concentrate mixture 2 containing 60: 40 RDP: UDP ratio (low UDP based on mustard cake and wheat grain) at normal (100%) and higher plane (115%, NRC) was fed to heifers in treatment groups 2 and 4, respectively. The mixed fodder (green oats + oats hay) served as sole roughage to all the animals. The average daily dry matter consumption in the heifers ranged from 2.72 to 2.78 kg per 100 kg body weight and 101.25 to 104.84 g per kg W°.75 and did not differ significantly among groups. The heifers in treatment group 3 fed high UDP ration at higher plane of feeding gained highest daily body weight (0.80 kg) followed by treatment groups 4 (0.75 kg), 1 (0.67 kg) and lowest in heifers in treatment group 2 fed low UDP ration at normal plane of feeding (0.59 kg). The daily body weight gain was improved by 10.45% due to high UDP ration and 23.8% due to higher plane of feeding. The daily water intake and water excretion did not differ significantly amongst the groups. However, water loss was more in faeces and less in urine due to high UDP ration but plane of feeding had no significant effect. The blood serum concentration of total protein, albumin, globulin, cholesterol, calcium and phosphorus and activities of SGOT, SGPT and serum alkaline phosphatase did not differ significantly among the treatment groups, however, there was higher concentration of serum total protein, calcium content and SGPT activity due to high UDP ration. The higher plane of feeding also increased serum albumin and phosphorus content and SGPT activities significantly. It is concluded that feeding high UDP ration (50: 50 RDP: UDP ratio) with 115% of nutrients as recommended in NRC (1989) feeding standard under Indian condition is advantageous in improving the weight gain in crossbred heifers at later stage of growth without affecting the feed and water intakes and with normal blood biochemical constituents.

067. Ravindra Kumar; Indian Veterinary Research Institute, Izatnagar (India).Kamra, D.N.; Indian Veterinary Research Institute, Izatnagar (India).Agarwal, N.; Indian Veterinary Research Institute, Izatnagar (India).Chaudhary, L.C.; Indian Veterinary Research Institute, Izatnagar (India). Effect of feeding a mixture of plants containing secondary metabolites and peppermint oil on rumen fermentation, microbial profile and nutrient utilization in buffaloes. Indian Journal of Animal Sciences (India). (May 2011) v.81(5)p. 488-492 KEYWORDS: WATER BUFFALOES. SECONDARY METABOLITES. RUMEN DIGESTION. RUMEN MICROORGANISMS. MICROBIAL PROTEINS. MICROORGANISMS.

A mixture of plants (mix) and peppermint oil (PO) were evaluated in fistulated buffaloes in 3×3 latin square design to study their effect on rumen fermentation, microbial profile, microbial protein synthesis and nutrients utilization. The plant mixture consisted of leaves of mango (Mangifera indica), jamun (Eugenia jambolana), guava (Psidium guajava), seed pulp of harad (Terminalia chebula) and fennel (Foeniculum vulgare) in equal proportions and was fed 40 g (dried) /100 kg BW, while peppermint oil was supplemented 2 ml/100 kg BW. There was no difference in postprandial changes in pH and total volatile fatty acids in rumen liquor among groups. The proportion of propionate was significantly lower in mix as compared to control and PO supplemented groups. The ammonia nitrogen (mg/dl) was lower in mix fed group as compared to control, whereas, total-N, TCA precipitable-N, activities (IU/mg protein) of carboxy-methylcellulase, xylanase and acetylestrase and protozoa population were similar in all the groups. Real time PCR studies indicated an increase of about 9- and 7-folds in total bacteria and Fibrobater succinogenes populations and a 30-fold decrease in Ruminococcus flavefaciens population with no change in fungal population by mix supplementation. The PO supplementation decreased about 7- and 1.5– folds in fungal and R. flavefaciens populations, whereas about F. succinogenes population showed 6-fold increase as compared to control. The concentrations of purine derivatives in urine were similar in all the groups reflecting similar microbial protein synthesis. The dry matter, TDN and DCP intakes and nutrients digestibility, except that of ether

extract were not affected by the feed additives. These results indicated that dietary supplementation of mix and peppermint oil at the present level had no adverse effect on rumen fermentation pattern, microbial protein synthesis and nutrient digestibility in buffaloes.

068. Dhayagude, Rohini S.; Indian Veterinary Research Institute, Izatnagar (India). Centre for Advanced Faculty Training in animal Nutrition.Garg, A.K.; Indian Veterinary Research Institute, Izatnagar (India). Centre for Advanced Faculty Training in animal Nutrition. Dass, R.S.; Indian Veterinary Research Institute, Izatnagar (India). Centre for Advanced Faculty Training in animal Nutrition.Bhadane, K.P.; Indian Veterinary Research Institute, Izatnagar (India). Centre for Advanced Faculty Training in animal Nutrition. Nutrient utilization and growth performance of guinea pigs (Cavia porcellus) exposed to different levels of dietary cadmium. Animal Nutrition and Feed Technology (India). (Jan 2012) v. 12(1) p. 25-34 KEYWORDS: GUINEA PIGS. NUTRIENTS. CADMIUM. GROWTH RATE. NUTRITION PHYSIOLOGY.
The experiment was aimed to study the effects of dietary cadmium (Cd) concentration on growth and nutrient metabolism in guinea pigs. Forty-eight healthy guinea pigs (30-35d old, mean body weight 297.4±2.76 g) were divided into four dietary groups (n=12 per group) and fed diets added with 0, 1.5, 3.0 and 4.5 mg Cd/kg for 91 days including a metabolism trial which lasted for 4 days. Intake and digestibility of nutrients and balance of calcium and phosphorus were not affected by dietary Cd concentration. However, nitrogen balance decreased and feed conversion efficiency was deteriorated in all the Cd supplemented groups, with significantly ($P<0.05$) lower values in group fed diet having 4.5 mg Cd/kg as compared with the control group. The average daily gain was also reduced in a linear manner as dietary cadmium content increased (r2.

069. Fernandes, A.P.; Zonal Agricultural Research Station, Kolhapur (India).Wagh, A.J.; Zonal Agricultural Research Station, Kolhapur (India).Kamble, D.K.; Zonal Agricultural Research Station, Kolhapur (India). Growth performance, nutrient digestibility and semen production in Pandharpuri buffalo bulls fed sprouted finger millet (Eleucine coracana) grain. Animal Nutrition and Feed Technology (India). (Jan 2012) v. 12(1) p. 135-140 KEYWORDS: WATER BUFFALOES. FINGER MILLET. FEEDING. ANIMAL PERFORMANCE. NUTRITION PHYSIOLOGY. DIGESTIBILITY.
Twelve Pandharpuri buffalo bulls were divided into two groups and fed for a period of 180d to assess the effect of dietary replacement of maize grain with finger millet. In treatment group, maize of the control group was replaced with 30 parts of sprouted finger millet grains. Animals were fed required quantity of maize as green and sorghum straw as dry fodder. The ADG was 432 and 440g in control and treatment group, respectively, with no ($P<0.05$) difference. Dry matter intake as well as intake of CP, DCP and TDN remained similar between the two groups. Significant ($P<0.05$) difference was observed in DM, EE and CF digestibility with values 54.68, 63.04 and 53.83%, and 53.24, 61.13 and 52.22% in treatment and control groups, respectively. The digestibility of CP (54.72 and 55.16%) and NFE (62.18 and 62.72%) however were similar for treatment and control groups, respectively. Semen was collected twice a week in the morning and the volume was 2.28 and 2.98 ml per ejaculation with mass activity 1.77 and 2.29 in control and treatment groups, respectively which shown significant ($P<0.05$) difference. Better quality of semen in the treatment group was further reflected by high percent (60.67 vs. 53.30%) of creamy ejaculation. The study conducted inferred that sprouted finger millet can replace 75% of maize without any adverse effect on feed intake and weight gain and with added advantage of better digestibility and semen quality in buffalo bulls.

L53 Animal physiology – Reproduction

070. Sharma, G. Taru; Indian Veterinary Research Institute, Izatnagar (India).Dubey, P.K.; Indian Veterinary Research Institute, Izatnagar (India).Katiyar, Amarnath; Indian Veterinary Research Institute, Izatnagar

(India).Sai Kumar, G.; Indian Veterinary Research Institute, Izatnagar (India). Localization and expression of proliferating cell nuclear antigen (PCNA)and cyclin B1 in buffalo (Bubalus bubalis) ovary during different stages of follicular development. Indian Journal of Animal Sciences (India). (Mar 2011) v. 81 (3) p. 231-234 KEYWORDS: OVARIAN FOLLICLES. WATER BUFFALOES. CELL CYCLE.

The present study was designed to determine the expression of proliferating cell nuclear antigen protein (PCNA) and cyclin B1 in buffalo during ovarian follicular development. PCNA and cyclin B1 were localized immunohistochemically in paraffin embedded ovarian sections whereas the expression of mRNA was done through semi-quantitative RT-PCR. Immunohistochemical studies demonstrated presence of PCNA and Cyclin B1 immunoreactivity throughout the follicular development. Positive immunoreactions of PCNA in preantral and actively growing small to large antral follicles showed extensive labeling in the layer of granulosa and theca cells. In contrast, cyclin B1 immunoreactivity was localized to the granulosa cells and it increased from small, medium to large follicles. mRNA transcript of PCNA (496 bp) and cyclin B1 (293 bp) was detected in ovarian stromal tissue, granulosa cells, preantral and antral follicles respectively. Follicles demonstrating advanced atresia showed only limited or no PCNA and cyclin B1 labeled granulosa and theca cells. In conclusion, follicular growth and development in buffalo ovary may be effectively monitored by determining the expression of PCNA and Cyclin B1 in granulosa cells.

071. Kumar, S.; National Bureau of Animal Genetic Resources, Karnal (India).Dixit, S.P.; National Bureau of Animal Genetic Resources, Karnal (India).Gupta, S.C.; National Bureau of Animal Genetic Resources, Karnal (India).Vyas, M.K.; National Bureau of Animal Genetic Resources, Karnal (India).Jagdeep Kaur; National Bureau of Animal Genetic Resources, Karnal (India). Genetic variability of growth hormone gene and its association with growth traits in Sirohi breed of goats. Indian Journal of Animal Sciences (India). (Apr 2011) v. 81 (4) p. 397-401 KEYWORDS: GOATS. GENETIC VARIATION. ENDOCRINE GLANDS. GROWTH RATE.

Genetic variations in the caprine growth hormone (c-GH) gene were investigated by single strand conformation polymorphism (SSCP) analysis of 8 amplified fragments covering almost the entire gene (approximately 2.5 kb) in 188 Sirohi goats and was associated with body weights at birth, 3, 6 and 9 months of age. SSCP analysis revealed 4 to 8 unique banding patterns across 8 studied fragments of GH. The promoter and region having exon 3 showed higher level of polymorphism with 8 variants. The fragments consisting of exon 1, exon 4 and exon 5 revealed 6 variants. SSCP patterns in the promoter region had significantly influenced the birth weight. The SSCP variants in fragments consisting of exonic regions had also influenced the body weight at different ages in breed of goat. SSCP analysis has indicated the possibility of marker assisted selection for higher body weight at different ages in Sirohi goats.

072. Bhooshan, Neeru; Central Institute for Research on Goats, Makhdoom (India).Puneet Kumar; Central Institute for Research on Goats, Makhdoom (India). Micro-mineral and biochemical profile of marwari goats. Indian Journal of Animal Sciences (India). (Mar 2011) v. 81(3)p. 238-241 KEYWORDS: GOATS. MINERAL CONTENT. ZINC. COPPER. REPRODUCTION.

Healthy, pluriparous, cyclic Marwari does (6) were used to investigate the changes in Zn, Cu and certain biochemical parameters during different physiological stages. Blood samples were collected during oestrous cycle, on the day of mating, gestation period (fortnightly up to fourth month, weekly during last month), day of kidding and up to 1 month of lactation period. In this study, glucose and protein profile did not change significantly between different phases of oestrus cycle, the activity of transaminases was significantly high during the follicular phase of oestrus cycle. Glucose concentration was significantly high during early and late gestation and attained significantly lowest level on the day of kidding. The activity of transaminases remained significantly low up to third month of gestation while on day of kidding, the activity increased significantly. Total protein level decreased progressively during fifth month of gestation period. However, it increased significantly at the beginning of the lactation. Up to 105 days of gestation period, albumin concentration decreased while globulin concentration increased. Albumin concentration tended to increase and attained normal value at term. However, the globulin decreased to term and lactation period. Zinc concentration

remained low up to third month of gestation. At fourth month of gestation it increased significantly and remained high up to first week of post-partum period. Copper concentration showed increasing trend from third month of gestation and attained significantly higher level in the mid of fifth month of gestation. Thereafter it decreased and remained low up to first week of lactation.

073. Singh, M.K.; Central Avian Research Institute, Izatnagar (India).H N Singh,; Central Avian Research Institute, Izatnagar (India).Gupta, Atul; Central Avian Research Institute, Izatnagar (India).Shukla, P.K.; Central Avian Research Institute, Izatnagar (India).Sharma, Deepak; Central Avian Research Institute, Izatnagar (India). PCR based sex differentiation in guinea fowl using W chromosome specific sequences. Indian Journal of Animal Sciences (India). (May 2011) v. 81 (5) p. 560-562 KEYWORDS: GUINEA FOWL. SEX DIFFERENTIATION. PCR.
In view of poor sexual bimorphism in guinea fowl, an attempt was made to develop PCR based method for sex differentiation using W chromosome specific sequence. A 370 bp sex specific fragment was amplified in female birds of guinea fowl, chicken, quail and turkey using the EE0.6 specific set of primers i.e. USP1 and USP3, while no amplification was observed in male birds. The 16S rRNA gene specific primers were used to amplify a 590 bp fragment in both the sexes, which acted as control. A multiplex PCR assay was developed by using sex specific primers and universal 16S rRNA primers for sex differentiation in guinea fowl and other galliform species. In all the species including guinea fowl, female showed 2 bands i.e. 370 bp female specific and 590 bp common band, while males showed only 590 bp band. These results showed the effectiveness of sex specific primers in sex differentiation in guinea fowl as well as other galliformes species.

074. Gupta, Raman; Veterinary College, Jabalpur (India). Department of Animal Reproduction, Gynaecology and Obstetrics.Thakur, M. S.; Veterinary College, Jabalpur (India). Department of Animal Reproduction, Gynaecology and Obstetrics. Sharma, Arvind; Veterinary College, Jabalpur (India). Department of Animal Reproduction, Gynaecology and Obstetrics. Estrus induction and fertility response in true anestrus buffaloes using lugol’s iodine . Veterinary World (India). (Feb 2011) v.4(2) p. 77-78 KEYWORDS: WATER BUFFALOES. INDUCED OVULATION. OESTROUS CYCLE. REPRODUCTIVE PERFORMANCE.
The present study was carried out to see the efficacy of lugol's iodine for the initiation of ovarian cyclicity in post-partum true anestrus buffaloes. Confirmation of true anestrus in 30 buffaloes was done by finding smooth ovaries at rectal examination, out of 30, 15 buffaloes was treated with Lugol's iodine (1:50) ratio @30ml I/U once only whereas, the remaining 15 buffaloes were serve as control for treated group and no treatment was given to such animals. The result for induction of estrus was 73.34 %(11/15) and the conception rate was 53.33% (8/15). This result shows that there are better possibilities of inducing ovarian cyclicity in functionally anestrus buffaloes and its cost effectiveness.

075. S. Mooyottu, S. Anees, S. Cherian; Indian Veterinary Research Institute, Izatnagar (India). Ovarian stem cells and neo-oogenesis: A breakthrough in reproductive biology research . Veterinary World (India). (Feb 2011) v.4(2) p. 89-91 KEYWORDS: OVARIAN FOLLICLES. OVARIES. REPRODUCTIVE PERFORMANCE.
The concept of ovarian stem cells which can replenish the ovarian reserve in postnatal mammalian females is a revolutionary breakthrough in reproductive biology. This idea overturned the central dogma existed in female reproductive physiology. Contradicting the popular belief that oogenesis does not occur in post natal life, researchers proved the existence of putative stem cells in ovary, which can supply functional follicles in post natal ovaries. Even though the idea of neo-oogenesis in postnatal ovaries in normal conditions is controversial, the isolation and manipulation of ovarian stem cells have got tremendous application in medical, veterinary and animal production fields.

076. Islam, R.; Sher-e-Kashmir University of Agricultural Science and Technology, Srinagar (India). Faculty of Veterinary Sciences & Animal Husbandry. Synchronization of estrus in cattle. Veterinary World (India). (Mar 2011) v.4(3) p. 136-141 KEYWORDS: CATTLE. SYNCHRONIZATION. OESTRUS SYNCHRONIZATION.

Numbers of estrus synchronization programmes are available in cattle based on the use of various hormones like progesterone, prostaglandin F2a and their various combinations with other hormones like estrogen and Gonadotrophin Releasing hormone (GnRH). Selection of appropriate estrus synchronization protocol should be made on the basis of management capabilities and expectations of the farmer. Synchronization of oestrus can be accomplished with the injection of prostaglandin F2a alone, but it needs proper detection of the ovarian status of the cows as prostaglandin F2a is active in only functional corpus luteum in between 8 to 17 days of estrous cycle. Progesterone may reduce fertility up to 14 percent, but short time progesterone exposure (less than 14 days) is beneficial. Addition of GnRH in the Progesterone or Prostaglandin based synchronization programme is helpful for more synchrony in estrus as GnRH may be helpful to synchronize the oestrous cycle in delayed pubertal heifers and post partum cows (Post partum anoestrum) and further a single, timed artificial insemination is possible with this method. New methods of synchronizing estrus in which the GnRH-PG protocol is preceded by progesterone treatment offer effective synchronization of estrus with high fertility.

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077. Malik, V.; Indian Veterinary Research Institute, Izatnagar (India).Kinjavdekar, P.; Indian Veterinary Research Institute, Izatnagar (India).Amarpal; Indian Veterinary Research Institute,Izatnagar (India).Aithal, H.P.; Indian Veterinary Research Institute, Izatnagar (India).Pawde, A.M.; Indian Veterinary Research Institute, Izatnagar (India).Surbhi; Indian Veterinary Research Institute, Izatnagar (India). Continuous intravenous infusion anaesthesia with ketamine in medetomidine, midazolam, butorphanol premedicated and thiopental induced buffaloes. Indian Journal of Animal Sciences (India). (Mar 2011) v. 81 (3) p. 224-230 KEYWORDS: WATER BUFFALOES. ANAESTHETICS. KETAMINE. INJECTION.
The study was conducted with to standardise and evaluate the continuous intravenous anaesthesia using ketamine in buffaloes and to compare it after 2 different preanaesthetic regimens. Continuous intravenous infusion (CII) anaesthesia in 6 male adult buffaloes was used in K-1 and K-2 groups. In K-1 medetomidine (2.5 ìg / kg) + butorphanol (0.05 mg/ kg) and in K-2 midazolam (0.25 mg/ kg) + butorphanol (0.05 mg/kg) intravenously were used. Induction by 5% thiopental sodium and maintenance by 1% ketamine was done. Clinico-physiological and haemodynamic parameters were recorded. Group K-1 produced better sedation and analgesia. Muscular relaxation was excellent in both groups. Depression of palpebral reflex was better in K-2, depression of corneal reflex was comparable and depression of pedal and pinprick reflexes was higher in K-1. Lesser dose of thiopental was required in K-1 (2.87±0.44 mg/kg) than K-2 group (7.14±0.36 mg/kg). The infusion rates of ketamine were 0.13±0.01 and 0.16±0.01 mg/kg/min in K-1 and K-2. Weak time was comparable. Recovery time, resumption of sternal recumbency and standing time were higher in K-2. Bradycardia in K-1 and tachycardia in K-2 was recorded. Respiratory rate decreased in K-1. Rectal temperature decreased in both groups. MAP decreased in K-1 and increased in K-2. CVP increased after premedication, decreased after induction and maintenance in both groups. Medetomidine - butorphanol provides better quality sedation, analgesia and muscle relaxation, has more dose sparing effect on induction and maintenance agents, and maintains cardiopulmonary dynamics better than midazolam-ketamine in buffaloes. Additionally continuous intravenous infusion of ketamine (0.13–0.16 mg/kg/min) can be used safely and effectively for maintenance of anaesthesia in buffaloes premedicated with proposed drugs.

078. 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). Sensitivity comparison of four diagnostic techniques to detect street rabies virus. Indian Journal of Animal Sciences (India). (Apr 2011) v. 81 (4) p. 370-373 KEYWORDS: RABIES VIRUS. DIAGNOSIS. LABORATORY ANIMALS.
Experimentally infected infected, suckling albino mice (180) were inoculated by intra-cerebral route with 3090 MICLD50 of street rabies virus, isolated from rabid dog, treated for 30 and 60 min at different ranges of temperature and exposed to sunlight for 30 and 60 min in different weather conditions, to evaluate the

sensitivity of direct immunofluorescene test, counter-immuno electrophoresis test, histopathology and impression smears stained with seller stain to detect street rabies virus. Among these techniques, on the basis of comparison of per cent sensitivity of FAT in different subgroups with various diagnostic techniques. CIEP was found to be the most sensitive technique for the detection of rabies antigen from the various brain tissues of infected albino mice followed by histopathology. Whereas, impression smear stained with sellers staining technique was found to be the least sensitive.

079. Kashoo, Zahid Amin; Indian Veterinary Research Institute, Izatnagar (India).Singh, Virendar 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).Jacob, Sijsiju Susan; Indian Veterinary Research Institute, Izatnagar(India).Molecular characterization of p80 gene of Indian Mycoplasma agalactiae isolates. Indian Journal of Animal Sciences (India). (May 2011) v. 81 (5) p.435-439 KEYWORDS: GENETIC MARKERS. MYCOPLASMA AGALACTIAE. MYCOPLASMA. PCR.
Serological tests are considered to be the most suitable for screening the goat pens for contagious agalactia, mainly caused by Mycoplasma agalactiae, but these have certain limitations due to the cross-reactive antigens among different mycoplasma species. The present study was undertaken to characterize the membrane protein p80 of M. agalactiae for specific diagnosis of disease as p80 protein is expressed in all field strains as well as throughout the course of infection. Five Indian isolates of M. agalactiae and one isolate of Mycoplasma bovis were used in the study after checking the purity by cultural examination, various biochemical tests and group specific and M. agalactiae specific PCR assays. Using group specific primers GPO-1 and MGSO, an amplified fragment ~715 bp was observed whereas, M. agalactiae specific PCR primers MboF2 and MboR2 produced an amplicon of size ~734 bp in all the 5 isolates. The cell lysates of all M. agalactiae isolates were subjected to SDS-PAGE western blot analysis, which resulted in a prominant band of ~80 kDa. The gene specific primers were designed and custom-synthesized for amplification of p80 which amplified the amplicon of 1014 bp from all strains. Our findings indicated that the membrane protein P80 is conserved antigen in the Indian isolates of M. agalactiae and can be used for specific diagnosis of contagious agalactia.

080. Aithal, H.P.; Indian Veterinary Research Institute, Izatnagar (India). Amarpal; Indian Veterinary Research Institute, Izatnagar (India). Kinjavdekar, P.; Indian Veterinary Research Institute, Izatnagar (India). Pawde, A.M.; Indian Veterinary Research Institute, Izatnagar (India).Pratap, K.; Indian Veterinary Research Institute, Izatnagar (India).Singh, G.R.; Indian Veterinary Research Institute, Izatnagar (India). Intravenous administration of halothane in ethanol (5% v/v) for general anaesthesia in sheep: A preliminary study. Indian Journal of Animal Sciences (India). (May 2011) v. 81 (5) p. 461-462 KEYWORDS: SHEEP. INJECTION. ANAESTHESIA. HALOTHANE. ETHANOL.
The effects of intravenous halothane (5%) in ethanol were studied in sheep premedicated with diazepam administered intramuscularly 0.5 mg/kg body weight. Ten min after the administration of diazepam, halothane was given as a drip 2.5–5 drops/kg/min. After induction, anaesthesia was maintained up to 60 min. During the period, the animals were observed for respiratory rate, heart rate and any untoward reaction. The onset of anaesthesia, the rate of administration, total dose of the anaesthetic required for induction and maintenance of anaesthesia and recovery time were determined. All the animals recovered smoothly within 5 min of discontinuation of halothane. No significant changes were recorded in cardiopulmonary parameters, except for an increase in heart rate and transient decrease in respiratory rate. The results suggested that intravenous administration of 5% halothane in ethanol could be used for induction and maintenance of general anaesthesia in sheep under constant monitoring.

081. Roy, Manju; College of Veterinary Science & Animal Husbandry, Durg (India).Roy, Sushovan; College of Veterinary Science & Animal Husbandry, Durg (India). Ameliorative potential of Psidium guajava in induced

arsenic toxicity in wistar rats. Veterinary World (India). (Feb 2011) v.4(2)p.82-83 KEYWORDS: PSIDIUM GUAJAVA.RATS. ARSENIC.TOXICITY. PHYTOTOXICITY.
The study was undertaken to determine the effect of Psidium. guajava leaf extract on arsenic induced biochemical alterations in Wistar rats. Significant (P<0.05) increased glucose serum urea nitrogen and serum creatinine was observed whereas non significant decrease in total protein, calcium and phosphorus was observed. It is concluded that kidney damage caused by arsenic can be repaired up to some extent by AEPG50.

082. Anjaneya, S.N.; Karnataka Veterinary, Animal and Fisheries Sciences University, Bangalore (India). Veterinary College. Ramesh, C. B.; Karnataka Veterinary, Animal and Fisheries Sciences University, Bangalore (India). Veterinary College. Shridhar, N.B.; Karnataka Veterinary, Animal and Fisheries Sciences University, Bangalore (India). Veterinary College. Hugar, Basavesha; Karnataka Veterinary, Animal and Fisheries Sciences University,Bangalore(India). Veterinary College. SunilKumar, K. M.; Karnataka Veterinary, Animal and Fisheries Sciences University, Bangalore (India). Veterinary College. Clinical management of multiple drug toxicity in Hallikar bullocks. Veterinary World (India). (Feb 2011) v.4(2) p. 87 KEYWORDS: BULLOCKS. TOXICITY.
This paper puts on the record toxicity of multiple drug therapy and its successful clinical management.

083. Rakshi, Sabita; College of Veterinary Science and Animal Husbandry, Jabalpur (India). Department of Veterinary Surgery and Radiology. Roy, Kabita; College of Veterinary Science and Animal Husbandry, Jabalpur (India). Department of Veterinary Surgery and Radiology. Datta, I.C.; College of Veterinary Science and Animal Husbandry, Jabalpur (India). Department of Veterinary Surgery and Radiology. Evaluation of pentazocine and lysine acetylsalicylate analgesic premedication in intravenous thiobarbiturate anaesthesia in atropinized dogs. Indian Journal of Veterinary Researh (India). (Dec 2012) v.21(2)p. 17-22 KEYWORDS: ANALGESICS. CLINICAL TRIALS. BIOCHEMISTRY. DOGS.
In thiopentone intravenous general anaesthesia in atropinized normal dogs, induction time with lysine acetyl salicylate (LAS) or pentazocine analgesic pre-medication was at par. The duration of anaesthesia was more with pentazocine, but recovery was smoother with LAS. Cardio-pulmonary suppression was subdued with pentazocine and minimal with LAS. Only a moderate decrease in rectal temperature signified that the thermo-regulatory mechanisms and metabolic rate were not significantly affected in both treatments. Neuromuscular incoordination was virtually absent with LAS pre-medication. Non-significant increases in serum glutamate-pyruvate transaminse (SGPT) and serum alkaline phosphatase (SAP) attested to absence of hepatic dysfunction. Values of serum total protein and icterus index within the normal range provided the corroborative evidence. Renal function tests further revealed that the glomerular filteration rate (GFR) remained virtually unaffected by the treatments. On the basis of these findings, for short-term surgical intervention either pentazocine or LAS may be used. However, in view of the remarkably smooth recovery, LAS is recommended, especially for ultra short-term procedures in the canine surgical patient.

084. Kushwaha, J.P.; Pandit Deen Dayal Upadhyay Pashu-Chikitsa Vigyan Vishwavidyalaya Evam Go-Anusandhan Sansthan, Mathura (India). Malik, V.; Pandit Deen Dayal Upadhyay Pashu-Chikitsa Vigyan Vishwavidyalaya Evam Go-Anusandhan Sansthan, Mathura (India).Singh, B.; Pandit Deen Dayal Upadhyay Pashu-Chikitsa Vigyan Vishwavidyalaya Evam Go-Anusandhan Sansthan,Mathura (India). Evaluation of midazolam and propofol in different combinations for clinical anaesthesia in dogs. Indian Journal of Veterinary Surgery (India). (Dec 2012) v.33(2)p.77-81 KEYWORDS: ANAESTHESIA. DOGS.
Thirty six clinical cases of dogs of either sex of different breeds and 2-8 yr of age and weighing 10-25 kg were used to study the effects of midazolam and propofol anaesthesia in different combinations. Different induction and recovery parameters, quality of anaesthesia and effect on different clinicophysiological, haematobiochemical and haemodynamic parameters were studied. Based on the results, it is concluded that midazolam 0.5 mg/kg b.wt, i.v. serves as a good tranquilizer for short duration and can be used as an

adjunct to local analgesia for minor surgical operations. Midazolam 0.5 mg/kg b.wt for tranquilization and a mixture of propofol and midazolam (1:2 v/v) for maintenance is better for balanced anaesthesia in dogs, which can easily be practised in various clinical/surgical procedures of various duration.

085. Pathak, Rekha; Indian Veterinary Research Institute, Izatnagar (India).Pratap, K.; Indian Veterinary Research Institute, Izatnagar (India). Aithal, H.P.; Indian Veterinary Research Institute, Izatnagar (India). Pawde, A.M.; Indian Veterinary Research Institute, Izatnagar (India). Pankaj; Indian Veterinary Research Institute, Izatnagar (India). Amarpal; Indian Veterinary Research Institute, Izatnagar (India).Kinjavdekar, P.; Indian Veterinary Research Institute, Izatnagar (India). Comparison of bupivacaine, xylazine and buprenorphine for spinal analgesia in buffalo calves. Indian Journal of Veterinary Surgery (India). Dec 2012 v.33(2) p.82-86 KEYWORDS: WATER BUFFALOES. SPINAL CORD. ANALGESICS. XYLAZINE. CALVES.
Eighteen male buffalo calves aged 7-8 months and weighing 60-75 kg were used to evaluate the efficacy and safety of lumbosacral spinal analgesia produced by bupivacaine 0.25 mg/kg, xylazine 0.05 mg/kg and buprenorphine 20 ìg/kg in groups A, B and C, respectively. The onset of analgesia was significantly ($P<0.01$) faster in group A as compared to groups B and C. Moderate analgesia spread from thorax to tail in groups A and B. Buprenorphine produced mild analgesia of tail and perineum only. Ataxia was severe in groups A and B. Xylazine produced maximal sedation. Plasma glucose increased significantly ($P<0.05$) after administration of bupivacaine or xylazine. Plasma urea nitrogen decreased significantly ($P<0.05$) in all groups. Plasma creatinine increased significantly ($P<0.05$) in group A. Plasma cortisol increased in all groups, group C had significantly higher cortisol levels than group B. It was concluded that bupivacaine and xylazine have similar analgesic potency on spinal administration in buffaloes. Both drugs produced only transient alterations in haematobiochemical parameters and therefore, may be considered for spinal use in buffalo calves. Buprenorphine is a poor analgesic agent when used spinally in buffalo calves.

086. Arif , Mohammed Basha K.; Karnataka Veterinary, Animal and Fisheries Sciences University, Bangalore (India).Ranganath, L.; Karnataka Veterinary, Animal and Fisheries Sciences University, Bangalore (India). Clinicophysiological and biochemical effects of isoflurane and sevoflurane anaesthesia in dogs. Indian Journal of Veterinary Surgery (India). Dec 2012 v.33(2) p.87-89 KEYWORDS: DOGS. BIOCHEMISTRY. CLINICAL TRIALS. PHYSIOLOGICAL FUNCTIONS. ANAESTHESIA.
In the present study, different clinico-physiological and biochemical effects of isoflurane and sevoflurane anaesthesia were studied in healthy female dogs (n=6 each) undergoing ovariohysterectomy. The results showed minimal and transiant adverse effects of the anaesthetics on different physiological and biochemical parameters.

087. Manuja, Harminder; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences. Department of Veterinary Surgery and Radiology. Peshin, P.K.; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences. Department of Veterinary Surgery and Radiology. Kumar, Ashok; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences. Department of Veterinary Surgery and Radiology. Singh, Sukhbir; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences. Department of Veterinary Surgery and Radiology,. Evaluation of pancuronium bromide as muscle relaxant in buffalo calves. Indian Journal of Veterinary Surgery (India). (Dec 2012) v.33(2) p.90-93 KEYWORDS: WATER BUFFALOES. CALVES. MUSCLES. BROMIDES. MUSCLE RELAXANTS.
The study was done on 16 buffalo calves of 1-2.5 yr of age weighing 120 to 300 kg. Pancuronium bromide was administered 25 ìg/kg b.wt, i.v. The animals showed ataxia at 0.98±0.07 min, and became recumbent at 1.41±0.06 min. The fore limbs were relaxed (2.24±0.08 min) earlier than the hind limbs (2.53±0.09 min). Complete relaxation of tail, ear, anus and preputial sheath was observed at 3.92±0.04 min. Involuntary defaecation and urination were also observed in all animals. Laboured breathing with marked alar opening was observed at 3.02±0.09 min. The animals remained calm and quiet, with constriction of pupil and

presence of cutaneous reflex from 3.92±0.04 to 16.25±0.16 min. Spontaneous movements of tail and ear were noticed at 16.25±0.16 min. The animals returned to sternal recumbency at 17.52±0.18 min and stood up of their own and walked with ataxia at 18.10±0.10 min, while ataxia disappeared at 26.01±0.26 min. Both tachycardia and bradypnoea were significant during the effect of drug, however, MAP was marginally lower than the base value. The electroencephalograms showed frequent spikes (n=7) and occasional rapid burst of high amplitude waves (n=3) against the background of b-rhythm with slightly increased voltage. Complete atrioventricular dissociation at 10 min and AV block of varying degree was observed in all animals.

088. Singh, A.P.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). College of Veterinary Sciences. Singh, N.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). College of Veterinary Sciences. Department of Veterinary and A.H. Extension. Mahajan, S.K.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). College of Veterinary Sciences. Department of Veterinary Surgery and Radiology. Echocardiography as a definitive diagnostic tool for dilated cardiomyopathy in dogs. Indian Journal of Veterinary Surgery (India). (Dec 2012) v.33(2) p.94-98 KEYWORDS: CARDIOVASCULAR DISEASES. DOGS. CARDIOMYOPATHY. HEART. ECHOGRAPHY.
Seven clinical cases of dogs of different breeds and ages, showing anorexia, exercise intolerance, lethargy and weight loss, were subjected to thorough physical, haematological, serum biochemical, radiographic, and 2-D mode, M-mode and Doppler echocardiographic examinations. In late dilated cardiomyopathy (DCM) (n=5), both systolic and diastolic left ventricular dimension, EPSS and LA/Ao ratio were increased with reduced fractional shortening (FS). Mild mitral regurgitation was observed in three cases of late DCM. In early DCM (n=2) there was normal diastolic dimension but increased systolic left ventricular dimension (LVIDs) and hence reduced FS was found.

089. Singh, Parampal; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India).Yadav, B.M.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Singh, Navdeep; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Mahajan, S.K.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Singh, Pritpal; Punjab Agricultural University, Ludhiana (India). Department of Plant Breeding and Genetics. Correlation of echocardiographic parameters and indices of normal healthy Indian dogs with their body weight. Indian Journal of Veterinary Surgery (India). (Dec 2012) v.33(2)p.99-102 KEYWORDS:DOGS.ECHOGRAPHY. HEART. MEASUREMENT.
The aim of the study was to establish normal reference echocardiographic values for Indian dogs and to determine the potential dependence of intracardiac parameters on body weight irrespective of the age factor. M-mode and two dimensional echocardiography was performed on 65 healthy dogs. Intracardiac measurements included interventricular septal thickness (IVS), leftventricular internal diameter (LVID), left ventricular posterior wall thickness (LVPW) both in systole and diastole, as well as left atrial internal diameter (LA), and aortic diameter (Ao) in early diastole. Fractional shortening (FS), ejection fraction (EF),end-diastolic and end-systolic left ventricular volumes (EDV, ESV), stroke volume (SV) as well as LA/Ao and Ao/LA ratios were calculated from these parameters. Body weight positively correlated with all left ventricular parameters, such as IVSd, IVSs, LVIDd, LVIDs, LVPWd, and LVPWs. LA and Ao values also showed positive correlation to body weight. LVM followed a positive correlation with polynomial mathematical trend of the order of two.

090. Bhatt, R.H.; Anand Agricultural University, Anand (Gujarat). Department of Surgery and Radiology. Kelawala, N.H.; Anand Agricultural University, Anand (India). Jhala, S.K.; Anand Agricultural University, Anand (India). Mathai, Roon Marium; Anand Agricultural University, Anand (India). Patil, D.B.; Anand Agricultural University, Anand (India). Veterinary College. Department of Surgery and Radiology. Parikh, P.V.; Anand Agricultural University, Anand (India). Veterinary College. Department of Surgery and Radiology. Laparoscopic diagnosis of abdomino-pelvic disorders in dogs. Indian Journal of Veterinary Surgery (India). (Dec 2012) v.33(2) p.103-105 KEYWORDS: ABDOMEN. DOGS. ENDOSCOPY.

Clinical study on laparoscopic diagnosis of abdominopelvic disorders in dogs was conducted in 12 clinical cases. After preliminary examinations, laparoscopic examination was carried out for abdominopelvic disorders of liver, kidney, spleen, intestine and urogenital organs. It confirmed the diagnosis of conditions like liver cirrhosis, liver fibrosis, liver neoplasm, renal neoplasm, splenic neoplasm, granulomatous mass involving spleen, intestinal neoplasm, intestinal distension due to phytobezoar, cystic ovaries and pyometra. Laparoscopic biopsies were taken to confirm pathological lesions. No complication was observed during and after the procedure. It was concluded that laparoscopy facilitated proper visualization of the abdominopelvic organs alongwith biopsy of the morphological lesions and was found to be a reliable diagnostic tool for intra-abdominal abnormalities in dogs.

091. Tiwari, D.K.; Jawahar Lal Nehru Krishi Vishwavidhyalaya, Jabalpur (India).Jawre, S.; Jawahar Lal Nehru Krishi Vishwavidhyalaya, Jabalpur (India).Bhargava, M.K.; Jawahar Lal Nehru Krishi Vishwavidhyalaya, Jabalpur (India).Swamy, M.; Jawahar Lal Nehru Krishi Vishwavidhyalaya, Jabalpur (India).Shahi, A.; Jawahar Lal Nehru Krishi Vishwavidhyalaya, Jabalpur (India).V.P. Chandrapuria; Jawahar Lal Nehru Krishi Vishwavidhyalaya, Jabalpur (India).Singh, Randhir; Jawahar Lal Nehru Krishi Vishwavidhyalaya, Jabalpur (India). Application of imaging modalities in diagnosis of hepatic disorders in dogs. Indian Journal of Veterinary Surgery (India). (Dec 2012) v.33(2)p.106-108 KEYWORDS: ENDOSCOPY. LIVER DISEASES. RADIOGRAPHY. ULTRASONICS. ECHOGRAPHY.
The study was undertaken on 18 dogs, of varied age, breed and sex, which were divided into two groups. The group-I consisted of 6 clinically healthy dogs, whereas group-II consisted of 12 dogs brought with liver disorders. The clinical, haematobiochemical, radiographic, sonographic and laparoscopic examinations were carried out in both group of animals. Results showed more liver disorders in older female animals. Haematobiochemical analysis revealed non-significant differences between the groups. Radiographic evaluation of the liver is unreliable. Ultrasonography revealed alteration in liver texture, thick hyperechoic walled gall bladder, mixed echogenic patches and anechoic cyst in the liver. By laparoscopic examination, disorders of liver like, hepatomegaly with hepatic cyst, cholecystitis, hepatitis, nodular cirrhosis, multifocal abscesses, fatty degeneration, icteric changes alongwith leafening of liver lobes could be diagnosed.

092. Dileepkumar, K.M.; Kerala Veterinary and Animal Sciences University, Wayanad (India). KeralaCollege of Veterinaryand Animal Sciences. Department of Veterinary Surgery and Radiology. Rajankutty, K.; Kerala Veterinary and Animal Sciences University, Wayanad (India). KeralaCollege of Veterinary and Animal Sciences. Department of Veterinary Surgery and Radiology. Sarada Amma, T.; Kerala Veterinary and Animal Sciences University, Wayanad (India). Kerala College of Veterinaryand Animal Sciences. Department of Veterinary Surgery and Radiology. Devanand, C.B.; Kerala Veterinary and Animal Sciences University, Wayanad (India). Kerala College of Veterinaryand Animal Sciences. Department of Veterinary Surgery and Radiology.Vijayan, N.; Kerala Veterinary and Animal Sciences University, Wayanad (India). Kerala College of Veterinaryand Animal Sciences. Department of Veterinary Surgery and Radiology. Comparative evaluation of positive contrast and double contrast gastrography in dogs. Indian Journal of Veterinary Surgery (India). (Dec 2012) v.33(2)p.109-111 KEYWORDS: BARIUM. RADIOGRAPHY. DOGS. SURGICAL OPERATIONS.
A contrast radiography of stomach with oral barium sulphate suspension 25% (5 mL/kg b.wt positive contrast) and double contrast with oral barium sulphate 25% (3 mL/kg b.wt) followed by air (2 to 10 mL/kg b.wt, negative contrast) was done on six dogs to study the affections of stomach. Contrast radiography using barium sulphate alone was found satisfactory to identify most of the lesions of the stomach. Double contrast radiography using barium sulphate and air, required sedation to control the animals for proper administration. For the diagnosis of mucosal lesions, double contrast radiography was better than barium sulphate alone.

093. Abdelfattah, M.; Beni-Suef University, Egypt. Department of Surgery, Anesthesiology and Radiology,Seddek, A.M.; Sohag University, Egypt. Faculty of Veterinary Medicine,Bakr, H.A.; Beni-Suef

University, Egypt. Department of Animal Medicine,El-Nesr Kh , A.; Beni-Suef University, Egypt. Department of Pathology. Less-invasive hysterocystoplasty technique: experimental study in goats. Indian Journal of Veterinary Surgery (India). (Dec 2012) v.33(2) p.112-116 KEYWORDS: UTERUS. BLADDER. GOATS. EXPERIMENTATION.

A novel less-invasive hysterocystoplasty technique was evaluated experimentally in goats, via closure of a large defect of the dorsal aspect of the bladder by the uterus. Follow up for six months included radiographic and ultrasonographic examinations, evaluation of kidney function and electrolyte changes, and histological examinations. Microscopically the perimetrium was completely covered with healthy urothelium under which disorganized smooth muscle fibers appeared admixed with slight fibrosis, without demonstrable evidences of shrinkage, infection or malignant transformation. Generally, the technique had many advantages as it required less-invasive procedures, avoided intestinal resection, achieved high survival rate without life threatening complications, caused no significant changes in kidney function or electrolyte levels, and associated with proper healing, acceptable degree of fibrosis, and absence of shrinkage or metaplasia. The technique can be considered as an alternative cystoplasty technique.

094. Holey, Ashish; Karnataka Veterinary, Animal and Fisheries Sciences University, Bangalore (India).Ranganath, L.; Karnataka Veterinary, Animal and Fisheries Sciences University, Bangalore (India).Nagaraja, B.N.; Karnataka Veterinary, Animal and Fisheries Sciences University, Bangalore (India).Krishnaswamy, A.; Karnataka Veterinary, Animal and Fisheries Sciences University, Bangalore (India).Yathiraj, S.; Karnataka Veterinary, Animal and Fisheries Sciences University, Bangalore (India). Laparoscopic electro-coagulation and endo-stapling techniques for ovariohysterectomy in female dogs. Indian Journal of Veterinary Surgery (India). (Dec 2012) v.33(2) p.117-119 KEYWORDS: ELECTRIFICATION. COAGULATION. ENDOSCOPY. FEMALES. DOGS. OVARIES. HYSTERECTOMY.

A clinical study on laparoscopic electro-coagulation and endostapling techniques for ovariohysterectomy was carried out in 12 healthy female dogs. Physiological and haematobiochemical parameters were studied. Bipolar electrocautery and large medium size titanium endostaples provided adequate haemostasis. There were no intra and postoperative complications. Minimal wound scar was noticed on 7th postoperative day.

095. Nikam, P.N.; Anand Agricultural University, Anand (India). College of Veterinary Sciencesand Animal Husbandry. Department of Veterinary Surgery and Radiology,Tank, P.H.; Anand Agricultural University, Anand (India).College of Veterinary Sciencesand Animal Husbandry. Department of Veterinary Surgery and Radiology. Vadalia, J.V.; Anand Agricultural University, Anand (India).College of Veterinary Sciencesand Animal Husbandry. Department of Veterinary Surgery and Radiology; Desai, B.D.; Anand Agricultural University, Anand (India).College of Veterinary Sciencesand Animal Husbandry. Department of Veterinary Surgery and Radiology; Javia, C.B.; Anand Agricultural University, Anand (India).College of Veterinary Sciencesand Animal Husbandry. Department of Veterinary Surgery and Radiology; Katare, Mukesh; Anand Agricultural University, Anand (India).College of Veterinary Sciencesand Animal Husbandry. Department of Veterinary Surgery and Radiology. Clinical and surgical findings in cows showing recurrent rumen tympany. Indian Journal of Veterinary Surgery (India). (Dec 2012) v.33(2) p.124-127 KEYWORDS: COWS. LAPAROTOMY. RECURRENT SELECTION. RUMENOTOMY.

Eighteen adult cows suffering from recurrent tympany for at least one month which underwent exploratory laparotomy and rumenotomy were divided into three groups. Group I (n=8) included cows with reticuloruminal metallic foreign bodies and perireticular adhesions and/or inflammation, group II (n=6) included cows with reticuloruminal non-metallic foreign bodies and no perireticular adhesions and group III (n=4) included cows with no reticuloruminal foreign bodies and no perireticular adhesions. Inappetance and recurrent ruminal tympany were the most common clinical signs in all groups. The signs of pain were predominantly expressed by all the animals and showed leukocytosis, neutrophilia and lymphocytopenia. The plasma fibrinogen and enzyme AST were increased in all the animals of group I. The postoperative

complications were recorded in all the cases, which recovered uneventfully after necessary therapeutic intervention.

096. Kumar, P.; Indian Veterinary Research Institute, Izatnagar (India). Division of Surgery; Aithal, H.P.; Indian Veterinary Research Institute, Izatnagar (India). Division of Surgery; Kinjavdekar, P.; Indian Veterinary Research Institute, Izatnagar (India).Division of Surgery; Amarpal; Indian Veterinary Research Institute, Izatnagar (India). Division of Surgery; Pawde, A.M.; Indian Veterinary Research Institute, Izatnagar (India).Division of Surgery;Pratap, K.; Indian Veterinary Research Institute, Izatnagar (India). Division of Surgery; Surbhi; Navsari Agricultural University, Navsari (India). College of Veterinary Science and Animal Husbandry, Department of Surgery and Radiology. Sinha, D.K; Indian Veterinary Research Institute, Izatnagar (India). CADRAD. Epoxy-pin external skeletal fixation for treatment of open fractures or dislocations in 36 dogs. Indian Journal of Veterinary Surgery (India). (Dec 2012) v.33(2) p.128-132 KEYWORDS: DISLOCATIONS. DOGS. EPOXY COMPOUNDS. BONES. FRACTURE FIXATION.
The objective of the study was to report an epoxy-pin external skeletal fixation system for treatment of open fractures/ dislocations, and outcome in 36 dogs. Epoxy-pin fixators were used to repair open fractures (n=30)/dislocations (n=6) distal to the stifle/elbow joints, using 1.2-2.0 mm K-wires fixed at different levels. Fixation wires in the same plane were bent and joined; and using additional wires scaffolds for connecting bars/rings were constructed. Thoroughly mixed epoxy putty was applied over the scaffold to create permanent connecting bars and rings. Dogs were evaluated clinically and radiographically at regular intervals until healing. Results showed that epoxy-pin fixation provided stable fixation with early weight bearing. Open wounds generally healed within 10 days and full weight bearing observed within 3 weeks in most of the dogs. With two exceptions, there was no appreciable damage or deformation of fixator components, and fixation maintained until healing occurred. The technique was easy, inexpensive, lightweight, and versatile to provide stable fixation of open fractures and dislocations below the stifle and elbow in dogs.

097. Ansari, M.M.; Indian Veterinary Research Institute, Izatnagar (India). Zama, M.M.S.; Indian Veterinary Research Institute, Izatnagar (India).Amarpal; Indian Veterinary Research Institute, Izatnagar (India). Saxena, A.C.; Indian Veterinary Research Institute, Izatnagar (India). Gugjoo, M.B.; Indian Veterinary Research Institute, Izatnagar (India). Clinical studies on therapeutic ultrasound and diathermy in dogs with hind quarter weakness. Indian Journal of Veterinary Surgery (India). (Dec 2012) v.33(2) p.136-139 KEYWORDS: CLINICAL TRIALS. DOGS. QUARTERS. THERMAL CONTROL. ULTRASONICS. THERAPY.
Clinical studies were conducted in dogs suffering from hind quarter weakness and subjected to conventional drug therapy CDT (n=8) alone and in combination with therapeutic ultrasound (n=8) or short wave diathermy (n=8). Sonication at 1 MHz frequency and 0.5 Watt/cm2 intensity, and diathermy (2 pads) at 200 mA intensity and 9 Volts alternating current was applied. All the therapies were continued for 14 days. All the animals regained their normal postural reactions, except hopping reaction in hind limbs by day 14 of the therapy. Hopping reaction was achieved in 12 dogs (2 in group I, 4 in group II and 6 dogs in group III) by day 14 and in rest of them by day 28. The dogs treated with shortwave diathermy in combination with CDT showed early recovery followed by therapeutic ultrasound alongwith CDT and CDT alone.

098. Kumar, Praveen; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences.Singh. Prem; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences. Chandolia, R.K.; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences. Chawla, S.K.; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences.Sandeep; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences. Reference values of echocardiographic indices with advancement of age in normal mongrel dogs. Indian Journal of Veterinary Surgery (India). (Dec 2012) v.33(2) p.140-142 KEYWORDS: HEART. ECHOGRAPHY. DOGS.

Present study was done on four apparently healthy mongrel pups. Echocardiography was done from first day of life to 10 months of age at regular intervals of 15 days. Dimensional echocardiographic indices i.e. aortic root dimension, left ventricular internal dimension at end-systole and end-diastole, left ventricular posterior wall thickness at end-systole and end-diastole, interventricular septal thickness at end-systole and end-diastole were measured. Functional echocardiographic indices i.e. fractional shortening, ejection fraction, left ventricle posterior wall and interventricular septum systolic thickening were calculated. Dimensional echocardiographic indices increased with advancement of age but functional echocardiographic indices were independent of age. Functional echocardiographic indices are better parameters to study morphological and functional cardiac homogeneity.

099. Deuri, B.; Assam Agricultural University, Guwahati (India). College of veterinary Science. Department of Veterinary Surgery and Radiology. Kalita, D.; Assam Agricultural University, Guwahati (India). College of veterinary Science. Department of Veterinary Surgery and Radiology. Sarma, K.K.; Assam Agricultural University, Guwahati (India). College of veterinary Science. Department of Veterinary Surgery and Radiology. Incidence of Canine Cataract in Guwahati, Assam. Indian Journal of Veterinary Surgery (India). (Dec 2012) v.33(2) p.146-147 KEYWORDS: CANIDAE. CATARACT. DOGS. ASSAM.
All the canine clinical cases presented to the Department of Veterinary Surgery and Radiology and Teaching Veterinary Clinical Complex, College of Veterinary Science, during a period of one year were examined to find out the incidence of cataract. The incidence among 1646 cases was 5.82%. Highest incidence was observed in German Spitz (38.46%) and the dogs above 8 years of age were the most frequently affected (47.25%). 62.63% cases were males and 70.33% dogs had bilateral involvement. Reduced pupillary light reflex and marked visual deficit were detected in mature bilateral cataract patients.

100. Tanwar, Mahendra; Rajasthan University of Veterinary and Animal Sciences, Bikaner (India). College of Veterinary and Animal Sciences. Department of Veterinary Surgery and Radiology. Gahlot, T.K.; Rajasthan University of Veterinary and Animal Sciences, Bikaner (India). College of Veterinary and Animal Sciences. Department of Veterinary Surgery and Radiology. Congenital surgical affections of calves. Indian Journal of Veterinary Surgery (India). (Dec 2012) v. 33(2) p.148-150 KEYWORDS: CALVES. GENETIC DISORDERS. COWS. SURGICAL OPERATIONS.
The study was conducted on 44 cases of congenital affections in cow calves and buffalo calves of either sex of less than 1 year of age. The occurrence of congenital affections were recorded in various regions of the body i.e. head (13.64%), abdomen (40.91%), perineum (15.91%) and limb (29.55%). These cases were treated on general principles of management. The calf having agenesis of oral commissure did not survive and succumbed during therapy. The ocular dermoids were successfully removed surgically. All the cases of intestinal evisceration died postoperatively after 28 to 72 hr. The cases of urachus pervious were managed surgically by ligation of urachus. The case of vertebral meningocele did not recover. The cases showing atresia ani, atresia ani with rectovaginal fistula and atresia coli were treated surgically. The cases of contracted flexor tendon were treated successfully by putting the plaster of Paris cast.

101. Bhatt , R.H.; Anand Agricultural University, Anand (India). Veterinary College. Department of Surgery and Radiology. Kelawala, N.H.; Anand Agricultural University, Anand (India). Jhala, S.K.; Anand Agricultural University, Anand (India). Veterinary College. Department of Surgery and Radiology.Mathai, Roon Marium; Anand Agricultural University, Anand (India).Patil, D.B.; Anand Agricultural University, Anand (India). Veterinary College. Department of Surgery and Radiology. Parikh , P.V.; Anand Agricultural University, Anand (India). Veterinary College. Department of Surgery and Radiology. P.D. Vihol; Anand Agricultural University, Anand (India). Laparoscopy guided biopsy in hepatic abnormalities in dogs. Indian Journal of Veterinary Surgery (India). (Dec 2012) v. 33(2) p.151 KEYWORDS: LAPAROTOMY. BIOPSY. FUNCTIONAL DISORDERS. DOGS. LIVER.

Laparoscopy for hepatic biopsy is considered the most precise method for diagnosing hepatic diseases (Nord, 1992). Liver biopsy is indicated to establish the presence and cause of the liver disease, to determine an appropriate therapy and to establish prognosis. The aim of this study was to evaluate the feasibility of hepatic biopsy through laparoscopy.

102. Kumar , Praveen; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences. Department of Surgery and Radiology. Singh, Prem; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences. Department of Surgery and Radiology. Chandolia,R.K.; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences. Department of Surgery and Radiology. Chawla, S.K.; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences. Department of Surgery and Radiology. Sandeep; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences. Department of Surgery and Radiology. Pericardial effusion diagnosed by echocardiography in four dogs. Indian Journal of Veterinary Surgery (India). (Dec 2012) v. 33(2) p.152 KEYWORDS: PERICARDIUM. DIAGNOSIS. HEART. ECHOGRAPHY. DOGS.
Pericardial effusions are the most common acquired pericardial disease in dogs. Echocardiography is the most sensitive and specific noninvasive method of detecting pericardial effusions.

103. Kumar, Praveen; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences. Department of Surgery and Radiology.Singh, Prem; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences. Department of Surgery and Radiology. Chandolia, R.K.; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences. Department of Surgery and Radiology.Chawla, S.K.; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences. Department of Surgery and Radiology.Sandeep; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences. Department of Surgery and Radiology. Echocardiographic diagnosis of dirofilariasis in a dog. Indian Journal of Veterinary Surgery (India). (Dec 2012) v. 33(2) p.153 KEYWORDS: HEART. ECHOGRAPHY. DIAGNOSIS. DOGS.
Heart worm disease caused by Dirofilaria immitis is primarily a disease of pulmonary arteries and in later stages involves right cardiac chambers. A 4-yr old small breed male dog was presented with history of intermittent coughing since last two months. Coughing was more sever at night. Epistaxis was seen four to five times in last two months. Antibiotic therapy provided no relief. There was exercise intolerance and weight loss during the last month. Haematological examination revealed mild anaemia, leukocytosis with absolute eosinophilia.

104. Kumar, Akhilesh; Indian Veterinary Research Institute, Izatnagar (India). Division of Medicine. Sarvanan, M.; Indian Veterinary Research Institute, Izatnagar (India). Division of Medicine. Sarma, K.; Indian Veterinary Research Institute, Izatnagar (India). Division of Medicine.Mahendran, K.; Indian Veterinary Research Institute, Izatnagar (India). Division of Medicine.Mondal, D.B.; Indian Veterinary Research Institute, Izatnagar (India). Division of Medicine. Dey, S.; Indian Veterinary Research Institute, Izatnagar (India). Division of Medicine. Ultrasonographic diagnosis and therapeutic management of multiple hepatic cysts in a dog. Indian Journal of Veterinary Surgery (India). (Dec 2012) v. 33(2) p.154 KEYWORDS: ULTRASONICS. ECHOGRAPHY. DIAGNOSIS. THERAPY. DOGS. LIVER. DIAGNOSIS.
The case responded well to the treatment and started taking food after 8 days and gradual reduction in distended abdomen was noted. ECG showed normal QRS which was found as low voltage before treatment, indicating no involvement of heart in the pathogenesis.

105. Saini, N.S.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). College of Veterinary and Animal Sciences. Department of Veterinary Surgery and Radiology. Anand, A.; Guru Angad

Dev Veterinary and Animal Sciences University, Ludhiana (India). College of Veterinary and Animal Sciences. Department of Veterinary Surgery and Radiology. Sangwan, V.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). College of Veterinary and Animal Sciences. Department of Veterinary Surgery and Radiology. Kumar, A.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). College of Veterinary and Animal Sciences. Department of Veterinary Surgery and Radiology. Mahajan, S.K.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). College of Veterinary and Animal Sciences. Department of Veterinary Surgery and Radiology. Successful surgical treatment of renal, ureteral, cystic and urethral calculi in a Dachshund male dog. Indian Journal of Veterinary Surgery (India). (Dec 2012) v. 33(2) p.155 KEYWORDS: SURGICAL OPERATIONS. KIDNEY DISEASES. URETHRA. MALES. DOGS.
Urinary calculi are commonly seen in different parts of urinary system and is a worldwide medical and surgical problem (Jones et al., 2001). Many a time this problem is associated with urinary tract infections (UTI). The present report discusses the presence of uroliths at multiple locations of urinary system in a dog.

106. Nagaraja, B.N.; Karnataka Veterinary, Animal and Fisheries Sciences University, Bangalore (India). Veterinary College. Department of Veterinary Surgery and Radiology. Rathod, Ramesh; Karnataka Veterinary, Animal and Fisheries Sciences University, Bangalore (India). Veterinary College. Department of Veterinary Surgery and Radiology. Patil, A.S.; Karnataka Veterinary, Animal and Fisheries Sciences University, Bangalore (India). Veterinary College. Department of Veterinary Surgery and Radiology. Vasanth, M.S.; Karnataka Veterinary, Animal and Fisheries Sciences University, Bangalore (India). Surgical management of atresia ani and polymelia in a calf. Indian Journal of Veterinary Surgery (India). (Dec 2012) v. 33(2) p.156 KEYWORDS: SURGICAL OPERATIONS. CALVES.
Atresia ani, commonly seen in calves and pigs, is a congenital defect caused due to genetic or environmental factors or both. It develops when a dorsal part of the cloacal plate fails to form. Atresia ani is the most common intestinal defect in sheep and is believed to be due to an autosomal recessive gene.

107. Veena, P.; Sri Venkateswara Veterinary University, Tirupati (India). College of Veterinary Science. Kumar, R.V.; Sri Venkateswara Veterinary University, Tirupati (India). College of Veterinary Science. Suresh; Sri Venkateswara Veterinary University, Tirupati (India). College of Veterinary Science. Sankar, P.; Sri Venkateswara Veterinary University, Tirupati (India). College of Veterinary Science. Dhanalakshmi, N.; Sri Venkateswara Veterinary University, Tirupati (India). College of Veterinary Science. Kokila, S.; Sri Venkateswara Veterinary University, Tirupati (India). College of Veterinary Science. Srilatha, Ch.; Sri Venkateswara Veterinary University, Tirupati (India). College of Veterinary Science. Surgical Management of Lipoma in A Dog. Indian Journal of Animal Research (India). (Mar 2011) v. 45(1) p. 65-66 KEYWORDS: DOGS. LIPOMA. SURGICAL OPERATIONS.
An eight year old Spitz weighing 6 kg was presented to the Department of Veterinary Surgery and Radiology, College of Veterinary Science, Tirupati with a complaint of swelling on the umbilical region for the past one month. Physical examination revealed semisolid, freely movable mass noticed on the umbilical region. Temperature, respiratory rate, pulse rate, heart rate were within physiological limits. Heamatobiochemical values revealed no significant changes. Radiograph of thorax revealed no lung metastasis and fine needle aspiration biopsy revealed fat cells. Under atropine sulphate and xylazine hydrochloride premedication and ketamine hydrochloride diazepam the tumor mass was excised. Excised tumor mass was subjected to histopathological examination which confirmed the mass as lipoma. Animal recovered uneventfully with no recurrence of tumor over a period of 6 months.

108. Shridhar, N.B.; Karnataka Veterinary, Animal and Fisheries Sciences University, Bangalore (India). Veterinary College. Perineal Hernia in A Cross Bred Cow and Its Surgical Management. Indian Journal of Animal Research (India). (Mar 2011) v. 45(1) p. 73-74 KEYWORDS: CROSSBREDS. COWS. HERNIA. SURGICAL OPERATIONS.

Perineal hernia is an uncommon phenomenon in cattle. A case of perineal hernia in a HF crossbred cow was surgically corrected. The urinary bladder was herniated into the vaginal folds and formed a perineal hernia. The same was corrected using a proper surgical technique and the cow recovered uneventfully.

109. Suresh Kumar, R.V.; Sri Venkateswara Veterinary University, Tirupati (India).College of Veterinary Science. Veena, P.; Sri Venkateswara Veterinary University, Tirupati (India).College of Veterinary Science. Sankar, P.; Sri Venkateswara Veterinary University, Tirupati (India).College of Veterinary Science. Dhana Lakshmi, N.; Sri Venkateswara Veterinary University, Tirupati (India).College of Veterinary Science. Kokila, S.; Sri Venkateswara Veterinary University, Tirupati (India).College of Veterinary Science. Surgical management of atresia recti-ani and coli in a holstein friesian cross bred calf. Veterinary World (India). (Apr 2011) v.4(4) p. 176-177 KEYWORDS: CALVES. NEWBORN ANIMALS. GENETIC DISORDERS. SURGICAL OPERATIONS.
The present paper describes a case of atresia coli with atresia recti and ani in a new born Holstein Friesian cross bred calf.

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110. Swarnkar, C.P.; Central Sheep and Wool Research Institute, Avikanagar (India). Singh, D.; Central Sheep and Wool Research Institute, Avikanagar (India). Role of bioclimatographs in forecasting of strongyle infection in Rajasthan. Indian Journal of Animal Sciences (India). (Mar 2011) v. 81 (3) p. 216-223 KEYWORDS: SHEEP. HAEMONCHUS CONTORTUS. HAEMONCHUS. CLIMATOLOGY. EPIDEMICS. RAJASTHAN.
The present communiqué describes the role of bioclimatographs in forecasting the periods suitable for translation of predominant nematode parasite of sheep (Haemonchus contortus) in Rajasthan. Bioclimatographs were useful in predicting the periods that are suitable for translation of exogenous stages of H. contortus in both arid and semi-arid environment with resultant peak of infection in host. Further, the study provides the possibility that climatic consideration in combination with grazing practices can be taken into account in evaluating expected level of refugia and thus treatments can be avoided at times when refugia are likely to be small. Thus, integration of climate and biology of parasite in the form of bioclimatograph may strengthen our tool box in combating the menace caused by gastrointestinal parasites.

111. Shahnawaz, M.; Sher-e-Kashmir University of Agricultural Science and Technology, Jammu (India). Shahardar, R.A.; Sher-e-Kashmir University of Agricultural Science and Technology, Jammu (India). Wani, Z.A.; Sher-e-Kashmir University of Agricultural Science and Technology, Jammu (India). Shah, S.A.; Sher-e-Kashmir University of Agricultural Science and Technology, Jammu (India). Prevalence of ovine platyhelminth parasite infections in Ganderbal area of Kashmir valley. Indian Journal of Animal Sciences (India). (Mar 2011) v. 81 (3) p. 245-248 KEYWORDS: SHEEP. PLATYHELMINTHES. EPIDEMICS. EPIDEMIOLOGY. JAMMU AND KASHMIR.
Necropsy examination of 55 slaughtered/dead sheep from Ganderbal, Lar and Kangan tehsils of Ganderbal district revealed 74.54% platyhelminth infection with trematodes and cestodes in 45.45 and 52.72% animals respectively. Stilesia globipunctata (38.18%) was the most prevalent platyhelminth followed by Dicrocoelium dendriticum (34.54%), Moniezia expansa (23.63%), Fasciola gigantica (12.72%), paramphistomes (7.27%) and Avitellina centripunctata (5.45%). Amongst metacestodes, hydatid cysts (9.09%) and Cysticercustenuicollis (5.45%) were also found. Infection was higher in spring season and in adult sheep. Mixed infection was found in 34.54% animals. Paramphistomes showed the highest mean worm count of 393.75±114 followed by Dicrocoelium dendriticum (253.47±32.90), Stilesia globipunctata (38.09±11), Fasciola gigantica (13.85±5.04), Avitellina centripunctata (7.66±5.24) and Moniezia expansa (5.15±1.02). Hydatid cysts and C. tenuicollis showed mean counts of 1.80±0.49 and 1.33±0.33 respectively.

112. Vatsya, S.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Banerjee, P.S.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Yadav, C.L.; Govind

Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Rajeev Ranjan Kumar; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Prevalence of Linguatula serrata infection in small ruminants in and around Pantnagar, Uttarakhand. Indian Journal of Animal Sciences (India). (Mar 2011) v. 81 (3) p. 249-250 KEYWORDS: SHEEP. GOATS. ZOONOSES. HELMINTHS. UTTAR PRADESH.
Mesentries and mesenteric lymph nodes of 97 small ruminants (95 goats and 2 sheep) slaughtered at two slaughter houses – Pantnagar and Rudrapur in Udham Singh Nagar, Uttarakhand were examined for L. serrata nymphal stages from January 2005 to December 2005. The nymphal stages of L. serrata were recovered from MLNs but not from the mesenteries. An overall prevalence of 12.37% (11 goats and one sheep) was observed. The highest percent of infection (37.5) was recorded in September whereas no MLN was found infected with nymphal stages in May, June, July and December. The number of nymphal stages ranged from 2–210.

113. Dimri, Umesh; Indian Veterinary Research Institute, Izatnagar (India). Sharma, M .C.; Indian Veterinary Research Institute, Izatnagar (India). Sarkar, T.K.; Indian Veterinary Research Institute, Izatnagar (India). Tiwari, R.; Indian Veterinary Research Institute, Izatnagar (India). Shukla, Shiva; Indian Veterinary Research Institute, Izatnagar (India). Mendiratta, S.K.; Indian Veterinary Research Institute, Izatnagar (India). Indigenous herbal preparation against skin mycotic infection in goats. Indian Journal of Animal Sciences (India). (May 2011) v. 81 (5) p. 440-444 KEYWORDS: GOATS. DERMATOMYCOSES. SKIN DISEASES. DRUG PLANTS.
An indigenous preparation consisting of Andropogan muricatus, Annona squamosa, Argemone mexicana, Butea frondosa, Melia azadirachta and Cedrus deodara was found effective against dermatomycosis in 12 goats based on changes towards normalcy with respect to skin scraping examination, total leukocyte count, total erythrocyte count, hemoglobin concentration, and changes in serum biochemistry including concentration/ activities of globulin, lipids, cholesterol, triglycerides, bilirubin, AST, ALT, serum albumin and A:G ratio. Other indices like change in body weight, milk yield, physico-chemical properties of meat and hepatic excretory function also responded positively to the treatment. All infected goats recovered within 1 month of therapy with indigenous herbal preparation.

114. Fayez Awadalla Salib; Cairo University, Cairo (Egypt). Faculty of Veterinary Medicine.Taher Ahamed Baraka; Cairo University, Cairo (Egypt). Faculty of Veterinary Medicine. Epidemiology, genetic divergence and acaricides of Otodectes cynotis in cats and dogs. Veterinary World (India). (Mar 2011) v.4(3) p. 109-112 KEYWORDS: CATS. DOGS. ACARICIDES. OTODECTES CYNOTIS. EPIDEMIOLOGY. GENETIC DISTANCE. PET ANIMALS.
Otodectes cynotis mite is a common parasite of cats and dogs, survives in the ear canal and causes otitis externa, itching and severe complications. The microscopic examination of ear swabs, skin scraps and faecal samples of 289 cats and 223 dogs revealed that mono-specific and mixed infestations of Otodectes cynotis in cats were (24.56%) and(6.57%) while in dogs were (7.17%) and (4.48%) respectively. The highest rate of infestation was in young cats and the lowest was in elder dogs. The mixed infestations were found in combination with Sarcoptes, Demodex, Dermatophytes, Ticks, Fleas, Ascarids, Dipylidium and Isospora. The RAPD-PCR proved the genetic divergence between cat and dog isolates whereas they are morphologically similar. Selamectin-pour on, Doramectin-subcutaneous injection and Ivermectin-Ear drops were evaluated two weeks post treatment. The rate of success in cats were (96.66%) ,(90.00%) and (83.33%) and in dogs were (77.77%), (75.00%) and (66.66%) respectively. It is concluded that Selamectin pour on is the best acaricide against Otodectes cynotis in both cats and dogs. It is also needed to prepare a vaccine in the future to prevent the infestation with Otodectes cynotis and its complications.

115. Maharana, Biswa Ranjan; Indian Veterinary Research Institute, Izatnagar (India). Baithalu, Rubina Kumari; Indian Veterinary Research Institute, Izatnagar (India). Allaie, Idrees Mehraj; Indian Veterinary Research Institute, Izatnagar (India). Mishra, Chinmoy; Indian Veterinary Research Institute, Izatnagar (India).

Lipismita Samal; Indian Veterinary Research Institute, Izatnagar (India). Mechanism of immunity to tick infestation in livestock. Veterinary World (India). (Mar 2011) v.4(3) p. 131-135 KEYWORDS: LIVESTOCK. TICKBORNE DISEASES. IMMUNITY.
Immunological interaction at the tick host interface involves both innate and acquired host defenses against infestation and Immunomodulatory countermeasures by thetick. Acquired resistance to tick infestation involves humoral and cellular immlmoregulatory effector pathways. Tick-borne disease-causing agentspr exploit tick suppression of host defenses during transmission and initiation of infection. Because of the public health importance of ticks and tick-borne diseases, it is crucial that we understand these interactions and exploit them in novel immunological control.

116. Singh, R. K.; Veterinary College, Durg (India). Sanyal, P.K.; Veterinary College, Durg (India). Fungal spread and faecal decomposition as indicators to evaluate short term environmental impact of egg parasitic fungi, Paecilomyces lilacinus and Verticillium chlamydosporium. Veterinary World (India). (Apr 2011) v.4(4) p. 168-170 KEYWORDS: BIOLOGICAL CONTAMINATION. MYCOSES. ENVIRONMENTAL IMPACT. FAECES.
Experiments were conducted to understand the extent of spread of Paecilomyces lilacinus and Verticillium chlamydosporium once deposited in faeces and alteration, if any, of the organic content of faeces by them, which could serve as evidences of their short-term environmental impact. Coproculture of the central part and two concentric rings of both the fungus contaminated plots were undertaken twice a week for four weeks in laboratory for the presence of P. lilacinus and V. chlamydosporium. Subcultures were done until the confirmation of desired fungus occur. Paecilomyces lilacinus could not be reisolated from the central part and two concentric rings at any point of sampling period except from the faecal sample of the central part on day 0. Verticillium chlamydosporium could be re-isolated from the faeces deposited at the central part on day 0, 7 and 14 but never from 21st day of sampling onward. However, V. chlamydosporium could not be recovered from the faeces of two concentric rings at any point of sampling. Moisture contents decreased with corresponding increase in dry matter content of the faeces as the time progressed. Faeces mixed with P. lilacinus, V. chlamydosporium and no fungus controls behaved similarly in terms of moisture and dry matter contents. From 60th day of deposition onwards, ash contents of faeces mixed with P. lilacinus, V. chlamydosporium and no fungus controls showed increasing trend with the corresponding decreasing trends in organic matter contents.

117. Singh, H.; Indian Veterinary Research Institute, Izatnagar (India). Tewari, A.K.; Indian Veterinary Research Institute, Izatnagar (India). Mishra, A.K.; Mekelle University, Mekelle (Euthopia) Maharana, B.R.; Indian Veterinary Research Institute, Izatnagar (India). Rao, J.R.; National Academy of Agricultural Research Management, Hyderabad (India). Raina, O.K.; Indian Veterinary Research Institute, Izatnagar (India). Molecular cloning, comparative sequence analysis and prokaryotic expression of GRA5 protein of Toxoplasma gondii. Indian Journal of Animal Sciences (India). (Mar 2011) v. 81 (3) p. 209-215 KEYWORDS: TOXOPLASMA GONDII. TOXOPLASMOSIS.
Among the several target molecules for sensitive detection of Toxoplasma gondii, dense granule antigens are considered important as these help in growth and multiplication of the organism in the host. The communication deals with the cloning and sequence analysis of 363 bp entire open reading frame (ORF) of GRA5, a dense granule protein, from 2 Indian isolates of T. gondii (Izatnagar and Chennai) as well as the standard RH strain. The sequence comparison analysis revealed 100% homology between the Chennai and Izatnagar isolates, 99.2% homology of RH strain with both the Chennai and Izatnagar isolates and 100% sequence homology of RH strain of T. gondii with the published sequence. The GRA5 protein (mature) was subsequently expressed in prokaryotic expression system. It had molecular size of ~29 kDa and the level of expression was measured as 12% of the total protein. The concentration of the mature recombinant GRA5 protein was 92µg/ml. Western blot with Ni-NTA anti-histidine HRPase conjugate and known positive serum confirmed the presence and purity of protein by immunoreactivity at the unique ~29 kDa region.

118. Yadav, C.L.; G.B. Pant University of Agriculture and Technology, Pantnagar (India). Department of Veterinary Parasitology. Rajeev Ranjan Kumar; G.B. Pant University of Agriculture and Technology, Pantnagar (India). Department of Veterinary Parasitology. Vatsya, Stuti; G.B. Pant University of Agriculture and Technology, Pantnagar (India). Department of Veterinary Parasitology. Garg, Rajat; G.B. Pant University of Agriculture and Technology, Pantnagar (India). Department of Veterinary Parasitology. Sanjay Kumar; National Research Centre on Camel, Jorbeer, Bikaner (India). Prevalence of gastrointestinal nematodosis in bovines of Western Uttar Pradesh. Pantnagar Journal of Research (India). (Jul-Dec 2010) v.8(2) p.251-254 KEYWORDS: MORBIDITY. DIGESTIVE SYSTEM DISEASES. NEMATODE CONTROL. UTTAR PRADESH. BOVIDAE.

L73 Animal Diseases

119. Dutta, T.K.; Sher-e-Kashmir University of Agricultural Science and Technology, Jammu (India). Bhat, M.A.; Sher-e-Kashmir University of Agricultural Science and Technology, Jammu (India). Wani, S.A.; Sher-e-Kashmir University of Agricultural Science and Technology, Jammu (India). Taku, A.K.; Sher-e-Kashmir University of Agricultural Science and Technology, Jammu (India). Prevalence of Pasteurella multocida serotype B:2 in livestock and poultry in Jammu and Kashmir. Indian Journal of Animal Sciences (India). (Mar 2011) v. 81 (3) p. 242-244 KEYWORDS: LIVESTOCK. POULTRY. PASTEURELLA MULTOCIDA. EPIDEMICS. DISEASE SURVEILLANCE. JAMMU AND KASHMIR.
Samples were collected from cattle (52), buffaloes (31), sheep (27), goats (22), pigs (39) and poultry (125)from different parts of Jammu and Kashmir for isolation and identification of Pasteurella multocida (P. multocida). A total of 52 P. multocida were isolated. Seventeen (4 from cattle and 13 from buffaloes) isolates were from diseased and 35 (5 from cattle, 4 each from buffaloes and pigs, 8 each from chicken and sheep and 6 from goats) were from apparently healthy animals. All the isolates from cattle (9).

120. Sonawane, G.G.; Central Sheep and Wool Research Institute, Avikanagar (India). Tripathi, S.; Central Sheep and Wool Research Institute, Avikanagar (India). Dubey, S.C.; Central Sheep and Wool Research Institute, Avikanagar (India). Sero-incidence of brucellosis in small ruminants of semiarid Rajasthan. Indian Journal of Animal Sciences (India). (Apr 2011) v. 81 (4) p. 327-329 KEYWORDS: GOATS. SHEEP. BRUCELLOSIS. MORBIDITY. RAJASTHAN.
The present study was taken up to ascertain the prevalence of brucellosis in sheep and goats of semiarid region of Rajasthan by Rose Bengal Plate Test and commercially available ELISA kit. RBPT detected brucella antibodies in 94 (8.82%) out of 1065 and ELISA in 118 (11.47%) out of 472 sheep serum samples tested. The highest seroprevalence was recorded in Tonk (24.47% and 43.29%), followed by Ajmer district (11.16% and 14.06%) by RBPT and ELISA, respectively. RBPT detected Brucella antibodies in 12 (1.65%) out of 723 and ELISA detected 19 (4.67%) out of 406 goat serum samples. The incidence in Tonk district was 1.31% and 10.44%, in Ajmer 2.20% and 2.63%, in Bundi 1.75% and 1.85%, and in Bhilwara 3.4% and 5.47%, by RBPT and ELISA, respectively. The combined incidence in sheep and goats of semiarid Rajasthan was 5.92% by RBPT and 15.6% by ELISA. Our results showed higher seroprevalences in small ruminants of Tonk, Bhilwara and Ajmer districts. There is a need to screen human population dealing with husbandry, health and marketing of small ruminants and to develop effective control and prevention strategies for sheep and goats of this area against brucellosis.

121. Rajbongshi, G.; Assam Agricultural University, Guwahati (India). Barman, N.N.; Assam Agricultural University, Guwahati (India). Das, S.K.; Assam Agricultural University, Guwahati (India). Survival and inactivation of classical swine fever virus isolated from pigs of Asom, India. Indian Journal of Animal Sciences (India). (Apr 2011) v. 81 (4) p. 330-333 KEYWORDS: SWINE. SWINE FEVER VIRUS. SWINE FEVER. ASSAM.
The present study was undertaken to evaluate stability and inactivation of the local isolates of classical swine fever virus (CSFV) along with the standard lapinized cell culture adapted CSF virus vaccine exposing to various physical and chemical agents. Vaccine strain and local isolates of CSFV adapted in PK-15 cell line

were exposed to different temperatures (4, 27, 60°C), pH (2, 7, 14) and chemicals (2% NaOH, 20% chloroform, 0.5% trypsin) at various time periods. TCID50 of the virus residue was estimated at the end of each treatment. Results showed that all the CSFV isolates lost their virus titre completely within 10 min at 60°C, at pH 2 and pH 14 within 30 min. Viruses exposed to 20% chloroform, 0.5% trypsin and 2% sodium hydroxide, inactivated completely within 60 min. On the other hand, at 27°C, within 60–120 min virus titre was reduced by 0.5–1.0 log10 and at 4°C, titre of the isolates were reduced by 0.5–1.0 log10 within 15–30 days. Exposure to different pH levels showed that CSFV titre remained stable at pH 7 within 15 to 30 min at room temperature. The work provides basic information on physico-chemical properties of cell culture adapted Indian isolates of CSF virus and also a comparison with lapinized CSFV.

122. Kaw, A.; 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). Ramneek; 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). Sood, N.K.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Deka, D.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Awahan, S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Diagnosis of rabies in animals by nested RT-PCR. Indian Journal of Animal Sciences (India). (Apr 2011) v. 81 (4) p. 367-369 KEYWORDS: RABIES. DIAGNOSIS. PCR.
Brain tissues (39) and skin samples (32) from rabies suspected animals were diagnosed by employing nested RTPCR. Brain samples (15: 38.46%) were positive by nested RT-PCR. The sensitivity of detection of rabies by nested RTPCR from brain tissue in present study was 75%. Out of 32 skin samples, rabies was detected in 9 skin samples by nested RT-PCR yielding a sensitivity of 56.25%.

123. Kumar, Rajeev Ranjan; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Yadav, C.L.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Garg, Rajat; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Vatsya, S.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Incidence of paramphistomosis in cattle and buffaloes of Uttarakhand. Indian Journal of Animal Sciences (India). (Apr 2011) v. 81 (4) p. 374-376 KEYWORDS: PARAMPHISTOMUM CERVI. CATTLE. WATER BUFFALOES. MORBIDITY. UTTAR PRADESH.
Out of the 39767 faecal samples (24 487 cattle and 15 280 buffaloes) examined from animals of various villages in tarai and hills of Uttarakhand from January 2001 to December 2007, 6894 (17.33%) were found positive for various amphistome eggs. Slightly higher infection of amphistomosis was recorded in buffaloes (17.65%) than in cattle (17.14%). The incidence of infection in cattle and buffaloes has decreased over the years in Uttarakhand, with the lowest incidence in cattle (10.95%) and buffaloes (6.32%) during the year 2005. Higher incidence of paramphistomosis was recorded in the animals of tarai region (20.48%) as compared to the hills (8.71%). Highest incidence of amphistome infection was recorded during the months of July (30.38% cattle, 36.15% buffaloes), while it was least in the month of November (7.28% cattle, 4.78% buffaloes). The most common species of amphistomes recovered from the rumen of buffaloes slaughtered at local abattoirs were Paramphistomum cervi, Cotylophoron cotylophorum, Fischoederius elongatus and Gastrothylax crumanifer. Based on the incidence of paramphistomosis in different parts of Uttarakhand, there is a need to devise management strategies against this parasitic disease.

124. Suneja, Bharat Bhushan; Indian Veterinary Research Institute, Izatnagar (India). Division of Surgery and Radiology. Amarpal; Indian Veterinary Research Institute, Izatnagar (India). Division of Surgery and Radiology. Rathore, R.; Indian Veterinary Research Institute, Izatnagar (India). Division of Surgery and Radiology. Kinjavdekar, P.; Indian Veterinary Research Institute, Izatnagar (India). Division of Surgery and Radiology. Aithal, H. P.; Indian Veterinary Research Institute, Izatnagar (India). Division of Surgery and Radiology. Pawde, A. M.; Indian Veterinary Research Institute, Izatnagar (India). Division of Surgery and Radiology. Level of fluoroquinolone resistance among some bacterial species of veterinary clinical

importance. Indian Journal of Veterinary Researh (India). (Dec 2012) v.21(2) p. 30-36 KEYWORDS: ANTIBIOTICS. BACTERIOLOGY. RESISTANCE TO CHEMICALS.
The study assessed the level of resistance against common fluoroquinolone antibiotics (ciprofloxacin, norfloxacin, ofloxacin and enrofloxacin), in bacterial species isolated from open wounds of domestic animals. Among the four fluoroquinolone antibiotics, the bacterial population showed maximal resistance against norfloxacin, only 25.56% of bacterial isolates were sensitive to this antibiotic. Ciprofloxacin, enrofloxacin and ofloxacin were almost similar in their efficacy against the bacterial isolates but 34-36% bacterial isolates were resistant to these antibiotics. The results indicated high bacterial resistance among fluoroquinolone antibiotics suggesting judicious use of this group of antibiotics under field conditions.

125. Heleili, N.; Hadj Lakhdar University, Batna (Algéria) Mamache, B.; Hadj Lakhdar University, Batna (Algéria)Chelihi, A.; Hadj Lakhdar University, Batna (Algéria). Incidence of Avian Mycoplasmosis in the region of Batna, Eastern Algeria. Veterinary World (India). (Mar 2011) v.4(3) p. 101-105 KEYWORDS: BROILER CHICKENS. MYCOPLASMOSES.
Avian mycoplasmosis is infectious and contagious disease which affects chicken and turkey as well as many other species with many economics losses. The absence of data on avian mycoplasmosis in Algeria and the importance of the poultry breeding in Batna encouraged us to undertake the prevalence of the most pathogenic mycoplasmas in broiler and layer chickens in this area, Mycoplasma gallisepticum (MG). 143 Mycoplasmas were isolate from 237 samples, at a rate of 60.33%. MG was isolate at a rate of 21.67% (2.09% in layer hens and 19.58% in broiler chickens). The serological screening using of breedings showed a sensitivity of 83.10%. This study shows that mycoplasmosis and in particular MG infection, represent a serious problem in chickens in Algeria in the absence of hygiene conditions and vaccination especially.

126. Adakole Hyacinth Abu; University of Agriculture, Makurdi (Nigeria) Chukwuka N. Uchendu; University of Nigeria, Nsukka (Nigeria). In vivo trypanocidal activity of Hydroethanolic extract of Hymenocardia acida stem bark in rats. Veterinary World (India). (Mar 2011) v.4(3) p. 113-116 KEYWORDS: RATS. TRYPANOSOMIASIS. PHYTOTHERAPY.
The in vivo trypanocidal efficacy of Hydroethanolic extract of Hymenocardia acida stem bark was evaluated in Wistar rats. Three groups of rats were treated orally with the extract at doses of 100, 200 and 400 mg/kg body weight for 6 days. Two other groups received the vehicle and Diminazene accurate at 3.5 mg/kg to serve as negative and positive control respectively. The mean survival period of infected animals, daily level of parasitaemia, packed cell volume, total and differential leukocyte counts were evaluated. Oral administration of the extract did not significantly ($P<0.05$) affect the packed cell volume. However, the extract reduced the level of parasitaemia and prolonged the life span of infected rats. This study shows in vivo potential of hydroethanolic extract of H. acida in the treatment of African trypanosomosis.

127. Kaliwal, B.B.; Karnatak University, Dharwad (India). P. G. Department of Studies in Biotechnology and Microbiology,Sadashiv, S.O.; Karnatak University, Dharwad (India). P. G. Department of Studies in Biotechnology and Microbiology,Kurjogi, M.M.; Karnatak University, Dharwad (India). P. G. Department of Studies in Biotechnology and Microbiology,Sanakal, R.D.; Karnatak University, Dharwad (India). P. G. Department of Studies in Biotechnology and Microbiology,. Prevalence and antimicrobial susceptibility of coagulase-negative staphylococci isolated from bovine mastitis. Veterinary World (India). (Apr 2011) v.4(4) p. 158-161 KEYWORDS: BOVINE MASTITIS. ANTIMICROBIAL PROPERTIES. STAPHYLOCOCCUS.
The study was carried out to investigate the prevalence and antimicrobial susceptibility of Coagulase-Negative Staphylococci isolated from Bovine Mastitis in and around Dharwad region. A total of 310 samples were screened and 180 confirmed Coagulase-Negative Staphylococci were obtained. The antimicrobial susceptibility of Coagulase-Negative Staphylococci against 10 antimicrobial agents was tested using the disc diffusion method. The highest numbers of Coagulase-Negative Staphylococci were susceptible to ceftriaxone 83.88% followed by cefotaxime 79.41%, methicillin 76.47%, ciprofloxacin 73.52%, erythromycin 70.05%,

amikacin 66.11%, gentamycin 42.94%, amoxicillin 36.76%, ampicillin 29.41%, and the lowest susceptibility was shown in penicillin 23.23% . The results indicated that the increase in prevalence and antibiotic resistance pattern of the Coagulase-Negative Staphylococci isolated from bovine mastitis exhibited the highest degree of susceptible to ceftriaxone of all the tested antimicrobial agents.

L74 Miscellaneous Animal Disorders

128 Singh, H.; 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). Ante-mortem diagnosis of rabies from body secretions and mucosal impression smears in experimentally infected buffalo calves. Indian Journal of Animal Sciences (India). (Mar 2011) v. 81 (3) p. 205-208 KEYWORDS: CALVES. DIAGNOSIS. SALIVA. RABIES VIRUS. IMMUNOLOGICAL TECHNIQUES.
An experimental study was carried out on 9 buffalo calves that were divided into 3 groups of 3 buffalo calves each. In group 1, buffalo calves (2) were inoculated with 656865 MICLD50 of Street Rabies Virus (SRV) via oral route. 5 ml of normal mice brain (NMB) suspension was inoculated via similar route to third buffalo calf which served as control of this group. In group 2, buffalo calves (2) were inoculated with 394119 MICLD50 of SRV via intra-thecal route. 3 ml of NMB suspension was inoculated via similar route to third buffalo calf which served as control of this group. In group 3, buffalo calves (2) were inoculated with SRV by instilling 131373 MICLD50 SRV in either eye. SRV could be detected earliest in salivary secretion, nasal secretion and rectal secretion at 15 days post-inoculation (DPI) in group 1, 20 DPI in group 1 and 3 and 35 DPI in group 1 and 2 respectively. In corneal and prepucial impression smears, virus was found as early as 25 DPI in groups 3 and 35 DPI in groups 1 and 3, respectively. It is suggested that simple detection of rabies virus by immune-fluorescence from body secretions and impression smears from mucosal surfaces could be of antemortem diagnostic value in rabies.

129. Singh, A.K.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India).Bansal, A.K.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India).Prabhakar, Sushil; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India).Cheema, Ranjna S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India).Prahlad Singh,; 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).Gandotra, V.K.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Level of cortisol in placental tissue vis-à-vis oxidative stress in dystocia affected buffaloes. Indian Journal of Animal Sciences (India). (Mar 2011) v. 81 (3) p. 235-237 KEYWORDS: WATER BUFFALOES. DYSTOCIA. GLUCOCORTICOIDS. OXIDATION. STRESS.
The study was planned to evaluate the oxidative stress vis-a-vis inflammation in placental tissue and umbilical cord of normally calved and dystocia affected buffaloes. MDA and total protein were estimated in the placental tissue and umbilical cord of all the animals, whereas cortisol was estimated in the placenta and blood plasma of normally calved and dystocia affected buffaloes. The levels of total protein in placental tissue and umbilical cord were significantly higher in normally calved (15.61±1.43 mg/ml and 14.42±1.58 mg/ml) as compared to the buffaloes suffering from fetal dystocia (2.87±1.04 mg/ml and 6.81±1.08 mg/ml) and uterine torsion (3.57±0.85 mg/ml and 4.66±0.47 mg/ml), respectively. On the contrary, the levels of MDA and cortisol were low in the placenta of normally calved buffaloes (0.17±0.02 µmoles MDA/mg protein ml-1 and 43.8±3.2 ng/ml) than in buffaloes with fetal dystocia (4.0±1.18 ¦Ìmoles MDA/mg protein ml-1 and 49.2±1.2 ng/ml) torsion affected ones (2.63±0.87 µmoles MDA/mg protein ml-1 and 49.3±1.3 ng/ml), respectively. Significant difference in cortisol level was observed in blood plasma of normally calved (39.3¡À2.0 ng/ml), fetal dystociac (64.3±10.1 ng/ml) and torsion affected buffaloes (46.2±4.5 ng/ml). Thus it appears that increase in levels of MDA and cortisol in tissue and blood plasma following dystocia and uterine torsion were indicative of stress and may lead to severe postpartum uterine inflammation.

130. Amarpal; Indian Veterinary Research Institute, Izatnagar (India).Kinjavdekar, P.; Indian Veterinary Research Institute, Izatnagar (India).Aithal, H.P.; Indian Veterinary Research Institute, Izatnagar (India).Pawde, A.M.; Indian Veterinary Research Institute, Izatnagar (India). Evaluation of Gokhru and Pashanbhed for management of experimental urolithiasis in rabbits. Indian Journal of Animal Sciences (India). (Mar 2011) v. 81 (3) p. 251-253 KEYWORDS: RABBITS. UROLITHIASIS. DRUG THERAPY. DIET TREATMENT.

The present study was conducted to evaluate the efficacy of gokhru (Tribulus terrestris) and pashanbhed (Bergenia ligulata) against experimentally produced struvite and oxalate calculi in rabbits. The rabbits (48) were randomly divided in 2 equal groups and were named as OX (oxalate) and ST (struvite). Animals of OX group were given ammonium chloride powder mixed in feed (1% of feed) for 1 week and ethylene glycol in drinking water (1% of water) for 1 month to induce oxalate calculi. These animals were further divided into 3 equal subgroups, viz. OXN, OXG and OXP. The animals of group ST were given magnesium phosphate in 1% concentration of their diet. These animals were also divided in 3 equal subgroups, viz. STN, STG and STP. Subgroups OXN and STN were not given any preventive drug whereas, subgroup OXG and STG were provided with 1%Gokhru fruit powder in their feed. Similarly, the animals of groups OXP and STP were provided with the 1% Pashanbhed rhizomes powder. The appetite of the animals remained normal but the water intake increased significantly in the animals of OX group. The urinary pH was between 6.5 and 7.0 in the animals of OX group, and from 6.5 to 8in the animals of group ST.

131. 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).Jagir 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). Ovsynch plus CIDR-based fixed-time AI protocol as a therapeutic strategy in repeat-breeder crossbred dairy cattle. Indian Journal of Animal Sciences (India). (Mar 2011) v. 81 (3) p. 257-259 KEYWORDS: DAIRY CATTLE. REPRODUCTIVE DISORDERS. REPRODUCTIVE PERFORMANCE. GNRH. INDUCED OVULATION.

Cattle(18) were administered GnRH analogue (20 µg buserelin) on day 0 and day 9 and to PGF 2α (500 µg cloprostenol) on day 7. A controlled internal drug release (CIDR, 1.38 g progesterone) device was inserted from day 0 till day 7. On day 10, AI was carried out in all the cattle. In response to day 0 GnRH, all the cattle ovulated within 24 h with subsequent development of corpus luteum (CL). All the cattle responded to PGF 2α on day 7. All the cattle exhibited synchronous ovulation between 72–96 h after CIDR and removal on day 7 (or 24 and 48 h after day 9 GnRH). First service conception rate was appreciably higher (61%) than 0% conception rate of all the cattle during their previous AIs (4.06±0.29). It is inferred that Ovsynch plus CIDR-based fixed-time AI protocol is highly successful for inducing synchronized ovulation in repeat-breeder cattle, and yields an appreciably high conception rate.

132. Singh, K.P.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Ahmad, A.H.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Singh, V.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Pant, K.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India).Rahal, A.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Effect of Emblica officinalis fruit in combating mercury-induced hepatic oxidative stress in rats. Indian Journal of Animal Sciences (India). (Mar 2011) v. 81 (3) p. 260-262 KEYWORDS: RATS. LIVER DISEASES. OXIDATION. STRESS. EXPERIMENTAL INFECTION. MERCURY.

The antioxidative effect of Emblica officinalis (amla) in mercury-induced oxidative stress in rats was evaluated in the present study. Mercury chloride (0.5 mg/kg, sc) increased the lipid peroxidation and decreased the level of GSH, SOD and catalase in liver which could be reversed by 100 mg/kg of ethanolic EO fruit extract out of 2 doses (50 and 100 mg/ kg) tested in the study. The present study concluded that Emblica officinalis has the antioxidative and hepatoprotective activity in mercury-induced hepatic damage, as it decreases the lipid peroxide, GPT and increases the natural antioxidants in liver in dose-dependant manner.

133. Honparkhe, M.; 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).Singh, Jagir; 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). A CIDR-based AI protocol establishes pregnancy in repeat-breeder dairy cattle. Indian Journal of Animal Sciences (India). (Apr 2011) v. 81 (4) p. 340-343 KEYWORDS: DAIRY CATTLE. REPRODUCTIVE DISORDERS. GNRH.
The objectives of this study were to document ovarian and endocrine responses as well as pregnancy establishment following the treatment of repeat-breeder crossbred dairy cattle with a progesterone-releasing controlled internal drug release (CIDR) -based artificial insemination (AI) protocol. Cattle (25) received prostaglandin F2a (PGF2a , 500ìg) on day 0, concurrent with the intravaginal placement of CIDR (1.38 g progesterone) for 15 days, followed by gonadotropin releasing hormone (GnRH) analogue (20ìg) administration at the spontaneous onset of estrus (day 17, 18 or 19). About 10 h after GnRH, AI was carried out in all the cattle. On day 0, a corpus luteum (CL, 13.7±1.4 mm) and a large follicle (11.1±0.6 mm) were detectable in all the cattle. On day 15, the former was regressed (P<0.05), whereas the latter disappeared completely in all the animals. Estrus detection was carried out daily subsequent to CIDR removal. All the cattle exhibited onset of estrus between 48–96 h after CIDR removal. The preovulatory follicle observed at the time of AI (15.0±0.5 mm) ovulated in all the cattle (P<0.05) between 72–120 h after CIDR removal (or 24–48 h after GnRH). First service conception rate was appreciably greater (52%, P<0.05) in comparison to 0% conception rate of all the cattle during their previous AIs (4.2±0.2). Retrospective analysis suggested that cattle failing to conceive had persistently higher (P<0.05) luteal activity on the day of AI compared to their conceiving counterparts. In conclusion, a CIDR-based (PGF2a +CIDR-GnRH) based AI protocol is highly successful for inducing ovulation in the repeat-breeder (due to endocrine dysfunctions) cattle, and resulted in an acceptable conception rate.

134. Bonia, K.K.; Assam Agricultural University, Guwahati (India). Baishya, N.; Assam Agricultural University, Guwahati (India). Therapeutic management versus biological constituents of sub-oestrous crossbred cows of Asom. Indian Journal of Animal Sciences (India). (Apr 2011) v. 81 (4) p. 362-366 KEYWORDS: CROSSBREDS. COWS. REPRODUCTIVE DISORDERS. DRUG THERAPY. ASSAM.
The present work was undertaken to observe efficacy of some drugs for therapeutic management of sub-oestrous crossbred cows. A total of 60 confirmed sub-oestrous cows were considered. Cows were divided into 6 groups each group comprising 10 cows. Respective cyclic group of cows were treated with prostaglandin 500 µg on day 10, estradiolvalerate 30 mg on day 10 and at early oestrus, laboratory made mineral mixture (aauvetmin), aauvetmin plus multivitamins and a herbal drug stenot bolus. The mean time interval from last treatment to onset of induced oestrus was shortest (3.25±0.25 days) with highest conception on first insemination after treating with cloprostenol injection. Oral administration of balanced mineral mixture along with multivitamins was also found to be cost effective. Regular monitoring of vulvar swelling might be useful from breeding point of view. The serum calcium, inorganic phosphorus, sodium, potassium, magnesium, cobalt, total protein were not much altered whereas, glucose level was dropped to lower level on the day of onset of oestrus. The level of cholesterol and alkaline phosphatase was elevated whereas when zinc concentration was increased, the iron and copper decreased on the day oestrus in all responded cows. Moreover, when 17ß- estradiol in blood was reached highest concentration, progesterone concentration decreased to the lowest but not below 0.50 ng/ml, while cortisol was at higher level on the day of induced oestrus than at before treatment in all responded cows.

135. Ramesh, S.; West Bengal University of Animal and Fishery Sciences, Kolkata (India). Bhowmik, M.K.; West Bengal University of Animal and Fishery Sciences, Kolkata (India). Mukhopadhayay, S.K.; West Bengal University of Animal and Fishery Sciences, Kolkata (India). Ganguly, S.; West Bengal University of Animal and Fishery Sciences, Kolkata (India). Niyogi, D.; West Bengal University of Animal and Fishery Sciences, Kolkata

(India). Biochemical analysis of cerebrospinal fluid of cattle and buffaloes affected with spontaneous brain disorders. Indian Journal of Animal Sciences (India). (May 2011) v. 81 (5) p. 459-460 KEYWORDS: WATER BUFFALOES. CATTLE. CEREBROSPINAL FLUID. BIOCHEMISTRY.
The present study was conducted to analyze the various biochemical parameters in spontaneous brain disorders of cattle and buffaloes which are being slaughtered at Kolkata, India. The mean CSF glucose concentrations in infected cattle and buffaloes were significantly lower than the values of control groups which indicated bacterial infection. The CSF protein levels of the infected cattle and buffaloes were significantly higher when compared with the values of control groups. The MDA assay showed that the average CSF status of the infected cattle and buffaloes were significantly higher when compared to that of control groups. The mean total leukocyte count of infected cattle and buffaloes were significantly higher than the values of control groups, which suggested the exudative properties of CSF due to bacterial meningitis.

136. Sakkariya Ibrahim, N.P.; Indian Veterinary Research Institute, Izatnagar (India).Dutt, Triveni; Indian Veterinary Research Institute, Izatnagar (India).Mukesh Singh; Indian Veterinary Research Institute, Izatnagar (India).Amit Kumar; Indian Veterinary Research Institute, Izatnagar (India). Prevalence of digestive and respiratory disorders in Vrindavani cattle. Indian Journal of Animal Sciences (India). (May 2011) v. 81 (5) p. 463-464 KEYWORDS: CATTLE. BREEDS (ANIMALS). RESPIRATORY DISORDERS. DIGESTIVE DISORDERS. MORBIDITY. DISORDERS. INDIA.
The prevalence of digestive and respiratory disorders in crossbred cattle strain Vrindavani was studied. The study revealed that the prevalence of digestive disorders was high in younger age groups and the prevalence was decreasing with the age. In young age groups, the prevalence was more during rainy season, while in advanced age groups the digestive disorders were more prevalent during the winter season. A significant difference was observed between the prevalence of digestive disorders in males and females. The prevalence of respiratory disorders was also found to be high in younger age groups. As the age increased, the prevalence of respiratory disorders decreased. In adults, the effect of season on prevalence of pneumonia was nonsignificant.

137. Veena, M. P.; Department of Animal Husbandry and Veterinary Services, Malavally (India).Sumathi, B. R.; Department of Animal Husbandry and Veterinary Services, Malavally (India). Thearapeutic management of neonatal calf pneumonia in HF calf – A case report. Veterinary World (India). (Feb 2011) v.4(2) p. 84 KEYWORDS: CALVES. PNEUMONIA. DRUGS.
The present report place on record a typical case of neonatal calf pneumonia in Holstein-Frisian calf and its successful thearapeutic management.

138. Veena, P.; Sri Venkatesawara Veterinary University, Tirupati (India). College of Veterinary Science.Sankar, P.; Sri Venkateswara Veterinary University, Hyderabad (India).SureshKumar, R. V.; Sri Venkateswara Veterinary University, Hyderabad (India).DhanaLakshmi, N.; Sri Venkateswara Veterinary University, Hyderabad (India).Kokila, S.; Sri Venkateswara Veterinary University, Hyderabad (India). Fibroleomyosarcoma of vagina in a bitch. Veterinary World (India). (Feb 2011) v.4(2) p. 85-86 KEYWORDS: DOGS. FEMALES. FIBROMA. FEMALE GENITAL SYSTEM.
On physical examination the animal was active, had a normal physical parameters. Genital tract examination revealed a growth with a stock like structure originating from the vaginal mucous membrane. Radiography of the lateral thorax and abdomen did not reveal any secondary lesions either in the lung or other abdominal organs but revealed fecal filled dilated colon and distended bladder. No major abnormalities were detected from the hematological examination.

139. Naik, S. Ganga; Karnataka Veterinary, Animal and Fisheries Sciences University, Shimoga (India). .Kotresh, A. M.; Karnataka Veterinary, Animal and Fisheries Sciences University, Shimoga (India). .Shambulingappa, B. E.; Karnataka Veterinary, Animal and Fisheries Sciences University, Shimoga (India).

.Ananda, K. J.; Karnataka Veterinary, Animal and Fisheries Sciences University, Shimoga (India). . Organophosphorous compound poisoning in cross bred cows – a case report. Veterinary World (India). (Feb 2011) v.4(2) p. 88 KEYWORDS: COWS. CROSSBREDS. ORGANOPHOSPHORUSCOMPOUNDS. POISONING. The butox (Deltamethrin 1.25 %) is usually used as spray and dip to treat the ectoparasites. As a standard practice this has to be repeated at interval of 8-10 days strictly under constant observation and following procedures in open space. Here in this case, farmer boldly used butox without following precautionary measures. When we visited the place surviving cows were immediately given atropine hydrochloride 0.25 mg/kg body weight. The one third of this dose given very slowly intravenously in a dilution (2%) and the remainder by intramuscular injection given. However the cows did not respond to the treatment and eventually succumbed to death. This incident might have been avoided if butox is applied after applying the mouth cap to the animals and diluting the butox solution (2-4 ml of butox in one liter of water) and in open place under sunlight. Animal should be made wet and then butox should be smeared all over the body except head region and wash the animal after one hour.

140. Sadaf Bukhari, Prabir Kumar Sanyal; Veterinary College, Durg (India). Epidemiological intelligence for grazing management in strategic control of parasitic gastroenteritis in small ruminants in India – A review. Veterinary World (India). (Feb 2011) v.4(2) p. 92-96 KEYWORDS: GOATS. SHEEP.
Because of the environmental and consumer concerns arising out of exponential growth in human population the world over, a term Sustainable Development has become an integral international concept, which is defined as one which meets the needs of the present without compromising the ability of future generations to meet their own needs. Ruminant animals appear sustainable as they do not compete with man for food, play a crucial role in the conversion of low quality plant material and crop residues to high quality human food as well as return valuable plant nutrients to the soil. Parasite control in ruminant livestock is a first-order input in any sustainable animal production system. As sustainable development is a compromise between reducing environmental degradation and positive economic growth, sustainable parasite control should aim towards less intensive, lower input, lesser risk of parasite induced losses with greater opportunities for integration of all available control resources. The compound scenario of rising anthelmintic resistance, food and environmental security and apathy of the pharmaceutical industry to go for the invention of new anthelmintic compounds has triggered the need for optimising the use of available anthelmintics with integration of all other alternative means for sustainable worm control. The “Sustainable Control of Parasitic Gastroenteritis in Ruminants” is thus encompasses a multidisciplinary approach involving integration of chemotherapy, grazing management, biological control, worm vaccines, genetic resistance of hosts, mathematical model based decision support and other strategies, if any. There is no single requirement more crucial to the rational and sustainable control of helminth parasites in grazing animals than a comprehensive knowledge of the epidemiology of the parasite as it interacts with the host in a specific climatic, management and production environment. In its absence, anthelmintic treatment is either given suppressively which provokes resistance or therapeutically which risks clinical disease and production losses. Sustainable parasite-control programmes require knowledge of seasonal larval availability, origin of larvae contributing to any peaks and climatic requirements for worm egg hatching, larval development and survival. Control measures based on this knowledge include strategic anthelmintic treatments and various forms of grazing management. While these measures can reduce the frequency of anthelmintic treatment required, their effect on selection for drench resistance is more problematical, unless they can be combined with other forms of control to reduce our current dependence on anthelmintics. The present article deals with sustainable nematode parasite control in small ruminants in India through grazing management using epidemiological intelligence

141. Parrah, J.D.; Sher-e-Kashmir University of Agricultural Science and Technology, Srinagar (India).Moulvi, B.A.; Sher-e-Kashmir University of Agricultural Science and Technology, Srinagar (India). Hussain, S.S.; Sher-e-Kashmir University of Agricultural Science and Technology, Srinagar (India).Bilal, S.; Sher-e-Kashmir University of Agricultural Science and Technology, Srinagar (India).Athar, H.; Sher-e-Kashmir University of

Agricultural Science and Technology, Srinagar (India). Aetiopathogenesis of Bovine Obstructive Urolithiasis. Indian Journal of Animal Research (India). (Mar 2011) v. 45(1) p. 10-17 KEYWORDS: CALVES. UROLITHIASIS. AETIOLOGY. PATHOGENESIS.

Urolithiasis in countries like India presents an important economic repercussion where cattle - based agriculture is strongly linked with the livelihood of an important segment of the population. Investigations on clinical studies on obstructive urolithiasis in cattle calves, were carried out from October 2006 - April 2008 with the objectives of studying the aetiopathogenesis of the disease. Thirty clinical cases of obstructive urolithiasis with 15 ruptured and 15 intact urinary bladders were brought to the clinics for the treatment during the study period. Diagnosis of the disease was made on the basis of history of anuria, clinical signs, radiographic, ultrasonographic, haematobiochemical, and peritoneal fluid examinations. Most of the calves suffering from obstructive urolithiasis had the history of feeding on diets containing wheat bran, commercial cattle feed, rice bran and rice straw. Wheat bran alone and in combination with other feed and fodder was given to maximum 76.66 per cent calves. Herbal litholytic agent (Tab. Cystone) was the most commonly used medication, which was used alone in 19 per cent and in combination with other drugs in 47.61 per cent cases. Under field conditions diuretics were the second most common drugs administered to the calves under study, before their presentation at the faculty clinics. In 90 per cent cases struvite was the only component of the calculi, while in rest of the cases other minor components like calcium phosphate, calcium carbonate, oxalate etc., were also found. High concentrate feeding with little provision of water during winter months seemed to be the most prominent predisposing factors for the development of the disease.

142. Singh Mahendra; National Dairy Research Institute, Karnal (India). Dairy Cattle Physiology Division.Garg, Ajay; National Dairy Research Institute, Karnal (India). Dairy Cattle Physiology Division. . Incidence of Different Pathogens and Milk Compositional Changes in Sub-Clinical and Clinical Milk Samples of Cows. Indian Journal of Animal Research (India). (Mar 2011) v. 45(1) p. 51-55 KEYWORDS: COW MILK. MASTITIS. PATHOGENS.

The udder of crossbred cows was screened by CMT for the detection of sub-clinical and clinical mastitis and bacteria incidence was determined. The milk samples were tested for the bacteria type and milk compositional changes viz., chloride, lactose, EC, pH and somatic cell count (SCC) was determined. Four types of bacteria incidence namely S. aureus, S. aglactiae, E. coli, E. faecalis was characterized with incidence of 30, 30, 30 and 10, and 30, 30, 10 and 20 per cent in sub-clinical and clinical milk samples. SCC varied between pathogen ($P<0.05$) and was significantly higher in subclinical milk samples having E. faecalis without any effect on pH and EC. However, pH, EC, Chloride and SCC in clinical mastitis samples was significantly more. It was concluded that four types of bacterial incidence occur in subclinical and clinical mastitis but their per cent incidence varied. The histo-pathological examination of clinically affected quarter indicated more tissue changes by S. agalactiae in comparison to S. aureus.

143. Anuradha; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India).Bansal, Neelam; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). Histoenzymic alterations in buffalo lung due to lead toxicosis: An Experimental study. Indian Journal of Veterinary Researh (India). (Dec 2012) v.21(2) p. 37-40 KEYWORDS: WATER BUFFALOES. ENZYMES. LEAD. POISONING.

The study was conducted on six crossbred calves below one year of age. The lead acetate was given @ 25 mg/kg body weight orally for 7 days. After the completion of the experimental period, the lung tissues were collected in liquid nitrogen and cryostat sections of 10 μ m thickness were incubated for the demonstration of phosphatases and dehyrogenases. The positive and negative controls were carried out wherever possible. The lungs showed moderate AKPase, ATPase and G-6-Pase activity whereas the SDH and LDH activity varied from weak to moderate in alveolar septae. ACPase activity was increased in histiocytes of alveolar septae. The alveolar ducts showed negligible activity of all the enzymes studied. The results may be correlated with cellular damage and lysis of macrophages of the alveoli.

144. 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,Bhat, F.A.; Sher-e-Kashmir University of Agricultural Science and Technology, Srinagar(India). Faculty of Veterinary Sciences and Animal Husbandry. Prevalence and management of ovulatory disturbances in crossbred cattle of rural Kashmir. Indian Journal of Veterinary Researh (India). (Dec 2012) v.21(2) p.45-50 KEYWORDS: CROSSBREDS. CATTLE. OVULATION.
Prevalence and management of ovulatory disturbances was recorded from 454 repeat breeding crossbred Jersey cattle of Kashmir valley during a 7 years period (2004‐05 to 2010‐11). Prevalence of anovulation and delayed ovulation was recorded 16.30 and 12.78% with an overall prevalence of 29.07% ovulatory disturbances. Anovulatory animals treated with HCG (Chorulon @ 1500 to 3000 IU i.v. per animal depending on body weight) showed conception rate (CR) of 86.36%; while those treated with Buserelin (Receptal @ 5ml i.v. per animal) as 100.00%, although this difference was statistically non-significant. Animals suffering from delayed ovulation inseminated twice, thrice or 4th times depending on the persistence of estrus signs showed overall CR of 87.93%.

145. Abdelrhman, M.A.; Beni-Suef University, Egypt. Department of Surgery, Anesthesiology and Radiology,Seddek, A.M.; ,Sohag Univ., Egypt. Faculty of Vet. Med. Department of Surgery, Anesthesiology and Radiology.Bakr, H.A.; Beni-Suef Univ., Egypt. Faculty of Vet. Med. Department of Animal Medicine,. Perineal versus prescrotal urethrostomy for treatment of obstructive urethrolithiasis in calves. Indian Journal of Veterinary Surgery (India). (Dec 2012) v.33(2) p.120-123 KEYWORDS: WATER BUFFALOES. CALVES. SCROTUM. URINARY TRACT DISEASES.
A clinical study was conducted on 40 cattle and buffalo calves suffered from urine retention with intact bladder as a result of urethroliths in the ventral curvature of sigmoid flexure. Animals were randomly categorized into two groups for performing perineal or prescrotal urethrostomy. Duration of surgery, severity of bleeding, post-surgical complications, and body gain were recorded for comparing between the techniques. The most common complications were urine scalding in 100% of perineal group, dehiscence of the surgical wound in 25% of perineal group, and stricture of the created fistula in both groups with higher incidence in perineal group. Although the operated calves by either technique cannot be used for breeding, it is concluded that prescrotal urethrostomy can be considered superior to perineal one as it required shorter duration of surgery, and associated with lesser bleeding, fewer complications, and higher body weight gain.

146. Kumar, Praveen; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences.Singh, Prem; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences.Chandolia, R.K.; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences.Chawla, S.K.; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences.Sandeep; Lata Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). College of Veterinary Sciences. Chronic valvular heart disease in geriatric dogs: an echocardiographic study. Indian Journal of Veterinary Surgery (India). (Dec 2012) v.33(2) p.143-145 KEYWORDS: CHRONIC COURSE. HEART DISEASES. DOGS. HEART. ECHOGRAPHY.
Echocardiographic assessment of mitral valve was done in four Spitz dogs aged more than 10 yr using two-dimensional, M-mode and colour flow Doppler echocardiography. All the dogs were diagnosed with chronic valvular heart disease. Mitral valve prolapse was present in all the dogs and mitral regurgitation in two dogs. Echocardiographic indices were calculated. Colour flow Doppler echocardiography was found more sensitive and specific for diagnosis of mitral valve prolapse and regurgitation.

147. Mathew, Dayamon D.; Karnataka Veterinary, Animal and Fisheries Sciences University, Bangalore (India).Mahesh, V.; Karnataka Veterinary, Animal and Fisheries Sciences University, Bangalore (India).Ranganath, L.; Karnataka Veterinary, Animal and Fisheries Sciences University, Bangalore (India). Flat-

pup syndrome: report of three cases. Indian Journal of Veterinary Surgery (India). (Dec 2012) v. 33(2) p. KEYWORDS: SYMPTOMS. DOGS. PUPPIES. GROWTH DISORDERS.
Flat-pup syndrome is an uncommon developmental abnormality seen in neonatal dogs. It is also known as swimmer puppy syndrome, twisted legs, turtle pup, pizza pups or Frisbee pups. It is most common in those breeds of dogs that have short legs and wide thoracic cavity.

148. Joseph, Dhanya; Indian Veterinary Research Institute, Izatnagar (India).More, Tukaram; Indian Veterinary Research Institute, Izatnagar (India). Molecular characterization of lingual antimicrobial peptide in the female reproductive tract of buffalo. Veterinary World (India). (Mar 2011) v.4(3) p. 120-123 KEYWORDS: WATER BUFFALOES. REPRODUCTION. MILK PRODUCTION.
Bubalus bubalis (Ruminantia: Bovidae, Bovinae) is an economically important animal of many Asian countries, making significant contribution to milk and meat production. Sub clinical infection of the reproductive tract is one of the important causes for reduced reproductive efficiency in dairy herd of buffaloes. Antimicrobial peptides are component of innate immune system which helps in augmenting the resistance to infection at epithelial surfaces e.g reproductive tract epithelium. In this study we have identified a ß-defensin called Lingual Antimicrobial Peptide (LAP) in buffalo reproductive tract. Interestingly the gene was 100 % identical to the LAP isolated from the tongue epithelium of Bos taurus. The 195 bp cDNA of LAP codes for 64 amino acids and of which 50% are cationic amino acids. Phylogenetic studies indicate that LAP of reproductive epithelium of buffalo is different from other beta defensins isolated from the various tissues of same species, but all beta defensin were found to have the same progenitor gene. It is concluded that buffalo reproductive tract epithelium lining contains LAP.

149. Rani, M. Prameela; Sri Venkateswara Veterinary University, Tirupati (India).Ahmad, N.N.; Sri Venkateswara Veterinary University, Tirupati (India).Prasad, P. Eswara; Sri Venkateswara Veterinary University, Tirupati (India).Latha, Ch. Sri; Sri Venkateswara Veterinary University, Tirupati (India). Haematological and biochemical changes of stunting syndrome in broiler chicken. Veterinary World (India). (Mar 2011) v.4(3) p. 124-125 KEYWORDS: BROILER CHICKENS. MALABSORPTION. BLOOD COMPOSITION. BIOCHEMISTRY.
An experiment was carried out to study the hematological and biochemical changes of stunting syndrome in broiler chicken from day old (group I) and 3 weeks (group III) of age to 8 weeks of age in two phases along with group II and group IV as control. Birds were slaughtered at 3, 5 ,7 and 8 weeks of age and the blood samples were collected and analyzed. The mean PCV, Hb, TEC values were reduced significantly (P<0.01) in stunted birds. Increased AHC, AMC and ABC values along with decreased ALC values were obtained. Significantly (P<0.01) lower serum total protein values and increased serum Amylase ALP, AST and ALT activity were observed in stunted groups (I and III) whereas blood glucose values among the groups were not significant. The decreased hematological and biochemical parameters in the present study indicates a decrease in the absorption and digestion of protein and damage to liver and intestines in stunting syndrome of broiler chicken.

150. Walia, Rajiv; Veterinary Hospital, Darang (India)Ravikanth, K.; Ayurvet Limited, Baddi (India)Maini, S.; Ayurvet Limited, Baddi (India). Efficacy of Ruchamax N in treatment of digestive disorders in cow. Veterinary World (India). (Mar 2011) v.4(3) p. 126-127 KEYWORDS: COWS. DIGESTIVE DISORDERS.
Therapeutic efficacy of Ruchamax N (M/s Dabur Ayurvet Ltd. India) against digestive disorders in 20 cow of 1 ½ to 3 years was evaluated. Of these, five animals were reported with the history of simple indigestion and rest fifteen with the history of disease induced anorexia & in few accompanied with low milk yield also. The animals were treated with Ruchamax N15 g orally twice daily for 5 days. Clinical signs were recorded so as to assess the time required for complete recovery. On the basis of observations, it was conclu.

151. Lipismita Samal; Indian Veterinary Research Institute, Izatnagar (India).Pattanaik, A.K.; Indian Veterinary Research Institute, Izatnagar (India).Mishra, Chinmoy; Indian Veterinary Research Institute, Izatnagar (India).Maharana, Biswa Ranjan; Indian Veterinary Research Institute, Izatnagar (India).Sarangi, L.R.; Indian Veterinary Research Institute, Izatnagar (India).Baithalu, R.K.; Indian Veterinary Research Institute, Izatnagar (India). Nutritional strategies to prevent urolithiasis in animals. Veterinary World (India). (Mar 2011) v.4(3) p. 142-144 KEYWORDS: RUMINANTS. PET ANIMALS. UROLITHIASIS. DISEASE CONTROL.
Urolithiasis is a common problem in both ruminants and non-ruminants and nutrition plays a significant role in predisposing urolithiasis. The nutritional factors mainly influence urinary constituents and pH, which affect stone nucleation and growth. While surgery can render a patient stone-free, non-operative treatment modalities are required to prevent and reduce the risk of recurrent urolithiasis. Moreover, long-term pharmacological therapy and its potential side effects often lead to subsequent failure. In this regard, nutritional management is the best preventive strategy against urolithiasis.

152. Ranjan Rajeev; Orissa University of Agriculture and Technology, Bhubaneswar (India). Orissa Veterinary College.Panda, S. K.; Orissa University of Agriculture and Technology, Bhubaneswar (India). Orissa Veterinary College.Acharya, A. P.; Orissa University of Agriculture and Technology, Bhubaneswar (India). Orissa Veterinary College.Singh, A. P.; Indian Veterinary Research Institute, Izatnagar (India). Department of Bacteriology and Mycology.Gupta, M. K.; Birsa Agriculture University, Ranchi (India). Ranchi Veterinary College. Molecular diagnosis of haemorrhagic septicaemia. Veterinary World (India). (Apr 2011) v.4(4) p. 189-192 KEYWORDS: HAEMORRHAGIC SEPTICAEMIA. DIAGNOSIS. PCR.
Pasteurella multocida is associated with hemorrhagic septicaemia in cattle and buffaloes, pneumonic pasteurellosis in sheep and goats, fowl cholera in poultry, atrophic rhinitis in pigs and snuffles in rabbits. Haemorrhagic septicaemia is caused by Pasteurella multocida type B:2, B:2,5 and B:5 in Asian countries and type E:2 in African countries. Pasteurella multocida have five types of capsular serotype i.e. type A, B, D, E and F. Diagnosis of the disease is mainly based on the clinical sign and symptom, post mortem findings. Confirmatory diagnosis is done by isolation and identification of causative agent. A variety of laboratory diagnostic techniques have been developed over the years for pasteurellosis and used routinely in the laboratory. Among these techniques molecular techniques of diagnosis is most important. This technique not only gives diagnosis but it also provides information regarding capsular type of Pasteurella multocida. Techniques which are used for molecular diagnosis of haemorrhagic septicaemia are PCR based diagnosis, Restriction endonuclease analysis (REA), Ribotyping, Colony hybridization assay, Filled alternation gel electrophoresis (FAGE), Detection of Pasteurella multocida by Real Time PCR. Among these techniques real time PCR is most sensitive and specific.

153. Balasundaram, B.; National Dairy Research Institute, Karnal (India). Dairy Cattle Breeding Division. Gupta, A.K.; National Dairy Research Institute, Karnal (India).Dairy Cattle Breeding Division. Dongre, V.B.; National Dairy Research Institute, Karnal (India).Dairy Cattle Breeding Division. Mohanty, T.K.; National Dairy Research Institute, Karnal (India).Dairy Cattle Breeding Division. Sharma, P.C.; National Dairy Research Institute, Karnal (India). Dairy Cattle Breeding Division. Khate, Keviletsu; National Dairy Research Institute, Karnal (India).Dairy Cattle Breeding Division. Singh, R.K.; National Dairy Research Institute, Karnal (India). Dairy Cattle Breeding Division. Influence of genetic and non-geneic factors on incidence of post partum utero-vaginal complications in Karan fries cows. Indian Journal of Animal Research (India). (Sep 2011) v. 45(3) p. 192-197 KEYWORDS: COWS. CROSSBREDS. FEMALE GENITAL DISEASES. FOETAL MEMBRANES.
The present study revealed that overall incidence of retention of foetal membrane, metritis and endometritis in Karan Fries cows was 18.67, 28.90 and 0.77% respectively for first calvers and 27.34, 38.93 and 1.62 respectively for all calvers. The effect of genetic group was found to be nonsignificant for all the post partum utero-vaginal complications in first calvers while it was significant for metritis in all calvers. The effect of season of calving on all post partum utero-vaginal complications was found to be non-significant in both all calvers and first calvers. Period of calving had significant effect for retention of foetal membrane for both

first calver and all calvers. The cows suffered with retention of foetal membrane and endometritis had significant effect on 305 day milk yield and total milk yield while metritis had significant effect on lactation length.

154. Preetha, S.P.; Tamil Nadu University of Veterinary and Animal Sciences, Chennai (India).Centre for Animal Health Studies. Thangapandiyan, M.; Tamil Nadu University of Veterinary and Animal Sciences, Chennai (India). Centre for Animal Health Studies. Selvaraj, J.; Tamil Nadu University of Veterinary and Animal Sciences, Chennai (India).Centre for Animal Health Studies. Devi,R. Gayathri; Tamil Nadu University of Veterinary and Animal Sciences, Chennai (India). Centre for Animal Health Studies. Roy, Parimal; Tamil Nadu University of Veterinary and Animal Sciences, Chennai (India).Centre for Animal Health Studies. Baegan, S.; Tamil Nadu University of Veterinary and Animal Sciences, Chennai (India).Centre for Animal Health Studies. Manohar, B. Murali; Tamil Nadu University of Veterinary and Animal Sciences, Chennai (India).Centre for Animal Health Studies. Cystic ovarian disease in a laboratory guinea pig – a case report. Indian Journal of Animal Research (India). (Sep 2011) v. 45(3) p. 228-229 KEYWORDS: GUINEA PIGS. OVARIAN CYSTS. OVARIAN DISEASES.
Necropsy examination was performed on a 26-month-old adult primigravid female guinea pig (sow). Morbid changes in the ovaries include fluid filled, large cysts replacing a majority of the ovarian tissue. Microscopic evaluation showed that the ovaries were composed of multiple, variable sized follicular cysts lined by low columnar epithelium with marked compression and desquamation of the ovarian tissue, consistent with that of cystic ovaries. Uterus showed mild multifocal adenomatous hyperplastic changes in the endometrium.

M11 Fisheries Production

155. Jadhav, R.R.; College of Fisheries, Ratnagiri (India)Mohite, A.S.; College of Fisheries, Ratnagiri (India). Kazi, T.G.; College of Fisheries, Ratnagiri (India). Ring Seines with Pockets Operated off Ratnagiri, Maharashtra. Fishery Technology (India). (Jul 2011) v.48(2) p. 119-124 KEYWORDS: COASTAL FISHERIES. MARINE FISHERIES.
Ring seine targeted at oil sardine and mackerel shoals moving in surface and column waters is a very recent introduction in Ratnagiri, Maharashtra. The design characteristics and operational aspects of the ring seine with pocket operated off Ratnagiri are presented in this communication. Twenty five to 32 vertical rectangular sections of polyamide knotted webbing of 14-20 mm mesh size were joined together to form a single net having a total length ranging from 486 to 655 m and depth ranging from 36 to 41 m. At both ends of the net, a triangular section referred to as choke with webbing of larger meshes and of thicker twines was rigged to give additional strength to the net. The ring seine was operated at a depth of less than 25 m from small fibre glass reinforced plastic (FRP) craft of 10.9-13.0 L fitted with 9.9 hp out board motor (OBM) and assisted by a carrier vessel for transporting the catch to the shore. The depth of operation was always less than the depth of the net.

M12 Aquaculture Production and Management

156. Sharma, R.; Central Institute of Fisheries Education, Mumbai (India). Influence of lunar cycle in breeding of zebra fish Danio rerio (Hamilton-Buchanan, 1822). Indian Journal of Animal Sciences (India). (Mar 2011) v. 81 (3) p. 306-309 KEYWORDS: DANIO RERIO. REPRODUCTIVE PERFORMANCE. BREEDING SEASONS. MOON PHASES.
Lunar cycle is one of such stimuli affecting breeding of many species. Hence a trial on breeding of Danio rerio was performed in glass aquaria to know the effect of lunar cycle on spawning. For this purpose, the zebra fish were allowed to breed in moonlight and was monitored for 3 months. It was observed that the breeding of the fish is having a rhythmic relation with the lunar period. The fishes bred on the 11th day of the lunar cycle which has established the relationship between spawning of the zebra fish and the lunar cycle.

157. Sardar, Parimal; Central Institute of Fisheries Education, Kolkata (India). Regional Centre.Sinha, Archana; Central Institute of Fisheries Education, Kolkata (India). Regional Centre.Datta, Subhendu; Central Institute of Fisheries Education, Kolkata (India). Regional Centre. Effect of mixed feeding schedules with varying dietary protein levels on the growth performances of common carp (Cyprinus carpio Linn.). Indian Journal of Animal Sciences (India). (May 2011) v. 81 (5) p. 537-542 KEYWORDS: CYPRINUS CARPIO. FEEDING. FEEDING LEVEL. FISH FEEDING. GROWTH RATE.

The applicability of mixed feeding schedule with varying protein levels in common carp was determined in the present study to reduce feed input cost. Acclimatized common carp, Cyprinus carpio Linn (12.06±0.04 g), were distributed in six experimental groups with 3 replicate each comprising ten fingerlings and reared for 8 weeks period in FRP tanks with recycling water system fitted with electrically operated aerators, using completely randomized design. Two kind diets comprising 20% crude protein considered as low protein (LP) diet and 30% crude protein considered as high protein (HP) diets were prepared. Fish of HP fed only HP diet, fish of LP fed only LP diet, fish of 1LP/1HP fed alternatively LP and HP diet at 1 day interval, fish of 3LP/3HP fed alternatively LP and HP diet at 3 days interval, fish of 7LP/7HP fed alternatively LP and HP diet at 7 days interval and fish of 14LP/14HP fed alternatively LP and HP diet at 14 days interval at twice daily for 8 weeks trial period. Results indicated that fish of 1LP/1HP and 3LP/3HP showed comparable growth, feed conversion ratio (FCR), specific growth rate (SGR) and protein efficiency ratio (PER) to the fish of HP but fish of 7LP/7HP, 14LP/14HP and LP were unable to show growth compensation during 8 weeks trial period. Muscle composition of fish indicated that the higher growth efficiency during realimentation was probably due to protein growth rather than fat deposition in gut. Thus, it is suggested that for profitable carp culture, farmers can use mixed feeding schedule with alternate feeding of low protein and high protein diets at 1 or 3 days interval as a means of minimizing the cost of production.

158. Surabhi; G. B. Pant University of Agriculture and Technology, Pantnagar (India). Department of Fishery Hydrography Upadhyay, A.K.; G. B. Pant University of Agriculture and Technology, Pantnagar (India). Department of Fishery Hydrography Trakroo, M. Das; G. B. Pant University of Agriculture and Technology, Pantnagar (India). Department of Fishery Hydrography. A study on the iced storage characteristics of Indian major carps. Pantnagar Journal of Research (India). (Jan-Jun 2008) v.6(1) p.128-133 KEYWORDS: CATLA CATLA. COLD STORAGE. FISH INDUSTRY. LABEO ROHITA. CIRRHINUS MRIGALA.

Present study was conducted with an aim to assess the storage quality characteristics of fillets of three Indian Major Carps namely Catla catla, Labeo rohita and Cirrhinus mrigala during ice-storage. Proximate composition of the fish did not reveal any change for entire storage span of 12 days. Total volatile basic nitrogen (mg/100g), free fatty acid (as % oleic acid), pH and total bacterial count (cfu/g) recorded significant increase. The functional utility of the Indian major carp fillets turned out to be 10 days in ice.

159. Pravin, P.; Central Institute of Fisheries Technology, Chochin (India). Gibinkumar, T.R.; Marine Products Export Development Authority, New Delhi (India). Sabu, S.; Central Institute of Fisheries Nautical Engineering and Training, Chochin (India).Boopendranath, M.R.; Central Institute of Fisheries Technology, Chochin (India). Hard Bycatch Reduction Devices for Bottom Trawls. Fishery Technology (India). (Jul 2011) v.48(2) p. 107-118 KEYWORDS: TRAWLERS. BYCATCH.

The term bycatch commonly refers to that part of a fisher’s catch which is not targeted. The importance of reducing bycatch and minimizing ecological impacts of fishing operations has been emphasized by scientists and fishery managers, and recognized by fishermen. FAO Code of Conduct for Responsible Fisheries has given priority status to development and improvement of fishing technology that eliminates bycatch and selectively target fish in a way that promotes sustainability and conservation. Any device that can be used to reduce or exclude bycatch is generally known as bycatch reduction device (BRD). BRDs that have rigid structures in their construction are designated as hard BRDs. In this paper, significance of hard BRDs in bycatch reduction in trawls and different hard BRDs in vogue in world fisheries, are reviewed.

Flat grid, bent grid, slotted grid, oval grid, hooped and fixed angle grid BRDs, BRDs with rigid escape slots, semi-flexible BRDs and combination BRDs are discussed.

Q02 Food Processing and Preservation

160. George, Ninan; Central Institute of Fisheries Technology, Chochin (India).Zynudheen, A.A.; Central Institute of Fisheries Technology, Chochin (India).Regina, M; Central Institute of Fisheries Technology, Chochin (India).Joseph, A.C.; Central Institute of Fisheries Technology, Chochin (India). Effectiveness of Spices on the Quality and Storage Stability of Freeze-dried Fish Balls. Fishery Technology (India). (Jul 2011) v.48(2) p. 133-140 KEYWORDS: FISH. PROCESSED ANIMAL PRODUCTS. MEAT.
Five different freeze-dried fish ball samples were prepared from the cooked mince of snapper (Pristipomoides multidens) incorporated with spices viz., curry leaf (Murraya koenigii S.), mint (Mentha spicata L.), turmeric (Curcuma longa) and a mixture of ginger (Zingiber officianale), garlic (Allium sativum L.) and pepper (Piper nigrum) with known antioxidant properties. The samples were packed and kept in ambient conditions to assess the antioxidant property of the spices and the storage stability. The evaluation of oxidation indices viz., thiobarbituric acid and free fatty acid values revealed that there was marked protective effect in samples incorporated with spices during storage. Incorporation of spices retarded the rate of oxidation of PUFAs in the samples. A combination of the spices was found to have an added advantage in terms of their synergistic effect against oxidation and in enhancing the taste. There was a gradual decrease in the antioxidant activity as storage time progressed. The control samples had a shorter shelf life when compared to spices incorporated samples.

161. Bindu, J.; Central Institute of Fisheries Technology, Chochin (India).Ravishankar, C.N.; Central Institute of Fisheries Technology, Chochin (India).Dinesh, K.; College of Fisheries , Chochin (India). Mallick, A.K.; Central Institute of Fisheries Technology, Chochin (India).Gopal, T.K.S.; Central Institute of Fisheries Technology, Chochin (India). Heat Penetration Characteristics and Shelf Life of Ready to Serve Mahseer Curry in Opaque. Fishery Technology (India). (Jul 2011) v.48(2) p. 141-148 KEYWORDS: FISH PROCESSING. KEEPING QUALITY.
Ready to serve thermal processed fish curry in Mughalai style has been developed using Mahseer (Tor khudree). The fish curry was vacuum packed in an indigenously developed three layered retortable pouch consisting of 12.5 ìm polyester / 12.5 ìm aluminum foil / 80 ìm cast polypropylene of size 18 x 11 cm and processed in a still over pressure retort at 121°C. The total process time was 38 min with a Fo value of 8.5 min and cook value of 76 min. Changes in biochemical parameters like free fatty acid, thiobarbituric acid and organoleptic parameters like colour and sensory scores during storage were studied. The processed products were found to be sterile and acceptable even after a period of 12 months at ambient storage of 28 ± 2°C.

162. Homchoudhury, M.; Jadavpur University, Kolkata (India). Deparment of Food Technolgy and Biochemical EngineeringChakraborty, R.; West Bengal University of Animal and Fishery Sciences, Kolkata (India).Sarkar, S.; Jadavpur University, Kolkata (India). Deparment of Food Technolgy and Biochemical EngineeringRaychaudhuri, U.; Jadavpur University, Kolkata (India). Deparment of Food Technolgy and Biochemical Engineering. Optimization of Rice Flour (Oryza sativa) and Chapra (Fenneropenaeus indicus) Extrusion by Response surface methodology. Fishery Technology (India). (Jul 2011) v.48(2) p. 155-162 KEYWORDS: RICE FLOUR. EXTRUSION.
Chapra (Fenneropenaeus indicus) powder and rice flour mixture was used as base material for extrusion process. The process was optimized using response surface methodology. Response (dependent) variables were: expansion ratio, density, shearing strength and sensory texture acceptability. Independent variables were processing temperature and feed moisture. All other process variables viz., screw speed, feed speed and dye diameter were kept constant at 475 rpm, 28 g min-1 and 3 mm respectively. The expanded products obtained at 150°C with feed material containing 15% moisture had the best properties. The study showed

that expanded products produced using rice and chapra flour under conditions that induced the maximum expansion, had the best texture and the highest acceptable snack product.

163. Gupta, Devesh; J. V. College, Baraut (India). Dairy Science and Technology Department. Studies on the variation in yield and qualities of chhana prepared from cross bred cow milk and buffalo milk. Pantnagar Journal of Research (India). (Jul-Dec 2008) v.6(2) p.305-307 KEYWORDS: CHANNA. CROSSBREDS. CROSSBREEDING. COWS. COW MILK. BUFFALO MILK. DAIRY INDUSTRY.
Studies on the variation in yield and qualities of chhana prepared from cross bred cow milk and buffalo milk were undertaken.

164. Thankappan, T.K.; Central Institute of Fisheries Technology, Cochin (India).Martin Xavier, K.A.; Central Institute of Fisheries Technology, Cochin (India). Extraction and composition of liver oil from triggerfish, Balistes Spp. Fishery Technology (India). (Jul 2011) v.48(2) p. 175-178 KEYWORDS: FISH OILS. TRIGGERFISH. PROXIMATE COMPOSITION.
The study revealed that triggerfish is a rich source of liver oil containig essential fatty acids like EPA and DHA. Processing on industrial level generates substantial quantity of liver, which can be utilized for oil production.

Q03 Food Contamination and Toxicology

165. Tiwari, J.G.; Central Agricultural University, Aizawl (India). Chaudhary, S.P.; Central Agricultural University, Aizawl (India). Tiwari, H.K.; Central Agricultural University, Aizawl (India).Dutta, T.K.; Central Agricultural University, Aizawl (India).Saikia, P.; Central Agricultural University, Aizawl (India).Hazarika, P.; Central Agricultural University, Aizawl (India). Microbial evaluation of market milk and milk-products of Mizoram, India with special reference to Staphylococcus aureus. Indian Journal of Animal Sciences (India). (Apr 2011) v. 81 (4) p. 429-431 KEYWORDS: LIQUID MILK. MILK PRODUCTS. STAPHYLOCOCCUS AUREUS. MIZORAM.
Samples of milk (105) and 100 samples of milk-products, viz. burfi, paneer, ice cream and kulfi comprising 25 each were collected from various shops of Mizoram, India. The incidence of pathogenic Staphylococcus aureus were recorded as 17, 20, 36, 12, and 8, respectively for milk, burfi, paneer, ice-cream and kulfi. The overall incidence of pathogenic Staphylococcus aureus in milk and milkproducts was estimated as 18.09%. The antimicrobial sensitivity test revealed that all the strains of Staphylococcus aureus were sensitive (100%) against cloxacillin, cotrimoxazole and gentamicin. The strains showed complete resistance (100%) against ampicillin.The strains showed identical sensitivity against erythromycin and lincomycin of 5.40%. The sensitivity of Staphylococcus aureus to other chemotherapeutic agents in decreasing order was streptomycin (91.89), chloramphenicol (86.49%), nitrofurantoin (86.49%), tetracycline (86.49%), cephotaxime (40.54%) and penicillin (13.51%).

166. Rather, M.A.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India).Aulakh, R.S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India).Gill, J.P.S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India).Verma, R.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India).Rao, T.S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Enterotoxigenic profile of Bacillus cereus strains isolated from raw and pasteurized milk. Indian Journal of Animal Sciences (India). (May 2011) v. 81 (5) p. 448-452 KEYWORDS: PASTEURIZED MILK. ENTEROTOXINS. BACILLUS CEREUS.
The present investigation was undertaken to study the incidence of Bacillus cereus in milk, its source of contamination and to detect the enterotoxigenic genes (hblCDA, nheABC, cytK and entFM) in isolates by a multiplex-PCR. B. cereus could be isolated from 2 (4%) of the 50 raw milk samples taken aseptically directly from the animals, while among 36 raw pooled milk samples from dairy farms and 74 pasteurized milk samples, 12 (33.33%) and 28 (37.83%) turned out positive, respectively. The levels of B. cereus in

contaminated milk samples ranged from 0.5×102 to 2.6×105 CFU/ml. The other related Bacilli like B. mycoides and B. thuringiensis were isolated from 10 (6.25%) and 6 (3.75%) milk samples, respectively. The multiplex-PCR of B. cereus isolates revealed the incidence of various enterotoxigenic genes hblD, hblA, hblC, nheA, nheB, nheC, cytK and entFM as 73.80, 69.04, 71.42, 95.23, 90.45, 95.23, 66.7 and 100%, respectively. A higher incidence of B. cereus in pasteurized milk and a large proportion (54.76%) of isolates harbouring all the enterotoxigenc genes, most of them being among the isolates from pasteurized milk samples (73.91%) pose a potential public health threat. Moreover, the genes in the operons (hblCDA and nheABC) can occur independently from each other.

167. Kumar, Arun; Indian Veterinary Research Institute Izatnagar (India), Division of Livestock Products Technology.Kumar, R.R.; Indian Veterinary Research Institute Izatnagar (India), Division of Livestock Products Technology.Sharma, B.D.; Indian Veterinary Research Institute Izatnagar (India), Division of Livestock Products Technology.Sharma, D.; Indian Veterinary Research Institute Izatnagar (India), Division of Livestock Products Technology.Kumar, Pavan; Indian Veterinary Research Institute Izatnagar (India), Division of Livestock Products Technology.P.Gokulakrishna; Indian Veterinary Research Institute Izatnagar (India), Division of Livestock Products Technology. Identification of cattle (Ox) meat by species-specific PCR assay of cytochrome b gene. Indian Journal of Veterinary Researh (India). (Dec 2012) v.21(2) p.41-44 KEYWORDS: MEAT TEXTURE. MEAT. QUALITY. IDENTIFICATION. PCR. CYTOCHROME B. GENES. BEEF.
Species-specific PCR technique targeting the mitochondrial cytochrome b gene was used for cattle meat identification. The published cattle specific primer pair with amplicon size of 113 bp was tested for cross reactivity with buffalo, sheep, goat and pig meat. An intense band in cattle meat whereas a relatively faint band of similar size fragments in buffalo was observed at reported annealing temperature. In the sheep, goat and pig, there was no amplification. In order to eliminate the cross reactivity of cattle specific primer in buffalo, amplification was carried out at the higher annealing temperature 67.0°C at which species-specific fragment was obtained only in cattle meat. Thus, the species specificity of the cattle specific primer for indigenous cattle meat was substantiated.

Q04 Food Composition

168. Marandi, S.; Central Avian Research Institute, Izatnagar (India). Department of Avian Genetics and Breeding. Sachdev, A. K.; Central Avian Research Institute, Izatnagar (India). Department of Avian Genetics and Breeding. Saxena, V. K.; Central Avian Research Institute, Izatnagar (India). Department of Avian Genetics and Breeding. Ram Gopal; Central Avian Research Institute, Izatnagar (India). Department of Avian Genetics and Breeding,Khan, A. A.; Central Avian Research Institute, Izatnagar (India). Department of Avian Genetics and Breeding. Quality changes in salted chicken eggs. Indian Journal of Veterinary Researh (India). (Dec 2012) v.21(2) p. 51-55 KEYWORDS: CHICKENS. EGGS. PROTEINS. QUALITY. BRINING.
Quality changes in albumen of salted as well as unsalted (control) chicken eggs were studied, through internal egg quality traits as well as SDS-PAGE analysis of albumen at regular intervals (0, 5, 7, 10 and 15 days) of storage under ambient (27–37° C, RH- 32–42%) and refrigeration (4±1° C, RH-80-85%) environments till 10 and 15 days, respectively. Significant (P< 0.01) decline in egg weight (%), albumen index and Haugh Unit score with increase in albumen pH was observed in control, as compared to the treated groups. SDS-PAGE analysis of the experimental eggs revealed presence of 'Avidin' band in salted eggs stored only for 5 days under refrigeration temperature. However, the protein band (115.3kDa) present in fresh samples could not be detected in any of the stored eggs. Increase in crude protein (%) of salted stored eggs was significantly less pronounced than the control. Based on the sensory evaluation, the salted egg albumen was found significantly superior till 7 and 10 days of ambient and refrigerated storage, respectively as compared to unsalted chicken eggs.

169. Hussain, Jakir; Assam Agricultural University, Guwahati (India). College of Veterinary ScienceRoychoudhury, R.; Assam Agricultural University, Guwahati (India). College of Veterinary ScienceDas, G.C.; Assam Agricultural University, Guwahati (India). College of Veterinary ScienceMili, D.C.; Assam Agricultural University, Guwahati (India). College of Veterinary ScienceGoswami, R.N.; Assam Agricultural University, Guwahati (India). College of Veterinary Science. Milk Composition of Assam Local Cattle and Their Crosses With Jersey and Holstein Friesian Under Field Condition. Indian Journal of Animal Research (India). (Mar 2011) v. 45(1) p. 75-76 KEYWORDS: MILK. CHEMICAL COMPOSITION. CATTLE. ASSAM.
The least square means of fat percent in the milk of Jersey X Local, Holstein Friesian X Local and Local cattle of Assam were 5.100 ± 0.087, 4.177 ± 0.087 and 5.117 ± 0.087 respectively. Corresponding values of SNF percent were 8.923 ± 0.072, 8.827 ± 0.072 and 8.848 ± 0.072 and those of specific gravity were 1.0310 ± 0.0003, 1.0314 ± 0.0003 and 1.0310 ± 0.0003 respectively. The fat percent differed highly significantly ($P<0.01$) due to genetic group. On the other hand effect of genetic group on the SNF percent and specific gravity was non-significant.

170. Murthy, L.N.; Karnataka Veterinary, Animal and Fisheries Sciences University, Bangalore (India) Fisheries Research and Information CentreRajanna, K.B.; Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar (India). Veterinary. Effect of Washing on Composition and Properties of Proteins from Tilapia (Oreochromis mossambicus) Meat. Fishery Technology (India). (Jul 2011) v.48(2) p. 125-132 KEYWORDS: TILAPIA. PROXIMATE COMPOSITION. FISH. ELECTROPHORESIS.
The effect of washing on the properties of proteins from tilapia (Oreochromis mossambicus) meat has been assessed. The composition of washed meat revealed higher moisture content (86.29%) and lower total protein content (12.80%) compared to unwashed meat. There was reduction in non- protein nitrogen constituents in washed meat. Washing could remove low molecular weight components as revealed by gel filtration profile. The reduced viscosity at 3 mg ml-1 of total proteins of washed meat was found to be higher (0.125 ml mg-1) than unwashed meat indicating concentration of myofibrillar proteins. The SDS-PAGE pattern revealed concentration of 205KD protein (Myosin Heavy Chain) upon washing. Higher value of ATPase activity reduced drastically (from 4.1-1.18 ìg Pi mg-1 of protein min-1) after the removal of sarcoplasmic proteins. High Modori Inducing Proteases (MIPase) activity at 55° C was observed in the muscle extract that might interfere in the gelling ability in unwashed meat but it reduced in washed meat.

171. Sharma, P.J.; Assam Agricultural University, Raha (India).College of Fisheries.Sudhakara, N.S.; Karnataka Veterinary, Animal and Fisheries Sciences University, Mangalore (India). College of Fisheries.Goswami, U.C.; Guwahati University, Guwahati (India). Department of Zoology. Nutritional and protein quality studies of textured protein concentrate prepared from Saurida tumbil. Fishery Technology (India). (Jul 2011) v.48(2) p. 179-182 KEYWORDS: SAURIDA TUMBIL. PROTEIN CONTENT. PROTEIN QUALITY.
The study showed that the destruction of lysine had not taken place during processing as the product was subjected to alcohol treatment at low temperature (0 to 5 degree C) and drying at 40 degree C.

Q52 Feed processing and preservation

172. Sanjay Kumar; S D Agricultural University, Dantiwada (India). Walli, T.K.; National Dairy Research Institute, Karnal (India).Rajni Kumari; National Dairy Research Institute, Karnal (India). Optimization of roasting condition for soybean cake evaluated by in situ protein degradability and N-fractionation method. Indian Journal of Animal Sciences (India). (Apr 2011) v. 81 (4) p. 402-406 KEYWORDS: OILSEED CAKES. SOYBEAN MEAL. ROASTING. PROTEIN METABOLISM. IN SACCO EXPERIMENTATION.
The present investigation was carried out to optimize temperature of roasting of soybean over a fixed time period of 30 min to make it a bypass protein. As the temperature of roasting increased, the effective protein degradability of soybean cake decreased and a reasonably good effect was seen when soybean cake was roasted at 160°C for 30 min, as reflected by a marginal increase in UDP content of the cake at 170°C. The

ADIN (acid detergent insoluble N) content of the cake also increased with the increase in the roasting temperature and there was hardly any further increase in UDP content after 160°C temperature. Protein fractionation on the basis of solubility in three solvents, namely, phosphate buffer, NDS (neutral detergent solution) and ADS (acid detergent solution) also gave the similar indication as the in situ protein degradation. As the temperature of roasting increased, A + B1 fraction which relates to RDP (rumen degradable protein) fraction decreased and correspondingly, the B2 fraction, which is the main component of UDP (undegradable dietary protein) increased. On the basis of N degradability in rumen and N solubility results, it could be concluded that the optimum roasting temperature for making soybean cake a good source of bypass protein is 160°C for 30 min.

173. Zynudheen, A.A.; Central Institute of Fisheries Technology, Chochin (India).George, Ninan; Central Institute of Fisheries Technology, Chochin (India).Mannodi, S.B.; Central Institute of Fisheries Technology, Chochin (India). Effect of Chitin and Chitosan on the Physicochemical Quality of Silage Based Fish Feed. Fishery Technology (India). (Jul 2011) v.48(2) p. 149-154 KEYWORDS: SILAGE. SILAGE MAKING. CHITIN.
Silage made from the filleting waste of rohu, Labeo rohita was used for the preparation of palletized fish feed. Three sets of feeds were prepared viz., control and two lots incorporated with chitin and chitosan respectively. Chitin and chitosan incorporated feeds were prepared along with the control. The biochemical and physical properties viz., durability, stability, sinking rate and leaching of the feeds were studied. The loss during stacking was found to be minimum in samples incorporated with chitin and chitosan while higher loss was observed in the case of control, indicating that chitin and chitosan have better binding property ($P<0.05$). The stability of feed was significantly higher ($P<0.05$) in the case of chitin and chitosan incorporated samples when compared to control indicating that both chitosan and chitin improved the stability when added at 2% level in feed. Pellet durability was also better in chitosan incorporated samples. Incorporation of chitin and chitosan was found to reduce the leaching of the pelletized feed. The control feed showed maximum leaching of protein (5.04 mg 100g-1) after 15 min in water but in the case of chitosan incorporated feeds leaching of protein for the corresponding period was marginal (0.82 mg 100g-1). The feeds contained essential amino acids indicating that high quality fish feed can be prepared from fish waste silage.

Q53 Feed contamination and toxicology

174. Sapcota, D.; Assam Agricultural University, Guwahati (India). Islam, R.; Assam Agricultural University, Guwahati (India).Borah, M; Assam Agricultural University, Guwahati (India). Effect of light and duration of exposure in counteracting aflatoxin B1 in broken rice. Indian Journal of Animal Sciences (India). (Apr 2011) v. 81 (4) p. 380-381 KEYWORDS: AFLATOXINS. ULTRAVIOLET RADIATION. FEEDS.
Effect of exposure of aflatoxin (AF) for its reduction was studied under sunlight or UV light. The broken rice was artificially contaminated with aflatoxin B1 (209.99±4.39 ppb) and was exposed to either sunlight or UV light for different periods, viz. 0, 1, 2, 4, 8 and 16 h. The reduction in aflatoxin content in feedstuff was recorded with TLC method. It was revealed that both the type of exposure reduced the AF content and the reduction was proportion to the exposure period. After 16 h of exposure the per cent reduction in AF content was recorded to be 74.85 and 53.63 in sunlight and UV light, respectively. It could be concluded that the sunlight can be efficiently used in counteracting aflatoxin B1 in broken rice.

Q54 Feed composition

175. Munilkumar, S.; Central Agricultural University, Agartala (India). College of Fisheries.Dey, A.; Central Agricultural University, Agartala (India). College of Fisheries.Mandal, S.C.; Central Agricultural University, Agartala (India). College of Fisheries. Nutritional status of commercial fish feed available in Tripura, India. Fishery Technology (India). (Jul 2011) v.48(2) p. 183-186 KEYWORDS: FISH MEAL. NUTRITIVE VALUE. TRIPURA.

As the nutritional quality of commercial fish feed available in Tripura, India was not as per the nutritional requirements of the indian major carps, the regular application of manure and fertilizers is a must in present senario.

176. Saijpaul, S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India).Singh, Parminder; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India).Sikka, S.S.; Guru Angad Dev University of Veterinary and Animal Sciences, Ludhiana (India). Quality assessment of mineral mixture and chelated minerals available in the market. Animal Nutrition and Feed Technology (India). (Jan 2012) v. 12(1) p. 83-90 KEYWORDS: MINERAL NUTRIENTS. QUALITATIVE ANALYSIS. QUALITY. SUPPLEMENTS.
Samples of 19 mineral mixtures and 6 chelated minerals were collected from the progressive dairy farmers and analysed. The range of DM, ash, acid insoluble ash (AIA), Mg, Mn, Zn, Fe, Cu, S, Ca and P were 93.69–99.8, 20.13–90.18, 0.85–23.35, 0.26–15.1, 0.01–0.25, 0.0–0.9, 0.0–2.69, 0.0–0.41, 0.19–1.98, 7.2–30.9 and 0.0–19.78%, respectively. As compared to the BIS specification for mineral mixture, all the samples had the required DM but contained 21.1% lower total ash and 94.7% higher AIA. The number of samples failing BIS specification for Mg, Mn, Zn, Fe and Cu were 57.9, 47.4, 47.4, 36.8 and 42.1%, respectively; whereas samples having lower Ca, P and S were 21.1, 63.2 and 73.7%, respectively. The price (Rs 40/kg to 350/kg) also did not relate to the mineral content or quality of the mineral mixture. In the 6 samples of chelated minerals, the range of Mn, Zn and Cu was 0.42–3.68%, 1.46–5.08% and 0.36–2.0%, respectively, and all met the daily requirement at the recommended dose. However, wide variation was observed in the total ash and AIA content. The price ranged from Rs 140 to 700/kg which supplied several times higher chelated minerals in the suggested dose. It may be concluded that there is a need to monitor the quality of mineral mixtures available in the market due to their non-uniformity in the minerals and higher AIA content. The chelated minerals supply the specific minerals in the daily dose but may not be cost effective due to its exuberant price.

177. Behura, N.C.; Orissa University of Agriculture and Technology, Bhubaneswar (India). Faculty of Veterinary Science and Animal Husbandry.Dehuri, P.K.; Orissa University of Agriculture and Technology, Bhubaneswar (India). Faculty of Veterinary Science and Animal Husbandry.Mishra, S.K.; Orissa University of Agriculture and Technology, Bhubaneswar (India). Faculty of Veterinary Science and Animal Husbandry.Mohapatra, A.K. Orissa University of Agriculture and Technology, Bhubaneswar (India). Faculty of Veterinary Science and Animal Husbandry. Feeding value of detoxified simaruba (Simarouba glauca) oil cake in egg type growers. Animal Nutrition and Feed Technology (India). (Jan 2012) v. 12(1) p. 121-126 KEYWORDS: OILSEED CAKES. NUTRITIVE VALUE. LAYER CHICKENS.
To find out the feeding value of detoxified simaruba (Simarouba glauca) oilcake in egg type growers, a feeding trial was conducted with 1750 grower chicks of 8 weeks of age, distributed in to seven dietary groups. Test diets T1, T2, T3, T4, T5 and T6 containing 0, 5, 7.5, 10, 12.5 and 15 percent NH3 treated and roasted simaruba oilcake (TSOC) were prepared and fed to the experimental chicks from 9 to 16 weeks of age. Weekly individual body weight and group-wise feed consumption of birds were recorded and feed conversion ratio (FCR) was calculated at the end. The 16th week body weight of T1, T2, T3, T4, T5 and T6 were 1113, 1111, 1107, 1105, 1025 and 905 g, respectively showing no significant difference among the groups. However, birds of T5 and T6 groups showed significantly ($P<0.05$) lower as compared to other groups. The FCR of T1, T2, T3, T4, T5 and T6 groups were 5.48, 5.78, 5.75, 5.83, 6.16 and 7.25, respectively. The profit was the highest in T4 group. The study revealed that TSOC could be fed to egg type growers up to a level of 10% without any adverse effect on the growth of the egg type growers.

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