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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

The diagram consists of six numbered arrows pointing to specific parts of the sample entry text:

- 1: Points to the entry number '001'.
- 2: Points to the authors 'Paul, P.R.C.; Xavier, F.; Leena, A.'.
- 3: Points to the title 'Dairysoft: A computer programme for dairy farms'.
- 4: Points to the source 'Indian Journal of Animal Sciences (India)'.
- 5: Points to the keywords 'DAIRY FARMS; COMPUTER SOFTWARE'.
- 6: Points to the affiliation '(College of Veterinary and Animal Sciences, Trissur (India), Department, of Livestock Production Management)'.

To exploit the full potential of dairy sector, a computerized 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

E10 Agricultural economics and policies

1. Anbkkani, P; IARI, New Delhi, (India). Economic analysis of dairy farming in dry farming area of Tamil nadu. Indian Journal of dairy Sciences. (Jan 2016) v.69 (1), p86-93 KEYWORDS: DAIRIES. FARMING SYSTEMS. MILK. FARMERS. ENTERPRISES.

The cost of the milk production is one of the important economic indicators influencing the farmers in taking production, management and marketing decision. The dairy farmers could enhance their income in two ways by increasing milk production and by reducing its cost of production. In Dharmapuri and Thiruvannamalai districts, which is a dry farming region in Tamil Nadu, dairy farming had been found a profitable enterprise for rural farmers. Dairy farming is an important enterprise helping in diversification of agriculture in this dry region. Private dairies are providing number of services to the dairy farmers. The dairy farmers need to adopt measures such as good and nutritious feed, health care of the animals and improved production and marketing managements in order to enhance their income. Crossbred cows play significant role in production and marketing of milk in comparison to buffalo milk. Research and development for evolving improved varieties of green fodder suitable for dry land areas may be promoted for enhancing milk production as well as income of the farmers.

2. D. Anindita; Department of Rural Development and Agricultural Production, North Eastern Hill University, West Garo Hills (India) Mishra, K. B.; Department of Rural Development and Agricultural Production, North Eastern Hill University, West Garo Hills (India). Economics of milk production of cattle in garo hills of Meghalaya. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.153-156 KEYWORDS: MILK PRODUCTION. CATTLE. CROSSBREDS. BREEDS (ANIMALS). INDIA.

The Garo Hills of Meghalaya was selected for the present study with the objective to work out the net returns from milk production of different breeds. Altogether 200 farmers were selected for the present study. Out of this, 142, 31, 24 and 3 farmers were rearing local cattle calving annually (Group-I), local cattle calving alternate year (Group-II), cross bred cattle (Group-III) and both breeds (Group-IV) were selected respectively by stratified random sampling technique. The average daily milk yield per milch cow per day was 0.34, 0.30, 9.48 and 3.34 litres group I, II, III and IV respectively. The average net returns were negative for both non-descript local cattle breeds (-Rs. 0.13 and -Rs. 4.48), and highest for crossbred with Rs. 247.41 per milch cow per day followed by the farmers having both breeds (Rs. 65.51).

3. Anbkkani, P; IARI, New Delhi, (India). Economic analysis of dairy farming in dry farming area of Tamilnadu. Indian Journal of dairy Sciences (India). (Jan 2016) v.69 (1), p.86-93 KEYWORDS: DAIRIES. FARMING SYSTEMS. MILK. FARMERS. ENTERPRISES.

The cost of the milk production is one of the important economic indicators influencing the farmers in taking production, management and marketing decision. The dairy farmers could enhance their income in two ways by increasing milk production and by reducing its cost of production. In Dharmapuri and Thiruvannamalai districts, which is a dry farming region in Tamil Nadu, dairy farming had been found a profitable enterprise for rural farmers. Dairy farming is an important enterprise helping in diversification of agriculture in this dry region. Private dairies are providing number of services to the dairy farmers. The dairy farmers need to adopt measures such as good and nutritious feed, health care of the animals and improved production and marketing managements in order to enhance their income. Crossbred cows play significant role in production and marketing of milk in comparison to buffalo milk. Research and development for evolving improved varieties of green fodder suitable for dry land areas may be promoted for enhancing milk production as well as income of the farmers.

E13 Investment, finance and credit

4. Vamsi, Kuraparthi; Department of Livestock Production Management, College of Veterinary Science, Tirupati (India) Parsad, V. M. R.; Department of Livestock Production Management, College of Veterinary Science, Tirupati (India) Suresh, J.; Department of Livestock Production Management, College of Veterinary Science, Tirupati (India) Ravi, A.; Department of Livestock Production Management, College of Veterinary Science, Tirupati (India) Ekambaram, B.; Department of Livestock Production Management, College of Veterinary Science, Tirupati (India). Cost structure and investment analysis of sheep enterprise in Chittoor district of Andhra Pradesh. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.90-95 KEYWORDS: TOTAL COSTS. VARIABLE COSTS. FIXED COSTS. LIVESTOCK NUMBERS. SHEEP. GERMPLOASM.

A survey was conducted with a sample of 38 sheep beneficiaries of Rashtriya Krishi Vikas Yojana (RKVY) in Chittoor District of Andhra Pradesh. Cost structure and investment analysis have been worked out in sheep rearing among the RKVY beneficiaries. The total cost per unit (20 ewes + 1 ram) was estimated as Rs.1,03,024.32, Rs.73,256.26 and Rs.66,909.04 for the first, second and third years, respectively. Net returns per unit were Rs.9157, Rs.18,222 and Rs.29,056 for the aforesaid years, respectively. The returns per rupee of expenditure tended to increase from 1.09 in the first year to 1.43 in the third year. NPW at 12 per cent rate was Rs.1,

43,220 while the Benefit cost ratio was 1.23. The sensitivity analysis indicated that the enterprise was economically viable even at 24% discount rate.

E20 Organization, administration and management of agricultural enterprises or farms

5. Prajapati, S. Vijay.; Deptt. Of Livestock Production Management, VCVS & AH, Navsari Agricultural University, Navsari (India) Singh, Ranjeet.Rana. Deptt. Of Livestock Production Management, VCVS & AH, Navsari Agricultural University, Navsari (India) Fulsoundar, B. A.; Deptt. Of Livestock Production Management, VCVS & AH, Navsari Agricultural University, Navsari (India) Patel, B. N.; Deptt. Of Livestock Production Management, VCVS & AH, Navsari Agricultural University, Navsari (India). Management practices of dairy animals in Navsari of south Gujarat. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.28-32 KEYWORDS: HOUSING. FEEDING.DAIRY CATTLE. MANAGEMENT. PRODUCTION. FARMERS.VILLAGES.

A field study was conducted to collect the information on housing and feeding management practices followed by the dairy animal owners of Navsari district of South Gujarat. All dairy animal owners (both rural and urban area) provided same kind of housing to their dairy animals. About 72.33 per cent respondents kept their animals in close house. Around 73.33 per cent of the respondents provided manger to their animals of which 50.33 per cent of the respondents had pucca type of manger while 23 per cent of the respondents had wooden manger. Majority of the respondents (58%) followed stall feeding for their dairy animals. About 65.32 per cent of the dairy farmers grew fodder. Paddy straw was major ingredient (82%) used as dry fodder. About 54 percent of farmers fed homemade + compounded cattle feed as concentrates to their milking animals, based on milk production, mainly after milking (43%).

6. Modi, J. R.; Department of Livestock Production and Management College of Veterinary Sciencw & Animal Husbandry Anand Agricultural University, Anand (India)Islam. M. M.; Department of Livestock Production and Management College of Veterinary Sciencw & Animal Husbandry Anand Agricultural University, Anand (India)Patel, B. K.; Department of Livestock Production and Management College of Veterinary Sciencw & Animal Husbandry Anand Agricultural University, Anand (India)Prahapati, B. K.; Department of Livestock Production and Management College of Veterinary Sciencw & Animal Husbandry Anand Agricultural University, Anand (India)Wadhvani, N. K.; Department of Livestock Production and Management College of Veterinary Sciencw & Animal Husbandry Anand Agricultural

University, Anand (India). Constraints perceived by the farmers in adoption of various dairy animal management practices. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.156-158 KEYWORDS: CONSTRAINTS. HOUSING. CONSTRAINTS. FARMERS. LIVESTOCK. OESOPHAGUS.

The study was carried out in Sabarkantha district of Gujarat to identify the various constraints perceived by the farmers in adoption of dairy animal management practices. A random sample of 100 farmers were selected from 5 talukas of the district and the constraints in adoption of management practices in aspect of housing, feeding, breeding, milking & health care management practices were studied. The result of study depicted that lack of knowledge of cheap and scientific housing, lack of knowledge for efficient utilization of feed and fodder, lack of knowledge for feeding mineral mixture, poor result of Artificial Insemination, repeat breeding, lack of knowledge about scientific method of milking and lack of knowledge to control ectoparasite were constraints perceived by the farmers.

E21 Agro-industry

7. Hirpara, Krupa; Seth M.C. College of Dairy Sciences, Anand University, Anand; Patel, H.G.; M.C. College of Dairy Sciences, Anand University, Anand; Gokhale, A.J.; Seth M.C. College of Dairy Sciences, Anand University, Anand; Patel, A.M.; Seth M.C. M.C. College of Dairy Sciences, Anand University, Anand. Effect of level of fat on composition, physico-chemical, rheological and sensory attributes of processed cream cheese based (PCCB) spread. Indian Journal of Dairy Sciences. (Jan 2016) v.69 (1), p.1-7 KEYWORDS: FATS. SOFT CHEESE. MILK. CHEESE. COAGULATION.

There are many varieties of cheese with differing characteristics, appeal and associated uses. Cream cheese is one such product which has potential of gaining popularity among the Indian consumers. Cream cheese is a soft, mild, rich, unripened cheese and is a creamy white, slightly acidic product with a diacetyl flavor. It is usually manufactured by the coagulation of cream or mixture of milk and cream by acidification with starter culture. Fat content plays an important role in physico-chemical, sensory and also the textural characteristics of cheese. Hence, for development of technology for processed cream cheese based (PCCB) spread manufacture, different levels of fat in milk (2, 4 and 6%) were studied so that an optimum level yielding best organoleptic characteristics in final product could be selected. The better quality product was made from milk standardized to 4 per cent fat and added with cream (45 percent fat) 45 per cent of cheese curd at the time of mixing in Stephan kettle. Final cost for production of 1 kg PCCB spread was computed 284.47. Based on the economic as well as sensory quality obtained, a level of 4 percent fat for standardization of cheese milk has been selected.

8. Baghubai, ronak Shrimali; Dairy Technology Division, ICAR- National Dairy Research Institute, karnal (India)Meena, Sahay Ganga; Dairy Technology Division, ICAR- National Dairy Research Institute, karnal (India)Gupta, Kumar Vijay; Dairy Technology Division, ICAR- National Dairy Research Institute, karnal (India)Khetra, Yogesh; Dairy Technology Division, ICAR- National Dairy Research Institute, karnal (India)V,H. Raghu; Dairy Microbial Division, ICAR- National Dairy Research Institute, karnal (India)Puri, Ritika; Dairy Technology Division, ICAR- National Dairy Research Institute, karnal (India). Sensorial and chemical changes in buffalo milk kheer mohan during storage. Indian Journal of Dairy Sciences. (Jan 2016) v.69 (1), p.8-16
KEYWORDS: FATTY ACIDS.PH.TEMPERATURE. EVALUATION.

Kheer Mohan is an energy dense popular sweet of eastern Rajasthan, Similar to other traditional Indian dairy products, this product also has the problem of short shelf life. It has maximum shelf life of six days at room temperature. Present investigation was undertaken to check the suitability of different packaging .methods viz.normal, vacuum and I nitrogen packaging using nylon films for shelf life enhancement as well as to monitor changes in sensory attributes, pH, and free fatty acid (FFA) content and microbial counts during its storage at $30 \pm 1^\circ\text{C}$. For storage period and packaging conditions, significant ($p < 0.01$) difference in overall acceptability scores was observed. Packaging conditions and storage period had highly significant ($p < 0.01$) decreasing effect on pH value during storage. Storage period showed highly significant ($p < 0.01$) increasing effect on FFA values, whereas packaging condition had non-significant effect on the same. Both packaging and storage period had highly significant ($p < 0.01$) increasing effect on SPC of Kheer Mohan. Vacuum packaging overhears Mohan samples was not feasible as it not only altered the shape of product but also made sugar syrup to squeeze out from the samples. Packaging of Kheer Mohan samples in nitrogen environment resulted in minimum 1.5 times increase in product shelflife (9 days) as compared to the product packed in normal air environment (6 days) at $30 \pm 1^\circ\text{C}$ storage temperature.

9. Agarwal, AK; College of dairy science and food technology Raipur (India) Karkhele, P.D; I.G.K.V., Raipur (India) Karthikeyan, s; College of dairy science and food technology Raipur (India) Shrivastva, A; College of dairy science and food technology Raipur (India)Sinha, Geetesh; College of dairy science and food technology Raipur (India). Effect of variation of ginger juice on some physical and sensory properties of ice cream. Indian Journal of dairy Sciences. (Jan 2016) v.69 (1), p.17-23
KEYWORDS: GINGER. ICECREAM. MIXING. SUCROSE. SODIUM.

Frozen desserts like ice cream are valued for their pleasing flavour, cooling and refreshing effects. Ginger (*Zingiber officinale*) is valued for its medicinal and therapeutic properties. In present

investigation, ginger - a natural herb, was used as a flavoring agent in ice cream. A basic ice cream mix having 12% fat, 11 % solid not fat, 15% sucrose, 0.4% sodium alginate and 0.1 % glycerol monostearate was prepared. Ginger juice was incorporated at levels of 0, 1,2,3,4 and 5% w/w of ice cream mix. After experimentation, it was found that the gradual increase of ginger juice caused increase in freezing time with decrease in freezing point depression. The ginger juice also brought significant variations in overrun and melting characteristics. However, the variations were within a close range which ultimately did not impart adverse effect on sensory quality of ginger ice cream. The ice cream made with 4% ginger juice comprising of 11.53% fat and 3.89% protein with 43% overrun was found to be most acceptable.

10. Yadav, upasana; Dairy technology institute, national dairy research institute, karnal (India) Singh, R.R.B; Sanjay gandhi institute of dairy science and technology, patna (India) Chatterjee, Alok; Dairy technology institute, national dairy research institute, karnal (India). Optimization of physical properties and proteins to produce functional extruded snack concocted with composite flour using RSM. Indian Journal of dairy Sciences. (Jan 2016) v.69 (1), p.24-32
KEYWORDS: SNACK FOODS. LIPID CONTENT. PROTEIN CONTENT. NUTRITIVE VALUE.

Currently, snack market is predominantly fat and calorie rich and deficient in nutrition, thus selling obesity, aiming children in particular. To counter this subject palatably, an effort was ventured by implementing extrusion cooking for designing a crisp snack by utilizing adjoined benefits of sweet potato flour (SPF; high carotene), rennet casein (RC; milk protein), barley flour (BF; fiber source) and rice flour (RF), as ingredients. The ingredient levels; treated as factors; were modulated using Central Composite Rotatable Design model with Response Surface Methodology approach. The level selection, rested on the model, was drawn from the fed range of [20 - 35 SPF, 15 - 30 BF, 10 - 30 RC and 30 - 40RF; all being in parts. The recorded responses against the independent variables were bulk density, expansion index, hardness and protein. Polynomial equations and regression coefficients were obtained for each (factor. The analyses by StatEraseDesignExpertTM software, v7.0, revealed statistically prominent positive and negative significances and non-significant effects of each independent variable over individual responses thru linear, interaction and quadratic levels at either ($p < 0.01$), ($p < 0.05$) or ($p > 0.05$). The maximization of protein was accounted for optimization criteria whilst rest responses were kept in-range. One out of three obtained optimized formulations was subjected to reproducibility validation (SPF 20, BF 15, RF 40 and RC 30 parts), leveling the selection on highest desirability quotient. A fairly palatable extruded snack was developed returning non-

significant variance ($p < 0.01$) over predicted scores. The optimized product had bulk density 0.098 g/cm^3 , expansion index 3.34, hardness 21.32 N and protein 27.5%.

11. Nigam, Rahul; ICAR, National Dairy Research Institute, Karnal (India) Khamrui, Kaushik; ICAR, National Dairy Research Institute, Karnal (India) Parsad, Wridhama; ICAR, National Dairy Research Institute, Karnal (India) Lodh, Jui; ICAR, National Dairy Research Institute, Karnal (India) Singh, Bhopal; ICAR, National Dairy Research Institute, Karnal (India) Debnath, Anindita; ICAR, National Dairy Research Institute, Karnal (India). Optimization and sensory profile of chhana based kulfi as function of ingredients using response surface methodology. Indian Journal of Dairy Sciences. (Jan 2016) v.69 (1), p.33-40 KEYWORDS: INGREDIENTS. MILK. METHODS. SUGAR. MILK BYPRODUCTS. PROFIT.

Investigation was undertaken to study the effect of ingredient levels viz., chhana, cow milk, sugar and stabilizer on sensory characteristics of kulfi using response surface methodology (RSM). Flavour score was significantly ($P \leq 0.01$) positively affected by level of chhana and sugar and significantly ($p \leq 0.01$) negatively affected by level of milk at linear level. Quadratic terms of milk and chhana had significant ($p \leq 0.01$) negative effect while quadratic term of sugar had significant ($p \leq 0.05$) positive effect on flavor score of chhana based kulfi. Body and texture score was significantly ($P \leq 0.01$) positively affected by level of chhana at linear level. Quadratic term of milk had significant ($P \leq 0.01$) negative effect while quadratic term of sugar had significant ($p \leq 0.05$) positive effect on body and texture score of chhana based kulfi. Colour and appearance score was significantly ($p \leq 0.01$) positively affected by level of chhana at linear level. Melting quality score was significantly ($p \leq 0.05$) positively affected by level of milk at linear level. Quadratic term of sugar had significant ($p \leq 0.01$) positive effect on melting quality score of chhana based kulfi. The formulation with 56.94% cow milk, 24.66% chhana, 18.21% sugar and 0.23% stabilizer, having the highest desirability (0.83), hence selected as optimized solution.

12. Divya, Nadupunathil; Department of traditional food and sensory sciences, CSIR, Food Technological Research Institute, Mysore (India) Vijay, R. Kannadaka; Department of Central Instrumental Facility, Defence Research Laboratory, Mysore (India) Somashekar, Rudrappa; Department of Studies in physics, University of Mysore, (India) Lokesh, R. Belur; Department of traditional food and sensory sciences, CSIR, Food Technological Research Institute, Mysore (India). Anhydrous milk fat as a substitute for partially hydrogenated fat: A Comparative physico-chemical characterization. Indian Journal of Dairy Sciences. (Jan 2016) v.69 (1), p.50-59 KEYWORDS: MILK. FATS. TRIGLYCERIDES. POLYMORPHISM. ORGANOLEPTIC PROPERTIES.

Partially hydrogenated fat (PHF) is widely used in the food industry especially as a bakery fat. However, PHF is perceived to have adverse effects on health and hence needs to be replaced by a fat which has similar structural and organoleptic properties without having harmful effects on health. In present study anhydrous milk fat (AMF) was tested for this purpose by comparing the structural aspects of AMF with PHF. AMF from three different sources were characterized for their physico- chemical properties. AMF obtained from commercial sources (Com-AMF) and AMF prepared from cow milk (Cow-AMF) and buffalo milk (BufI-AMF) was used in this study. The AMF samples contained 4.5-6.2% short chain fatty acids and 17.4-19.4% medium chain fatty acids which were not detected in PHF. The amount of trisaturated triacylglycerols (TAG) in Com- AMF, Cow-AMF and BufI-AMF was 22.3, 18.8 and 22.5 respectively whereas PHF contained 27.5% trisaturated TAG. The results from DSC studies showed that the total change in enthalpy (ΔH) for melting as well as crystallization for Com- AMF was closer to that of PHF. The SFC pattern for Com- AMF and PHF indicated the plasticity of both the fats. Com- AMF samples showed TAG in β' polymorph similar to that of PHF. Micro-structural Analysis showed crystal clusters of comparable size for Com-AMF and PHF with high refraction. The structural studies indicate that PHF can be replaced to.

13. Patil, Prasad; Dairy microbial Division, CAR-National Dairy Research Institute Karnal, (India)Tomar, Kumar.Sudhir; Dairy microbial Division, CAR-National Dairy Research Institute Karnal, (India). Isolation and characterization of B-galactosides positive *Kluyveromyces* spp. from dairy Products. Indian Journal of dairy Sciences. (Jan 2016) v.69 (1), p.60-66 KEYWORDS: ISOLATION. MILK PRODUCTS. YEASTS. EUKARYOTIC CELLS. BEVERAGES.

K. marxianus and *K. lactis* happen to be the only lactose fermenting yeast species found regularly in milk products. These species are considered to be Generally Regarded as Safe organisms (GRAS) and have been approved as a food additive. Since, the information regarding the prevalence of *Kluyveromyces* spp. In dairy products is scanty especially under Indian conditions, hence an attempt has been made in the present study to isolate and characterize β' -galactosidase (β' -gal) positive *Kluyveromyces* spp. From dairy products. A total number of 110 randomly selected colonies were isolated from different dairy products. Out of these 60 isolates were identified as *Kluyveromyces* spp. after morphological and biochemical characterization. However, after molecular characterization, 18 isolates were confirmed as *Kluyveromyces* spp. Out of which 14 isolates were confirmed as *K. marxianus* and 4 as *K. lactis*. The present study has revealed that indigenous dairy products can be natural and preferred niche for isolation and growth of native and novel strains of dairy yeasts such as *K. lactis* and *K. marxianus*.

14. Dash, Kant. Shakti; College of Veterinary Sciences, GADVASU, Ludhiana (India) Gupta, kumar. Ashok; DCB, Division, NDRI, Karnal (India) Singh, Avtar; DCB, Division, NDRI, Karnal (India) Mohanty, Kumar. Tushar; LPM, Section NDRI, Karnal (India) Ahmad, Tavsief; DCB, Division, NDRI, Karnal (India) Singh, Manvinder; DCB, Division, NDRI, Karnal (India). Analysis of lactation specific demographic parameters and effects of involuntary culling and morality on lifetime performance in Karan Fries. Indian Journal of dairy Sciences. (Jan 2016) v.69 (1), p. 71-75
KEYWORDS: DEMOGRAPHY. AGRICULTURAL ECONOMICS. CROSSBREEDING. CULLING. COWS.

Disposal at an early stage shortens the breeding and productive life of dairy animal and affects the farm economics. Present study was aimed at estimating various demographic parameters and studying the parity wise disposal in Karan Fries cows. Data was spread over a period 30 years (1981 to 2010), the information consisted of disposal records of 1813 adult Karan Fries cattle maintained at ICAR-National Dairy Research Institute (NDRI) herd. Parity wise disposal pattern (up to fifth parity), revealed that the average parity wise culling and disposal rates were 26.08% and 31.96%, respectively. Involuntary culling accounted for the major cause of culling in the Karan Fries herd. Highly significant difference in lifetime performance of cows affected with different disposal causes was observed, in comparison to normal crossbred cows culled due to older age. Highly significant unfavorable effect of involuntary culling on lifetime performance of Karan Fries cows was observed. Estimates of parity wise demographic parameters indicated that stayability (L) of cows up to fourth parity was less than half (33 %) of the total cows that entered the herd during first parity. The average survival (P_x) and disposal rate (Q_x) were around 70% and 30% for most of the parities. Lactation specific herd structure indicated that the more than half (62%) of the cows belong to first two parities and the lactation wise disposal was highest in the first and second parity due to the voluntary culling of the cows for low milk production. Expected herd life (E_x) decreased with increased in lactation number.

15. Nirmal, Singh; Guru angad Dev veterinary and Animal Sciences University, Ludhiana, (India) Malhotra, Puneet; Guru angad Dev veterinary and Animal Sciences University, Ludhiana, (India). Singh, Jaswinder. Guru angad Dev veterinary and Animal Sciences University, Ludhiana, (India). Information need and seeking behavior of dairy farming of Punjab. Indian Journal of dairy Sciences. (Jan 2016) v.69 (1), p.98-104
KEYWORDS: INFORMATION NEEDS. BEHAVIOUR. MILK BYPRODUCTS. PUNJAB.

The present study is an attempt to ascertain the information needs and seeking behaviour of dairy farmers of Punjab State (India). This is based on the data collected from 102 farmers at Pashu Palan

Mela (Livestock Fair) held at Guru Angad Dev Veterinary and Animal Sciences University (GADVASU), Ludhiana during September 2014 via structured Interview Schedule. The study revealed that 70.58% farmers needed information on different subsidy schemes of the Government, followed by 70% on feed and fodder and 64.70% on animal breeding. About 89.21 % farmers met their information needs from Pashu Palan Mela and animal welfare camps, and 85.29% got needed information from television and newspapers. The age of farmers, experience in dairy farming, herd size owned and membership of dairy farming related organizations have a significant relation with their information needs. In view of advancements in Information and Communication Technology and its growing adaptability among farmers, the cyber extension is expected to play a crucial role in dissemination of animal husbandry information in near future. The mobile based information services grounded on the partnership between milk co-operatives, telecommunication companies and veterinary university could be an imperious venture for delivering Information to the palms of dairy farmers.

16. Singh, Meenu; ICAR-NDRI, Karnal (India)Chakravarty, Ritu; ICAR-NDRI, Karnal (India)Singh, Khajan; ICAR-NDRI, Karnal (India)Wani, Sajad.Ahmed; ICAR-NDRI, Karnal (India). Animal health care and management practices followed by tribal dairy farmers in Ranchi. Indian Journal of dairy Sciences. (Jan 2016) v.69 (1), p.105-111
KEYWORDS: MANAGEMENT.ETHNIC GROUPS. DAIRY FARMS. FARMERS.

Animal health care and management practices followed by the farmers play a vital role in enhancing the income from the dairy enterprise. The present study was undertaken purposively in Ranchi district of Utarkhand to study the animal health care and management practices followed by 180 tribal dairy farmers selected randomly from six villages in three blocks. The study revealed that the majority of the respondents practiced vaccination whereas deforming was practiced only by a small number of the respondents. A large percentage of the respondents were consulting Veterinary doctor for sick animals; however few consulted Vaidya, quack and practiced self-medication. Precautions related to sick animals were not followed by majority of the respondents, which may lead to further spread of infection in the area; however few were isolating their sick animals. Burying of carcass was practiced by majority of the respondents. The relation analysis of herd size with various animal health care and management practices suggested that there was no significant relation between herd size and various health care and management practices followed by the tribal dairy farmers.

17. Paul, Pampi; ICAR-NDRI, Karnal (India) Meena, B.S; ICAR-NDRI, Karnal (India) Singh, Amit; ICAR-NDRI, Karnal (India). Gender analysis in dairy

farming in Tripura, India. Indian Journal of dairy Sciences. (Jan 2016) v.69 (1), p.116-119 KEYWORDS: MILK BYPRODUCTS. FARMING SYSTEMS. GENDER. ANALYTICAL METHODS.

The study was framed to assess the activity and decision making performed by the respondents of plain and hilly region involved in dairy farming in Tripura. Primary data was collected from 100 farm families (male + female) actively involved in dairy farming. Both counterparts were separately interviewed to weigh up their decision making pattern and activity profile (who is doing what). The result shows that, regarding decision making pattern in both the region male members of the family were most active and involved rather than their female counterparts almost in all the activities. Though some variation as in hilly region where joint decision making were more important. The respondents (male) were active in activities like purchasing of animals (96.00 & 94.59 %) and selling of the milk (74.00 & 89.19%) in both plain and hilly region. But the females were most active in cleaning of the animal, utensils and animal shed (83.79 & 86.00%), milking (97.29 & 84.00 %) in plain and hilly region. It was further seen that female in the hilly region were more participating in decision making than females of plain region. The study has recommended that there is need to encourage the respondents for dairy farming. The female members should be empowered through imparting knowledge in dairy fanning so that they can take part in farming equally with their male Counterparts.

18. Patel. A.S; Colege of veterinary Sc & A.H.,AAU, Anand (India)Roy,S.K; olege of veterinary Sc & A.H.,AAU, Anand (India). Comparative rheological study of goat milk yoghurt and cow milk yoghurt. Indian Journal of dairy Sciences. (Jan 2016) v.69 (1), p124-127 KEYWORDS: MILK. GOATS. YOGHURT. COW MILK. VISCOSITY. RHEOLOGICAL PROPERTIES.

Goat is popularly known as poor man's cow (or mini- cow) because of its immense contribution to the poor man's economy like milk, yoghurt is also very nutritious. It has been demonstrated that acid milk is better to digest than normal milk. The most important benefits of yoghurt consumption cover the reduction of blood cholesterol level, anti-cancer effects and the improvement of antimicrobial activity and immunity in the human body. From the point of view of rheology, yoghurt is a non-Newtonian, rheological unstable, viscoelastic and pseudoplastic fluid. Beside the sensory quality, another important factor for the consumer's acceptance of the product are the rheological properties of yoghurt, such as apparent viscosity and flow behaviour. An important role is also played by the composition and physicochemical properties of milk Which yoghurt is prepared from. Because of the differences in composition and physicochemical properties of goat and cow milk differences in

the rheological properties of yoghurt from these types of milk can be expected. Texture analysis of goat and cow milk yoghurt was carried out to compare the quality of yoghurt using instrument namely TA.XT Plus texture analyzer. Study revealed that goat milk yoghurt was having lower firmness, consistency, cohesiveness and index of viscosity than cow milk yoghurt.

19. Saha, Rupu; Dept. of Livestock Products Technology College of Veterinary Science, Assam Agricultural University, Khanapara (India) Laskar, K. S.; Deptt. Of Livestock Products Technology College of Veterinary Science, Assam Agricultural University, Khanapara (India) Nath, R. D.; Deptt. Of Livestock Products Technology College of Veterinary Science, Assam Agricultural University, Khanapara (India). Effect of dietary fiber on the proximate composition, calorie value and cost of production of fat reduced pork patties. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.6-10 KEYWORDS: PORK. DIETARY FIBRES.PROXIMATE COMPOSITION.PETROLEUM. FOODS. TECHNOLOGY.

A study was carried out to estimate the proximate composition, calorie value and cost of production of fat reduced pork patties. The fat reduced pork patties were prepared by incorporating three different levels of dietary fibers ie. Wheat and oat bran along with other non-meat ingredients. The formulations attempted were - C_T (0% dietary fiber), WB₁ & OB₃ (2% dietary fiber). WB₂ & OB₂ (3% dietary fiber) and WB₃ & OB₃ (4% dietary fiber). A total of five batches of patties for each formulation were prepared and evaluated. Patties were cooked in a hot air oven at $185 \pm 5^{\circ}\text{C}$ till the internal temperature reached $75 \pm 2^{\circ}\text{C}$. Proximate composition study revealed significant ($P < 0.01$) decrease in the per cent moisture; crude protein and ether extract content from the control to the treated groups. On the contrary, the per cent total ash content increased significantly ($P < 0.01$) in the control compared to the treated formulations. The study revealed a significant ($P < 0.01$) reduction in calorie value of pork patties from the control product to the treated ones. Estimation of production cost indicated that products prepared by incorporating WB were more economic than the OB added ones and the control. It is concluded that low fat pork patties could be prepared by incorporating up to 4 per cent levels of both WB & OB without affecting the sensory properties.

20. Nirmala, Vijaya. T.; Deptt. of Animal Husbandry and Dairy Science, Mahatma Phule Krishi Vidyapeeth, Rahuri (India) Sharma, K, R. G.; Deptt. Of Animal Husbandry and Dairy Science, Mahatma Phule Krishi Vidyapeeth, Rahuri (India). Farmers' perception about quality of multimedia modules ondairy farming practices. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4)

p.38-43 KEYWORDS: SENSES. DAIRY FARMS. MANAGEMENT. TRADITIONAL FARMING. FARMERS. QUALITY. INDIA.

Present study interprets the perception of dairy farmers about the quality of multimedia modules developed for the purpose along with the constraints faced and suggestions voiced. The quality of multimedia modules were perceived with the help of the parameters related to attractiveness, holding interests, use of visuals and models, production skills and presentation skills. The results revealed that majority of the dairy farmers had perceived that, the quality of multimedia modules are good and found to be useful. But, lack of awareness was perceived as major constraint while using multimedia modules as information source. An awareness campaign at different places at regular intervals will certainly help out to promote such multimedia modules as information source and that can be effectively used for disseminating technologies on various dairy farming practices.

21. Rajgor, B.B.; Saradarkrushinagar Dantiwada Agricultural University, Gujarat (India) Raval, P.A.; Saradarkrushinagar Dantiwada Agricultural University, Gujarat (India) Bhagwat, R.S.; Saradarkrushinagar Dantiwada Agricultural University, Gujarat (India) Sorathiya, M.L.; Saradarkrushinagar Dantiwada Agricultural University, Gujarat (India). Fulsoundar, B.A.; Saradarkrushinagar Dantiwada Agricultural University, Gujarat (India). Savsni, H.H.; Saradarkrushinagar Dantiwada Agricultural University, Gujarat (India). Effect of dietary supplementation of prebiotic and probiotic on growth of broiler chicks. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.87-89 KEYWORDS: BROILER CHICKENS. GROWTH. PROBIOTICS. ANTIBIOTICS. FARMERS. YEASTS.

One hundred and eighty (n=180) day old white commercial broiler chicks (Cobb 400) were randomly assigned to four treatment groups to study the effect of prebiotics, probiotic and symbiotic on growth performance of broilers. Birds were fed either basal diet only (CON) or the basal diet supplemented 500 g/tonne periodic (PRE), 100 g/tonne probiotic (PRO) or 500 g/tonne prebiotic and 100 g/tonne probiotic (SYN). Average body weight gain (BWG), feed intake (FI), feed conversion ratio (FCR), mortality and cost of feeding of broilers were determined. Dietary supplementation with PRO and SYN had better ($P<0.05$) body weight as compared to CON and PRE-fed birds. BWG, FI, FCR and cost/kg live weight remained comparable ($p>0.05$) amongst different dietary treatment groups but the supplementation of probiotic had shown better gain as compared to other dietary treatments.

22. Bhoite, Y.U.; Department of Animal Husbandry and Dairy Science, Mahatma Phule Krishi Vidyapeeth, Rahuri (India) Tambe, R.D.; Department of Animal Husbandry and Dairy Science, Mahatma Phule

Krishi Vidyapeeth, Rahuri (India). Bhoite, U.S.; Department of Animal Husbandry and Dairy Science, Mahatma Phule Krishi Vidyapeeth, Rahuri (India). Milk production performance of HF X Gir halfbred. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31(3-4) p.120-124 KEYWORDS: MILK PRODUCTION. CROSSBREEDING. BREEDS (ANIMALS). LIVESTOCK. PRODUCTION. LACTATION.

The data on milk production performance of 342 HF X Gir half breeds having 1039 lactations were collected from records maintained at Research Cum Development Project on Cattle, Mahatma Phule Krishi Vidyapeeth, Rahuri (Maharashtra) over a period of 40 years (1974 to 2013). The overall least squares means of 300 days milk yield, lactation length, peak milk yield and number of days required to attain peak milk yield in HFxGir halfbred was 3351.77±40.46 kg, 335.33±2.38 days, 16.52±0.15 kg and 39.19±0.41 days respectively. The effect of period of calving was significant on all traits. Lactation order significantly influenced 300 DMY and peak milk yield. Phenotypic correlations of lactation length, (0.10) and peak milk yield (0.20) with 300 days milk yield were positive and significant (P<0.01). Heritability of 300 days milk yield, lactation length, peak milk yield and days to attain peak milk yield in HF X Gir halfbred were 0.89±0.14 and 0.02±0.10, 0.58±0.13 and 0.22±0.12 respectively.

23. Hirpara, Krupa; Seth m.c college of dairy sciences, Anand University, AnandPatel, H.G; Seth m.c college of dairy sciences, Anand University, AnandGokhale, A.J; Seth m.c college of dairy sciences, Anand University, AnandPatel, AM; Seth m.c college of dairy sciences, Anand University, Anand. Effect of level of fat on composition, physico-chemical, rheological and sensory attributes of processed cream cheese based (PCCB) spread. Indian Journal of dairy Sciences (India). (Jan 2016) v.69 (1), p.1-7 KEYWORDS: FATS. SOFT CHEESE. MILK. CHEESE. COAGULATION.

There are many varieties of cheese with differing characteristics, appeal and associated uses. *Cream cheese* is one such product which has potential of gaining popularity among the Indian consumers. *Cream cheese* is a soft, mild, rich, unripened cheese and is a creamy white, slightly acidic tasting product with a diacetyl flavor. It is usually manufactured by the coagulation of cream or mixture of milk and cream by acidification with starter culture and is ready for consumption after the manufacturing process is complete. Fat plays an important role in physico-chemical, sensory and also the textural characteristics of cheese. Hence, for development of technology for *Processed cream cheese based (PCCB) spread* manufacture, different levels of fat i.e. 2, 4 and 6 (percent of milk) were studied so that an optimum level yielding best organoleptic characteristics in final product can be selected. The product was made from milk standardized to 4 percent fat level and added with cream (45 percent)

@ 45 per cent of cheese curd at the time of mixing in Stephan kettle. Based on the economic as well as sensory quality obtained, a level of 4 per cent fat for standardization of cheese milk has been selected.

24. Baghubai, ronak Shrimali; Dairy Technology Division, ICAR-National Dairy Research Institute, karnal (India)Meena, Sahay Ganga; Dairy Technology Division, ICAR- National Dairy Research Institute, karnal (India)Gupta, Kumar Vijay; Dairy Technology Division, ICAR- National Dairy Research Institute, karnal (India)Khetra, Yogesh; Dairy Technology Division, ICAR- National Dairy Research Institute, karnal (India)V,H. Raghu; Dairy Microbial Division, ICAR- National Dairy Research Institute, karnal (India)Puri, Ritika; Dairy Technology Division, ICAR- National Dairy Research Institute, karnal (India). Sensorial and chemical changes in buffalo milk kheer mohan during storage. Indian Journal of dairy Sciences (India). (Jan 2016) v.69 (1), p.8-16 KEYWORDS: FATTY ACIDS. PH. TEMPERATURE. EVALUATION.

Kheer Mohan is an energy dense popular sweet of eastern Rajasthan. Similar to other traditional Indian dairy products, this product also has the problem of short shelf life. It has maximum shelf life of six days at room temperature. Present investigation was undertaken to check the suitability of different packaging methods viz. normal, vacuum and nitrogen packaging using nylon films for shelf life enhancement as well as to monitor changes in sensory attributes, pH, free fatty acid (FFA) content and microbial counts during its storage at $30\pm 1^{\circ}\text{C}$. For storage period and packaging conditions, significant ($p<0.01$) difference in overall acceptability scores was observed. Packaging conditions and storage period had highly significant ($p<0.01$) decreasing effect on pH value during storage. Storage period showed highly significant ($p<0.01$) increasing effect on FFA values, whereas packaging condition had non-significant effect on the same. Both packaging and storage period had highly significant ($p<0.01$) increasing effect on SPC of *Kheer Mohan*. Vacuum packaging of *Kheer Mohan* samples was not feasible as it not only altered the shape of product but also made sugar syrup to squeeze out from the samples. Packaging of *Kheer Mohan* samples in nitrogen environment resulted in minimum 1.5 times increase in product shelf life (9 days) as compared to the product packed in normal air environment (6 days) at $30\pm 1^{\circ}\text{C}$ storage temperature.

25. Agarwal, AK; College of dairy science and food technology Raipur (India) Karkhele, P.D; I.G.K.V., Raipur (India)Karthikeyan, s; College of dairy science and food technology Raipur (India) Shrivastva, A; College of dairy science and food technology Raipur (India)Sinha, Geetesh; College of dairy science and food technology Raipur (India). Effect of variation of ginger juice on some physical and sensory properties of ice cream. Indian Journal of dairy Sciences (india). (Jan 2016) v.69 (1),

p.17-23 KEYWORDS: GINGER. ICECREAM. MIXING. SUCROSE. SODIUM.

Frozen desserts like ice cream are valued for their pleasing flavour, cooling and refreshing effects. Ginger is one such natural herb which is valued for its medicinal and therapeutic properties since time immemorial. In present investigation, ginger - a natural herb, was used as a flavouring agent in ice cream. In the present investigation a basic ice cream mix having 12% fat, 11% solid not fat, 15% sucrose, 0.4% sodium alginate and 0.1% glycerol mono stearate was prepared. Ginger juice was incorporated at level 0, 1, 2, 3, 4 and 5% w/w of ice cream mix. The whole experiment was based on 4 replications (i.e. 24 lots) of preparation of ice cream. After experimentation, it was found that the gradual increase of ginger juice decreased per cent overrun. Due to its high moisture content the ginger juice brought significant variations in overrun and melting characteristics. However, the variations were within a close range which ultimately did not imparted adverse effect on overrun, melting characteristics and sensory quality of ginger ice cream. The ice cream made with 4% ginger juice was found to be most acceptable.

26. Yadav, upasana; Dairy technology institute, national dairy research institute, Karnal (India) Singh, R.R.B; Sanjay Gandhi institute of dairy science and technology, patna (India) Chatterjee, Alok; Dairy technology institute, national dairy research institute, karnal (india). Optimization of physical properties and proteins to produce functional extruded snack concocted with composite flour using RSM. Indian Journal of dairy Sciences (India). (Jan 2016) v.69(1), p.24-32
KEYWORDS: SNACK FOODS. LIPID CONTENT. PROTEIN CONTENT. NUTRITIVE VALUE.

Currently, snack market is predominantly fat and calorie rich and deficient in nutrition, thus selling obesity, aiming children in particular. To counter this subject palatably, an effort was ventured by implementing extrusion cooking for designing a crisp snack by utilizing adjoined benefits of sweet potato flour (SPF; high carotene), rennet casein (RC; milk protein), barley flour (BF; fibre source) and rice flour (RF), as ingredients. The ingredient levels; treated as factors; were modulated using Central Composite Rotatable Design model with Response Surface Methodology approach. The level selection, rested on the model, was drawn from the fed range of 20 – 35 SPF, 15 – 30 BF, 10 – 30 RC and 30 – 40 RF; all being in parts. The recorded responses against the independent variables were bulk density, expansion index, hardness and protein. Polynomial equations and regression coefficients were obtained for each factor. The analyses by StatEase DesignExpert™ software, v7.0, revealed statistically prominent positive and negative significances and non-significant effects of each independent variable over individual responses thru linear, interaction and quadratic levels at either $p < 0.01$, $p < 0.05$ or

$p > 0.05$. Maximization of protein was accounted for optimization criteria whilst rest responses were kept in-range. One out of three obtained optimized formulations was subjected to reproducibility validation (SPF 20, BF 15, RF 40 and RC 30 parts), leveling the selection on highest desirability quotient. A fairly palatable extruded snack was developed returning non-significant variance ($p < 0.01$) over predicted scores. The optimized product had bulk density 0.098 g/cm^3 , expansion index 3.34, hardness 21.32 N and protein 27.5%.

27. Nigam, Rahul; ICAR, National Dairy Research Institute, Karnal (India) Khamrui, Kaushik; ICAR, National Dairy Research Institute, Karnal (India) Parsad, Wridhama; ICAR, National Dairy Research Institute, Karnal (India) Lodh, Jui; ICAR, National Dairy Research Institute, Karnal (India) Singh, Bhopal; ICAR, National Dairy Research Institute, Karnal (India) Debnath, Anindita; ICAR, National Dairy Research Institute, Karnal (India). Optimization and sensory profile of chhana based kulfi as function of ingredients using response surface methodology. Indian Journal of Dairy Sciences (India). (Jan 2016) v.69 (1), p.33-40
KEYWORDS: INGREDIENTS. MILK. METHODS. SUGAR. MILK BYPRODUCTS. PROFIT.

Investigation was undertaken to study the effect of ingredient levels viz., *chhana*, cow milk, sugar and stabilizer on sensory characteristics of *kulfi* using response surface methodology (RSM). Flavour score was significantly ($p \leq 0.01$) positively affected by level of *chhana* and sugar and significantly ($p \leq 0.01$) negatively affected by level of milk at linear level. Quadratic terms of milk and *chhana* had significant ($p \leq 0.01$) negative effect while quadratic term of sugar had significant ($p \leq 0.05$) positive effect on flavour score of *chhana* based *kulfi*. Body and texture score was significantly ($p \leq 0.01$) positively affected by level of *chhana* at linear level. Quadratic term of milk had significant ($p \leq 0.01$) negative effect while quadratic term of sugar had significant ($p \leq 0.05$) positive effect on body and texture score of *chhana* based *kulfi*. Colour and appearance score was significantly ($p \leq 0.01$) positively affected by level of *chhana* at linear level. Melting quality score was significantly ($p \leq 0.05$) positively affected by level of milk at linear level. Quadratic term of sugar had significant ($p \leq 0.01$) positive effect on melting quality score of *chhana* based *kulfi*.

28. Divya, Nadupunathil; Department of traditional food and sensory sciences, CSIR, Food Technological Research Institute, Mysore (India) Vijay, R. Kannadaka; Department of Central Instrumental Facility, Defence Research Laboratory, Mysore (India) Somashekar, Rudrappa; Department of Studies in physics, University of Mysore, (India) Lokesh, R. Belur; Department of traditional food and sensory sciences, CSIR, Food Technological Research Institute, Mysore (India). Anhydrous milk fat as a substitute for partially hydrogenated fat: A Comparative physico-chemical characterisation. Indian Journal of

dairy Sciences (india). (Jan 2016) v.69 (1), p.50-59 KEYWORDS: MILK. FATS. TRIGLYCERIDES. POLYMORPHISM. ORGANOLEPTIC PROPERTIES.

Partially hydrogenated fat (PHF) is widely used in the food industry especially as a bakery fat. However, PHF is perceived to have adverse effects on health and hence needs to be replaced by a fat which has similar structural and organoleptic properties without having harmful effects on health. In present study anhydrous milk fat (AMF) was tested for this purpose by comparing the structural aspects of AMF with PHF. AMF from three different sources were characterised for their physico-chemical properties. AMF obtained from commercial sources (Com-AMF) and AMF prepared from cow milk (Cow-AMF) and buffalo milk (Bufl-AMF) was used in this study. The AMF samples contained 4.5-6.2% short chain fatty acids and 17.4-19.4% medium chain fatty acids which were not detected in PHF. The amount of trisaturated triacylglycerols (TAG) in Com-AMF, Cow-AMF and Bufl-AMF was 22.3, 18.8 and 22.5 respectively whereas PHF contained 27.5% trisaturated TAG. The results from DSC studies showed that the total change in enthalpy (ΔH) for melting as well as crystallisation for Com-AMF was closer to that of PHF. The SFC pattern for Com-AMF and PHF indicated the plasticity of both the fats. Com-AMF samples showed TAG in β' polymorph similar to that of PHF. Micro-structural analysis showed crystal clusters of comparable size for Com-AMF and PHF with high refraction. The structural studies indicate that PHF can be replaced to certain extent with Com-AMF in the preparation of food products with desirable organoleptic properties.

29. Patil, Prasad; Dairy microbial Division, ICAR-National Dairy Research Institute Karnal, (India) Tomar, Kumar.Sudhir; Dairy microbial Division, ICAR-National Dairy Research Institute Karnal, (India). Isolation and characterization of β -galactosidase positive *Kluyveromyces* spp. from dairy Products. Indian Journal of dairy Sciences (india). (Jan 2016) v.69(1) p.60-66 KEYWORDS: ISOLATION. MILK PRODUCTS. YEASTS. EUKARYOTIC CELLS. BEVERAGES.

K. marxianus and *K. lactis* happen to be the only lactose fermenting yeast species found regularly in milk products. These species are considered to be Generally Regarded As Safe organisms (GRAS) and have been approved as a food additive. Since, the information regarding the prevalence of *Kluyveromyces* spp. in dairy products is scanty especially under Indian conditions, hence an attempt has been made in the present study to isolate and characterize β -galactosidase positive *Kluyveromyces* spp. from dairy products. A total number of 110 randomly selected colonies were isolated from different dairy products. Out of these, 60 isolates were identified as *Kluyveromyces* spp. after morphological and biochemical characterization. However, after molecular characterization, 18

isolates were confirmed as *Kluyveromyces* spp. Out of which 14 isolates were confirmed as *K. marxianus* and 4 as *K. lactis*. The present study has revealed that indigenous dairy products can be natural and preferred niche for isolation and growth of native and novel strains of dairy yeasts such as *K. lactis* and *K. marxianus*.

30. Dash, Kant. Shakti; College of Veterinary Sciences, GADVASU, Ludhiana (India) Gupta, Ashok Kumar; NDRI, Karnal (India) DCB Division. Singh, Avtar; NDRI, Karnal (India). DCB Division. Mohanty, Tushar Kumar; NDRI, Karnal (India). LPM Section. Ahmad, Tavsieff; NDRI, Karnal (India) DCB Division. Singh, Manvinder; NDRI, Karnal (India). DCB Division. Analysis of lactation specific demographic parameters and effects of involuntary culling and morality on lifetime performance in karan fries. Indian Journal of dairy Sciences (india). (Jan 2016) v.69(1), p. 71-75 KEYWORDS: DEMOGRAPHY. AGRICULTURAL ECONOMICS. CROSSBREEDING. CULLING. COWS.

Disposal at an early stage shortens the breeding and productive life of dairy animal and affects the farm economics. Present study was aimed at estimating various demographic parameters and studying the parity wise disposal in Karan Fries cows. Data was spread over a period of 30 years (1981 to 2010), the information consisted of disposal records of 1813 adult Karan Fries cattle maintained at National Dairy Research Institute (NDRI) herd. Parity wise disposal pattern (upto fifth parity), revealed that the average parity wise culling and disposal rates were 26.08% and 31.96%, respectively. Involuntary culling accounted for the major cause of culling in the Karan Fries herd. Highly significant difference in lifetime performance of cows affected with different disposal causes was observed, in comparison to normal crossbred cows culled due to older age. Highly significant unfavourable effect of involuntary culling on lifetime performance of Karan Fries cows was observed. Estimates of parity wise demographic parameters indicated that stayability (L_x) of cows upto fourth parity was less than half (33%) of the total cows that entered the herd during first parity. The average survival (P_x) and disposal rate (Q_x) were around 70% and 30% for most of the parities. Lactation specific herd structure indicated that the more than half (62%) of the cows belong to first two parities and the lactation wise disposal was highest in the first and second parity due to the voluntary culling of the cows for low milk production in the early parities. Expected herd life (E_x) had a declining trend with increase in lactation number.

31. Nirmal, singh; Guru angad Dev veterinary and Animal Sciences University, Ludhiana,(India)Malhotra, Puneet; Guru angad Dev eterinary and Animal Sciences University, Ludhiana,(India)Singh, Jaswinder. Guru angad Dev veterinary and Animal Sciences University, Ludhiana,(India). Information need and seeking behaviour of dairy

farming of punjab. Indian Journal of dairy Sciences (india). (Jan 2016) v.69(1),p.98-104 KEYWORDS: INFORMATION NEEDS. BEHAVIOUR. MILK BYPRODUCTS. PUNJAB.The present study is an attempt to ascertain the information needs and seeking behaviour of dairy farmers of Punjab State (India). This is based on the data collected from 102 farmers at Pashu Palan Mela (Livestock Fair) held at Guru Angad Dev Veterinary and Animal Sciences University (GADVASU), Ludhiana during September 2014 via structured Interview Schedule. The study revealed that age of farmers, experience in dairy farming, herd size owned and membership of dairy farming related organisations have a significant relation with their information needs. In view of advancements in Information and Communication Technology and its growing adaptability among farmers, the cyber extension is expected to play a crucial role in dissemination of animal husbandry information in near future. The mobile based information services grounded on the partnership between milk co-operatives, telecommunication companies and veterinary university could be an imperious venture for delivering information to the palms of dairy farmers.

32. Singh, Minu; ICAR-NDRI, Karnal (India)Chakravarty, Ritu;ICAR-NDRI, Karnal (India) Singh, Khajan; ICAR-NDRI, Karnal (India) Wani, Sajad Ahmed; ICAR-NDRI, Karnal (India). Animal health care and management practices followed by tribal dairy farmers in Ranchi. Indian Journal of dairy Sciences (India). (Jan 2016) v.69 (1), p.105-111 KEYWORDS: MANAGEMENT. ETHNIC GROUPS. DAIRY FARMS. FARMERS.

Animal health is an important part of animal welfare and has a direct bearing on the profits accrued from the farm. Monitoring animal health helps in minimizing the incidence of disease and mortality, which causes huge loss to the already marginalized dairy farmers. Therefore, the health care and management practices followed by the farmers play a vital role in enhancing the income from the dairy enterprise. The present study was undertaken purposively in Ranchi district of Jharkhand to study the animal health care and management practices followed by the tribal dairy farmers. Three blocks and, two villages from each block were selected at random. From each village 30 tribal respondents were selected randomly, constituting a total number of 180 respondents. The tribal respondents having at least one milch animal were selected. The study revealed that 70% of the respondents were not following the recommended animal health care and management practices.

33. Paul, Pampi; ICAR-NDRI, Karnal (India) Meena, B.S; ICAR-NDRI, Karnal (India) Singh, Amit; ICAR-NDRI, Karnal (India). Gender analysis in dairy farming in Tripura, India. Indian Journal of dairy Sciences (India). (Jan

2016) v.69 (1), p.116-119 KEYWORDS: MILK BYPRODUCTS. FARMING SYSTEMS. GENDER. ANALYTICAL METHODS.

Indian economy is predominantly rural and agriculture oriented where dairy farming is one of the sources of income for majority of the farmers of the country. In Indian context, the farming became a familial tradition where along with the male counterparts females are also associated from the beginning of the era. Thus, a study was framed to have a look on dairy farming with the analysis of gender in dairy farming in one of the north-eastern state of India. For that purpose, both 100 male and 100 female were interviewed to weigh up their decision making pattern and activity profile (who is doing what) in dairy farming in both plain and hilly region of Tripura. The results shows that, regarding decision making pattern in both the region male members of the family (such as 88 % in Selling and purchasing of animals in plain) were most energetic rather than their female counterparts almost in all the activities. The results show a different picture in hilly region where joint decision making were important rather than plain region and participation in different activities of dairy farming males were active in purchasing of animals (96.00 % in plain) and selling of the milk (74.00 % in plain) in both the region. But the females were most active in cleaning of the animal, utensils and animal shed (83.79 % in hilly), milking (97.29 % in hilly) in both the region. It was further seen that female in the hilly region were more participating in decision making than females of plain region. The study has recommended that there is need to empower the female farther so that they can take part in farming equally with their male counterparts.

34. Patel. A.S; Colege of veterinary Sc & A.H.,AAU, Anand (India) Roy, S.K; olege of veterinary Sc & A.H.,AAU, Anand (India). Comparative rheological study of goat milk yoghurt and cow milk yoghurt. Indian Journal of dairy Sciences (india). (Jan 2016) v.69 (1), p124-127 KEYWORDS: MILK. GOATS. YOGHURT. COW MILK. VISCOSITY. RHEOLOGICAL PROPERTIES. Goat is popularly known as poor man's cow (or mini-cow) because of its immense contribution to the poor man's economy. Like milk, yoghurt is also very nutritious. It has been demonstrated that acid milk is better to digest than normal milk. The most important benefits of yoghurt consumption cover the reduction of blood cholesterol level, anti-cancer effects and the improvement of antimicrobial activity and immunity in the human body. From the point of view of rheology, yoghurt is a non-Newtonian, rheological unstable, viscoelastic and pseudo plastic fluid. Beside the sensory quality, another important factor for the consumer's acceptance of the product are the rheological properties of yoghurt, such as apparent viscosity and flow behaviour. An important role is also played by the composition and physicochemical properties of milk which yoghurt is prepared from. Because of the differences in composition

and physicochemical properties of goat and cow milk differences in the rheological properties of yoghurt from these types of milk can be expected. Texture analysis of goat and cow milk yoghurt was carried out to compare the quality of yoghurt using instrument namely TA.XT Plus texture analyzer. Study revealed that goat milk yoghurt was having lower firmness, consistency, cohesiveness and index of viscosity than cow milk yoghurt.

E50 Rural Sociology

35. Chaurasiya, K.K; Rajmata Vijayearaje scindia Krishi vidhyalaya, Gwalior (India)Badodiya, S.K; Rajmata Vijayearaje scindia Krishi vidhyalaya, Gwalior (India)Somvanshi, SPS; Rajmata Vijayearaje scindia Krishi vidhyalaya, Gwalior (India)Gaur, C.L; Rajmata Vijayearaje scindia Krishi vidhyalaya, Gwalior (India). Entrepreneurial behaviour of dairy farmer in gwalior district of madya pradesh. Indian Journal of dairy Sciences. (Jan 2016) v.69 (1), p.112-115 KEYWORDS: MILK BYPRODUCTS. FARMERS. RURAL AREAS.

Entrepreneurship development in rural areas is now being considered as a means to achieve socio-economic enhancement of rural people and overall development of rural a economy, Dairy farming has good potential for employment generation both in rural and peri-urban areas. The study was conducted on 80 dairy farmers selected from eight villages of Morar block of Gwalior district of Madhya Pradesh, who were selected by proportionate random sampling technique to find out the entrepreneurial behavior of dairy farmers. The study concluded that majority of respondents were moderate level of entrepreneurial behavior followed by high and low level of entrepreneurial behavior, The correlation coefficient between personal and socio- economic characteristics of the dairy farmers with their entrepreneurial behavior was found to have positive and significant relationship with entrepreneurial behavior at 0.01 level of probability. While age, family size and organization participation were no significant relationship entrepreneurial behavior of dairy farmers. Hence, special type of consideration is required to develop the entrepreneurship in dairy farmers There is a possibility to enhance these traits among dairy farmers.

36. Manna, K. T.; Department of Livestock Production Management, Faculty of Veterinary and Animal Science West Bangal University of Animal & Fishery Science, Kolkata (India)Samanta, K. A.; Department of Livestock Production Management, Faculty of Veterinary and Animal Science West Bangal University of Animal & Fishery Science, Kolkata (India)Pal, A.; Department of Livestock Production Management, Faculty of Veterinary and Animal Science West Bangal University of Animal & Fishery Science, Kolkata (India)Debbarma, N,; Department of Livestock Production Management, Faculty of

Veterinary and Animal Science West Bengal University of Animal & Fishery Science, Kolkata (India) Behera, D.; Department of Livestock Production Management, Faculty of Veterinary and Animal Science West Bengal University of Animal & Fishery Science, Kolkata (India) Bera, S.; Department of Livestock Production Management, Faculty of Veterinary and Animal Science West Bengal University of Animal & Fishery Science, Kolkata (India). Socio-economic status of goat farmers in alluvial and coastal region of West Bengal. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.76-79 KEYWORDS: ALLUVIUM. FARMERS. GOATS. LAND. INCOME. HUMAN BEHAVIOUR. ANIMALS. INDIA.

An investigation was carried out in two districts of West Bengal namely Nadia (alluvial) and South 24 Paraganas (coastal) to evaluate the socio-economic status of the goat farmers through survey by a structured questioner amongst the selected beneficiaries by local institution and communities. The study revealed that the average goat holding per house hold was better for female farmers in both the agro climatic regions. The income (11.63 %) generated from goat husbandry in coastal region was less than alluvial region (15.22%). The income generated in coastal and alluvial by the female farmer were Rs. 2375.41±304.49 & Rs. 2900.0± 438.95 better compared to that of the male farmers Rs. 1646.66±426.31 & Rs. 2164.70± 392.19 respectively, in relation to goat husbandry practices in both the regions, providing the women empowerment. Majority of the goat farmers gain information from personal cosmopolitaness in alluvial region, whereas in coastal region, personal localiteness was the main source of information. The overall knowledge level of goat farmers in alluvial region was better compared to that of coastal region. The attitude of farmers towards goat farming due to mass media, personal cosmopolitaness and personal localiteness had significant effect in both the agro-climatic regions.

37. Chaurasiya, K.K; Rajmata Vijayearaje scindia Krishi vidhyalaya, Gwalior (India) Badodiya, S.K; Rajmata Vijayearaje scindia Krishi vidhyalaya, Gwalior (India) Somvanshi, SPS; Rajmata Vijayearaje scindia Krishi vidhyalaya, Gwalior (India) Gaur, C.L; Rajmata Vijayearaje scindia Krishi vidhyalaya, Gwalior (India). Entrepreneurial behavior of dairy faremer in Gwalior district of madya Pradesh. Indian Journal of dairy Sciences. (Jan 2016) v.69 (1), p.112-115 KEYWORDS: MILK BYPRODUCTS. FARMERS. RURAL AREAS.

Dairy entrepreneur is the most important figure of economic activity and prime mover of development. The study was conducted on 80 dairy farmers selected from all the dairy farmers of Morar block of Gwalior District of Madhya Pradesh who are practicing dairy and possessing minimum six dairy animals such as cow/buffalo/both to find out the entrepreneurial behavior of dairy farmers. The study revealed that majority (68.75%) of dairy farmers found to have

medium level of entrepreneurial behavior followed by high and low level of entrepreneurial behavior. The entrepreneurial behavior was positively and significantly related with education, dairy experience, organization participation, land holding, livestock possession, annual income, material possession, economic motivation, market orientation, scientific orientation and knowledge of improved dairy management practices found to have positive and significant relationship with entrepreneurial behavior. Distance location of A.I. centres and lack of veterinary facilities in the village were major constraints reported by dairy farmers.

E70 Trade, marketing and distribution

38. Koveio, Michael L.L.; ICAR-NDRI, Karnal (India). Jain, D.K.; ICAR-NDRI, Karnal (India) Das, Gautam; Indian Institute of Crop processing Technology, Thanjavur (India). A study on marketed surplus and disposal pattern of milk in the north-Eastern State of Nagaland. Indian Journal of dairy Sciences. (Jan 2016) V.69 (1), P. 94-97 KEYWORDS: CONSUMERS. MARKETING. SURPLUSES. MILK. HOUSEHOLDS.

The present study was undertaken during 2010-11 to estimate the marketed surplus and existing disposal pattern of milk in Nagaland. Overall 12.26 litres of milk were produced per day per household out of which 1.74 litres were consumed per day per household. Thus, the overall marketed surplus of milk was 10.52 litres per day per households which was 85.83 per cent of the total milk produced. So, the consumption of milk across different household categories (small, medium and large) was very low resulting in relatively higher marketed surplus of milk. It was found that total milk produced had a positive and significant ($P < 0.01$) effect on the marketed surplus of milk. It was found that relatively higher percentage of marketed surplus of milk was disposed off to unorganized sector (consumers) than Milk Producers Co-operative Societies due to relatively lower price being paid by cooperatives based on fat and SNF percentage. The study suggested the need for more government incentives to encourage the farmers for commercial dairying as this would in turn increase the production and marketed surplus of milk for higher return.

39. Koveio, Michael L.L.; ICAR-NDRI, Karnal (India) Jain, D.K.; ICAR-NDRI, Karnal (India) Das, Gautam; Indian Institute of Crop processing Technology, Thanjavur (India). A study on marketed surplus and disposal pattern of milk in the North-Eastern State of Nagaland. Indian Journal of dairy Sciences (India). (Jan 2016) V.69(1), P.94-97 KEYWORDS: CONSUMERS. MARKETING. SURPLUSES. MILK. HOUSEHOLDS.

The present study was undertaken during 2010-11 to estimate the marketed surplus and existing disposal pattern of milk in Nagaland. Overall 12.26 litres of milk were produced per day per household out of which 1.74 litres were consumed per day per household. Thus, the overall marketed surplus of milk was 10.52 litres per day per households which was 85.83 per cent of the total milk produced. So, the consumption of milk across different household categories (small, medium and large) was very low resulting in relatively higher marketed surplus of milk. It was found that total milk produced had a positive and significant ($P < 0.01$) effect on the marketed surplus of milk. The study suggested the need for more government incentives to encourage the farmers for commercial dairying as this would in turn increase the production and marketed surplus of milk for higher return. It was found that relatively higher percentage of marketed surplus of milk was disposed off to unorganised sector (consumers) than Milk Producers Co-operative Societies which would be due to relatively lower price being paid by cooperatives based on fat and SNF percentage.

J13 Handling, transport, storage and protection of animal products

40. Khan Mehdi, K.; Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu, Jammu & Kashmir (India). Division of Animal Genetic and Breeding. Kumar, N.; Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu, Jammu & Kashmir (India). Division of Animal Genetic and Breeding. Chakraborty, D.; Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu, Jammu & Kashmir (India). Division of Animal Genetic and Breeding. Kumar, D.; Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu, Jammu & Kashmir (India). Division of Animal Genetic and Breeding. Das, A.K.; Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu, Jammu & Kashmir (India). Division of Animal Genetic and Breeding. Taggar, R.K.; Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu, Jammu & Kashmir (India). Division of Animal Genetic and Breeding... Wool type of regional Sheep (Purky) of Kargil. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.92-94
KEYWORDS: WOOL. SHEEP. SHEARING.

A total of 161 wool samples of adult sheep of both sexes were collected randomly and analyzed for different wool production traits at Fleece testing laboratory, Kartholi, Jammu. The average annual wool production was 1.33 kg. Among four different wool colours, white colour showed the highest percentage. Coefficient of variations for all the traits was very low except for modulation. Phenotypic correlations among wool traits were very low and most of them were negative barring few exceptions. The values of analysis of wool parameters suggested that wool of Purky sheep is of course type.

L01 Animal husbandry

41. Haque, M.; Assam Agricultural University, Khanapara (India). College of Veterinary Science. Department of Extension Education. Hazarika, P.; Assam Agricultural University, Khanapara (India). College of Veterinary Science. Department of Extension Education. Saharia, K.K.; Assam Agricultural University, Khanapara (India). College of Veterinary Science. Department of Extension Education. Ray, M.N.; Assam Agricultural University, Khanapara (India). College of Veterinary Science. Department of Extension Education. Borgohain, A.; Assam Agricultural University, Khanapara (India). College of Veterinary Science. Department of Extension Education. As, Mukut; Assam Agricultural University, Khanapara (India). College of Veterinary Science. Department of Extension Education. Constraints perceived by the self help groups (SHGs) engaged in livestock Enterprises in availing bank loans. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.43-45 KEYWORDS: CONSTRAINTS. LIVESTOCK. LOANS.

SHG members seek bank loans under urgency to meet some acute income generating needs for better livelihood. Hundred representative SHG members from Darrang and Kamrup districts of Assam through Rank Based Quotient (RBQ) technique revealed that constraints relating to more visits to bank than actually required delay in opening of bank account delay in sanction of bank loan and under finance needed effective attention from banks.

42. Dangar, N.S.; Navsari Agricultural University, Navsari (India). College of Veterinary Science and Animal Husbandry. Department of Instructional Livestock Farm Complex. Vataliya, P.H.; Navsari Agricultural University, Navsari (India). College of Veterinary Science and Animal Husbandry. Department of Instructional Livestock Farm Complex. Factors affecting lactation milk yield in Gir Cattle. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.71-73 KEYWORDS: LACTATION. MILK YIELD. CATTLE.

The production records on 346 Gir cows with 680 complete Lactations sired by 62 bulls, for 24 years (1987-2010) were studied. The data were analyzed to study the effect of period and season of calving and parity as fixed effect on lactation milk yield (LMY). The least-squares mean of LMY was 2276.60 ± 171.32 kg. Highly significant effect of period of calving and parity on LMY was observed. There were highest LMY during fifth parity (2694.20 ± 184.94 kg.) and significant drop after eighth parity. Season of calving did not affect significantly LMY, which is one of the best attributes of Gir cattle.

43. Kumar, Anil; ICAR-Central Institute for women in agriculture, Odisha (India) Kushwaha, B.P.; ICAR-Central institute for research on

buffaloes, Hissar (India). Prioritizing districts in India for buffalo development. Indian Journal of Animal Sciences (India). (Oct 2015) v.85 (10) p.1087-1091 KEYWORDS: DENSITY. ECONOMIC DISTRIBUTION. GROWTH RATE. ZONING. INDIA. BUFFALO MEAT.

Prioritization of districts for buffalo development in India was done taking into account the buffalo growth rate (r), density (d) and number per 1,000 human beings (PTH). Priority Index for buffalo (PI-B) was worked out by giving equal weight to the 3 variables. Analysis was done for 19 states with 311 districts for the period 1966 to 2007, taking 1966 as the base year and apportioning the subsequent data to the base year. The 19 states covered 90.53% of the geographical area having 98.7% of the total buffalo population. Zones I to IV were demarcated each having 25% of the total buffalo population based on decreasing order growth rate, density, PTH and PI-B. Based on the Priority Index, 25% of the buffaloes with highest index (Z- I) were reared in 31 districts in 6.74% of the geographical area of the country by 9.37% of human beings. This zone had an overall growth rate of 2.70% p.a., buffalo density 124 and 245 buffalo PTH. Zone II with next 25% of buffaloes were located in 51 districts in 14.6% area of the country where 14.8% of human beings reside. This zone had an overall growth rate of 2.15% p.a., buffalo density 57 and 154 buffalo PTH. Zone III with next 25% of buffaloes were located in 67 districts in 19.7% area of the country where 22.4% of human beings reside. This zone had an overall growth rate of 1.86% p.a., buffalo density 42 and 102 buffalo PTH. Zone IV with next 23.7% of buffaloes were located in 162 districts in 49.5% area of the country where 49.4% of human beings reside. This zone had an overall growth rate of 0.54% p.a., buffalo density 16 and 44 buffalo PTH. GIS maps were also prepared for visualization of the location of different zones based on growth rate, density, PTH and Priority Index for buffalo.

44. Cilek, Suleyman; Faculty of veterinary medicine, Kirikkale Unvi. (Turkey). Dept. of animal breeding. Effective factors on survival rate of Malya lambs (11/16 Akkaraman × 5/16 Deutsches Merinofleischschaf). Indian Journal of Animal Sciences (India). (Oct 2015) v.85 (10) p.1112-1116 KEYWORDS: BIRTH WEIGHT. SURVIVAL.
45. Dana, S.S.; West Bengal Unvi. of animal & Fishery sciences, West Bengal (India) Kaul, P.N.; IVRI, Uttar Pradesh (India) Bandyopadhyay, U.K.; IVRI-Kolkata centre, West Bengal (India) Ghosh, A.; West Bengal Unvi. Of animal & Fishery sciences, West Bengal (India). Dept. of fishery extension. Goat production practices of santal tribe for improving their socio-economic condition and household nutrition. Indian Journal of Animal Sciences (India). (Oct 2015) v.85 (10) p.1123-1125 KEYWORDS: GOATS. HOUSEHOLDS. SOCIOECONOMIC DEVELOPMENT. ETHNIC GROUPS.

46. Neha, Chandra.Binoy; ICAR-NDRI, Karnal (India) Chakravarty, A.K; ICAR-NDRI, Karnal (India)Mir, Ayoud.Mohsin; ICAR-NDRI, Karnal (India) Bhakat, Mukesh; ICAR-NDRI, Karnal (India). Studies on age at first semen freezing and age at first semen use of sahiwal bull. Indian Journal of dairy Sciences. (Jan 2016) v.69 (1), p.76-79 KEYWORDS: SEMEN. FREEZING. BULLS. REPRODUCTIVE PERFORMANCE. EVALUATION. BREEDS (ANIMALS).

The objective of this study was to investigate the studies on the reproduction traits i.e. Age at first semen freezing and Age at first semen use in Sahiwal bulls. Informations on Sahiwal bulls during last 27 years (1987-2013) were collected from reproductive records, bull AI register maintained at different sections of institute viz. record room of DCB Division, Cattle Yard, Artificial Breeding Research Centre (ABRC), National Dairy Research Institute (NDRI), and Karnal. The present study revealed that the average Age at first freezing and Age at first use in Sahiwal breeding bulls were estimated as (3.17 ± 0.01) years and (5.35 ± 0.01) years, respectively and the coefficient of variation were 18.93% and 20%, respectively. It was found that highest rank was in Set VIIIth and lowest rank was in Set IVth for early Age at first semen freezing of Sahiwal bull. For early Age at first semen use of bull, highest rank was in Set IXth and lowest rank was in Set IIIth. Since, temporary environmental factors are major role in inheritance of traits so better breeding management should be implemented. Multi-trait evaluation with reproductive traits may be carried out for simultaneous improvement of reproductive performances of Sahiwal bulls in the herd.

47. Dixit, V.B; Central institute for Research on Buffalos, Hissar (India)Bharadwaj, A; Central institute for Research on Buffalos, Hissar (India)Sikka, P; Central institute for Research on Buffalos, Hissar (India)Phulia, S.K; Central institute for Research on Buffalos, Hissar (India). Training modules for promoting buffalo husbandry among different categories of respondents.. Indian Journal of dairy Sciences. (Jan 2016) v.69 (1), p.120-123 KEYWORDS: MILK BYPRODUCTS. ANIMAL HUSBANDRY. MANAGEMENT. FARMERS.

To undertake this study nine trainings of week's duration on buffalo husbandry were organized for different types of respondents in which 254 farmers, entrepreneurs, women and youth participated. Training needs of different categories of respondents were worked out. The farmers considered the topics on heat symptoms in buffaloes and artificial insemination, feeding and management of lactating animals and mastitis in buffaloes and its care and management as most important for their training module. As far as training contents for youth are concerned they specially desired to include nutrients in concentrate mixture and importance of reproduction in buffaloes. They also wanted that half of the time each should be devoted to theory and practicals respectively. Women evinced keen interest in

feeding requirements of dry, milch and pregnant buffaloes, management and reproduction of buffaloes during heat and importance of AI in buffaloes. The entrepreneurs desired that they should be given information on some new technologies like preparation of mineral mixture, preparation of complete feed blocks, care and management of calves for meat production and importance of reproduction, heat detection and therapeutic control of estrous. The appropriateness of contents was confirmed when response was elicited from different categories of respondents in subsequent training programmes.

48. Behera D.; Deptt. of Livestock production Management, F/O Veterinary & Animal Science West Bengal University of Animal & Fishery Sciences, Kolkata (India) Samanta, R.; Deptt. Of Livestock production Management, F/O Veterinary & Animal Science West Bengal University of Animal & Fishery Sciences, Kolkata (India) Bera, S.; Deptt. Of Livestock production Management, F/O Veterinary & Animal Science West Bengal University of Animal & Fishery Sciences, Kolkata (India) Debbarma, N.; Deptt. of Livestock production Management, F/O Veterinary & Animal Science West Bengal University of Animal & Fishery Sciences, Kolkata (India) Das, C. B.; Deptt. Of Livestock production Management, F/O Veterinary & Animal Science West Bengal University of Animal & Fishery Sciences, Kolkata (India). Profitability of commercial broiler chicken under different light regime. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.49-51 KEYWORDS: BROILER CHICKENS.LIGHT. ECONOMICS. PERFORMANCE TESTING. STRESS. GROWTH. INDIA.
49. Sravanthi, V.; Department of Livestock Production Management N.T.R College of Veterinary Science, Gannavaram (India) Babu, Suresh. D.; Department of Livestock Production Management N.T.R College of Veterinary Science, Gannavaram (India) Anitha, A.; Department of Livestock Production Management N.T.R College of Veterinary Science, Gannavaram (India) Latha, Asha. P.; Department of Livestock Production Management N.T.R College of Veterinary Science, Gannavaram (India) Rao, Eswara; Department of Livestock Production Management N.T.R College of Veterinary Science, Gannavaram (India). Effect of early weaning on carcass characteristics of large white Yorkshire pigs under intensive system. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.55-57 KEYWORDS: WEANING. MUSCLES. BONES. SWINE. WEIGHT. PROTEIN CONTENT.
50. Ramesh, V.; Department of Livestock Production Management, Veterinary College and Research Institute, Namakkal (India) Sivakumar, T.; Department of Livestock Production

Management, Veterinary College and Research Institute, Namakkal (India)Kumar, Saravana.Ramesh. V.; Department of Livestock Production Management, Veterinary College and Research Institute, Namakkal (India). Influence of accommodation on farrowing behavior in large white Yorkshire gilts. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.68-72 KEYWORDS: PARTURITION. HOUSING. SWINE. ROOTING. ANIMALS. SOWS.

An experiment was conducted to find out the different housing systems on the reproductive behaviour of pigs. Twenty four Large White Yorkshire pigs in the age group of 5 months were selected and randomly divided into four groups consisting of 6 animals each. Among these, two groups were reared under intensive system and two groups under semi- intensive system. From each system one group in individual housing and other group in group housing. All pregnant gilts under group housing both from intensive and Semi- intensive system of management were transferred to farrowing crate, one week prior to expected date of farrowing, whereas gilts under individual housing both from intensive and semi-intensive system of management remained in the individual pen itself during farrowing and lactation. Farrowing behaviors were recorded from 3 days prior to farrowing and continued till the placenta was expelled. All the farrowing activities except straw were performed for significantly ($P>0.01$) longer periods and more frequently by the gilts from group housed in farrowing crate than those in individual pen.

51. Talukdar, J. D.; Department of Animal Reproduction, Gynaecology & Obstetrics College of Veterinary Sciences, Khanapara (India) Burhagohian, R.; Department of Animal Reproduction, Gynaecology & Obstetrics College of Veterinary Sciences, Khanapara (India)Ahmed, M.; Department of Animal Reproduction, Gynaecology & Obstetrics College of Veterinary Sciences, Khanapara (India)Deka, A.; Department of Animal Reproduction, Gynecology & Obstetrics College of Veterinary Sciences, Khanapara (India)Ahmed, K.; Department of Animal Reproduction, Gynecology & Obstetrics College of Veterinary Sciences, Khanapara (India)Hussain, J.; Department of Animal Reproduction, Gynaecology & Obstetrics College of Veterinary Sciences, Khanapara (India). Seminal attributes of Japanese quail in Assam. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.80-82 KEYWORDS: EGGS. QUAILS. SEMEN. STATISTICAL METHODS. BIRDS. COLLECTIONS.

Behera D.; Deptt. of Livestock production Management, F/O Veterinary & Animal Science West Bengal University of Animal & Fishery Sciences, Kolkata (India) Samanta, R.; Deptt. Of Livestock production Management, F/O Veterinary & Animal Science West Bengal University of Animal & Fishery Sciences, Kolkata (India) Bera, S.; Deptt. Of Livestock production Management, F/O Veterinary & Animal Science West Bengal University of Animal & Fishery Sciences,

Kolkata (India) Debbarma, N.; Deptt. of Livestock production Management, F/O Veterinary & Animal Science West Bengal University of Animal & Fishery Sciences, Kolkata (India) Das, C. B.; Deptt. of Livestock production Management, F/O Veterinary & Animal Science West Bengal University of Animal & Fishery Sciences, Kolkata (India). Profitability of commercial broiler chicken under different light regime. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.49-51 KEYWORDS: BROILER CHICKENS. LIGHT. ECONOMICS. PERFORMANCE TESTING. STRESS. GROWTH. INDIA.

52. Goswami, R.; Deptt. of Livestock Production and Management College of Veterinary Science, AAU, Khanapara (India) Mili, C. D.; Deptt. Of Livestock Production and Management College of Veterinary Science, AAU, Khanapara (India) Naharadeka, N.; Deptt. of Livestock Production and Management College of Veterinary Science, AAU, Khanapara (India) Gogoi, K. A.; Deptt. of Livestock Production and Management College of Veterinary Science, AAU, Khanapara (India) Bora, C. M.; Deptt. Of Livestock Production and Management College of Veterinary Science, AAU, Khanapara (India) Roychoudhury, R.; Deptt. Of Livestock Production and Management College of Veterinary Science, AAU, Khanapara (India) Saikia, N. B.; Deptt. Of Livestock Production and Management College of Veterinary Science, AAU, Khanapara (India). Constraints perceived by goat farmers in certain adopted villeges of Assam. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.52-54 KEYWORDS: GOATS. CONSTRAINTS. LIVESTOCK. NUTRITIONAL REQUIREMENTS. ASSAM. FARMERS.

A study on the constrains faced by adopted and non- adopted goat farmer in three rural village of Assam viz. nahira tepesia and Tetelia adopted by "All india co-ordinated Research Project on Goat improvement ". Goat Research station, Assam agriculture university, Byrnihut, guwahati indiacted that the major constrains perceived by the adopted and non- adopted goat farmers were inadequate grazing facility (38.10 and 28.57) high coat of feed (29.52 and 31.43%) lack of knowladg about scientific management of goat veterinary services (0 and 27.62%) exploitation by middleman (40.95 and 52.38%) and predators attack (29.52 and 30.48) respectively.

53. Sravanthi, V.; Department of Livestock Production Managemnt N.T.R College of Veterinary Science, Gannavaram (India) Babu, Suresh. D.; Department of Livestock Production Managemnt N.T.R College of Veterinary Science, Gannavaram (India) Anitha, A.; Department of Livestock Production Managemnt N.T.R College of Veterinary Science, Gannavaram (India) Latha, Asha. P.; Department of Livestock Production Managemnt N.T.R College of Veterinary Science, Gannavaram (India) Rao, Eswara; Department of Livestock Production

Managemnt N.T.R College of Veterinary Science, Gannavaram (India). Effect of early weaning on carcass characteristics of large white Yorkshire pigs uder intensive system. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.55-57
KEYWORDS: WEANING. MUSCLES. BONES. SWINE. WEIGHT. PROTEIN CONTENT.

A Study was carried out in 54 large white Yorkshire pigs to find out the effect of early weaning on carcass traits. Three weaning age groups namely group 2 (40 days) and group 3 (56 Days) were compared. Each group consists of 18 Piglets from three litres. Five month after wearing, six pigh from each groups were slaughtered and the carcass traits studied included pre- slaughter weight, carcass length, hot carcass weight average back fat thickness, Dressing percentage , Meat – bone ratio and whole sale primal cuts. A highly significant ($p < 0.01$) variation was observed between group 2 and the other two groups with respect to Pre- slaughter weight (64.99 ± 0.30 kg), C carcass length (26.42 ± 0.27 inces), Average Back Fat Thickness (1.52 ± 0.03 inches), Hot carcass weight (48.86 ± 0.38 kg), Dreesing percentage (75.2 ± 0.39 %) , Meat–Bone ratio (4.16 ± 0.00), Ham (27.63 ± 0.22 %) and Belly (8.69 ± 0.15 %) . Whereas Group 2 while picnic shoulder in group 1 was higher and higher significant ($p < 0.01$) than that of group 2 and 3.

54. Roy, Rakesh; Indian Veterinary Research Institute, Izatnagar (India) Tiwar, Rupasi; Indian Veterinary Research Institute, Izatnagar (India)Dutt, Triveni; Indian Veterinary Research Institute, Izatnagar (India). Extent and level of utilization of information sources among goat owners in India. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.62-67
KEYWORDS: GOATS. MASS MEDIA. FEEDING. TECHNOLOGY. ANIMALS. FARMERS.

A study with the objectives to assess the pattern of information utilization was carried out among goat owners in purposively selected states of West Bengal and Uttar Pradesh with a sample size of 180 randomly selected respondents. The study shows the accessibility and extent of utility of different information sources. Total Rank Order Score (TROS) shows that informal interpersonal sources were more used by the goat owners than formal interpersonal and mass media sources. The study reveals that informal interpersonal sources were used for all types of information such as breeding, feeding, healthcare, management and marketing of goat while formal interpersonal sources were used for healthcare, breeding, feeding and management. The study further shows that the goat owners had low level of mass media and formal interpersonal sources utilization while utilization of informal interpersonal sources was medium.

55. Ramesh, V.; Department of Livestock Production Management, Veterinary College and Research Institute, Namakkal (India)Sivakumar, T.; Department of Livestock Production Management, Veterinary College and Research Institute, Namakkal (India)Kumar, Saravana.Ramesh. V.; Department of Livestock Production Management, Veterinary College and Research Institute, Namakkal (India). Influence of accommodation on farrowing behavior in large white Yorkshire gilts. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.68-72 KEYWORDS: PARTURITION. HOUSING. SWINE. ROOTING. ANIMALS. SOWS.

An experiment was conducted to find out the different housing systems on the reproductive behaviour of pigs. Twenty four Large White Yorkshire pigs in the age group of 5 months were selected and randomly divided into four groups consisting of 6 animals each. Among these, two groups were reared under intensive system and two groups under semi- intensive system. From each system one group in individual housing and other group in group housing. All pregnant gilts under group housing both from intensive and Semi- intensive system of management were transferred to farrowing crate, one week prior to expected date of farrowing, whereas gilts under individual housing both from intensive and semi-intensive system of management remained in the individual pen itself during farrowing and lactation. Farrowing behaviors were recorded from 3 days prior to farrowing and continued till the placenta was expelled. All the Farrowing activities except straw were performed for significantly ($P < 0.01$) longer periods and more frequently by the gilts from group housed in farrowing crate than those in individual pen.

56. Kumar, Ravindra; All India Co-ordinated Research Project on Pig Ranchi Veterinary College, Kanke (India). Use of silkworm (*Bombyx mori* L.) pupae as a protein supplement in pig rations. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.95-100 KEYWORDS: BODY WEIGHT. SWINE. SILKWORMS. FISH. CALCIUM. CRUDE FIBRE.

The study was conducted at Pig Breeding Farm, Ranchi Veterinary College, Kanke, and Ranchi. It deals with evaluating unconventional silkworm pupae (SWP) as an economic substitute of protein concentrate. Eighteen (18) growing crossbred piglets (3-3.5 months) were randomly divided into 3 groups (T1, T2, and T3). Piglets of group T1 (control) were fed standard concentrate mixture. In group T2 and T3, the fish meal of ration T1 was replaced with silk worm pupae 50 and 100 percent on protein equivalent basis, respectively. Significantly highest feed consumption was observed in group I followed by group II and III. At the end of experiment (7th fortnight) the feed conversion ratio was observed to be lowest in T2 (2.15 ± 0.16) followed by T1 (2.63 ± 0.34) and T3 (2.68 ± 0.22). Non-significant but highest body weight gain were observed for group I (77.75 ± 4.34)

followed by groups II (72.75 ± 4.57) and III (66.08 ± 5.76). The average cost per kg body weight gain (Rs.) was observed to be 54.02, 50.72 and 45.72, respectively for group I, II and III. Hence, silkworm pupae meal may be used in place of fish meal to make the ration cost effective, without affecting the performance adversely.

57. Maurya, M. C.; Department of Livestock Production & Management, College of Veterinary Science and A.H. NDVSU, Jabalpur (India) Lakhani, P. G.; Department of Livestock Production & Management, College of Veterinary Science and A.H. NDVSU, Jabalpur (India) Ghosh, S.; Department of Livestock Production & Management, College of Veterinary Science and A.H. NDVSU, Jabalpur (India) Roy, B.; Department of Livestock Production & Management, College of Veterinary Science and A.H. NDVSU, Jabalpur (India) Jain, A.; Department of Livestock Production & Management, College of Veterinary Science and A.H. NDVSU, Jabalpur (India). Effect of water restriction on body weight, feed intake and physiological responses in Barbari goats. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.115-119 KEYWORDS: GOATS. WATER ACTIVITY. DRY MATTER CONTENT. BODY WEIGHT. HEART RATE. RESPIRATION. BODY TEMPERATURE.

Total of 18 Adult female Barbari goats of identical body weight and size were selected to study the effect of water restriction on body weight, feed intake and physiological responses. The goats were distributed randomly in three different groups of 6 in each and assigned three different treatments control (T1), 15 % water restriction (T2) and 30 % water restriction (T3). All the goats were stall fed on concentrate and gram straw. Study was conducted in two phases, 30 days in each phase (January and April) for total 60 days. The body weight reduced by 3.89% when goats are kept in 15% water restriction (T2) and 9.28% when goats kept on 30% water restriction (T3) compared to control group (T1). The dry matter intake was reduced by 8.01% when goats are kept in 15% water restriction (T2) and 19.06% when goats kept on 30% water restriction (T3) compared to control group (T1). There was significant effect of water restriction both at 15% and 30% levels on pulse rate and at 30% level on rectal temperature. But, water restriction had no significant effect on respiration rate. Therefore, 15% water restriction is possible in goat without much affecting its performance.

58. Reddy, Ravindra, Y.; Department of Livestock Production Management College of Veterinary Science, Tirupati (India) Roa, Sarjan. K.; Department of Livestock Production Management College of Veterinary Science, Tirupati (India) Babu, Suresh. D.; Department of Livestock Production Management College of Veterinary Science, Tirupati (India) Gangaraju, G. Department of Livestock Production Management College of Veterinary Science, Tirupati (India)

Sreedhar, S.. Department of Livestock Production Management College of Veterinary Science, Tirupati (India) Reddy, Bhaskar. Vijaya. K.; Department of Livestock Production Management College of Veterinary Science, Tirupati (India). Performance traits of sahiwal and jersey x sahiwal crossbreds. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.129-132 KEYWORDS: LACTATION. CROSSBREDS. COWS. MANAGEMENT. INDUSTRIAL EQUIPMENT. BREEDS (ANIMALS).

The data of 60 lactation records and reproduction parameters of the Sahiwal and Jersey x Sahiwal crossbred cows maintained at Dairy Experimental station, College of Veterinary Science, Tirupati were utilized for the study. The average lactation milk yield, peak yield, average daily milk yield in Sahiwal cow were 1780 ± 5.40 kg, 9.20 ± 16 kg, 6.05 ± 0.06 kg respectively whereas in Jersey x Sahiwal cow the average lactation milk yield, peak yield and daily milk yield were 2984.51 ± 65.41 kg, 14.12 ± 0.18 and 10.25 ± 0.22 kg respectively. The days to attain peak yield and lactation length in Sahiwal cow and Jersey x Sahiwal cow were 38.32 ± 1.25 , 295.54 ± 2.95 days and 42.23 ± 1.25 , 285 ± 1.95 days respectively. The mean gestation period, dry period, service period and calving period (days) in Sahiwal and jersey x Sahiwal cows were 285.12 ± 0.63 days, 176.79 ± 8.12 days, 205.0 ± 3.27 days and 490.58 ± 4.16 and 281.58 ± 0.38 days, 128.52 ± 6.28 , 152.0 ± 3.97 and 432.58 ± 5.10 respectively. The average Fat and SNF % in Sahiwal and Jersey x Sahiwal cows were 4.89 ± 0.15 , 9.01 ± 0.05 and 4.48 ± 0.18 , 8.62 ± 0.10 respectively.

59. Das, D.; Department of Livestock Production & Management, College of Veterinary Sciences & Animal Husbandry, Orissa University of Agriculture & Technology, Bhubaneswar (India) Mohanty, P. G.; Department of Livestock Production & Management, College of Veterinary Sciences & Animal Husbandry, Orissa University of Agriculture & Technology, Bhubaneswar (India) Pardhan, R. C.; Department of Livestock Production & Management, College of Veterinary Sciences & Animal Husbandry, Orissa University of Agriculture & Technology, Bhubaneswar (India) Behera, K.; Department of Livestock Production & Management, College of Veterinary Sciences & Animal Husbandry, Orissa University of Agriculture & Technology, Bhubaneswar (India) Behera, D.; Department of Livestock Production & Management, College of Veterinary Sciences & Animal Husbandry, Orissa University of Agriculture & Technology, Bhubaneswar (India) Gupta, K. S.; Department of Livestock Production & Management, College of Veterinary Sciences & Animal Husbandry, Orissa University of Agriculture & Technology, Bhubaneswar (India) Panigrahy, K. K.; Department of Livestock Production & Management, College of Veterinary Sciences & Animal Husbandry, Orissa University of Agriculture & Technology, Bhubaneswar (India). Effect of stocking

density on growth and carcass characteristics of Japanese quail. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.132-136 KEYWORDS: QUAILS. STOCKING DENSITY. GROWTH. BROODING. CLIMATE. BIRDS. INDIA.

The experiment was conducted to know the effect of stocking density on growth and carcass characteristics of Japanese quail in floor rearing. Four hundred thirty two no. of quail chicks (variety-ICAR Brown) were procured from Central Poultry Development Organization, Bhubaneswar and were brooded up to 14 days. Then these 14 day old chicks were divided into 4 groups consisting of 108 no. of chicks each. Each group were divided into three replicates, having 36 no. of chicks. Study was undertaken during the growing period (15-35 days) with the following floor space provisions in the four groups, G₁-150 cm²/chick, G₂-200 cm²/chick, G₃-250 cm²/chick, G₄-300 cm²/chick. In 3rd week, G₃ showed the highest gain (52.58 ± 0.42 g) followed by G₄ (50.37 ± 0.57 g), G₂ (48.31 ± 0.70 g) and G₁ (39.68 ± 0.48 g). Group G₃ showed significantly (Pd" 0.05) higher gain than G₁ or G₂, while it did not differ significantly (Pe" 0.05) from G₄. Group G₄ showed a significantly (Pd" 0.05) higher gain than either G₂ or G₁. In 4th week, G₃ showed the highest gain (82.97 ± 0.92 g) followed by G₄ (79.46 ± 0.81 g), G₂ (76.81 ± 1.15 g) and G₁ (66.71 ± 2.18 g). Groups G₂, G₃ and G₄ did not differ significantly (Pe"0.05) between them, while each of these three groups had higher gains (Pd" 0.05) than G₁. In case of FCR the groups with 200, 250 and 300 cm² per bird stocking densities did not differ significantly (P≥0.05), while each of these groups showed significantly (P≤ 0.05) lower FCR than the group with 150 cm² per bird floor space. For dressing yield, group G₃ had significantly (Pd" 0.05) higher yield than G₁. It was concluded that provision of an optimal floor space 250cm² per bird resulted in higher body weight, gain in body weight, feed efficiency, dressed and eviscerated yield.

60. Kumar, Sanjay; Department of Livestock Production and Management Ranchi Veterinary College, Ranchi (India) Prasad, M. C.; Department of Livestock Production and Management Ranchi Veterinary College, Ranchi (India) Kumari, Sushma; Department of Livestock Production and Management Ranchi Veterinary College, Ranchi (India). Effect of antistress agents on the performance of broiler under different management systems. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.141-145 KEYWORDS: DEEP LITTER HUSBANDRY. MULTIPLE BIRTHS. HONEY. BROILER CHICKENS. GLUCOSE. CHICKS.

A study was conducted to investigate the effect of different Anti-stress agents on the growth performance and survivability of broilers. Four hundred and eight day old chicks were randomly divided into two groups and reared under cage and deep litter system respectively. Each group was further divided into 4 sub-groups of 51

chicks each and was given different anti-stress agents along with standard broiler ration. Group T₁ & T₅ were treated as Control. Group T₂ & T₆ were treated with Zeetress, Group T₃ & T₇ were treated with Glucose and Group T₄ & T₈ were treated with honey under cage and deep litter system respectively. The body weight gain and Feed Conversion Ratio was significantly (P<0.01) higher in Zeetress treated groups T₂ & T₆ both for a period of 42 days over glucose and honey treated groups T₃ & T₇ and T₄ & T₈ respectively. The average body weight was significantly (P<0.01) higher in cage system (45.30±0.32) than deep litter system (44.76 ± 0.28) The overall mortality varied from 3.92% (honey treated) to 7.84% (control) under cage system while 0.82% (honey treated) to 5.88% (control & glucose) under deep litter system of management. Antistress agent Zeetress has better effect on growth performance and survivability of broiler chickens followed by glucose and honey over control.

61. Nizamuddin; Department of Livestock Production and Management Nagaland University, SASRD, Medziphema (India) Bernard, B.S.D.; Department of Livestock Production and Management Nagaland University, SASRD, Medziphema (India) Vidyarthi, K. V.; Department of Livestock Production and Management Nagaland University, SASRD, Medziphema (India). Performance of broiler chicken on two rearing systems. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31(3-4) p.148-152 KEYWORDS: FEED CONVERSION EFFICIENCY. NAGALAND. BROILER CHICKENS. BROODING. CAGES.

240 day-old commercial broiler chicks of Vencob strain was randomly divided into 4 groups i.e. two groups each for hover (Groups 1 and 2) and battery (Groups 3 and 4) types of brooding. All groups were sub divided into 4 replicates each with 15 chicks in per replicate. They were reared with standard feeding and hygienic management. On 22 day, 60 birds each from hover (Group 1) and battery (Group 4) brooding were subjected to deep-litter system of rearing and designated as T₁ and T₂ respectively. Similarly, 60 birds each from hover (Group 2) and battery (Group 3) brooding were subjected to cage system of rearing and designated as T₃ and T₄ respectively and were reared for 42 days. Mean body weight was significantly (P< 0.05) better in T₃ as compared to other groups. Feed consumption was significantly (P< 0.05) lower in T₄ as compared to other groups. Gain in body weight did not differ irrespective of treatments. Feed conversion efficiency (FCE) and performance index were significantly (P< 0.05) better in T₃ than other groups. Other parameters like livability, carcass characteristics, dressing percentage and net profit was better in caged birds. From the results, it can be concluded that the performance in terms of growth, feed consumption, FCE, performance index and net profit was better in cage system than deep litter systems of rearing.

62. Borah, I.P.; Department of Livestock Production and Management Nagaland University, SASRD, Medziphema (India) Sharma, B.V.; Department of Livestock Production and Management Nagaland University, SASRD, Medziphema (India) Vidyarthi, K.V.; Department of Livestock Production and Management Nagaland University, SASRD, Medziphema (India). Comparative evaluation of physical characteristics of mithun (*Bos frontalis*). Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.159-161
KEYWORDS: BODY CONFORMATION. PHYSICAL ACTIVITY. MODERNIZATION. INBREEDING. STRESS.

The study on physical characteristics was carried on 20 Mithuns irrespective of sexes, 5 from each strain collected from the States of Arunachal Pradesh (AR), Mizoram (MZ), Manipur (MN) and Nagaland (NL). The value for head breadth was significantly ($P<0.05$) higher in MN strain and the least in MZ strain of mithun. The values for muzzle circumference, wither height, pouch girth, fore shank length, cannon circumference, thigh length, tail length, tail circumference and body weight were significantly ($P<0.05$) higher in AR strain as compared to other strains of mithun. The values for height at naval and pouch points were significantly ($P<0.05$) higher in NL and the lowest in AR strain. The values for physical characters like length of head, horn, ear, neck, barrel, croup, fore arm and hind shank and their circumferences, eye to eye space, rump height, heart girth, abdominal girth and the heights at sterna did not vary significantly amongst four strains of mithun. It can be concluded that AR strains of mithuns have better body conformation as compared to other strains of mithun. Further, all the strains of mithun had almost similar body conformation like other bovines; however, such study should be repeated with large sized samples keeping the present investigation as a base-line work.

63. Saikia, Prasant; Department of Livestock Production and Management College of Veterinary Sciences & A.H., Central Agricultural University , Aizawal (India)Hmar, Lalunluangi; Department of Livestock Production and Management College of Veterinary Sciences & A.H., Central Agricultural University , Aizawal (India)Kalita, Girin; Department of Livestock Production and Management College of Veterinary Sciences & A.H., Central Agricultural University , Aizawal (India)Zosangpui; Department of Livestock Production and Management College of Veterinary Sciences & A.H., Central Agricultural University , Aizawal (India)Lalliankimi, H.; Department of Livestock Production and Management College of Veterinary Sciences & A.H., Central Agricultural University , Aizawal (India). Performance of ghungroo pigs under intensive housing system. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.162-164
KEYWORDS: SWINE. FARM AREA. PIGLETS. HOUSING. WEANING. SOWS. MIZORAM.

The study was carried out on 24 Ghungroo sows kept under controlled breeding programme at instructional farm of College of Veterinary Sciences; Central Agricultural University, Aizawl, Mizoram to observe the performances of piglets and sows. The study revealed that the litter size was highest in second parity and subsequently declined till fourth parity. The body weight was also lowest in the fourth parity. ADG was highest in the fourth week and lowest in the first week. The weekly body weight showed a progressive increase in the body weight. The overall mortality was 29.6 % and it was highest in 1st to 2nd week.

64. Haque, M.; Assam Agricultural University, Khanapara (India). College of Veterinary Science. Department of Extension Education. Hazarika, P.; Assam Agricultural University, Khanapara (India). College of Veterinary Science. Department of Extension Education. Saharia, K.K.; Assam Agricultural University, Khanapara (India). College of Veterinary Science. Department of Extension Education. Ray, M.N.; Assam Agricultural University, Khanapara (India). College of Veterinary Science. Department of Extension Education. Borgohain, A.; Assam Agricultural University, Khanapara (India). College of Veterinary Science. Department of Extension Education. Das, Mukut; Assam Agricultural University, Khanapara (India). College of Veterinary Science. Department of Extension Education. Constraints perceived by the self help groups (SHGs) engaged in livestock enterprises in availing bank loans. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.43-45 KEYWORDS: CONSTRAINTS. LIVESTOCK. LOANS.

SHG members seek bank loans under urgency to meet some acute income generating needs for better livelihood. Hundred representative SHG members from Darrang and Kamrup districts of Assam through Rank Based Quotient (RBQ) technique revealed that constraints relating to more visits to bank than actually required, delay in opening of bank account, delay in sanction of bank loan and undernourishment needed effective attention from bank.

65. Neha, Chandra. Binoy; ICAR-NDRI, Karnal (India) Chakravarty, A.K; ICAR-NDRI, Karnal (India) Mir, Ayoub. Mohsin; ICAR-NDRI, Karnal (India) Bhakat, Mukesh; ICAR-NDRI, Karnal (India). Studies on age at first semen freezing and age at first semen use of Sahiwal bull. Indian Journal of Dairy Sciences (India). (Jan 2016) v.69 (1), p.76-79 KEYWORDS: SEMEN. FREEZING. BULLS. REPRODUCTIVE PERFORMANCE. EVALUATION. BREEDS (ANIMALS).

The objective of this study was to investigate the studies on the reproduction traits i.e. Age at first semen freezing and Age at first semen use in Sahiwal bulls. Information on Sahiwal bulls during last 27 years (1987-2013) were collected from reproductive records, bull AI register maintained at different sections of institute viz. record

room of DCB Division, Cattle Yard, Artificial Breeding Research Centre (ABRC), National Dairy Research Institute (NDRI), Karnal. The present study revealed that the average Age at first freezing and Age at first use in Sahiwal breeding bulls were estimated as (3.17 ± 0.01) years and (5.35 ± 0.01) years, respectively and the coefficient of variation were 18.93% and 20%, respectively. It was found that highest rank was in Set VIIIth and lowest rank was in Set IVth for early Age at first semen freezing of Sahiwal bull. For early Age at first semen use of bull, highest rank was in Set IXth and lowest rank was in Set III. Since, temporary environmental factors are major role in inheritance of traits so better breeding management should be implemented. Multi-trait evaluation with reproductive traits may be carried out for simultaneous improvement of reproductive performances of Sahiwal bulls in the herd.

66. Dangar, N.S.; Navsari Agricultural University, Navsari (India). College of Veterinary Science and Animal Husbandry. Department of Instructional Livestock Farm Complex. Vataliya, P.H.; Navsari Agricultural University, Navsari (India). College of Veterinary Science and Animal Husbandry. Department of Instructional Livestock Farm Complex. Factors affecting lactation milk yield in Gir Cattle. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.71-73 KEYWORDS: LACTATION. MILK YIELD. CATTLE.

The production records on 345 Gir cows with 680 complete lactations sired by 52 bulls, for 24 years (1987-2010) were studied. The data were analyzed to study the effect of period and season of calving and parity as fixed effect on lactation milk yield (LMY). The least-squares mean of LMY was 2276.60 ± 171.32 kg. Highly significant effect of period of calving and parity on LMY was observed. There were highest LMY during 5th parity (2694.20 ± 184.94 kg.) and significant drop after eighth parity. Season of calving did not affect significantly LMY, which is one of the best attributes of Gir cattle.

67. Dixit, V.B.; Central institute for Research on Buffalos, Hissar (India) Bharadwaj, A; Central institute for Research on Buffalos, Hissar (India) Sikka, P; Central institute for Research on Buffalos, Hissar (India) Phulia, S.K; Central institute for Research on Buffalos, Hissar (India). Training modules for promoting buffalo husbandry among different categories of respondents. Indian Journal of Dairy Sciences (India). (Jan 2016) v.69 (1), p.120-123 KEYWORDS: MILK BYPRODUCTS. ANIMAL HUSBANDRY. MANAGEMENT. FARMERS.

To undertake this study nine trainings of week's duration on buffalo husbandry were organized for different types of respondents in which 254 farmers, entrepreneurs, women and youth participated. Training needs of different categories of respondents were worked out. The farmers considered the topics on heat symptoms in buffaloes

and artificial insemination, feeding and management of lactating animals and mastitis in buffaloes and its care and management as most important for their training module. As far as training contents for youth are concerned they specially desired to include nutrients in concentrate mixture and importance of reproduction in buffaloes. They also wanted that half of the time each should be devoted to theory and practicals respectively. Women evinced keen interest in feeding requirements of dry, milch and pregnant buffaloes, management and reproduction of buffaloes during heat and importance of AI in buffaloes. The entrepreneurs desired that they should be given information on some new technologies like preparation of mineral mixture, preparation of complete feed blocks, care and management of calves for meat production and importance of reproduction, heat detection and therapeutic control of estrous. The appropriateness of contents was confirmed when response was elicited from different categories of respondents in subsequent training programmes.

L02 Animal feeding

68. Ankita; IVRI, Izzatnagar (India). AN Division.Saha, S.K.; IVRI, Izzatnagar (India). AN Division.Malpure, C.D.; IVRI, Izzatnagar (India). AN Division. Sahoo, S.; IVRI, Izzatnagar (India). AN Division. Effect of feeding Sugarcane Press Mud (SPM) on dry matter intake, FCR and average daily gain in Goat kids. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.90-91 KEYWORDS: SUGARCANE. GROWTH. FEED INTAKE.

An experiment was conducted on eighteen goat kids to study the effect of SPM inclusion at 10% and 20% level in concentrate mixture on feed intake, FeR and average daily gain in goat kids. The experimental animals were randomly divided into 3 groups as T1 (control), T2 (10% SPM) and T3 (20% SPM). After 120 days of metabolic trial, results revealed that the growth was significantly ($P<0.05$) lower in T3. The feed intake was comparable in all the groups; FeR was significantly ($P<0.05$) lower in T3 than 'I' whereas T2 was comparable to T1 group.

69. Gupta, J.J.; Veterinary college campus, Bihar (India). Division of livestock & Fishery managementBaishya, S.K.; Krishi vigyan Kendra, Meghalaya (India). Effect of phytase supplementation on growth performance of growing pigs fed on rice polish based diets. Indian Journal of Animal Sciences (India). (Oct 2015) v.85 (10) p.1120-1122 KEYWORDS: DIGESTIBILITY. GROWTH. PHYTASE. SWINE. RICE POLISHINGS. DIET.

70. Katole, Shrikant .B.; Anand agricultural Unviversity. Gujarat (India). Animal nutrition research Dept.Das, A.; Indian Veterinary research institute, Uttar Pradesh (India) Saini, M.; Indian Veterinary research institute, Uttar Pradesh (India) Sharma, A.K.; Indian Veterinary research institute, Uttar Pradesh (India). Effect of moderate work on intake and serum profile of minerals in semi-captive Asian elephants (*Elephas maximus*) fed sugarcane based diet. Indian Journal of Animal Sciences (India). (Oct 2015) v.85 (10) p.1126-1129 KEYWORDS: INDIAN ELEPHANT. LABOUR. MINERALS. SUGARCANE. DIET.

L10 Animal genetics and breeding

71. Muralidhran, K.; Tamil Nadu veterinary and Animal Sciences University, Chennai (India). Madras Veterinary College. Department of Vetrinary Physiology.Eswari, S.; Tamil Nadu veterinary and Animal Sciences University, Chennai (India). Madras Veterinary College. Department of Vetrinary Physiology.Vijayarani, K.; Tamil Nadu veterinary and Animal Sciences University, Chennai (India). Madras Veterinary College. Department of Vetrinary Physiology. Altered time dependent mRNA expression of GDF-9 and BMP-15 using reverse transcriptase-PCR from Buffalo COCs during IVM. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.45-48 KEYWORDS: RNA. REVERSE TRANSCRIPTASE. PCR. WATER BUFFALOES.

Growth Differentiation Factor (GDF-9) and Bone Morphogenetic Protein (BMP-15) genes are involved in the regulation of folliculogenesis. This study determines the expression of these two genes during in vitro maturation (IVM) at different time points such as 0 h (immature), 6 h, 12 hand 24 h from buffalo cumulus oocyte complexes using semi-quantitative RT-PCR. The GDF-9 transcripts were detected from cumulus free oocytes during 0 h, 6 h, 12 hand 24 h of in vitro maturation where as in cumulus cells upto 12h of maturation. But the mRNA expression of BMP-15 from cumulus free oocytes was detected during all the four mentioned duration points of IVM, but highly transcribed in immature oocytes and declined during maturation. In case of cumulus cells, BMP-15 transcript was expressed from 0 h upto 12 h and undetectable at 24 h of maturation. This study revealed that both GDF -9 and BMP-15 were expressed in different manner during in vitro maturation of buffalo oocytes.

72. Premavalli, K.; Tamil Nadu Veterinary Sciences University, Chennai (India). Poultry Research Station.Ashok, A.; Tamil Nadu Veterinary Sciences University, Chennai (India). Poultry Research Station. Sangilimadan, K.; Tamil Nadu Veterinary Sciences University, Chennai (India). Poultry Research Station.Thyagarajan, D.; Tamil Nadu Veterinary Sciences University, Chennai (India). Poultry Research Station.A study on seasonal variation in fertility and hatchability performance of Japanese Qual breeders. Indian Veterinary Journal

(India). (Jul 2015) v.92 (7) p.51-53 KEYWORDS: QUAILS. SEASONS. FERTILITY. EGG HATCHABILITY.

Japanese quail hatching eggs collected at four different seasons were incubated to find out the effect of seasonal variations on the fertility and hatchability performance of Japanese quail breeders. Significantly ($P < 0.01$) higher mean per cent fertility, total hatchability, fertile hatchability and lower embryonic mortality were observed in south west monsoon (79.32, 58.32, 73.30 and 21.00) followed by winter (74.13, 50.83, 68.61 and 23.29), north east monsoon (75.14, 48.06, 63.69 and 27.07) and summer (69.36, 40.68, 58.28 and 28.68) respectively. It can be concluded that better hatching performance of Japanese quail was observed during south west monsoon, followed by winter, north east monsoon and summer seasons respectively.

73. Mitra Susweta, Das; ICAR, Yelahanka (India) National Institute of Veterinary Epidemiology and Disease Informatics. Das, Wilfred Anthony; ICAR, Yelahanka (India) National Institute of Veterinary Epidemiology and Disease Informatics. Tewari, Rituparna; ICAR, Yelahanka (India) National Institute of Veterinary Epidemiology and Disease Informatics. Venugopal Nimita, C; ICAR, Yelahanka (India) National Institute of Veterinary Epidemiology and Disease Informatics. Mani, Bhuvana; ICAR, Yelahanka (India) National Institute of Veterinary Epidemiology and Disease Informatics. Natesan, Krithiga; ICAR, Yelahanka (India) National Institute of Veterinary Epidemiology and Disease Informatics. Shome, Bibek Ranjan; ICAR, Yelahanka (India) National Institute of Veterinary Epidemiology and Disease Informatics. Rahman, Habibur; ICAR, Yelahanka (India) National Institute of Veterinary Epidemiology and Disease Informatics.. Duplex PCR for specific detection of *Escherichia coli* and its differentiation from other Enterobacteriaceae. Indian Journal of Animal Sciences (India). (Aug 2015) v.85 (8) p.832-835 KEYWORDS: PCR. *ESCHERICHIA COLI*. ENTEROBACTERIACEAE.

Escherichia coli is a normal inhabitant of gastrointestinal tract of humans and animals and one of the most important causes of bovine mastitis. Definitive identification of *E. coli* from other members of Enterobacteriaceae remains ambiguous. The present study describes a duplex PCR, targeting 2 housekeeping genes, the *lacZ* (lactose permease) and *phoA* (alkaline phosphatase) for the reliable detection of *E. coli* that enables its differentiation from biochemically and phylogenetic ally related bacteria. The assay was evaluated employing 19 ATCC (American type culture collection) reference strains of Enterobacteriaceae family. Validation of the assay with *E. coli* (154) isolated from milk and faeces rendered the assay to be specific. The results suggest that the technique can be used for accurate detection of *E. coli* and thus can be adapted for testing bacteriological safety of milk, for field applications, and in laboratories

handling clinical samples. This PCR (polymerase chain reaction) can successfully distinguish *E. coli* including *E. coli* O157 from *Shigella* spp and other related enterobacteria, emphasizing its relevance and utility in studies related to *E. coli* infection.

74. Sudan, Vikrant; Indian Veterinary Research Institute, Izatnagar (India). Tewari, A.K.; Indian Veterinary Research Institute, Izatnagar (India). Singh, Harkirat; Indian Veterinary Research Institute, Izatnagar (India).. Molecular cloning and prokaryotic expression of truncated surface antigen protein (SAG1) of *Toxoplasma gondii*. Indian Journal of Animal Sciences (India). (Aug 2015) v.85 (8) p.836-839 KEYWORDS: CLONING. ANTIGENS. PROTEINS. TOXOPLASMA GONDII.

The WHO guidelines on control strategies, especially of food-borne diseases, insist on mandatory systematic serological investigations of the causative agent(s) at the farm level and in slaughtered animals for serodetection purposes. Amongst the several target molecules for sensitive detection of *Toxoplasma gondii*, surface antigens are considered important as these are always exposed to host cellular immune response. The communication deals with the molecular cloning, prokaryotic expression and purification of SAG I, a surface antigen protein, from standard RH strain of *T. gondii*. Accordingly, the SAG I protein (mature) was subsequently expressed in prokaryotic expression system. It had molecular size of ~47 kDa and the level of expression was measured as 42% of the total protein. The concentration of the mature recombinant SAG I protein was 0.678 mg/ml. Western blot with Ni-NTA anti-histidine HRPase conjugate confirmed the presence and purity of protein by immunoreactions at the unique ~47 kDa region.

75. Khurana, K.Sandip; ICAR-National Research Center on Equines, Haryana (India)Singha, Harisankar; ICAR-National Research Center on Equines, Haryana (India)Malik, Praveen; ICAR-National Research Center on Equines, Haryana (India)Gulati, R.Baldev; ICAR-National Research Center on Equines, Haryana (India)Singh, K.Raj; ICAR-National Research Center on Equines, Haryana (India). Molecular characterization of clinical isolates of *Rhodococcus equi* with PCR assay based on virulence plasmid marker. Indian Journal of Animal Sciences (India). (Oct 2015) v.85 (10) p.1063-1066 KEYWORDS: ANTIMICROBIALS. PLASMIDS. FOALS. PATHOGENICITY. BACTERIA.

Rhodococcus equi is one of the most important pathogens of foals, in which it causes a disease manifesting in pyogranulomatous bronchopneumonia, abscesses, lymphadenitis or ulcerative enterocolitis. *R. equi* can be pathogenic to other domestic and wild animals and humans as well. Although, *R. equi* is prevalent in India, the work carried out in our country has not gone much beyond isolation of organism from clinical cases of foal pneumonia. Therefore, the present study was carried out for characterization of *R. equi*

strains isolated from clinical cases based on plasmid markers (traA, vapA and vapB genes) and antibiotic sensitivity. In the present study, 298 samples (nasal swab, 136; fecal sample, 130; soil, 28; tissue, 4) were collected and processed for isolation, identification, and characterization of *R. equi* via biochemical test, antimicrobial susceptibility test and PCR. A total of 28 *R. equi* isolates could be recovered from clinical samples. All the 28 isolates were found sensitive to chloramphenicol, erythromycin, oxytetracycline, ciprofloxacin, neomycin and rifampin while resistant to ampicillin, trimethoprim, sulphadiazine, cloxacillin, amikacin, cephalexin, and kanamycin in in vitro antimicrobial assay. PCR typing based on plasmid gene markers: traA, vapA, and vapB revealed that vapA plasmid was present in 26 isolates whereas it was absent in 2 isolates. Periodic monitoring of horse farm before and after foaling season is recommended for diagnosis of *R. equi* and initiating requisite bio-security and therapeutic measures.

76. Dash, S.K.; Guru Angad dev veterinary and animal sciences Univ. Ludhiana (India). Dept. of animal genetics and breeding Gupta, A.K.; Guru Angad dev veterinary and animal sciences Univ. Ludhiana (India) Singh, Avtar; Guru Angad dev veterinary and animal sciences Univ. Ludhiana (India) M. Manoj; KVASU, Ludhiana (India). Dept. of animal genetics and breeding Shivahre, Raj Pushp; National dairy research institute, Haryana (India). Dairy cattle breeding division A. Panmei; National dairy research institute, Haryana (India). Dairy cattle breeding division Sahoo, S.K. Covariance component and genetic parameter estimate of production and fertility traits in Holstein Friesian cross cattle using repeatability animal model. Indian Journal of Animal Sciences (India). (Oct 2015) v.85 (10) p.1092-1097
KEYWORDS: GENETIC COVARIANCE. CATTLE. ANIMAL MODELS.

The aim of present study was to estimate expected breeding value (EBV) using repeatability animal model and studying the efficiency of bivariate repeatability model over univariate repeatability model, on the basis of performance records pertaining to fertility and production traits in Holstein Friesian crossbred cattle. Lactation records (5,878) on 1,988 crossbred cows sired by 186 bulls, spread over a period of 34 years (1978 – 2012) were analysed in the study. Estimates of covariance components and genetic parameters for fertility and production traits were obtained using restricted maximum likelihood (REML) approach using average information (AI) algorithm. Estimates of heritability obtained by AIREML were significantly lower in fertility traits in comparison to the production traits. Repeatability model helped in the partitioning of additive, permanent environment and residual variances and thus the upwardly bias due to permanent environment in estimation of additive variance was prevented. The genetic parameter estimates of bivariate repeatability animal model were superior in comparison to

the estimates of univariate model. The genetic correlation estimates indicated unfavourable association between fertility and production traits. The bivariate repeatability model had greater potential in identification of sires with higher genetic merit for fertility and production traits.

77. Kumari, N.; Ranchi Veterinary College, Jharkhand (India). Dept. of Animal Genetics & Breeding Singh, L.B.; Ranchi Veterinary College, Jharkhand (India). Dept. of Animal Genetics & Breeding Kumar, S.; Ranchi Veterinary College, Jharkhand (India). Dept. of Animal Genetics & Breeding Kumari, Kiran; Ranchi Veterinary College, Jharkhand (India). Dept. of Animal Genetics & Breeding Thakur, S.K.; Ranchi Veterinary College, Jharkhand (India). Dept. of Animal Genetics & Breeding. Comparison of Black Bengal and Jharkhand Black Goats Using Both Physical Attributes and Molecular Characterization. Indian Veterinary Journal (India). (Dec 2015) v.92 (12) p.14-17 KEYWORDS: RAPD. GOATS. Two goat breeds, Black Bengal and Black Bengal type goats of Jharkhand were characterized using RAPD markers in the present investigation. DNA was extracted from 50 blood samples each for Black Bengal and Jharkhand Black i.e. total of 100 examples. All the parameters studied with the help of 10 primers using RAPD-PCR helped to compare the two breeds. Current article summarizes the earlier findings about two breeds using physical parameters and the current findings using molecular (statistical) parameters.

78. Tomar, A.K.; College of Veterinary Science, Lala Lajpat Rai Univ. of Veterinary and Animal Sciences Haryana (India). Dept. of Animal Genetics and Breeding Poonia, J.S.; College of Veterinary Science, Lala Lajpat Rai Univ. of Veterinary and Animal Sciences Haryana (India). Dept. of Animal Genetics and Breeding Choudhari, M.; College of Veterinary Science, Lala Lajpat Rai Univ. of Veterinary and Animal Sciences Haryana (India). Dept. of Animal Genetics and Breeding Sangwan, S.; College of Veterinary Science, Lala Lajpat Rai Univ. of Veterinary and Animal Sciences Haryana (India). Dept. of Animal Genetics and Breeding. Restricted Selection Indices for Genetic Improvement of Egg Type Chicken. Indian Veterinary Journal (India). (Dec 2015) v.92(12) p.78-80 KEYWORDS: BREEDING METHODS. SELECTION INDEX. SELECTION. EGGS. CHICKENS.

The present study was undertaken on 2416 pullets, progenies of 252 sires of White Leghorn over five generations (2008-09 to 2012-13), maintained at poultry breeding farm of department of Animal Genetics and Breeding, LUVAS, Hisar. The index I1, constructed using BW20, AFE, EW40, EN40, BW40 and EM40, was found to be most superior index in terms of ΔH (33.44) and RIH (0.656) values. The index IR1 constructed with complete restriction on EW40 was observed in terms of ΔH (27.14) and RIH (0.533) with expected response in each trait as 16.40g, -0.41days, 0.00g, 2.26 eggs, -3.46g

and 74.70g in BW20, AFE, EW40, EN40, BW40 and EM40, respectively. Restricted indices were inferior to standard selection index (I_1), however, IR_1 is recommended as the best index for genetic improvement in egg type chicken because there was increase in egg number as well as egg mass, while no change in egg weight.

79. Dangar, N.S.; College of Veterinary Science and Animal Husbandry, Navsari Agricultural Univ. Gujarat (India).Dept. of Instructional Livestock Farm ComplexVataliya, P. H.; College of Veterinary Science and Animal Husbandry, Navsari Agricultural Univ. Gujarat (India).Dept.of Instructional Livestock Farm Complex. Genetic Correlation of Standard Lactation Milk Yield with Other Production and Reproduction Traits in Gir Cattle. Indian Veterinary Journal (India). (Dec 2015) v.92 (12) p.86-88 KEYWORDS: GENETIC CORRELATION. COWS. LACTATION. MILK. YIELDS. PRODUCTION. REPRODUCTION.

The production data on 1257 lactations of 680 Gir cows, sired by 52 bulls, maintained at Cattle Breeding Farm, Junagadh, Gujarat over 24 years (1987-2010) were analyzed to study genetic correlation of standard lactation milk yield(SLMY) with different production traits viz., lactation milk yield(LMY), peak milk yield(PMY), lactation length(LL), dry period(DP), calving interval(CI) and age at first calving(AFC). The analysis revealed highly significant genetic correlation of SLMY with LMY, LL and PMY of 0.985 ± 0.015 , 0.744 ± 0.209 and 0.868 ± 0.066 , respectively. Non-significant genetic correlation was found between SLMY and AFC was 0.006 ± 0.178 . There were negative genetic correlation of SLMY with DP and CI were -0.472 ± 0.217 and -0.100 ± 0.269 .

80. Patel, K. Bhumait; Mahi milk producer company, Rajkot (India)Patel, A.C; Amul research and development association, Anand (India)Patel, S.B; Department of animal Genetics & breeding, college of veterinary & animal husbandry, A.A.U.,Anand (india)RANK, D.N; Department of animal Genetics & breeding, college of veterinary & animal husbandry, A.A.U.,Anand (india). Estimation of genetic parameter for test day records of murrah graded buffalos. Indian Journal of dairy Sciences. (Jan 2016) v.69 (1), p. 67-70 KEYWORDS: GENETICS. MILK. PROGENY. LIPID CONTENT. EVALUATION.

The present study was carried out using test day yield for sire evaluation in Murrah graded buffaloes. A total of 2329 test day lactation records of daughters of 79 sires distributed in 47 villages under field progeny testing programme in Anand milk shed area. Heritability estimates for Test pay Milk Yield (TDMY) records were ranged from 0.01 to 0.13. Heritability estimate for Predicted First Lactation Yield for 305 days (PFLY 305) was 0.01. The phenotypic correlations among monthly test day milk yields and with 305-day milk yield were found to be highly significant ($P < 0.01$). The estimates

of phenotypic and genetic correlation among all the monthly test day milk yields ranged from 0.22 to 0.86 and from 0.20 to 1.11 respectively. Heritability estimates for Test Day Fat Percent (TDFP) records (were higher in first half than second half of lactation and ranged γ from 0.01 to 0.06 for TD milk fat percent. Heritability estimate T for 305-days fat percent was 0.02 for milk fat percent. The phenotypic correlations among monthly test day milk fat percent y_i and with 305-day milk fat percent were found to be highly significant ($P < 0.01$). The estimates of phenotypic and genetic t_{ln} correlation among all the monthly test day milk fat percent ranged from 0.05 to 0.78 and from 0.22 to 1.99 respectively.

81. Bhat, A. showkat; NDRI, Karnal, (Delhi) Bhushan, Bharat; IVRI, Izatnagar (India) Sheikh, A. Sheikh; IARI, Izatnagar (India) Panigrahi, Manjit; IVRI, Izatnagar (India) Patel, BHM; IVRI, Izatnagar (India) Gaur, G.K; IVRI, Izatnagar (India) Gyanendra, Singh; IVRI, Izatnagar (India). Effect of infrared lamps to ameliorate and mortality in Murrah calves. Indian Journal of Dairy Sciences. (Jan 2016) v.69 (1), p.80-85 KEYWORDS: BLOOD. EVALUATION. PHYSIOLOGICAL FUNCTIONS. LEUKOCYTES.

The present study was conducted out to evaluate the effect of infrared lamps to ameliorate morbidity and mortality in Murrah calves. Ten newborn Murrah calves were randomly divided into two groups (G_1 and G_2) of five each. The calves of G_1 were provided with no additional protection; however the calves of G_2 were protected against the cold weather by using the Infrared lamps. The health status of calves were monitored daily both in the morning and evening. The blood samples collected within six hours of birth and then at fortnightly interval were analyzed for total leukocyte count (TLC, thousands/ μ l) and differential leukocyte count (DLC). The physiological parameters i.e. respiration rate (RR, breaths/min), heart rate (HR, beats/min) and rectal temperature (RT, $^{\circ}$ F) were recorded at weekly interval. The health performance was better in calves of G_2 as compared to G_1 . The calves in G_1 showed comparatively higher values of TLC and neutrophils and the differences were found significant ($P < 0.05$) on 15th day for TLC and 45th day for neutrophils. The values of lymphocytes were significantly ($P < 0.05$) lower in calves of G_1 than G_2 on 4th day. The physiological parameters did not vary significantly between the group except for RT which was found significantly ($P < 0.01$) lower on 56th in calves of G_1 . Then G_2 . On the basis of the results, it could be concluded that the Infrared lamps were efficient in providing favourable microclimate and hence can be effectively used in calf shed to protect newborn calves from adverse conditions of winter.

82. Gupta, Pakash. Gupta; Division of Aimal Genetics, ICAR-IVRI, Izatnagar (India) Bhushan, Bharat; Division of Aimal Genetics, ICAR-IVRI, Izatnagar (India) Panigrahi, Manjit; Division of Aimal Genetics,

ICAR-IVRI, Izatnagar(India)Asaf, Muhasin.V.N; Division of Aimal Genetics, ICAR-IVRI, Izatnagar(India)Kumar, Amod; Division of Aimal Genetics, ICAR-IVRI, Izatnagar(India)Ranjan, Sanjeev.; Division of Aimal Genetics, ICAR-IVRI, Izatnagar(India)Gaur, ganendra.Kumar; Division of Aimal Genetics, ICAR-IVRI, Izatnagar(India). Effect of non-genetic factors on somatic cell measures in Vrindavani cattle. Indian Journal of Dairy Sciences. (Jan 2016) v.69 (1), p.128-131 KEYWORDS: CELLS. HERITABILITY. SOMATIC CELL COUNT. CATTLE.

This study was conducted to investigate the effect of non-genetic factors on somatic cell count (SCC) and somatic cell score (SCS) in cross bred cattle. At the time of milk collection California mastitis test (CMT) were performed and data of only those animals were collected which were tested negative by CMT. Somatic cell count was measured using the Newman-Lampert staining technique and converted to SCS. Study revealed that the least squares means of SCS in Vrindavani cows were slightly higher than the earlier reports which are mainly reported from the temperate countries. No effect of season, parity, Milk Yield Class (MYC) and stage of lactation on the SCS was found for Vrindavani cross-bred dairy cattle. As the heritability estimate of SCC was higher than normal heritability estimates of clinical mastitis so it can be preferred for the selection of animals against mastitis. Correlations measured among different season, parity were non-significant and only stage of lactation were having significant correlations with milk yield and number of parity.

83. Dengre, S. R.; Deptt. of Animal Husbandry and Dairy Science, Mahatma Phule Krishi Vidyapeeth, Rahuri (India)Deokar, K. D.; Deptt. Of Animal Husbandry and Dairy Science, Mahatma Phule Krishi Vidyapeeth, Rahuri (India) Birari, R. D.; Deptt. Of Animal Husbandry and Dairy Science, Mahatma Phule Krishi Vidyapeeth, Rahuri (India). Selection indices for genetic improvement of Holstein Friesian x Gir halfbreds. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.32-37 KEYWORDS: BREEDING METHODS. GENETIC GAIN. LACTATION. HERITABILITY. RESEARCH.

The data pertaining to Holstein Friesian x Gir halfbreds were collected on first lactation traits and classified according to generation, period of birth/calving, season of birth/calving and peak milk yield and analyzed by least squares method. Corrected data were used for estimation of genetic and phenotypic correlation and heritability. The economic weights of different traits were calculated. The relative economic value of different traits was obtained by considering the economic weight of FLMY as standard unit. The aggregate genetic economic gain ("H) and relative efficiency of the index was computed. Selection indices (21) were constructed by using different traits in different combinations. Index with four trait combination $1_5 [(-1.504) (AFC) + (0.337)(FLMY) + (- 6.840) (FLL) + (2.412) (FCI)]$ and index with three trait combination $1_2 [(-1.305) (AFC)$

+ (1.854) (FOP) + (-0.055) (FLMY)] were found to be the most useful indices. Using 1_5 indexes the response in each trait per generation was expected to be decrease in age at first calving (228.80 days), increase in first lactation milk yield (521.04 kg), decrease in first lactation length (50.31 days) and decrease in first calving interval (42.50 days). While using 1_2 index responses in each trait per generation was expected to be 188.54 days in age at first calving (AFC), 10.22 days in first dry period (FDP) and 73.39 kg in first lactation milk yield (FLMY). Therefore, from these results it may be inferred that out of 21 selection indices constructed for HF x Gir halfbreds, index 15 from four traits combination and 12 from three traits combination were found to be relatively efficient indices and rated as the most. Useful indices for their high reliability and expected genetic gain.

84. Khekare, M. M.; Deptt. Of Animal Husbandry and Dairy Science, Mahatma Phule Krishi Vidyapeeth, Rahuri (India) Bhoite, Y. U.; Deptt. Of Animal Husbandry and Dairy Science, Mahatma Phule Krishi Vidyapeeth, Rahuri (India). Production performance of 5/8 gir crossbred. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.43-46 KEYWORDS: PRODUCTION. CROSSBREDS. LACTATION. GENETIC CORRELATION. CROSSBREDS. MILK.

The data on production performance of 191 cows of 5/8 Gir crossbreds maintained at RCDP on Cattle, Rahuri were utilized for study. The least squares means of lactation milk yield (LMY), 300 days milk yield (300DMY), lactation length (LL) and dry period (DP) were worked out. The overall mean LMY, 300DMY, LL and DP were 2889.44 ± 67.68 kg, 2882.13 ± 58.34 kg, 302.86 ± 4.62 days and 98.42 ± 5.44 days respectively. The period of calving and season of calving had non-significant effects on all the traits under study. The lactation order had significant ($P < 0.01$) influence on LMY and 300 DMY. The phenotypic and genetic correlations of LMY with 300 DMY and LL and between 300 DMY and LL were positive and significant.

85. Sonawane, V. R.; Department of Animal Science and Dairy Science, Mahatma Phule Krishi Vidyapeeth. Rahuri (India) Deokar, K. D.; Department of Animal Science and Dairy Science, Mahatma Phule Krishi Vidyapeeth. Rahuri (India) Garudkar, R. S.; Department of Animal Science and Dairy Science, Mahatma Phule Krishi Vidyapeeth. Rahuri (India). Evaluation of phule triveni sire for estimated breeding value of lifetime traits. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.82-86 KEYWORDS: GENETIC VARIATION. CATTLE. MILK. RESEARCH. DATA. MALES. PERFORMING ANIMALS.

The data of Phule Triveni crossbred cows of FJG, H, 3H, 4H, 5H and 6H generations maintained at Research Cum Development

Project on Cattle, MPKV, Rahuri for a period of 33 years (1977 to 2009) were used to estimate sire's breeding value for lifetime performance traits. Lifetime traits were herd life, productive life, and lifetime milk yield, number of days in milk, lifetime milk yield per day of productive life and lifetime milk yield per day of lactating life. The least-squares method was used to obtain the estimates of breeding values. The estimated breeding values (EBVs) of sires showed large genetic variation between sires for lifetime traits. The estimated breeding values (EBVs) for sires ranged from 893.92 to 1065.63 days for age at first calving, 4237.73 to 12785.71 kg for lifetime milk yield, 667.98 to 1389.52 days for number of days in milk, 1929.18 to 2790.86 days for herd life, 925.71 to 1741.80 days for productive life, 8.94 kg for lifetime milk yield per day of lactating life and 3.93 to 7.32 kg for lifetime milk yield per day of productive life. Due to the significant and positive correlation amongst estimated breeding value of lifetime production traits selection based on these traits will be useful for improvement in the herd.

86. Khekare, M. M.; Deptt. of Animal Husbandry and Dairy Science, Mahatma Phule Krishi Vidyapeeth, Rahuri (India) Bhoite, Y. U.; Deptt. Of Animal Husbandry and Dairy Science, Mahatma Phule Krishi Vidyapeeth, Rahuri (India). Production performance of 5/8 gir crossbred. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.43-46 KEYWORDS: PRODUCTION. CROSSBREDS. LACTATION. GENETIC CORRELATION. CROSSBREDS. MILK.

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87. Sonawane, V. R.; Department of Animal Science and Dairy Science, Mahatma Phule Krishi Vidyapeeth. Rahuri (India) Deokar, K. D.; Department of Animal Science and Dairy Science, Mahatma Phule Krishi Vidyapeeth. Rahuri (India) Garudkar, R. S.; Department of Animal Science and Dairy Science, Mahatma Phule Krishi Vidyapeeth. Rahuri (India). Evaluation of phule triveni sire for estimated breeding value of lifetime traits. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.82-86 KEYWORDS:

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88. Saxena, Kumar, Vijay; Division of Physiology and Biochemistry, Central Sheep and Wool Research Institute, Malpura (India) Jha, Kumar. Bipul; Division of Physiology and Biochemistry, Central Sheep and Wool Research Institute, Malpura (India) Meena, Singh. Amar; Division of Animal Biotechnology, Central Sheep and Wool Research Institute, Malpura (India) Naqvi, K. M.; Division of Physiology and Biochemistry, Central Sheep and Wool Research Institute, Malpura (India). Xharacterization of MTNRIA gene in terms of genetic variability in a panel of subtemperature and subtropical Indian sheep breeds. *Journal of Genetics (India)*. (Dec 2015) v.94 (4) p.715-721 KEYWORDS: PERIODICITY. SEASONS. GENOTYPES. POLYMORPHISM. SHEEP. BREEDS (ANIMALS). MAMMALS. INDIA.

Seasonality of animals is an important adaptive trait for successful survival and production during limited food availability and extreme environmental conditions. Photoperiodic changes in day length are utilized by these seasonal animals as an important environmental cue for regulating their annual rhythms of reproduction cycles. Melatonin is an important hormone which is secreted by the pineal gland in proportion to darkness and its effect is mediated by melatonin receptor subtypes, principally MTNRIA. In the present study, polymorphism in the coding sequence at two important SNPs (C606T and G612A), known to be markers for out of season breeding in sheep were studied by PCR-RFLP in a panel of four breeds of sheep from subtemperate and subtropical arid conditions, respectively. The frequencies of 'G' and 'A' alleles with reference to

G6I2A SNP did not differ considerably among all the breeds of sheep. Frequency of 'T' allele of the C606T SNP was found to be dominantly higher in subtemperate sheep breeds in comparison to subtropical sheep breeds. Identified SNPs in the coding region were mostly synonymous and did not lead to any change in conformation of the MTNRIA receptor protein.

89. Kumari, N.; Department of Animal Genetics & Breeding, Ranchi Veterinary College, Ranchi (India) Singh, B. L.; Department of Animal Genetics & Breeding, Ranchi Veterinary College, Ranchi (India) Kumar, S.; Department of Animal Genetics & Breeding, Ranchi Veterinary College, Ranchi (India) Kumari, Kiran; Department of Animal Genetics & Breeding, Ranchi Veterinary College, Ranchi (India) Thakur, K. S.; Department of Animal Genetics & Breeding, Ranchi Veterinary College, Ranchi (India). Comparison of black Bengal and Jharkand black goats using both physical attributes and molecular characterization. The Indian Veterinary Journal (India). (Dec 2015) v.92 (12) p.14-17 KEYWORDS: GOATS. CAPRINAE. BREEDS (ANIMALS). BLOOD. WEIGHT. DNA. INDIA.

Two goats breeds, Black Bengal and Black Bengal type goats of Jharkhand were characterized using RAPD markers in the present investigation. DNA was extracted from 50 blood samples each for Black Bengal and Jharkand Black i.e. total of 100 examples. All the parameters studied with the help of 10 primers using RAPD-PCR helped to compare the two breeds. Current article summarizes the earlier findings about two breeds using physical parameters and the current findings using molecular (statistical) parameters.

90. Singh, Khushpreet; Department of Veterinary Gynaecology and Obstetrics, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India) Kumar, Ajeet; Department of Veterinary Gynaecology and Obstetrics, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India) Honparkhe, M.; Department of Veterinary Gynaecology and Obstetrics, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). Endocrine status of serum testosterone, estradiol, prolactin and thyroid hormones in good and poor libido breeding buffalo bulls. The Indian Veterinary Journal (India). (Dec 2015) v.92 (12) p.39-40 KEYWORDS: BULLS. HORMONAL CONTROL. PROLACTIN. THYROID HORMONES. LIBIDO. TESTOSTERONE.

The present study was conducted to assess the endocrine status of serum testosterone, estradiol, prolactin and thyroid hormones in good and poor libido breeding buffalo bulls. Twenty buffalo bulls were categorized into good (n=10) and poor libido (n=10) on the basis of reaction time. Serum levels of testosterone, prolactin and thyroid hormones were similar in both the groups. However, serum estradiol was significantly lower in high libido bulls. It could be

concluded that testosterone to estradiol ratio can be used to demarcate high libido bulls.

91. Tomar, K. A.; Department of Animal Genetics and Breeding, College of Veterinary Science, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India) Poonia, S. J.; Department of Animal Genetics and Breeding, College of Veterinary Science, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India) Choudhari, M.; Department of Animal Genetics and Breeding, College of Veterinary Science, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India) Sangwan, S.; Department of Animal Genetics and Breeding, College of Veterinary Science, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar (India). Restricted selection indices for genetic improvement of egg type chicken. The Indian Veterinary Journal (India). (Dec 2015) v.92 (12) p.78-80 KEYWORDS: GENETICS. SELECTION INDEX. EGGS. CHICKENS. BREEDS (ANIMALS). FARMS. ANIMALS.

The present study was undertaken on 2416 pullets, progenies of 252 sires of White Leghorn over five generations (2008-09 to 2012-13), maintained at poultry breeding farm of department of Animal Genetics and Breeding, LUVAS, Hisar. The index 1, constructed using BW_{20} , AFE, EW_{40} , EN_{40} , BW_{40} and EM_{40} , was found to be most superior index in terms of ΔH (33.44) and R_{IH} (0.656) values. The index IR_1 constructed with complete restriction on EW_{40} was observed in terms of ΔH (27.14) and R_{IH} (0.533) with expected response in each trait as 16.40g, -0.41days, 0.00g, 2.26 eggs, -3.46g and 74.70g in BW_{20} , AFE, EW_{40} , EN_{40} , BW_{40} and EM_{40} , respectively. Restricted indices were inferior to selection index (I_1), however, IR_1 is recommended as the best index for genetic improvement in egg type chicken because there was increase in egg number as well as egg mass, while no change in egg weight.

92. Dangar, S. N.; Department of Instructional Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, Navsari Agricultural University, Navsari (India) Vataliya, H. P.; Department of Instructional Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, Navsari Agricultural University, Navsari (India). Genetic correlation of standard lactation milk yield with other production and reproduction traits in gir cattle. The Indian Veterinary Journal (India). (Dec 2015) v.92 (12) p.86-88 KEYWORDS: GENETICS. COW MILK. LACTATION. PRODUCTION. MONSOON CLIMATE. INDIA.

The production data on 1257 lactations of 680 Gir cows, sired by 52 bulls, maintained at Cattle Breeding Farm, Junagadh, Gujarat over 24 years (1987-2010) were analyzed to study genetic correlation of standard lactation milk yield (SLMY) with different production traits viz., lactation milk yield (LMY), peak milk yield (PMY), lactation length (LL), dry period (DP), calving interval (CI) and age at first calving (AFC).

The analysis revealed highly significant genetic correlation of SLMY with LMY, LL and PMY of 0.985 ± 0.015 , 0.744 ± 0.209 and 0.868 ± 0.066 , respectively. Non-significant genetic correlation was found between SLMY and AFC was 0.006 ± 0.178 . There were negative genetic correlation of SLMY with DP & CI were -0.472 ± 0.217 and -0.10 ± 0.269 .

93. Muralidhran, K.; Tamil Nadu veterinary and Animal Sciences University, Chennai (India). Madras Veterinary College. Department of Veterinary Physiology. Eswari, S.; Tamil Nadu veterinary and Animal Sciences University, Chennai (India). Madras Veterinary College. Department of Veterinary Physiology. Vijayarani, K.; Tamil Nadu veterinary and Animal Sciences University, Chennai (India). Madras Veterinary College. Department of Veterinary Physiology.. Altered time dependent mRNA expression of GDF-9 and BMP-15 using reverse transcriptase-PCR from Buffalo COCs during IVM.. Indian Veterinary Journal (India). (Jul 2015) v.92(7) p.45-48 KEYWORDS: RNA. REVERSE TRANSCRIPTASE. PCR. WATER BUFFALOES.

Growth Differentiation Factor (*GDF-9*) and Bone Morphogenetic Protein (*BMP-15*) genes are involved in the regulation of folliculogenesis. This study determines the expression of these two genes during *in vitro* maturation (IVM) at different time points such as 0 (immature), 6h, 12 h and 24 h from buffalo cumulus oocyte complexes using semi-quantitative RT-PCR. The *GDF-9* transcripts were detected from cumulus free oocytes during 0 h, 6 h, 12 h and 24 h of *in vitro* maturation where as in cumulus cells upto 12h of maturation. But the mRNA expression of *BMP-15* from cumulus free oocytes was detected during all the four mentioned duration point of IVM, but highly transcribed in immature oocytes and declined during maturation. In case of cumulus cells, *BMP-15* transcript was expressed from 0 h upto 12 h and undetectable at 24 h of maturation. This study revealed that both *GDF-9* and *BMP-15* were expressed in different manner during *in vitro* maturation of buffalo oocytes.

94. Premavalli, K.; Tamil Nadu Veterinary Sciences University, Chennai (India). Poultry Research Station. Ashok, A.; Tamil Nadu Veterinary Sciences University, Chennai (India). Poultry Research Station. Sangilimadan, K.; Tamil Nadu Veterinary Sciences University, Chennai (India). Poultry Research Station. Thyagarajan, D.; Tamil Nadu Veterinary Sciences University, Chennai (India). Poultry Research Station.. A study on seasonal variation in fertility and hatchability performance of Japanese Quail breeders.. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.51-53 KEYWORDS: QUAILS. SEASONS. FERTILITY. EGG HATCHABILITY. Japanese quail hatching eggs collected at four different seasons were incubated to find out the effect of seasonal variations on the fertility and hatchability performance of Japanese quail breeders. Significantly ($P < 0.01$) higher mean per cent fertility, total hatchability, fertile hatchability and lower embryonic

mortality were observed in south west monsoon (79.32, 58.32, 73.30 and 21.00) followed by winter (74.13, 50.83, 68.61 and 23.29), north east monsoon (75.14, 48.06, 63.69 and 27.07) and summer (69.36,40.68,58.28 and 28.68) respectively. It can be concluded that better hatching performance of Japanese quail was observed during south west monsoon, followed by winter, northeast monsoon and summer seasons respectively.

95. Patel, k. Bhumait; Mahi milk producer company, Rajkot (India) Patel, A.C; Amul research and development association, Anand (India) Patel, S.B; Department of animal Genetics & breeding, college of veterinary & animal husbandry, A.A.U.,Anand (india)RANK, D.N; Department of animal Genetics & breeding, college of veterinary & animal husbandry, A.A.U.,Anand (india). Estimation of genetic parameter for test day records of murrah graded buffalos. Indian Journal of dairy Sciences (india). (Jan 2016) v.69(1), p. 67-70 KEYWORDS: GENETICS. MILK. PROGENY. LIPID CONTENT. EVALUATION. The present study was carried out using test day yield for sire evaluation in Murrah graded buffaloes. A total of 2329 test day lactation records of daughters of 79 sires distributed in 47 villages under field progeny testing programme in Anand milk shed area. Heritability estimates for TDMY records were ranged from 0.01 to 0.13. Heritability estimate for PFLY 305-day was 0.01 for milk yield. The phenotypic correlations among monthly test day milk yields and with 305-day milk yield were found to be highly significant ($P<0.01$). The estimates of phenotypic and genetic correlation among all the monthly test day milk yields ranged from 0.22 to 0.86 and from 0.20 to 1.11 respectively. Heritability estimates for TDFP records were higher in first half than second half of lactation and ranged from 0.01 to 0.06 for TD milk fat percent. Heritability estimate for 305-days fat percent was 0.02 for milk fat percent. The phenotypic correlations among monthly test day milk fat percent and with 305-day milk fat percent were found to be highly significant ($P<0.01$). The estimates of phenotypic and genetic correlation among all the monthly test day milk fat percent ranged from 0.05 to 0.78 and from 0.22 to 1.99 respectively.

96. Bhat, A. Showkat; NDRI, Karnal, (Delhi). Bhushan, Bharat; IVRI, Izatnagar (India). Sheikh, A.Sheikh; IARI, Izatnagar (India)Panigrahi, Manjit; IVRI, Izatnagar (India)Patel, BHM; IVRI, Izatnagar (India) Gaur, G.K; IVRI, Izatnagar (India)Gyanendra, Singh; IVRI, Izatnagar (India). Effect of infrared lamps to ameliorate and morality in murrah calves. Indian Journal of dairy Sciences (india). (Jan 2016) v.69(1), p.80-85 KEYWORDS: BLOOD. EVALUATION. PHYSIOLOGICAL FUNCTIONS. LEUKOCYTES.

The present study was conducted out to evaluate the effect of Infrared lamps to ameliorate morbidity and mortality in Murrah calves. Ten newborn Murrah calves were randomly divided into two

groups (G_1 and G_2) of five each. The calves of G_1 were provided with no additional protection; however the calves of G_2 were protected against the cold weather by using the Infrared lamps. The health status of calves was monitored daily both in the morning and evening. The blood samples collected within six hours of birth and then at fortnightly interval were analyzed for total leukocyte count (TLC, thousands/ μ l) and differential leukocyte count (DLC). The physiological parameters i.e. respiration rate (RR, breaths/min), heart rate (HR, beats/min) and rectal temperature (RT, °F) were recorded at weekly interval. The health performance was better in calves of G_2 as compared to G_1 . The calves in G_1 showed comparatively higher values of TLC and neutrophils and the differences were found significant ($P < 0.05$) on 15th day for TLC and 45th day for neutrophils. The values of lymphocytes were significantly ($P < 0.05$) lower in calves of G_1 than G_2 on 45th day. The physiological parameters did not varied significantly between the groups except for RT which was found significantly ($P < 0.01$) lower on 56th day in calves of G_1 than G_2 . On the basis of the results, it could be concluded that the Infrared lamps were efficient in providing favourable microclimate and hence can be effectively used in calf shed to protect newborn calves from adverse conditions of winter.

97. Gupta, Pakash. Division of Animal Genetics, ICAR-IVRI, Izatnagar(India)Bhushan, Bharat; Division of Animal Genetics, ICAR-IVRI, Izatnagar(India)Panigrahi, Manjit; Division of Animal Genetics, ICAR-IVRI, Izatnagar(India)Asaf, Muhasin.V.N; Division of Animal Genetics, ICAR-IVRI, Izatnagar(India)Kumar, Amod; Division of Animal Genetics, ICAR-IVRI, Izatnagar(India)Ranjan, Sanjeev.; Division of Animal Genetics, ICAR-IVRI, Izatnagar(India)Gaur, ganendra.Kumar; Division of Animal Genetics, ICAR-IVRI, Izatnagar(India). Effect of non-genetic factors on somatic cell measures in vrindavani cattle. Indian Journal of dairy Sciences (India). (Jan 2016) v.69 (1), p.128-131
KEYWORDS: CELLS. HERITABILITY. SOMATIC CELL COUNT. CATTLE.

This study was conducted to investigate the effect of non-genetic factors on somatic cell count (SCC) and somatic cell score (SCS) in cross bred cattle. At the time of milk collection California mastitis test (CMT) were performed and data of only those animals were collected which were tested negative by CMT. Somatic cell count was measured using the Newman–Lampert staining technique and converted to SCS. Study revealed that the least squares means of SCS in Vrindavani cows were slightly higher than the earlier reports which are mainly reported from the temperate countries. No effect of season, parity, MYC and stage of lactation on the SCS was found for Vrindavani cross-bred dairy cattle. As the heritability estimate of SCC was higher than normal heritability estimates of clinical mastitis so it can be preferred for the selection of animals against mastitis. Correlations measured among different season, parity were non-

significant and only stage of lactation were having significant correlations with milk yield and number of parity.

L20 Animal ecology

98. Chaki, E.K.; West Bengal Unvi. Of animal and fishery sciences, West Bengal (India) Pan, S.; West Bengal Unvi. Of animal and fishery sciences, West Bengal (India). Dept. of livestock production and management Santra, A.K.; West Bengal Unvi. Of animal and fishery sciences, West Bengal (India). Dept. of livestock production and management Chaurasia, Durga; West Bengal Unvi. Of animal and fishery sciences, West Bengal (India). Dept. of Anatomy Kumari, Kiran; College of veterinary science and animal husbandry (India). Dept. of instructional livestock farm complex Singh, Nishma; K.V.K, Rajnandgaon (India). Animal and land resource management practices leading to ecological sustainability of smallholder dairy farms in different agro-ecozones of West Bengal, India. Indian Journal of Animal Sciences (India). (Oct 2015) v.85 (10) p.1108-1111 KEYWORDS: ECOLOGY. PRESSURE. LAND. DIMENSIONS. RESOURCE MANAGEMENT. SUSTAINABILITY. DAIRY FARMS. AGROECOSYSTEMS. WEST BENGAL.

A study was conducted on the existing animal and land resource management of small holder dairy farms in 3 agro-ecozones of West Bengal. The study revealed that overall average dairy herd size was 5.47 LU in agroecozone I (sub-humid with red and lateritic soils of Purulia) followed by agro-ecozone II (2.64 LU), warm perhumid with brown and red hill soils and agro-ecozone of Darjeeling], III (2.63 LU), hot subhumid to humid with alluvial soils of North 24 Parganas]. Proportions of large and medium sized herds were also considerably higher i.e. 58.9 and 30%, respectively, in agro-ecozone I. This showed greater ecological pressure from dairy animals in agro-ecozone I. It was also further revealed that 78.7% of total stock comprising nondescript cattle and buffaloes in agro-ecozone I while farmers, in agro-ecozone II kept crossbred cattle (83.3%) in their herds. Favourable climatic conditions, long term crossbreeding by dairy cooperatives and availability of green fodder might be the reasons of raising higher concentration of crossbred cattle in this agro-ecozone. In agro-ecozone III owing to hot and humid climatic condition and higher intensity of crop production, farms maintained both nondescript (33%) and crossbred cattle (67%) of total herd strength in low density depending upon their financial capabilities. These animals were mostly raised on crop residues and byproducts under stall-fed condition thus creating lesser ecological pressures as compared to those of other 2 zones. It was also further revealed that 100% respondents farms in agro-ecozone I used pastures and post harvested croplands regularly and 31% used forestlands occasionally or regularly for grazing their stock. Farms in this zone practiced on an

average 6.7 h of grazing/day which was much higher than agroecozone II (0.37 h) and agro-ecozone III (1.55 h). The differences in the utilization pattern of different types of grazing lands between 2 dairying sectors were not remarkable except that use of forest under unorganized sectors was much higher than organized sector in agro-ecozone I

99. Kumar, Pravender; J.V.College, Baraut (India). Dept. of animal husbandry and dairyingSingh, Rajbir; Sardar Vallabhbhai Patel Unvi. of agriculture and technology, Meerut (India). Dept. of animal husbandry Anwar, P.S.; ICAR-National Bureau of animal genetic resources, Karnal (India). Performance status of cattle in rural ecology. Indian Journal of Animal Sciences (India). (Oct 2015) v.85 (10) p.1134-1138 KEYWORDS: CATTLE. RURAL AREAS. PARTURITION INTERVAL. DRY PERIOD. FATS. LIVESTOCK NUMBERS. LACTATION. MILK YIELD.

L40 Animal structure

100. Rai, Somil; Nanaji Deshmukh Veterinary science Univ., Madhya Pradesh (India)Chandrapuria, V.P.; Nanaji Deshmukh Veterinary science Univ., Madhya Pradesh (India)Shahi, A.; Nanaji Deshmukh Veterinary science Univ., Madhya Pradesh (India). Dept. of surgery and radiology Gupta, Devendra; College of veterinary science and animal husbandry (India). Dept. of veterinary medicine. Saphenoperitoneal shunting for canine ascites. Indian Journal of Animal Sciences (India). (Oct 2015) v.85 (10) p.1081-1083 KEYWORDS: ASCITES.

L50 Animal Physiology and Biochemistry

101. Singh, Jagmohan; College of Veterinary Sciences & Animal Husbandry, Anjora (India). Department of Veterinary Pharmacology and Toxicology. Koley, K.M.; College of Veterinary Sciences & Animal Husbandry, Anjora (India). Department of Veterinary Pharmacology and Toxicology. Nety, S.; College of Veterinary Sciences & Animal Husbandry, Anjora (India). Department of Veterinary Pharmacology and Toxicology. Chandrakar, Khushboo; College of Veterinary Sciences & Animal Husbandry, Anjora (India). Department of Veterinary Pharmacology and Toxicology. Effects of Cajanus Indicus on dressing percentage and haemoto-biochemical parameters of Broiler Chickens. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.53-55 KEYWORDS: CAJANUS CAJAN. DRESSING PERCENTAGE. BIOCHEMICAL REACTIONS. CHICKENS.

Total 90 Ven Cobb broiler chicks were used in this experiment, allocated in three groups, having 3 replicate each. Group T₁ received basal diet; group T₂ received an antibiotic growth promoter 0.05% in feed and group T₃ was provided Cajanus indicus leaf powder (CLP) at

rate of 2% in feed. At the end of sixth week dressing percentage of the groups T₁, T₂ and T₃ were 72.49 ± 1.57, 71.95 ± 0.43 and 72.67 ± 1.15, respectively. No significant (P<0.05) differences were observed amongst all the groups. There were no significant (P<0.05) differences in the value of MCV, MCH, MCHC, TLC and DLC (Lymphocyte, Heterophil, Monocyte, Eosinophil and Basophil) amongst all the groups.

102. Narute, H.S.; College of Veterinary and Animal Sciences, Udgir (India). Department of Animal Nutrition. Kanduri, A.B.; College of Veterinary and Animal Sciences, Udgir (India). Department of Animal Nutrition. Patil, P.V.; College of Veterinary and Animal Sciences, Udgir (India). Department of Animal Nutrition. Khan, M.A.; College of Veterinary and Animal Sciences, Udgir (India). Department of Animal Nutrition.. Effect of herbal combination on the haematological and serum biochemical profile of Osmanabadi Goat kids. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.59-61 KEYWORDS: BLOOD. BIOCHEMICAL REACTIONS. GOATS.

The present study was conducted to assess the effect of herbal combination on the hematological and serum biochemical profile of Osmanabadi goat kids. Twenty four goat kids were equally divided in three groups and the kids were reared in intensive system with similar managemental practices for all the three groups. All the three groups were fed with farm made concentrate mixture. In addition to this Group- II was supplemented with Combination of herbs and Group-III was supplemented with another Combination of herbs 500 gm/ tonne of feed for 120 days. The blood samples were collected fortnightly intervals from 1st fortnight to 8th fortnight of study. The values on hematological and serum biochemical estimations revealed that the supplementation of herbal combination had no adverse effect on hematological and serum biochemical profile.

103. Chandra, V.; Nanaji Deshmukh Veterinary Science University, Jabalpur (India) Shukla, S.N.; Nanaji Deshmukh Veterinary Science University, Jabalpur (India) Kumar, P.R.; Nanaji Deshmukh Veterinary Science University, Jabalpur (India) Shrivastava, O.P.; Nanaji Deshmukh Veterinary Science University, Jabalpur (India) Quadri, M.A.; Nanaji Deshmukh Veterinary Science University, Jabalpur (India). Fertility response on intrauterine administration of lochial extracts in postpartum diary buffaloes.. Indian Journal of Animal Sciences (India). (Aug 2015) v.85 (8) p.849-852 KEYWORDS: BACTERIA. BIOCHEMISTRY. WATER BUFFALOES. PERINATAL PERIOD. PROGESTERONE.

The present investigation aimed to assess the effect of intrauterine administration of lochial extract on fertility, uterine bacterial load, serum biochemical and hormonal profiles in postpartum buffaloes. Therefore, experiment was conducted in 30 postpartum buffaloes, randomly divided into 3 groups (10 each).

Animals of G₁ received PBS (30 ml) however, in G₂, Lochial extract (30 ml) and in G₃, gentamicin (200 mg) were given as intrauterine infusion on day 15 postpartum. Fertility was ascertained in terms of uterine involution, induction of estrus and conception rate. Bacterial load in uterine contents, serum progesterone, calcium and phosphorus concentrations were also studied before and after the treatments. The uterine involution within 30 days postpartum was highest in both groups 2 and 3 (80% in each). The oestrus induction within 60 days postpartum was also highest in both groups 2 and 3 (60% in each). The conception rate at induced estrus was recorded higher (100%) in lochial extract group followed by gentamicin (83.33%) and control (75%) group. No significant differences were observed in the data of fertility responses. There was significant reduction in bacterial load after treatment in both the treated groups. However, no significant difference was recorded in serum progesterone, calcium and phosphorus neither within the group nor among the groups before and after treatments. Overall results of the present study revealed better and comparable fertility with low uterine bacterial load in postpartum buffaloes administered intrauterine lochial extract and gentamicin.

104. Mili, Bhabesh; National Dairy Research Institute, Karnal (India). Pandita, Sujata; National Dairy Research Institute, Karnal (India). Mohini, Madhu; National Dairy Research Institute, Karnal (India). Kumar, Bharath, B.S.; National Dairy Research Institute, Karnal (India). Effect of vitamin E supplementation on antioxidant status and selective humoral and cellular immune responses in periparturient buffaloes. *Indian Journal of Animal Sciences (India)*. (Aug 2015) v.85 (8) p.853-855 KEYWORDS: VITAMIN E. SUPPLEMENTS. ANTIOXIDANTS. HUMORAL IMMUNITY. PERINATAL PERIOD. WATER BUFFALOES.

This study was aimed at assessing the anti oxidant status and selective humoral and cellular immune response mediators in periparturient buffaloes supplemented with vitamin E in the feed regularly. Murrah buffaloes (12) were selected during their late gestation from NDRI herd and divided randomly into 2 groups, comprising 6 each. Buffaloes of group 1 were given only the control diet, while group 2 was supplemented with 2,000 IU/day/head vitamin E along with control feed. Blood sample was drawn from each buffalo at weekly interval from day -56 to day +56 relative to parturition by jugular vein- puncture. Nitric oxide (NO) level was quantified using modified Griess reaction whereas IL-6, total antioxidant activity (TAA) and IgG levels were estimated in blood plasma using ELISA kits. TAA and IgG levels increased significantly upon vitamin E supplementation. However, levels of cellular immune response mediators (NO and IL-6) were significantly lowered. Except for plasma NO, the levels of all other mediators declined significantly

on the day of calving as compared to prepartum levels in both the groups. TAA was also significantly reduced. The magnitude of decline was significantly greater in group 1. It could be concluded that peripartum supplementation of vitamin E to buffaloes not only improved humoral and cellular immune responses but also enhanced total antioxidant activity.

105. Gain, Swarnaya; West Bengal University of Animal and Fishery sciences, Kolkata (India).Mukherjee, Joydip; West Bengal University of Animal and Fishery Sciences, Kolkata (India).Chatterjee, Saibal; West Bengal University of Animal and Fishery Sciences, Kolkata (India).Batabyal, Subhashis; West Bengal University of Animal and Fishery Sciences, Kolkata (India).Guha, Chanchal; West Bengal University of Animal and Fishery Sciences, Kolkata (India).. Alteration in the activity of blood and milk leukocytes together with the serum enzyme profile during sub-clinical mastitis in cross-bred cows.. Indian Journal of Animal Sciences (India). (Aug 2015) v.85 (8) p.856-860
KEYWORDS: LEUKOCYTES. IMMUNE RESPONSE. MASTITIS. BLOOD PROTEINS.

In vitro activity of blood and milk leukocytes together with serum enzyme profile during sub-clinical mastitis in crossbred cows were evaluated after collection of blood and milk samples from normal (10) and sub-clinical mastitic (10) cows. Blood total leukocyte counts (TLC) and differential leukocyte counts (DLC) were estimated by standard hematological procedure. Milk somatic cell counts (SCC) was performed microscopically. In vitro phagocytic activity of blood and milk neutrophils was performed by colorimetric nitro blue tetrazolium (NBT) assay and mitogen concanavalin A (con A) induced blood and milk lymphocyte blastogenic response was evaluated by colorimetric MTT (tetrazolium) assay. Serum total protein and alkaline phosphatase (ALP) were measured by the standard biochemical methods. The alanine amino transferase (ALT) and aspartate amino transferase (AST) activities in serum were estimated by commercially available kit. Milk SCC was significantly higher in sub-clinical mastitic cows. Phagocytic index of both blood and milk neutrophil was significantly lower in sub-clinical mastitic cows than normal animals. Con- A induced blood and milk lymphocyte blastogenic response was significantly lowered in sub-clinical mastitic cows than. Serum albumin, globulin ratio decreased significantly during sub-clinical mastitis. Serum AST and ALP level in sub-clinical mastitic cows was significantly higher. The study indicated decreased blood and milk leukocyte activity and higher AST and ALP during the sub-clinical mastitis which could be used as a diagnostic tool for sub-clinical mastitis.

106. Mehta, S.C.; National Research Centre on Camel, Bikaner (India). Sharma, A.K.; National Research Centre on Camel, Bikaner

(India). Bissa, U.K.; National Research Centre on Camel, Bikaner (India). Singh, Sajjan; National Research Centre on Camel, Bikaner (India).. Lactation persistency, yield and prediction models in Indian dromedary. Indian Journal of Animal Sciences (India). (Aug 2015) v.85 (8) p.875-882 KEYWORDS: LACTATION. YIELDS. FORECASTING. MODELS. CAMELS.

The demand driven economy is leading to production and utilization of camel milk for nutritional security of the human population. Lactation records (65) of the she-camels belonging to the Bikaneri, Kachchhi and Mewari breeds were analysed. The average daily milk production from 2 teats was 2.9 ± 0.04 litre with 2.7 ± 0.05 litre in Bikaneri, 3.2 ± 0.07 litre in Kachchhi and 2.6 ± 0.08 litre in Mewari breed. The average daily production was 2.5 ± 0.07 , 2.8 ± 0.06 , 3.2 ± 0.07 and 3.0 ± 0.10 litres respectively in first, second, third and fourth parity. Highest individual average daily milk yield from 2 teats was 8.06 litres. The peak yield was observed in fifth month of lactation. The average lactation yield from 4 teats was estimated to be $1,883 \pm 75$, $2,239 \pm 88$, $2,520 \pm 100$ and $3,017 \pm 148$ litre for the lactation length of 10, 12, 14 and 16 months, respectively. Two breeding and milking models were compared. Eleven mathematical functions were fitted for the prediction lactation yield and it was observed that for the sake of simplicity, the linear equation can be utilized for the purpose. The fifth month average daily yield gave the best predictions. Therefore, the mathematical equation $Y=106.727+238.597(Y5m)$ can be utilized for prediction of 10 months lactation yield and respective equations for the lactation yields of 12, 14 and 16 months lactation. The persistency of lactation was 76.20, 67.07, 55.67 and 35.87% when calculated for lactation length of 10, 12, 14 and 16 months, respectively. The present observations and analyses indicated tremendous scope in dromedary to fulfill the human aspirations which may lead to its sustenance too.

107. Padihari, V.P.; Chhattisgarh Kamdhenu Vishwavidyalaya, Durg (India). Tiwari, S.P.; Chhattisgarh Kamdhenu Vishwavidyalaya, Durg (India). Sahu, Tarini; Chhattisgarh Kamdhenu Vishwavidyalaya, Durg (India). Gendley, M.K.; Chhattisgarh Kamdhenu Vishwavidyalaya, Durg (India). Naik, Surendra Kumar; Chhattisgarh Kamdhenu Vishwavidyalaya, Durg (India). Influence of mannan-oligosaccharide and *Saccharomyces cerevisiae* on performance, carcass yield and biochemical profile of broiler chickens. Indian Journal of Animal Sciences (India). (Aug 2015) v.85 (8) p.902-907 KEYWORDS: BIOCHEMICAL REACTIONS. CARCASSES. YIELDS. MANNANS. OLIGOSACCHARIDES. SACCHAROMYCES.

Day old Vencobb broiler chicks (150) were randomly allocated to 5 treatment groups with 3 replicates of 10 chicks in each to study the effect of mannan oligosaccharide (MOS) and *Saccharomyces cerevisiae* (SC) on growth performance, nutrient utilization and

carcass yield. The trial lasted for 5 weeks. The starter (0-14 day), grower (14-28 days), and finisher (28-35 days) diets contained 23, 21.5 and 20% CP and 2,900, 3,000 and 3,100 kcal ME/kg feed, respectively. The control (C) group in starter, grower and finisher was supplemented with premix while their negative control (NC), mannan oligosaccharides (MOS), *Saccharomyces cerevisiae* (SC) and mannan oligosaccharides+ *Saccharomyces cerevisiae* (MOS+SC) groups were not supplemented with premix. The later 3 groups were supplemented with MOS 500g/tonne, SC 500g/tonne and MOS+SC 500g+500g/tonne feed, respectively. Maximum conversion of feed into gain was recorded in MOS followed by SC and MOS+SC. The chicks attained relatively more body weight in MOS+SC than other groups. It was least in group C. Phosphorus retention was maximum and significant in MOS+SC in spite of their minimum intakes. There was significant improvement in weight of different cuts in MOS+SC group as compared to other groups. Maximum serum cholesterol, LDL cholesterol and triglyceride was recorded in NC group while in the MOS supplemented treatment serum HDL cholesterol and total protein was maximum. The mean serum glucose, Ca and P was recorded highest in MOS+ SC group. It may be concluded that MOS+SC supplementation in the diet improves the overall FCR and blood biochemical profile of broiler chickens.

108. Senapati, Manas Rajan; OUAT, Bhubaneswar (India). College of Veterinary Science and Animal Husbandry. Dept. of Veterinary Biochemistry. Behera, Prakash Chandra; OUAT, Bhubaneswar (India). College of Veterinary Science and Animal Husbandry. Dept. of Veterinary Biochemistry. Maity, Apratim; OUAT, Bhubaneswar (India). College of Veterinary Science and Animal Husbandry. Dept. of Veterinary Biochemistry. Mandal, Arun Kumar; OUAT, Bhubaneswar (India). College of Veterinary Science and Animal Husbandry. Dept. of Veterinary Anatomy and Histology. Spleen: an immune tissue in poultry birds - a comparative histological study. *Journal of Interacademia* (India). (Apr 2015) v19 (2) p.243-248 KEYWORDS: SPLEEN. IMMUNITY. POULTRY. BIRDS.

The spleen of six adult poultry birds each (quail, broiler chicken and duck) of either sex was studied histo-morphologically for variations in immune tissues. The spleen in quail and chicken was covered by a thin connective tissue capsule interspersed with smooth muscle cells. The spleen of the duck was surrounded by a comparatively thick capsule without any appearance of true trabeculae. The sharply distinguished areas of red and white pulp were better observed in chicken and ducks than in quails. The pale coloured, distinct ellipsoids were distributed throughout the spleen of duck. The white pulps appeared as denser lymphoid tissue and were closely associated with the vascular tree. Prominent lymphatic nodules were observed in white pulps in case of ducks as compared to

those of chickens. But such nodules were scanty or even absent in case of quail. Therefore, these lymphatic nodules of spleen of poultry birds could play an important role in immunological surveillance against foreign microorganism.

109. Chandrahas; Guru Angad Dev Veterinary and Animal Sciences Univ. Punjab (India) Saini, A. L.; Guru Angad Dev Veterinary and Animal Sciences Univ. Punjab (India). Effect of Disbudding Pre-Medication on Physiology, Gut Health and Body Measurements in Beetal Kids. Indian Veterinary Journal (India). (Dec 2015) v.92 (12) p.18-20 KEYWORDS: KIDS. DISBUDDING. BODY MEASUREMENTS.

Twenty four Beetal kids were randomly distributed, in D₀ (control), D_L (2% Lignocaine), DM (Meloxicam) and D_{L+M} (Lignocaine and Meloxicam), to see the effect of disbudding pre-medication on physiological responses, gut health and body measurements under stall-fed conditions. No effect of disbudding pre-medication was observed on physiological responses except evening respiration rate which was significantly higher ($P < 0.05$) in DL than control and other two groups. Gut health was not affected by stress of disbudding. The body measurements were not affected by treatment except pin-to-pin and hip-to-hip distance. Study emphasized the necessity of pre-medication disbudding for better future productivity and performance of the animals.

110. Sarmah, K. B.; Department of Veterinary Physiology, College of Veterinary Science Assam Agricultural University, Khanapara (India) Biswas, K. R.; Department of Veterinary Physiology, College of Veterinary Science Assam Agricultural University, Khanapara (India). Total serum protien and cholesterol concentrations at induced and natural pubertal oestrus in indigenous heifers. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.58-62 KEYWORDS: CHOLESTEROL. OESTROUS CYCLE. HEIFERS. BLOOD PROTEINS. BODY WEIGHT. CATTLE.

Twenty prepubertal indigenous heifers (BOS indicus) of Assam aged 18-24 months, weighing 67-90 kg were selected for hormonal induction of oestrus and to compare the serum levels of protein and cholesterol at induced and at natural pubertal oestrus. Another 15 prepubertal indigenous heifers of similar age and body weight served as untreated control. Heifers were examined rectally to ensure that they had no corpus luteum and/or onset of oestrus before treatment. Each of the heifers was treated with Crestar injection containing 3 mg norgestomet and 5 mg oestradiol valerate. Implant was removed on day 9 of insertion and PMSG was administered @ 300 IU. Of 20 treated heifers induced to oestrus, 16 (80%) ovulated, 4 (20%) heifers did not ovulate. Heifers under control group J exhibited natural pubertal oestrus at an average age of 33.60 ± 2.81 months. Of these 10 (66.67%) heifers ovulated while 5(33.33%) did not ovulate. Total

serum protein concentration in prepubertal heifers before treatment ranged between 7.20 ± 0.10 and 7.65 ± 0.18 g%. The pre-treatment level of total serum protein was lower in prepubertal heifers that did not ovulate subsequently which was significant ($P < 0.01$) in control heifers. The mean total serum protein concentration at oestrus was 7.40 ± 0.10 and 7.67 ± 0.26 g% in ovulated and non-ovulated heifers respectively following treatment. The mean serum cholesterol concentration in heifers before treatment ranged between 106.43 ± 7.68 and 155.64 ± 8.04 mg%. In treated heifers the mean serum cholesterol concentration decreased at induced oestrus from that of before treatment levels which was significant ($P < 0.01$) in ovulated heifers. Contrary to the treated group, in control heifers serum cholesterol concentration increased significantly ($P < 0.01$) at pubertal oestrus irrespective of their ovulation status. From the present study it may be concluded that hormonal induction of oestrus in prepubertal heifers was associated with changes in the levels of serum protein and cholesterol. While serum protein concentration could maintain homeostasis despite hormonal treatment, the level of cholesterol was significantly altered concomitant with bringing about ovulatory oestrus.

111. Doley, S.; ICAR Research Complex for NEH Region, Umroi Road, Umiam (India) Kumar, Suresh; ICAR Research Complex for NEH Region, Umroi Road, Umiam (India) Kadirvel, G.; ICAR Research Complex for NEH Region, Umroi Road, Umiam (India) Kumar, Ashok; ICAR Research Complex for NEH Region, Umroi Road, Umiam (India) Khargharia, G.; ICAR Research Complex for NEH Region, Umroi Road, Umiam (India) Rajkhowa, J. D.; ICAR Research Complex for NEH Region, Umroi Road, Umiam (India) Das, Mukut; ICAR Research Complex for NEH Region, Umroi Road, Umiam (India). Effect of housing on performance and blood biochemical traits of chicken in Meghalaya. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.107-112 KEYWORDS: HUMIDITY. BIRDS. CHICKENS. WEIGHT GAIN. MANAGEMENT. FOOD ADDITIVES.

The experiment was carried out to study the effect of deep litter and raised floor housing systems on the performance and blood-biochemical parameters in Vanaraja, Gramapriya and Indigenous grower chickens (9-18 weeks) in the agro-climatic condition of Meghalaya during summer (March to July) season. Different weather parameters like temperature, humidity and rainfall were recorded during the experimental period. The body weight gain (g/day/bird), FeR and mortality(%) recorded under deep litter system were 15.58 ± 1.26 , 3.51 ± 0.17 and 4.03 ± 0.49 respectively; whereas the corresponding values under raised floor system were 18.29 ± 1.69 , 3.2 ± 0.15 and 2.85 ± 0.38 respectively. System of housing had no significant effect on blood biochemical traits. The results revealed that

the birds under raised floor system performed better than the birds. Under deep litter system which indicated that the raised floor system would be better during summer for grower birds in the climatic condition of Meghalaya.

112. Seth, N.; Deptt. of Livestock Production and Management College of Veterinary Science & Animal Husbandry OUAT, Bhubaneswar (India) Pradhan, R. C.; Deptt. of Livestock Production and Management College of Veterinary Science & Animal Husbandry OUAT, Bhubaneswar (India) Mishra, K. S.; Deptt. Of Livestock Production and Management College of Veterinary Science & Animal Husbandry OUAT, Bhubaneswar (India) Chichilichi, B.; Deptt. of Livestock Production and Management College of Veterinary Science & Animal Husbandry OUAT, Bhubaneswar (India) Das, S.; Deptt. Of Livestock Production and Management College of Veterinary Science & Animal Husbandry OUAT, Bhubaneswar (India). Azolla supplementation as dietary protein source on immunity and antioxidant status of vanaraja chicken. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.136-141
KEYWORDS: AZOLLA. HUMORAL IMMUNITY. OXIDATION. STRESS. HUMORAL IMMUNITY. CHICKENS. INDIA.

The present study was conducted to assess the immunological and antioxidant effect of fresh Azolla supplementation on Vanaraja chicken. Two hundred fifty six one week-old birds were distributed into 4 dietary treatments (C_1, T_2, T_3) with 3 replicates each supplemented with 0, 5, 10 and 15% dietary protein .from fresh Azolla, respectively. The experiment continued up to 10 weeks of age. At the 56th day of age Cutaneous Basophilc Hypersensitivity (CBH) test as cellular immune response and .antibody titre against SRBC as humoral immunity response were determined. The weight of lymphoid organs, antioxidant enzyme, and lipid peroxidation activity were determined at 10th week of age. The cellular and humoral immune response and weight of lymphoid organs exhibited non-significant ($P>0.05$) difference between the treatment groups. Erythrocyte catalase activity was significantly ($P>0.05$) higher in Azolla supplemented groups compared to the control group where as the erythrocyte malondialdehyde (lipid peroxidation activity) level between the treated groups did not show any significant ($P>0.05$) difference. Liver Hist pathology revealed absence of any deleterious effect of Azolla on Vanaraja chickens.

113. Kumar, Sanjay; Department of Livestock Production and Management Ranchi Veterinary College, Ranchi (India) Prasad, M. C.; Department of Livestock Production and Management Ranchi Veterinary College, Ranchi (India) Kumari, Sushma; Department of Livestock Production and Management Ranchi Veterinary College, Ranchi (India). Influence of stress management on blood profile of

broiler chickens. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.145-147 KEYWORDS: STRESS. MANAGEMENT. BROILER CHICKENS. GLUCOSE. WEIGHT GAIN. BLOOD. INDIA.

A study was conducted to investigate the influence of stress management on blood profile of broiler chickens kept under cage system. Two hundred four day old commercial broiler chicks were randomly selected and divided into four groups equally and given treatment of different anti stress agents along with standard diet. The blood profile was investigated at 42 day age of five chickens randomly selected from each group. The Hb%, TEC($10^6/\text{mm}^3$), PCV% ,TLC ($103/\text{mm}^3$) and differential counts along with biochemical parameters viz. Blood sugar (mg/dl), serum protein (g/dl), SGOT and SGPT (IU) indicated improvement in general health condition of birds in anti stress treated group than control. The effect was best on zee stress followed by honey, glucose and control group.

114. Chandrabhas; Guru Angad Dev Veterinary and Animal Sciences Univeristy, Ludhiana (India) Saini, L. A.; Guru Angad Dev Veterinary and Animal Sciences Univeristy, Ludhiana (India). Effect of disbudding pre-medication on physiology, gut health and body measurements in beetal kids. The Indian Veterinary Journal (India). (Dec 2015) v.92 (12) p.18-20 KEYWORDS: KIDS. DISBUDDING. BODY MEASUREMENTS. DIARRHOEA. LIVESTOCK. HEALTH. Twenty four Beetal kids were randomly distributed, in D₀ (control), D₁ (2% Lignocaine), D_m (Meloxicam) and D_{L+m} (Lignocaine and Meloxicam), to see the effect of disbudding pre-medication on physiological responses, gut health and body measurements under stall-fed conditions. No effect of disbudding pre-medication was observed on physiological responses except evening respiration rate which was significantly higher ($P < 0.05$) in D₁ than control and other two groups. Gut health was not affected by stress of disbudding. The body measurements were not affected by treatment except pin-to-pin and hip-to-hip distance. Study emphasized the necessity of pre-medication disbudding for better future productivity and Performance of the animals.

115. Singh, Jagmohan; College of Veterinary Sciences & Animal Husbandry, Anjora (India). Department of Veterinary Pharmacology and Toxicology. Koley, K.M.; College of Veterinary Sciences & Animal Husbandry, Anjora (India). Department of Veterinary Pharmacology and Toxicology. Nety, S.; College of Veterinary Sciences & Animal Husbandry, Anjora (India). Department of Veterinary Pharmacology and Toxicology. Chandrakar, Khushboo; College of Veterinary Sciences & Animal Husbandry, Anjora (India). Department of Veterinary Pharmacology and Toxicology. Effects of *Cajanus Indicus* on dressing percentage and haemato-biochemical parameters of Broiler Chickens. Indian Veterinary Journal (India). (Jul 2015) v.92(7) p.53-55

KEYWORDS: CAJANUS CAJAN. DRESSING PERCENTAGE. BIOCHEMICAL REACTIONS. CHICKENS.

Total 90 Ven Cobb broiler chicks were used in this experiment, allocated in three groups, having 3 replicate each. Group T1 received basal diet; group T2 received an antibiotic growth promoter @ 0.05% in feed and group T3 was provided *Cajanus indicus* leaf powder (CLP) at rate of 2% in feed. At the end of sixth week, dressing percentage of the groups T1, T2 and T3 were 72.49 ± 1.57 , 71.95 ± 0.43 and 72.67 ± 1.15 , respectively. No significant ($P < 0.05$) differences were observed amongst all the groups. There were no significant ($P > 0.05$) differences in the values of MCV, MCH, MCHC, TLC and DLC (Lymphocyte, Heterophil, Monocyte, Eosinophil and Basophil) amongst all the groups.

116. Nature, H.S.; College of Veterinary and Animal Sciences, Udgir (India). Department of Animal Nutrition. Kanduri, A.B.; College of Veterinary and Animal Sciences, Udgir (India). Department of Animal Nutrition. Patil, P.V.; College of Veterinary and Animal Sciences, Udgir (India). Department of Animal Nutrition. Khan, M.A.; College of Veterinary and Animal Sciences, Udgir (India). Department of Animal Nutrition.. Effect of herbal combination on the hematological and serum biochemical profile of Osmanabadi Goat kids. Indian Veterinary Journal (India). (Jul 2015) v.92(7) p.59-61 KEYWORDS: BLOOD. BIOCHEMICAL REACTIONS. GOATS.

The present study was conducted to assess the effect of herbal combination on the hematological and serum biochemical profile of Osmanabadi goat kids. Twenty four goat kids were equally divided in three groups and the kids were reared in intensive system with similar managemental practices for all the three groups. All the three groups were fed with farm made concentrate mixture. In addition to this Group- II was supplemented with Combination of herbs and Group-III was supplemented with another Combination of herbs @ 500 gm/ tone of feed for 120 days. The blood samples were collected fortnightly intervals from 1st fortnight to 8th fortnight of study. The values on hematological and serum biochemical estimations revealed that the supplementation of herbal combination had no adverse effect on hematological and serum biochemical profile.

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117. Singh, S.P.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). College of Veterinary Sciences. Department of Veterinary Physiology. Singh, D.V.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). College of Veterinary Sciences. Department of Veterinary Physiology.. Effect of Yea Sacc 1026 Supplementation on Rumen Metabolites and Microbial Activity in Buffalo Calves (*Bubalus Bubalis*).. Indian

Veterinary Journal (India). (Jul 2015) v.92 (7) p.37-40 KEYWORDS: RUMEN. METABOLITES. WHEAT STRAW. WATER BUFFALOES. CALVES.

Fifteen apparently healthy rumen fistulated buffalo calves were divided into group I kept on conventional diet consisting of green fodder and wheat straw, group II animals maintained on wheat straw alone and group III animals supplemented with Yea Sacc1026 along with wheat straw. Rumen liquor samples were collected before feeding (0 hr) and subsequently at 1, 2, 3, 4, 5 and 6 hr postprandial for 3 consecutive days after the period of microbial adaptation of 21 days. There was a significant decrease in ruminal pH, SAT and MBRT with supplementation of Yea Sacc1026 as compared to conventional diet and exclusive wheat straw feeding. The levels of TVF As, NH₃ - N and total nitrogen were significantly increased during supplementation of Yea Sacc1026 the body weight of the animals increased significantly with Yea Sacc1026 supplementation and conventional feeding, while exclusive feeding of wheat straw resulted in deterioration of body conditions and loss of body weight.

118. Tyagi, Amrish Kumar; National Dairy Research Institute, Karnal (India). Shandilya, Umesh K.; National Dairy Research Institute, Karnal (India). Srivastava, Anima; National Dairy Research Institute, Karnal (India). Kale, Vishnu R.; National Dairy Research Institute, Karnal (India). Kewalramani, Neelam J.; National Dairy Research Institute, Karnal (India). Fatty acids profile of milk and milk products in cow and buffalo fed roughage based diet. Indian Journal of Animal Sciences (India). (Aug 2015) v.85 (8) p.889-896 KEYWORDS: FATTY ACIDS. FORAGE. MILK PRODUCTS. COWS. WATER BUFFALOES.

Diet composition is an important determinant of milk production and composition, including milk fatty acid profile. Present experiment evaluated the influence of diet on milk fatty acid composition of cow and buffaloes, which have varying genetic potential of milk secretion and mammary lipogenesis. Sixteen of each multiparous crossbred cows and Murrah buffaloes were divided in 2 equal groups of each species with 8 animals in each group making 4 groups altogether (groups 1 and 2 for cows and groups 3 and 4 for buffaloes). Cows and buffaloes of groups 1 and 3 were fed ad lib. Berseem (*Trifolium alexandrinum*) fodder along with wheat straw, whereas, animals of groups 2 and 4 were offered concentrate mixture and wheat straw. Fatty acid profiles were determined of milk samples and ghee (clarified butter oil) prepared at fortnight intervals by indigenous and creamery (commercial) methods from the total milk collected from each group. Total milk fat, protein, total solids and solid not fat contents of milk were similar between cow and buffaloes irrespective of dietary changes. Total CLA content in milk was higher in berseem fed groups of both the species. In conclusion, total PUFA and SFA levels of cow and buffalo milk with same feeding regimen

were nonsignificant. However, the total MUFA content significantly increased in cows when fed with green fodder as compared to buffaloes. Furthermore, total CLA content in ghee prepared using indigenous method was higher as compared to that of creamery method.

119. Kumar, Ravindra; ICAR, Makhdoom (India). Central Institute for Research on Goats.Tripathi, P.; ICAR, Makhdoom (India). Central Institute for Research on Goats.Chaudhary, U.B.; ICAR, Makhdoom (India). Central Institute for Research on Goats.Tripathi, M.K.; ICAR, Makhdoom (India). Central Institute for Research on Goats. Singh, R.K.; ICAR, Makhdoom (India). Central Institute for Research on Goats.. Effect of azolla based complete pellet feed on growth, nutrient utilization, blood metabolites and rumen fermentation in Barbari goats.. Indian Journal of Animal Sciences (India). (Aug 2015) v.85 (8) p.897-901 KEYWORDS: AZOLLA. BLOOD PROTEINS. NUTRIENTS. RUMEN. METABOLITES.

Present study was conducted to examine the effect of replacing concentrate mixture with sun-dried azolla on growth, nutrient utilization, and blood and rumen metabolites in growing Barbari goats in completely randomized design. Male Barbari goats (12) were divided into 2 groups, control and experimental, consisting of 6 animals in each group. The control group was fed with complete pellet feed having Bengal gram straw and concentrate mixture in 60:40 ratio, experimental group was fed with complete pellet feed in which 25% of concentrate mixture was replaced with sun-dried azolla. The duration of experimental feeding was 8 weeks. Weekly body weights were recorded to assess growth rate of goats. After 6 weeks of experimental feeding a metabolism trial of 6 days duration was conducted to determine nutrients digestibility and nitrogen balance. Blood and rumen liquor samples were collected at the end of experimental feeding. The average daily gain (g) of control group (56.60) and experimental group (78.12) was statistically similar. The goat of control and experimental group had statistically similar daily dry matter intake. The digestibility (%) of dry matter, organic matter, ether extract and total carbohydrate was statistically similar to control and experimental group of goat (52.41, 55.46, 69.72 and 57.46 respectively). Crude protein digestibility was significantly higher in treatment group (77.43) as compared to control (71.14) group of goats. The digestibility (%) of different fibre fractions (neutral detergent fibre, acid detergent fibre), cellulose and hemicellulose were similar in treatment group. Animals of both the groups were in positive balance of nitrogen. There was no statistically significant effect replacement of concentrate mixture with sun-dried azolla on hematology and blood biochemical metabolites (hemoglobin, total protein, albumin, globulin, triglycerides and total cholesterol) of goats. The pH of rumen fluid was 6.30 for control group and 6.25 for

experimental group of goats. Total volatile fatty acids (mmol/100ml) were statistically similar in control (15.46) and treatment (16.70) groups of goats. There was no significant difference in nitrogenous fractions (mg/dl), total nitrogen, TCA-ppt nitrogen and non protein nitrogen of rumen fluid collected at the end of experimental feeding of control and treatment group of goats. From present study it can be concluded that sun-dried azolla can replace 25% of concentrate mixture in the complete pellet feed of growing Barbari goats without any adverse effect on growth, nutrient utilization, and blood and rumen fermentation parameters.

120. Chandrahas; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). Saijpal, S.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). Sandhu, K.S.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). Saini, A.L.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). Stress appraisal by organic-inorganic zinc and copper supplementation in Beetal kids. Indian Journal of Animal Sciences (India). (Aug 2015) v.85 (8) p.908-912 KEYWORDS: COPPER. ZINC. SUPPLEMENTS. TOLERANCE. COLEOPTERA.

To assess the stress tolerance, challenge stressor was induced in 14 Beetal kids of 3 months after random distribution in 2 groups (T_{MM} and T_{OM}). All kids received ad lib. Concentrate feed supplemented with 2% mineral mixture of similar composition except T_{MM} with inorganic Zn and Cu as sulphate salts and T_{OM} with organic amino acid-mineral complex as Zn-lysine and Cu-lysine. The kids of both groups were challenged with 0.2 ml adjuvant complete Freund (ACF) intra-dermally after 90 days of feeding. Hb and PCV declined in T_{MM} group. TLC declined in T_{OM} group. Serum creatinine was higher in T_{MM} group. Serum BUN and albumin elevated after challenge in T_{OM} group. Serum glucose declined after challenge in T_{MM} . At the end of study GPX level was higher in T_{OM} group. It was concluded that organic Zn and Cu had better potential for stress tolerance in goat kids.

121. Rani, K.Sudha; Sri Venkateswara veterinary unvi. Andhra Pradesh (India) Ramana, J.V.; Sri Venkateswara veterinary unvi. Andhra Pradesh (India) Devasena, B.; College of veterinary sciences, Proddutur (India). Dept. of animal nutrition. Gowda, N.K.S; NIANP, Adugodi (India) Reddy, P.Sudhakara; SVVU, Tirupati (India). In vivo evaluation of mineral bioavailability in groundnut haulm based complete diets supplemented with organic and inorganic mineral sources in goats. Indian Journal of Animal Sciences (India). (Oct 2015) v.85 (10) p.1098-1103 KEYWORDS: IN VIVO EXPERIMENTATION. COPPER. GOATS. MANGANESE. STEMS. DIET. ORGANIC COMPOUNDS. INORGANIC COMPOUNDS. MINERALS.

A study was carried out to evaluate in vivo mineral bio-availability in groundnut haulm based complete diets supplemented with organic and inorganic mineral sources in goats. A basal complete diet was prepared with GNH and concentrate mixture (8% maize, 10% soybean meal, 21.5% de-oiled rice bran and 0.5% salt) in 60: 40 ratios. The basal diet was treated as control (T1) and 3 more diets were prepared by supplementing basal diet with commercial mineral mixture at 1.5% (T2), inorganic mineral supplements at 26.4g (8.3 g ZnSO₄, 4.0 g CuSO₄ and 14.0 g MnSO₄) (T3) and organic mineral supplements @ 72g (12g Zn-P, 10 g Cu-P and 50g Mn-P) (T4). The CP, CF, EE, TA, AIA and NFE contents of the basal diet were 15.8, 20.0, 1.4, 17.8, 9.7 and 45.0% respectively. In vivo metabolic studies were carried out on 4 complete diets T1, T2, T3 and T4. The DMI was 2.7 kg/% body weight which is in accordance with ICAR (1998) recommendation. The DCP intake was 115.7, 121.2, 117 and 117 g/animal/day in T1, T2, T3 and T4 respectively. There was no significant difference between treatments with regard to DMI or DCP intake. Significant differences were also not observed between treatments with regard to total nitrogen excretion (g/day), N retention (g/day) and N retention expressed as % of intake. The N-retention expressed as % of intake in T1, T2, T3 and T4 were 57.1, 58.1, 52.0 and 54.1% respectively. The mineral supplementation did not influence the nitrogen retention in all the treatments. Positive nitrogen balances were observed in all the treatments showing that there was no negative effect of mineral supplementation on N- balance. The copper retention expressed as % of Cu intake in T1, T2, T3 and T4 were 65.1, 64.8, 70.8 and 75.0% respectively, suggesting that significant differences were observed between the treatments with regard to Cu intake (g/d) and copper retention (g/day). The zinc retention (g/day) and zinc retention expressed as per cent of intake showed significant differences between the treatments. Mn retention expressed as per cent of intake was 18.0, 38.2, 32.3 and 33.7% respectively in T1, T2, T3 and T4 treatments. Significant differences were observed between the treatments with regard to Mn intake (g/day), Mn retention and Mn retention expressed as % of intake. The plasma Cu, Mn and Zn concentrations in all the animals increased at the end of the metabolic study, as compared to the values at the start of the experiment. It can be concluded that the organic mineral supplements were better bio-available than the inorganic mineral supplements.

122. Malik, P.K.; National Institute of animal nutrition and physiology, Karnataka (India)Thulasi, A.; National Institute of animal nutrition and physiology, Karnataka (India)Soren, N.M.; National Institute of animal nutrition and physiology, Karnataka (India)Jose, L.; National Institute of animal nutrition and physiology, Karnataka (India) Prasad, K.S.; National Institute of animal nutrition and physiology, Karnataka (India)Prasad, C.S.; National Institute of animal nutrition and physiology, Karnataka (India). Phylogenic diversity analysis of rumen acetogens in adult sheep fed on conventional roughage diet. Indian Journal of Animal Sciences (India). (Oct 2015) v.85 (10) p.1104-1107 KEYWORDS: GENES. PHYLOGENY. SHEEP. ROUGHAGE. DIET.

The study was conducted to screen the Indian sheep for the presence as well as diversity of rumen acetogens. Rumen liquor samples from 3 adult female sheep (Mandya × Rambouillet) was collected through stomach tube. Genomic DNA was isolated and amplified using touchdown PCR protocol for partial formyltetrahydrofolate synthetase (fhs) gene sequence. Bioinformatic analysis of obtained sequences was done to construct phylogenic tree for molecular characterization and diversity analysis. PCR based amplification and further agarose gel electrophoresis revealed the presence of fhs functional gene in sheep rumen confirming the occurrence of acetogens in adult sheep fed on conventional roughage diet. However, we could not amplify the gene acs conserved with acetogens described by Australian workers. From the phylogenic tree it is clear that act1 group is distant from all other clones (act2 - act10) obtained in this study and represent a distinct uncultured acetogens genera. The act3 and act5 clones are also present in different clusters and are distant to act2, act10; act4 and act6 are closer to each other in the phylogenic tree but distant from act1. From the phylogeny tree it is clear that majority of the acetogens in these sheep are different from those acetogens reported elsewhere in the world. Thus, there is an urgent need to screen our livestock for the acetogens species/strains and to culture them for exploring the prospects of their use as alternate H₂ sink for methane mitigation from ruminants.

123. Jalal, Heena; Sher-e-Kashmir Unvi. Of agricultural sciences and technology, Jammu Kashmir (India) Hussain, Sayed Arshad; Sher-e-Kashmir Unvi. of agricultural sciences and technology, Jammu Kashmir (India) Bhat, M.Mansoor; Sher-e-Kashmir Unvi. Of agricultural sciences and technology, Jammu Kashmir (India) Salahuddin, Mir; Sher-e-Kashmir Unvi. of agricultural sciences and technology, Jammu Kashmir (India). Evaluation of hydrated oatmeal as fat replacer on the shelf life of low fat goshtaba. Indian Journal of Animal Sciences (India).

(Oct 2015) v.85 (10) p.1130-1133 KEYWORDS: FAT SUBSTITUTES. FAT RESTRICTED DIETS. OATMEAL. COLD STORAGE. KEEPING QUALITY.

124. Selvarau, K.; Veterinary College and Research Institute, Tamil Nadu (India). Dept. of Poultry Science Amutha, R.; Veterinary College and Research Institute, Tamil Nadu (India). Dept. of Poultry Science Edwin, S.C.; Veterinary College and Research Institute, Tamil Nadu (India). Dept. of Poultry Science Natarajan, A.; Veterinary College and Research Institute, Tamil Nadu (India). Dept. of Poultry Science Mani, K.; Veterinary College and Research Institute, Tamil Nadu (India). Dept. of Poultry Science. Serum Profile of Broilers by Dietary Supplementation of Valine. Indian Veterinary Journal (India). (Dec 2015) v.92 (12) p.24-26 KEYWORDS: VALINE. BROILER CHICKENS. DIET. SUPPLEMENTS.

The experiment was conducted by using two hundred commercial (Vencobb), sexed, day-old broiler chicks for a period of six weeks to study the dietary supplementation of valine with respect to serum protein and cholesterol characteristics. These chicks were randomly grouped into five treatments with four replicates of ten chicks each and fed with basal diet as T₁ (Control), T₂ (Basal diet + 0.04 per cent valine) T₃ (Basal diet + 0.08 per cent valine), T₄ (Basal diet + 0.12 per cent valine) and T₅ (Basal diet + 0.16 per cent valine). Significantly (P < 0.01) the lowest value for serum total cholesterol (104.24 mg / dl) and HDL cholesterol (67.57 mg / dl) was observed in T₂ group. The dietary valine supplementation in broiler diet on serum total protein, albumin, and serum creatinine and serum uric acid revealed a significant (P < 0.01) difference and the globulin and A/G ratio showed a significant (P < 0.05) difference between treatments. Based upon this study, it is concluded that supplementation of valine in broiler basal diet at the level of 0.04 per cent (T₂ group) significantly reduced the serum total cholesterol, Creatinine and uric acid levels and increased the total protein and albumin levels in a cost effective way.

125. Thomas, K. Shibi; Veterinary University Training and Research Centre, Tiruchirapalli (India) Jalaudeen, A.; Veterinary University Training and Research Centre, Tiruchirapalli (India) Rajendran, D.; Veterinary University Training and Research Centre, Tiruchirapalli (India) Jagatheesan, P.N. Richard; Veterinary University Training and Research Centre, Tiruchirapalli (India). Influence of Dietary Supplementation of Probiotic on Body Weight of White Pekin Ducks. Indian Veterinary Journal (India). (Dec 2015) v.92 (12) p.34-36 KEYWORDS: PROBIOTICS. BODY WEIGHT. DIET. SUPPLEMENTS. DUCKS.

A study was conducted to find out the effect of dietary supplementation of probiotic (0, 0.25% probiotic and 0.05% probiotic) 'Livesac' in White Pekin ducks (Vigova variety) for a period of eight

weeks. Ducks with 0.05% probiotics recorded a significantly ($P < 0.01$) higher body weight than other groups from second fortnight onwards and followed a similar pattern till the end of the experiment. The cumulative body weight gain upto six and eight weeks showed significantly higher ($P < 0.01$) values in 0.05% probiotic group than the control and 0.025 per cent probiotic supplemented group. Mortality percentage between treatments was not affected by probiotic supplementation.

126. Sangilimadan, K.; Veterinary College and Research Institute, Thanjavur (India)Rajini, R.Asha; Veterinary College and Research Institute, Thanjavur (India)Prabakaran, R.; Veterinary College and Research Institute, Thanjavur (India)Murugan, M.; Veterinary College and Research Institute, Thanjavur (India). Effect of Dietary Protein on Egg Production in Layer Japanese quail (*Coturnix Coturnix Japonica*). Indian Veterinary Journal (India). (Dec 2015) v.92 (12) p.41-43
KEYWORDS: QUAILS. DIET. EGG PRODUCTION.

Japanese quail farming is popular because of it require less space and feed, early sexual maturity, good egg production, high disease resistance and low capital investment. Japanese quail meat and egg is known as gourmets delight. One of the major constraints for rapid development of quail industry is the escalating feed cost. Feed cost can be reduced by adopting optimal scientific methods. Dietary protein, if manipulated positively, it could lower feed cost with added favorable results such as, optimum egg production. This work has been attempted to examine which protein combination could help with higher egg production in Japanese quails, nevertheless with lower feed cost.

127. Sangilimadan, K.; Veterinary College and Research Institute, Thanjavur (India)Rajini, R.Asha; Veterinary College and Research Institute, Thanjavur (India)Prabakaran, R.; Veterinary College and Research Institute, Thanjavur (India)Murugan, M.; Veterinary College and Research Institute, Thanjavur (India). Influence of Dietary Protein on Egg Weight in Layer Japanese Quail (*Coturnix coturnix japonica*). Indian Veterinary Journal (India). (Dec 2015) v.92 (12) p.44-46
KEYWORDS: QUAILS. EGGS. WEIGHT. DIET.

Japanese quail, is a hardy bird, and had assumed importance world wide as a laboratory animal but is presently commercially exploited for its meat and egg. Its distinct small size bird with rapid growth and early onset of egg production, it reaches peak egg production by 10 weeks of age and therefore is an able enterprise to be established with low capital outlay, and quicker returns to the entrepreneur. Egg weight ranges from 9 to 12 gm, with an average weight of 10g. A trial was done to study the effect of different dietary

protein concentrations and their effect on the egg weight of layer Japanese quails.

128. Randhawa, Harveen Kaur; Guru Angad Dev Veterinary & Animal Sciences Univ., Punjab (India). Dept. of Veterinary Physiology and Biochemistry Rajesh, Jindal; Guru Angad Dev Veterinary & Animal Sciences Univ., Punjab (India). Dept. of Veterinary Physiology and Biochemistry Shashi, Nayyar; Guru Angad Dev Veterinary & Animal Sciences Univ., Punjab (India). Dept. of Veterinary Physiology and Biochemistry. Amla Powder Supplementation Improves Antioxidant Status of Summer Stressed Goats. Indian Veterinary Journal (India). (Dec 2015) v.92 (12) p.47-49 KEYWORDS: GOATS. ANTIOXIDANTS. SUMMER. SUPPLEMENTS.

Effect of amla powder supplementation on antioxidant status and reproductive performance of summer stressed Beetal goats was investigated. Fifteen summer stressed goats were randomly divided into three groups, viz. Control; Group-I: supplemented with amla powder @7.5g/day and Group-II: supplemented with amla powder @15g/day. Oxidative stress indicators erythrocytic lipid peroxidation level and superoxide dismutase activity were significantly ($p < 0.05$) lowered, whereas the plasma vitamin C levels were improved by amla powder supplementation. Conception rate was improved to 60% and 80% in group I and II respectively as compared to 40% in control.

129. Mekala, P.; Veterinary College and Research Institute, Namakkal (India). Dept. of Veterinary Pharmacology and Toxicology Jagadeeswaran, A.; Veterinary College and Research Institute, Namakkal (India). Dept. of Veterinary Pharmacology and Toxicology Yogeswari, R.; Veterinary College and Research Institute, Namakkal (India). Dept. of Veterinary Pharmacology and Toxicology Arivuchelvan, A.; Veterinary College and Research Institute, Namakkal (India). Dept. of Veterinary Pharmacology and Toxicology Raja, M. J.; Veterinary College and Research Institute, Namakkal (India). Dept. of Veterinary Pharmacology and Toxicology. Hepatoprotective Effect of Aloe Health Drink in Broiler Chicken. Indian Veterinary Journal (India). (Dec 2015) v.92 (12) p.76-78 KEYWORDS: BROILER CHICKENS. POISONING. AFLATOXINS. HISTOPATHOLOGY. LIVER.

Aflatoxicosis was induced in commercial broiler chicken by administering 0.25 and 0.5ppm of aflatoxin through feed. The birds were concurrently treated with aloe health drink a commercial preparation at 1 and 2 per cent level through drinking water. Aflatoxin (0.5 ppm) induced reduction in serum antioxidant enzymes and histopathological changes in liver were reversed to near normal by supplementation of aloe health drink at 2 per cent level.

130. Baba, A. I.; Division of Livestock Production and Management, Faculty of Veterinary Sciences and Animal Husbandary, R. S Pura

(India)Singh, Y.; Division of Livestock Production and Management, Faculty of Veterinary Sciences and Animal Husbandary, R. S Pura (India)Sheikh, U. I.; Division of Livestock Production and Management, Faculty of Veterinary Sciences and Animal Husbandary, R. S Pura (India)Thirumurugan, P.; Division of Livestock Production and Management, Faculty of Veterinary Sciences and Animal Husbandary, R. S Pura (India). Performances and organoleptic quality of vanaraja chicken under different rearing system. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.23-27 KEYWORDS: CHICKENS. ANIMAL HUSBANDRY METHODS. ECONOMICS. SPLEEN. DRESSING PERCENTAGE. EFFICIENCY.

A total of 120 day old chicks were utilized to evaluate the production performance of Vanaraja chickens under different rearing systems viz. cage, deep litter and semi intensive during 2009. The overall mean body weight, feed conversion ratio were recorded as 1323±28.02, 1238.12±46.02 and 1283.00±26.30 g; and 2.27, 2.44 and 2.05 for cage, deep litter and semi intensive systems respectively. Overall feed conversion ratio (FCR), protein efficiency ratio (PER) and energy efficiency ratio (EER) was significantly better (P<0.05) in T3 group than T1 and T2 groups. The dressing percentage was found to be non- significant among the groups. The weight of giblet, bursa and spleen were significantly (P<0.05) heavier in T3 groups (reared in semi-intensive) than T1 (reared in cages) and T2 groups (reared in deep litter). Net profit per bird in cage, deep litter and semi intensive systems was Rs.18.87, Rs.12.40 and Rs.23.54 respectively. The results suggested that Vanaraja chickens could be reared more economically in semi intensive system.

131. Boruah, K.; Department of Livestock Production Management College of Veterinary Science, Assam Agricultural University, Khanapara (India) Saharia, J.; Department of Livestock Production Management College of Veterinary Science, Assam Agricultural University, Khanapara (India) Gogoi, K. A.; Department of Livestock Production Management College of Veterinary Science, Assam Agricultural University, Khanapara (India)Saikia, N. B.; Department of Livestock Production Management College of Veterinary Science, Assam Agricultural University, Khanapara (India)Laskar, K. S.; Department of Livestock Production Management College of Veterinary Science, Assam Agricultural University, Khanapara (India)Borah, C. M.; Department of Livestock Production Management College of Veterinary Science, Assam Agricultural University, Khanapara (India). Effect of body cooling on feed intake and feed conversion efficiency of Hampshire pigs during summer. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.73-76 KEYWORDS: SPRINKLERS. FEED INTAKE. FEED CONVERSION EFFICIENCY. WATER. COOLING.

An experiment was carried out at 30-sow Teaching Unit, College of Veterinary Science, AAU, Khanapara Campus for a period of four months (May 2014 to August 2014) to find out the effect of body cooling on the feed intake and feed conversion efficiency of Hampshire pigs during the summer seasons. Total twenty numbers of pregnant sows was taken for the experiment of second and third parity and each group comprises ten numbers of pregnant sows. Both Control(C) and Treatment (T) groups were provided same feeding standard in the farm. Sprinkling of water on the body of sows was practiced during the hotter part of the day in the treatment group. In the experiment period mean, environmental temperature, relative humidity and THI were taken into account. Results showed that Temperature ranged from 27.44 ± 0.43 to 33.76 ± 0.37 °C, Relative humidity 71.49 ± 1.77 to $95.58 \pm 0.71\%$ and THI 78.49 ± 0.53 to 88.37 ± 0.49 respectively during the experimental period. The overall feed consumption and feed conversion efficiency (FCE) of the sows was recorded to be 32.22 ± 0.07 and 34.51 ± 0.09 kg and 5.46 ± 0.053 and 5.46 ± 0.059 for control and treatment groups respectively. Statistical analysis revealed significant difference ($P > 0.01$) for feed intake of sows but no significant difference was observed for FCE between the control and the experimental groups.

132. Pathak, R.; Department of Livestock Production and Management, College of Veterinary Science, Assam Agricultural University, Khanapara (India)Sarma, K. N.; Department of Livestock Production and Management, College of Veterinary Science, Assam Agricultural University, Khanapara (India)Bora, C. M.; Department of Livestock Production and Management, College of Veterinary Science, Assam Agricultural University, Khanapara (India)Ahmed, F. H.; Department of Livestock Production and Management, College of Veterinary Science, Assam Agricultural University, Khanapara (India)Saharia, K. K.; Department of Livestock Production and Management, College of Veterinary Science, Assam Agricultural University, Khanapara (India). Effect of concentrate supplementation on performance of Assam hill does. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.124-129
KEYWORDS: CONCENTRATES. PARTURITION. BODY WEIGHT. PREGNANCY. FARMERS. INDIA.

An experiment was conducted with 40 numbers of pregnant Assam Hill does in village Tetelia under Kamrup (Metro), Assam and the 40 does were randomly divided in two groups comprising of 20 pregnant does in each group viz., G₁ (Control group) where concentrate ration was not supplemented and G₂ (Experimental group) in which concentrate ration was supplemented 200g/ head/ day from 91 days of pregnancy up to kidding (pre-partum period) and first month of lactation (post-partum period).The average initial body weight of the does during the pre-partum period under the control

and experimental groups were 16.28 ± 1.05 kg and 15.84 ± 0.60 kg respectively, while the final body weight of does were 18.91 ± 1.09 kg and 18.99 ± 0.75 kg respectively. The average initial body weight of does immediately within 24 hours of kidding (post-partum) were 16.43 ± 1.03 kg and 16.21 ± 0.60 kg respectively in control and experimental group while the final body weight of the does were 16.89 ± 0.99 kg and 16.74 ± 0.64 kg respectively after 1 month of lactation. No significant difference was observed in body weight of the does during the pre-partum and post-partum period in between the group. The total cumulative live weight gain during the pre-partum period were 2.63 ± 0.13 kg and 3.15 ± 0.23 kg respectively in control and experimental group while during post-partum period the total cumulative live weight gain were 0.46 ± 0.27 kg and 0.53 ± 0.08 kg respectively in control and experimental group.

133. Randhawa, Kaur. Harveen; Department of Veterinary Physiology and Biochemistry, CPVS, Guru Angad Dev Veterinary & Animal Sciences University, Ludhiana (India) Jindhal, Rajesh; Department of Veterinary Physiology and Biochemistry, CPVS, Guru Angad Dev Veterinary & Animal Sciences University, Ludhiana (India) Nayyar, Shashi; Department of Veterinary Physiology and Biochemistry, CPVS, Guru Angad Dev Veterinary & Animal Sciences University, Ludhiana (India). Amla powder supplementation improves antioxidant status of summer stressed goats. The Indian Veterinary Journal (India). (Dec 2015) v.92 (12) p.47-49 KEYWORDS: SUMMER. STRESS. GOATS. ANTIOXIDANTS. BLOOD. OXIDATION.

Effect of amla powder supplementation on antioxidant status and reproductive performance of summer stressed Beetal goats was investigated. Fifteen summer stressed goats were randomly divided into three groups, viz. Control: Group-I: supplemented with amla powder 7.5/day and Group-II supplemented with amla powder 15g/day. Oxidative stress indicators erythrocytic lipid peroxidation level and superoxide dismutase activity were significantly ($p < 0.05$) lowered, whereas the plasma vitamin C levels were improved by amla powder supplementation. Conception rate was improved to 60% and 80% in group I and II respectively as compared to 40% in control.

134. Singh, S.P.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). College of Veterinary Sciences. Department of Veterinary Physiology. Singh, D.V.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). College of Veterinary Sciences. Department of Veterinary Physiology. Effect of Yea Sacc 1026 Supplementation on Rumen Metabolites and Microbial Activity in Buffalo 9 Calves (Bubalus Bubalis). Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.37-40 KEYWORDS: RUMEN. METABOLITES. WHEAT STRAW. WATER BUFFALOES. CALVES.

Fifteen apparently healthy rumen stulated buffalo calves were divided into group I kept on conventional diet consisting of green

fodder and wheat straw, group II animals maintained on wheat straw alone and group III animals supplemented with Yea Sacc along with wheat straw. Rumen liquor samples were collected before feeding (0 hr) and subsequently at 1, 2, 3, 4, 5 and 6 hr postprandial for 3 consecutive days after the period of microbial adaptation of 21 days. There was a significant decrease in ruminal pH, SAT and MBRT with supplementation of Yea Sacc as compared to conventional diet and exclusive wheat straw feeding. The levels of TVFAs, NH-N and total nitrogen were significantly increased during supplementation of Yea Sacc. The body weight of the animals increased significantly with Yea Sacc supplementation and conventional feeding, while exclusive feeding of wheat straw resulted in deterioration of body conditions and loss of body weight.

L52 Animal physiology - Growth and development

135. Yadav, Niwas. Shree; Department of Veterinary Pathology, College of Veterinary and Animal Sciences, GB Pant University of Agriculture and Technology, Pantnagar (India)Batra, Munish; Department of Veterinary Pathology, College of Veterinary and Animal Sciences, GB Pant University of Agriculture and Technology, Pantnagar (India)Amandeep. Ameliorative effects of withania somnifera root powder on growth performance of cadmium treated chickens. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.101-107 KEYWORDS: WITHANIA. GROWTH. PERFORMANCE TESTING. CADMIUM. CHICKENS. SWEAT. WATER.

A total of 90 chicks of one day age were divided randomly into five groups of 18 birds each viz. Group I (control), group II (100 ppm cadmium), group III (200 ppm cadmium), group IV (100 ppm cadmium+ Withania somnifera root powder, WSRP) and group V (200 ppm cadmium+WSRP). Groups IV and V were administered WSRP orally in standard recommended feed at the rate of 1 % concentration from 2 weeks of age till 60 days post treatment (DPT). Clinical signs, Body weight, feed consumption, body weight gain and feed conversion ratio were studied at 0, 15, 30, 45, 60 DPT. Birds in all the experimental groups were examined twice daily in morning and evening for recording of clinical manifestations, if any. Birds in groups I and IV were active, healthy and bright in appearance. In groups II and III, the birds showed decreased feed intake, weakness, lethargy, dullness and depression from 10th DPT upto 60th DPT. However, in coordination of movement was also observed in groups II and III from 30th OPT to 60th OPT. In group V, no other clinical signs were observed except dullness. There was dose and time dependent significant decrease in body weight, feed consumption, body weight gain but significant increase in feed conversion ratio. *Withania somnifera*,

administered @ 1 % in feed, in cadmium intoxicated birds 100 ppm and 200 ppm, minimized the adverse effects of cadmium.

L53 Animal physiology - Reproduction

136. Reetha Lurthu, T.; TANUVAS, Pudukottai (India). Regional Research Centre.Senthikumar, P.; TANUVAS, Pudukottai (India). Regional Research Centre.Jagtheesan Richard, P.N.; TANUVAS, Pudukottai (India). Regional Research Centre. Productivity of Emus under Pen and Run system of Management. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.41-42 KEYWORDS: EMUS. EGGS. CHICKS. PRODUCTION POSSIBILITIES. HATCHING.

The eggs collected from four emu breeding pairs in two laying season maintained in the emu research unit at TANUV AS Regional Research Centre, Pudukkottai, Tamil Nadu were used for this study. The birds were maintained under standard manage mental practices. The mean egg production performance, the mean egg weight and the mean hatch weight of four emu pairs during 5th laying season were 40.5 ±3.22, 570.03±4.17g and 410.63±5.66g respectively and the 6th laying season were 30.75± 1.65, 583.46 ±3.80g and 414.14±5.47g respectively. The hatching performance analysis of 5th laying season indicated that the per cent total egg hatchability, fertile hatchability and dead in shell were 72.66, 93.5 and 6.93 respectively. The hatching performance of 6th laying season indicated that the per cent total egg hatchability, fertile hatchability, early embryonic mortality, late embryonic mortality and dead in shell was 36.6, 52.5, 9.8, 5.35 and 15.17 respectively.

137. Premavalli, K.Ramamurthy, N.Omprakash, A.V.Balakrishnan, V.Rao Appa, V. Influence of age on internal egg quality characteristics of Guinea fowl.Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.48-50 KEYWORDS: AGE. LAYING PERFORMANCE. GUINEA FOWL.

Internal egg quality was assessed on 456 guinea fowl eggs collected from 20 to 95 weeks of age. Significant (P<0.01) increasing trend in egg weight, albumen index, Haugh unit and yolk index was observed as the age increased from 20 to 47 weeks and decline gradually thereafter to reach the lowest level between 56-59 weeks of age, then a second increasing trend was observed from 60 weeks upto 95 weeks of age coinciding with the peak trends of egg production. The present study suggested that the guinea fowl eggs had superior Haugh unit and yolk index.

138. Nath, I.; QUAT, Bhubaneswar (India). College of Veterinary and Animal Husbandry. Department if Veterinary Surgery and Radiology.Biswal Shuvranshu, Sh.; QUAT, Bhubaneswar (India). College of Veterinary and Animal Husbandry. Department if Veterinary Surgery and Radiology. Samantara, S.; QUAT, Bhubaneswar

(India). College of Veterinary and Animal Husbandry. Department of Veterinary Surgery and Radiology. Successful management of egg bound condition in Indian Cobra (*Naja naja*). Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.62-63 KEYWORDS: EGGS. HORMONAL CONTROL. SNAKES.

The present case report describes a rare case of egg bound condition in an Indian cobra (*Naja naja*) and its successful management by manual obstetrical maneuvers after hormonal induction failed to relieve the eggs.

139. Padhi, M.K.; ICAR-Project Directorate on Poultry, Hyderabad (India). Chatterjee, R.N.; ICAR-Project Directorate on Poultry, Hyderabad (India). Rajkumar, U.; ICAR-Project Directorate on Poultry, Hyderabad (India). Bhattacharya, T.K.; ICAR-Project Directorate on Poultry, Hyderabad (India). Bhanja, S.K.; ICAR-Project Directorate on Poultry, Hyderabad (India). Genetic and phenotypic parameters estimates for body weight, conformation, production and reproduction traits of PD1 (Vanaraja male line) during different periods. Indian Journal of Animal Sciences (India). (Aug 2015) v.85 (8) p.883-888 KEYWORDS: BODY WEIGHT. HERITABILITY. PRODUCTION. REPRODUCTION. BIRDS.

The present study was undertaken to investigate growth, conformation, and production and reproduction performance of PD1 (Vanaraja male line). The data collected for different periods from the birds were produced using 50 sires and 250 dams through pedigreed mating. Body weight was 640.21 g and shank length 75.39 mm at 6 weeks of age in pooled sex. In female the shank length increases faster up to 12 weeks of age and at 20 weeks it reached the maximum length, whereas other traits like body weight, keel length and breast angle increased up to 20 weeks of age. The ASM was 188 days and egg production up to 40 weeks of age was 46.29 eggs with egg weight at 40 weeks 54.61 g. The fertility % and hatchability % on total egg set and fertile egg set were 90.46, 83.20, and 91.38 %, respectively. The heritability estimates for juvenile body weight and conformation traits are low in magnitude. Growing period body weight showed moderate heritability estimates, whereas, conformation traits during growing period showed low to moderate heritability estimates. Egg production and age at sexual maturity showed low heritability estimates. Fertility and hatchability % showed moderate heritability estimates. Genetic and phenotypic correlation were estimated between different traits at different period and showed varying levels of correlations estimates. The results indicated that PD1 line has the potential for further improvement and to be used as male line to

produce backyard variety and to increase the performance of Vanaraja commercial.

140. Anilkumar, R.; Veterinary College and research institute, Namakkal (India). Dept. of veterinary gynaecology and obstetricslyue, M.; Tamil Nadu veterinary and animal sciences Unvi. Tamil Nadu (India). Sheep breeding research stationVenkataramanan, R.; Post graduate research institute in animal sciences, Kancheepuram (India). Growth and hatch performance of geese in hilly terrain of Nilgiris. Indian Journal of Animal Sciences (India). (Oct 2015) v.85 (10) p.1117-1119 KEYWORDS: GEESE. GROWTH RATE. EGG HATCHABILITY. HIGHLANDS.

141. Konch, H.; Deptt. Of Veterinary Physiology College of Veterinary Science, Assam Agriculture University, Khanapara (India) Dutta, Arup; Deptt. Of Veterinary Physiology College of Veterinary Science, Assam Agriculture University, Khanapara (India) Baruah, K. K.; Deptt. Of Veterinary Physiology College of Veterinary Science, Assam Agriculture University, Khanapara (India) Sinha, S.; Deptt. Of Veterinary Physiology College of Veterinary Science, Assam Agriculture University, Khanapara (India). Serum oestradiol -17 α and progesterone profile in Hampshire gilts following synchronization of oestrus by PGF 20c analogues. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.46-49 KEYWORDS: OESTROGENS. PROGESTERONE. PREGNANCY. SYNCHRONIZATION. ANIMALS. SOWS.

Following synchronization of oestrus by PGF₂ α analogue, serum oestradiol 17 β and progesterone concentration during different stages of gestation were carried out in a total 18 pubertal Hampshiregilts gilts reared in the Base Pig Breeding Farm, Department of Animal Husbandry and Veterinary, Government of Assam, Khanapara, Guwahati. The pubertal gilts were divided in to three group's viz. Group I and II as treated and Group III as control. Gilts of Group I received 5ml lliren during luteal phase of cycle whereas gilts of Group II received two injection of 5ml lliren at 11 days apart. The mean serum oestradiol and progesterone showed significantly ($P < 0.01$) higher and lower concentration respectively in all gilts of three experimental groups on the day of oestrus as compared to the concentration obtained during different days of gestation. During gestation, a significantly lower level of mean serum oestradiol-17 α and higher level of progesterone concentration was recorded whereas on the day of farrowing, the concentration again significantly increased and decreased for serum oestradiol-f Za and progesterone respectively in all the gilts of treated and control group.

142. Reetha Lurthu, T.; TANUVAS, Pudukottai (India). Regional Research Centre.Senthikumar, P.; TANUVAS, Pudukottai (India). Regional Research Centre.Jagtheesan Richard, P.N.; TANUVAS,

Pudukottai (India). Regional Research Centre.. Productivity of Emus under Pen and Run system of Management. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.41-42 KEYWORDS: EMUS. EGGS. CHICKS. PRODUCTION POSSIBILITIES. HATCHING.

The eggs collected from four emu breeding pairs in two laying seasons maintained in the emu research unit at TANUVAS Regional Research Centre, Pudukkottai, Tamil Nadu were used for this study. The birds were maintained under standard management practices. The mean egg production performance, the mean egg weight and the mean hatch weight of four emu pairs during 5 laying seasons were 40.5 ± 3.22 , 570.03 ± 4.17 g and 410.63 ± 5.66 g respectively and the 6 laying seasons were 30.75 ± 1.65 , 583.46 ± 3.80 g and 414.14 ± 5.47 g respectively. The hatching performance analysis of 5 laying seasons indicated that the per cent total egg hatchability, fertile hatchability and dead in shell were 72.66, 93.5 and 6.93 respectively. The hatching performance of 6 laying seasons indicated that the per cent total egg hatchability, fertile hatchability, early embryonic mortality, late embryonic mortality and dead in shell were 36.6, 52.5, 9.8, 5.35 and 15.17 respectively.

143. Premavalli, K.Ramamurthy, N.Omprakash, A.V.Balakrishnan, V.Rao Appa, V. Influence of age on internal egg quality characteristics of Guinea fowl. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.48-50 KEYWORDS: AGE. LAYING PERFORMANCE. GUINEA FOWL.

Internal egg quality was assessed on 456 guinea fowl eggs collected from 20 to 95 weeks of age. Significant ($P < 0.01$) increasing trend in egg weight, albumen index, Haugh unit and yolk index was observed as the age increased from 20 to 47 weeks and decline gradually thereafter to reach the lowest level between 56-59 weeks of age, then a second increasing trend was observed from 60 weeks up to 95 weeks of age coinciding with the peak trends of egg production. The present study suggested that the guinea fowl eggs had superior Haugh unit and yolk index.

144. Nath, I.; OUAT, Bhubaneswar (India). College of Veterinary and Animal Husbandry. Department of Veterinary Surgery and Radiology. Biswal Shuvranshu, Sh.; OUAT, Bhubaneswar (India). College of Veterinary and Animal Husbandry. Department of Veterinary Surgery and Radiology. Samantara, S.; OUAT, Bhubaneswar (India). College of Veterinary and Animal Husbandry. Department of Veterinary Surgery and Radiology. Successful management of egg bound condition in Indian Cobra (*Naja naja*). Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.62-63 KEYWORDS: EGGS. HORMONAL CONTROL. SNAKES.

The present case report describes a rare case of egg bound condition in an Indian cobra (*Naja naja*) and its successful management by manual obstetrical maneuvers after hormonal induction failed to relieve the eggs.

L70 Veterinary science and hygiene

145. Balwada, Ashok Kumar; Indian Veterinary Research Institute, Izatnagar (India). Division of Veterinary Surgery and Radiology Sandeep, Kumar; Indian Veterinary Research Institute, Izatnagar (India). Division of Veterinary Surgery and Radiology Sharma, Ashok Kumar; Indian Veterinary Research Institute, Izatnagar (India). Division of Veterinary Surgery and Radiology Naveen, Kumar; Indian Veterinary Research Institute, Izatnagar (India). Division of Veterinary Surgery and Radiology Maiti, Swapan. Kumar; Indian Veterinary Research Institute, Izatnagar (India). Division of Veterinary Surgery and Radiology Singh, M. K.; G. B. Pant University of Agriculture and Technology, Pantnagar (India). Department of LPMSathapathy, S.; G. B. Pant University of Agriculture and Technology, Pantnagar (India). Department of Veterinary Anatomy Goyal, Jayant; Indian Veterinary Research Institute, Izatnagar (India). Division of Veterinary Surgery and Radiology. Effect of fibroblast cell in full thickness skin wound healing in rat model. International Journal of Basic and Applied Agricultural Research. (Dec 2015) v.13 (3) p.446-449 KEYWORDS: FIBROBLASTS. WOUNDS. HEALING. RATS. MODELS. SKIN. THICKNESS.

The present study was conducted in eighteen wistar rats of either sex divided into two equal groups (n=9) to evaluate the healing potential of fibroblast cell. Full thickness skin wound (20X20 mm²) was created on dorsal region of thorax of adult wistar rats. Topical application of paraffin gauze over the wound acted as control (Group- A). In second group (Group-B) animals were treated with fibroblast cells locally. Early granulation tissue formation with reduced exudation and peripheral swelling was observed in treatment group-B. In group-B, complete wound healing was observed on day 22-23, whereas in group-A on day 27-28.

L72 Pests of animals

146. Ravindran, Reghu; College of Veterinary and Animal Sciences, Wayanad (India). Chithra, Nayikottummal Devadas; College of Veterinary and Animal Sciences, Wayanad (India). Deepa, Pattanpur Edathil; College of Veterinary and Animal Sciences, Wayanad (India). Juliet, Sanis; College of Veterinary and Animal Sciences, Wayanad (India). Kumar, Karapparambu Gopalan Ajith; College of Veterinary and Animal Sciences, Wayanad (India). Nair, Suresh Narayanan; College of Veterinary and Animal Sciences, Wayanad (India). Udayan, Darsana; College of Veterinary and Animal Sciences, Wayanad (India). Nanjudappa, Sathish; College of Veterinary and Animal Sciences, Wayanad (India). Chandrasekhar, Leena; College of Veterinary and Animal Sciences, Wayanad (India). Ghosh, Srikanta; College of Veterinary and Animal Sciences, Wayanad (India)..

Contrasting effects of ethanolic extracts of leaf and flower of *Chromolaena odorata* against *Rhipicephalus (Boophilus) annulatus*. *Indian Journal of Animal Sciences (India)*. (Aug 2015) v.85 (8) p.844-848 KEYWORDS: LEAVES. FLOWERS. CHROMOLAENA ODORATA. RHIPICEPHALUS.

In the present study, ethanolic extracts of leaves and flowers of *Chromolaena odorata* were compared at different dilutions (6.2 mg/mL, 12.5 mg/mL, 25 mg/mL, 50 mg/mL and 100 mg/mL) for their efficacy against ticks. Per cent adult mortality, inhibition of fecundity and hatching of laid ova were studied. Leaf extract did not cause any adult tick mortality. The negative values for the per cent inhibition of fecundity observed with the leaf extract indicated that it promoted egg lying. On the contrary, the ethanolic extract of flowers at 10% concentration caused 62% adult tick mortality and 80% inhibition of fecundity. However, both extracts did not produce any change in the hatching of the laid ova by treated ticks.

L73 Animal diseases

147. Palanisamy, M. Napoleam Ezakial, R. Selvaraju, M. Balasubramanian, G.A. Krishnakumar, K.Manokaran, S. Efficacy of immunomodulators, Lugol's Iodine and PGF₂ on the bacterial load in the endometritis affected cows. *Indian Veterinary Journal (India)*. (Jul 2015) v.92 (7) p.56-58 KEYWORDS: IODINE. PROSTAGLANDINS. BACTERIA. COWS.

The present study was conducted to assess the efficiency of immunomodulators in controlling the microbial load in endometritis cows in comparison with Lugol's Iodine (LI) and Prostaglandin F_{2a} (PGF_{2a}). A total of 72 cross-bred cows divided equally in to six groups viz. Group I - treated with 30 ml of 2 per cent Lugol iodine for 3 days, Group II, III and IV - single intrauterine dose of 30 ml PBS containing 100 ug of *E. coli* LPS, 2 mg of L YZs and 500 mg of OG, respectively, Group V - 25 mg of PGF_{2a} and Group VI- control cows given 30 ml of PBS intra-uterine. The bacterial colony counts recorded were significantly ($P < 0.01$) reduced after treatment. The elimination of bacterial load was better in the immunomodulator treated groups than other groups. *E. coli* LPS was found to be most effective in controlling uterine infections followed by LYZ and OG.

148. Jayanthi, D.; TANUVAS, Pottaneri (India). Mecheri Sheep Research Station. Murali, N.; TANUVAS, Pottaneri (India). Mecheri Sheep Research Station. Arun, L.; TANUVAS, Pottaneri (India). Mecheri Sheep Research Station. Senthilkumar, P.; TANUVAS, Pottaneri (India). Mecheri Sheep Research Station. Udhayavel, S.; TANUVAS, Pottaneri (India). Mecheri Sheep Research Station. Rekha, B.; TANUVAS, Pottaneri (India). Mecheri Sheep Research Station.. Correction of rectal prolapse in Salem Black kid... *Indian Veterinary Journal (India)*.

(Jul 2015) v.92 (7) p.63-64 KEYWORDS: DIGESTIVE SYSTEM DISEASES. DISEASE CONTROL.

A five weeks old Salem black female kid was referred with a history of dullness, cough, strain- ing for defecation/urination and protrusion of red coloured mass from the anus. On clinical examination, protrusion of rectal mucosa was observed. The kid was stabilized; the prolapsed rectal mucosa was cleansed, repositioned and retained by purse-string suture. The animal recovered with normal defecation and urination.

149. Singh, Satyaveer; Mahatma Gandhi Veterinary Collge, Bharatpur (India). Department of Veterinary Surgery and Radiology. Bharti, B.; Mahatma Gandhi Veterinary Collge, Bharatpur (India). Department of Veterinary Surgery and Radiology.. Management of complete hoof capsule avulsion in a Foal: A case report. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.64-65 KEYWORDS: HOOVES. FOALS. MANAGEMENT.

A six month old foal was presented with the history of accidental injury by automobile on his right fore limb and whole hoof get avulsed with bleeding and slight portion of the coronary band was present. Foal was sedated with Xylazine hydrochloride 0.5mg/kg bwt and Butorpha- nol tartarate 0.01mg/kg bwt, IN and treated with inj. Haemocoagulase 1.5ml, IN, Tetanus Toxoid 2.5 ml, 11M, procaine penicillin 20000 IU/kg bwt, 11M, phenylbutazone 4.4mg/kg bwt, IN and dressing of injured area with help of 0.5% povidone iodine solution and sufficient padding and bandaging of the exposed sensitive part of foot was done. For the next seven days, treatment was continued. Wound was healed and complete recovery occurs after eight months of injury.

150. Manokaran, S.; Vateriaary College and Research Institute, Namakal (India). Department of Animal Reproduction, Gynaecology and bstetrics. Palanisamy, M.; Vateriaary College and Research Institute, Namakal (India). Department of Animal Reproduction, Gynaecology and Obstetrics. Selvaraju, M.; Vateriaary College and Research Institute, Namakal (India). Department of Animal Reproduction, Gynaecology and Obstetrics. Prabakaran, V.; Vateriaary College and Research Institute, Namakal (India). Department of Animal Reproduction, Gynaecology and Obstetrics. Napoleon Ezakial, R.; Vateriaary College and Research Institute, Namakal (India). Department of Animal Reproduction, Gynaecology adn Obstetrics.. Dystocia due to Fetal Giantism with Brachygnathism in a Sirohi Ewe. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.66-67 KEYWORDS: CAESAREAN SECTION. DYSTOCIA.

A rare case of fetal giantism with brachygnathism in a Sirohi ewe caused dystocia was treated by cesarean section and is reported.

151. Kumbhakar, N.K.; Chhattisgarh Kamdhenu Vishwavidyalaya, Anjora (India). College of Veterinary Science and Animal Health. Department of Veterinary Parasitology. Dewangan, B.K.; Chhattisgarh Kamdhenu Vishwavidyalaya, Anjora (India). College of Veterinary Science and Animal Health. Department of Veterinary Parasitology. Kumar, Bhupendra; Chhattisgarh Kamdhenu Vishwavidyalaya, Anjora (India). College of Veterinary Science and Animal Health. Department of Veterinary Parasitology. Sanyal, P.K.; Chhattisgarh Kamdhenu Vishwavidyalaya, Anjora (India). College of Veterinary Science and Animal Health. Department of Veterinary Parasitology. Bovine Nasal Granuloma in a non-descript Bullock.. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.67-68
KEYWORDS: NOSE. GRANULOMA. BULLOCKS. SCHISTOSOMA.

Nasal granuloma is caused by the blood fluke *Schistosoma nasalis* adversely affects the health and production of domestic livestock in various parts of India. The present report describes the occurrence of bovine nasal granuloma in a non-descript bullock from village Thanud of Durg (Chhattisgarh). Clinical examination revealed mucopurulent bloody nasal discharge, snoring sound and cauliflower-like granulomatous growth in the nasal cavity. Microscopical examination of nasal discharges revealed boomerang-shaped eggs of *S. nasalis*. The bullock was treated with anthiomaline 20 ml deep i/m injection on three occasions at intervals of 1 week. The bullock responded well and recovered completely after the 3rd injection.

152. Rangasamy, S.; Madras Veterinary College, Chennai (India). Department of Animal Reproduction, Gynaecology and Obstetrics. Sarath, T.; Madras Veterinary College, Chennai (India). Department of Animal Reproduction, Gynaecology and Obstetrics. Balasubramanian, S.; Madras Veterinary College, Chennai (India). Department of Animal Reproduction, Gynaecology and Obstetrics. Clinical management of Multiple Vaginal Tear in Prepartum Vagino-Cervical Prolapse in a non-descript Buffalo. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.69-70
KEYWORDS: VAGINAL DISEASES. WATER BUFFALOES.

A pluriparous non-descript buffalo at nine months of gestation was presented to Madras Veterinary College Teaching Hospital with history of continuous straining and frequent prolapse of vagina and cervix for the past five days. Under epidural anaesthesia, vaginal examination revealed blood clots and raw blood oozing out from the vaginal tear. Following surgical repair, the mass was reduced and repositioned. The animal had an uneventful recovery following treatment with antibiotic, anti-inflammatory and anti-histamine for five consecutive days.

153. Jarora, V.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). College of Veterinary Science.

Department of Veterinary Gynaecology and Obstetrics.Singh, A.K.; Guru Angad Dev Veterinary and Aniaml Sciences University, Ludhiana (India). College of Veterinary Science. Department of Veterinary Gynaecology and Obstetrics.Zodinsanga, V.; Guru Angad Dev Veterinary and Aniaml Sciences University, Ludhiana (India). College of Veterinary Science. Department of Veterinary Gynaecology and Obstetrics.Singla, V.K.; Guru Angad Dev Veterinary and Aniaml Sciences University, Ludhiana (India). College of Veterinary Science. Department of Veterinary Gynaecology and Obstetrics.Brar, P.S.; Guru Angad Dev Veterinary and Aniaml Sciences University, Ludhiana (India). College of Veterinary Science. Department of Veterinary Gynaecology and Obstetrics.Singh, T.; Guru Angad Dev Veterinary and Aniaml Sciences University, Ludhiana (India). College of Veterinary Science. Department of Veterinary Gynaecology and Obstetrics.Fetal Arthrogyrosis causing Dystociaina in a Mare. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.74-75 KEYWORDS: DYSTOCIA. MARES. MANAGEMENT.

A rare case of dystocia in a mare due to fetal arthrogyrosis and its successful management is described.

154. John; Tamil Nadu Veterinary and Animal Sciences University, Chennai (India). Madras Veterinary College. Department of Veterinary Pathology.Dhinkar Raj, G.; Tamil Nadu Veterinary and Animal Sciences University, Chennai (India). Madras Veterinary College. Department of Veterinary Pathology.Sridhar, R.; Tamil Nadu Veterinary and Animal Sciences University, Chennai (India). Madras Veterinary College. Department of Veterinary Pathology.Selvasubramaniam, S.; Tamil Nadu Veterinary and Animal Sciences University, Chennai (India). Madras Veterinary College. Department of Veterinary Pathology.. Hepatic Abscess in Sheep and Goat caused by O26 Escherichia Coli serotype: An emerging pathogen. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.76-79 KEYWORDS: LIVER DISEASES. ABSCESSSES. SHEEP. GOATS. ESCHERICHIA COLI.

Liver abscess is a major economic problem in meat industry due to condemnation of edible part of carcass. In this study, an incidence 0.224% (56/25000) of hepatic abscess was recorded. Escherichia coli was isolated in highest number of cases which showed metallic sheen on eosin methylene blue agar in 12 cases (21.48%). Serotype O26 E. coli was identified and, recognized as an emerging pathogen. Other pathogens isolated were Streptococcus spp., Fusobacterium necrophorum, Staphylococcus spp., Corynebacteria spp. and Pseudomonas spp. Grossly, single to multiple and minute to large creamy-yellow coloured abscesses of varying sizes were found on both parietal and visceral surfaces of liver. Histologically, the abscesses consisted of central areas of liquefactive necrosis

surrounded by numerous polymorphonuclear neutrophils, few mononuclear cells, calcified centers and colonies of bacteria.

155. Maansi; GBPUAT, Pantnagar (India). College of Veterinary and Animal Sciences. Department of Veterinary Public Health and Epidemiology. Upadhyay, A.K.; GBPUAT, Pantnagar (India). College of Veterinary and Animal Sciences. Department of Veterinary Public Health and Epidemiology. Antibiotic susceptibility of Smooth Brucella Abortus S99 and Rough Brucella Melitensis B115 Strains. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.80-81 KEYWORDS: BRUCELLAABORTUS. ANTIBIOTICS. DISEASE CONTROL.

Brucellosis is an economically devastating and highly infectious zoonosis. The disease has attained a re-emerging and a wide range of domestic and wild animals are being involved. In humans, the disease ranges from a febrile illness to a more complicated form. The disease has been reported globally with endemic pockets worldwide. Brucella organisms occur in smooth and rough forms. Virulency of smooth forms is more than the rough forms. The clinical isolates of Brucella are generally susceptible to the antibiotics but with the increase in drug resistance, the antibiotic susceptibility of the organisms is to be ensured for effective therapeutic results and to prevent relapse of the disease.

156. Konwar, B.; Central Agricultural University, Aizwal (India). College of Veterinary Sciences and Animal Husbandry. Department of Veterinary Surgery and Radiology. Saikia, B.; Central Agricultural University, Aizwal (India). College of Veterinary Sciences and Animal Husbandry. Department of Veterinary Surgery and Radiology. Bayan, H.; Central Agricultural University, Aizwal (India). College of Veterinary Sciences and Animal Husbandry. Department of Veterinary Surgery and Radiology.. Survey of Foot Affections in Mizoram dairy animals. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.82-83 KEYWORDS: CATTLE. FEET. FOOT DISEASES. MOVEMENT DISORDERS.

Stall fed cattle were surveyed for lameness and the prevalence of clinical lameness was found to be 20.4% (204), out of which fore limb (50, 24.51 %) affection was significantly less than hind limb (154, 79.49%) and sole ulcer was recorded (68, 33.33%). Overgrowth of hoof was significantly more in lateral claws for hind limb (130, 84.42%) than medial claws for fore limb (38, 76%). Lactating cows in first four weeks after calving between 2-5 years of age were found to be most sensitive. Key words: Foot affections survey cattle.

157. Ponnusamy, P.; Veterinary College and Research Institute, Orathanadu (India). Department of Veterinary Microbiology. Chitra Ananda, M.; Veterinary College and Research Institute, Orathanadu (India). Department of Veterinary Microbiology. Kumar Ranjith, M.; Veterinary College and Research Institute, Orathanadu (India).

Department of Veterinary Microbiology. Ramesh, A.; Veterinary College and Research Institute, Orathanadu (India). Department of Veterinary Microbiology. . Infectious Bovine Corneal Ulceration associated with Methicillin resistant Staphylococcus Aureus in a dairy Cow: A case report. Green Farming. (Jul 2015) v.92 (7) p.83-84
KEYWORDS: EYE DISEASES. ANTIBIOTICS. STAPHYLOCOCCUS AUREUS. COWS.

A 2 year old female Jersey cross bred dairy cattle was presented to the Teaching Veterinary Clinical Complex, Veterinary College and Research Institute, Orathanadu, Thanjavur Dt, Tamilnadu with history of bilateral corneal ulceration, lymph node enlargement and bruxism. Samples were taken from affected eyes using a sterile swab for bacterial isolation and identification. Staphylococcus aureus was isolated and identified and it was found to be most sensitive to Tetracycline, Enrofloxacin, Gentamicin and Amikacin and resistant to penicillin, ampicillin and methicillin. Animal was treated with gentamicin systemically and locally and completely recovered with restoration of vision in 5 days of treatment duration.

158. Simon Shiju, M.; Veterinary College and Research Institute, Tirunelveli (India). Teaching Veterinary Clinical Complex. Gupta, Chhavi; Veterinary College and Research Institute, Tirunelveli (India). Teaching Veterinary Clinical Complex. Kumar Sasi, S.; Veterinary College and Research Institute, Tirunelveli (India). Teaching Veterinary Clinical Complex. Ramprabhu, R.; Veterinary College and Research Institute, Tirunelveli (India). Teaching Veterinary Clinical Complex. Pazhanivel, N.; Veterinary College and Research Institute, Tirunelveli (India). Teaching Veterinary Clinical Complex. Prathaban, S.; Veterinary College and Research Institute, Tirunelveli (India). Teaching Veterinary Clinical Complex. Plate-Rod technique for the management of Diaphyseal Humeral fracture in a Dog: A case report.. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.85-86
KEYWORDS: LIMB BONES. FRACTURE FIXATION. DOGS.

A three year old Chippiparai male dog was subjected to physical examination of humerus revealed pain, swelling and crepitus. Confirmative diagnosis of an unstable humeral diaphyseal fracture was made by radiographic evaluation. It was treated by open reduction and internal fixation accomplished using a 3.5mm dynamic compression plate applied over the tension surface of the bone and additional stability was provided by insertion of 3mm of intramedullary steinmann pin. Normal weight bearing was noticed on immediate post operative day and the animal recovered uneventfully gaining normal mobility.

159. Ramakrishnas, K.V.; Animal Disease Diagnostic Laboratory, West Godavari (India). Rao Sudersana, K.; Animal Disease Diagnostic Laboratory, West Godavari (India). Nageshbabu, M.; Animal Disease

Diagnostic Laboratory, West Godavari (India).. Incidence of Ram Lamb mortalities in a commercial farm.. The Indian Journal of Nutrition and Dietetics. (Jul 2015) v.92 (7) p.95-96 KEYWORDS: LAMBS. MORTALITY. FARM AREA. FARMS.

Containment of mortalities is key for successful commercial ram lamb farming. Incidence of mortalities in commercial farms fluctuates between 10-24% (Reddy and Choudhury 2000, Srinivasan et al., 2003). Factors like selection of lambs, stocking, live weight, adequacy of colostrum, maternal acquired immunity, deworming, mode of transportation, biosecurity, climate can influence lamb mortalities. An attempt was made to investigate into the etiopathogenesis of unusually high mortalities among ram lambs in a commercial farm.

160. Pal, Papri; ICAR, Gangtok (India). Research Complex for NEH Region. Sikkim Centre. Chatlod, L.R.; ICAR, Gangtok (India). Research Complex for NEH Region. Sikkim Centre. Bandyopadhyay, S.; ICAR, Gangtok (India). Research Complex for NEH Region. Sikkim Centre. Rahman, H.; ICAR, Gangtok (India). Research Complex for NEH Region. Sikkim Centre. Avasthe, R.K.; ICAR, Gangtok (India). Research Complex for NEH Region. Sikkim Centre.. Epidemiology of Nematodirus filicolis infection in goats in temperate humid zone of Sikkim.. Indian Journal of Animal Sciences (India). (Aug 2015) v.85 (8) p.840-843 KEYWORDS: EPIDEMIOLOGY. NEMATODIRUS. INFECTION. GOATS. HUMID CLIMATE.

Out of 9,480 faecal samples examined, 1,622 (17.11 %) were positive with a eggs per gram of faeces (EPG) range of 100-700. Highest prevalence was observed in May (26.57%). Examination of small intestines of slaughtered goats (365) showed 12.39% incidence of N. filicolis infection with worm count in the range of 2.22 - 18.17. The female/male ratio was 0.153. The incidence was more prevalent in animals above 2 years of age (11.96%) followed by 1-2 year (9.38%) while those below 1 year of age showed only 3.45% prevalence. Moreover, the prevalence was more in spring (22.44%) and summer (21.07%) compared with autumn (15.47%) and winter (9.08%).

161. Kumari, Shudha; BVC, Patna (India). Dept. of Veterinary Microbiology. Kumar, Rajesh; BVC, Patna (India). Dept. of Veterinary Surgery and Radiology. Kumari, Archana; BVC, Patna (India). Dept. of Veterinary Surgery and Radiology. Kumar, Pankaj; BVC, Patna (India). Dept. of Veterinary Parasitology.. Gross and histopathological study of artificially infected Salmonella gallinarum in poultry birds. Journal of Interacademia (India). (Apr 2015) v19 (2) p.224-226 KEYWORDS: SALMONELLA GALLINARUM. EXPERIMENTAL INFECTION. POULTRY. BIRDS. KIDNEYS.

Fowl typhoid in poultry causes a high morbidity and mortality. Therefore, present study was done to early diagnosis of fowl typhoid

and so that mortality can be presented. For this study chicks were divided randomly in to two groups as infected' group and control at the age of 3 weeks. Infected groups were infected with Salmonella gallinarum inoculation intraperitoneally. Post-mortem examination of infected dead chicks showed gross pathological change in liver spleen kidney and heart. Histopathological change also observed in liver intestine, kidney spleen and heart. These changes help in diagnosis of fowl typhoid.

162. Jena, Basanti; CVSc & AH, OUAT, Bhubaneswar (India). Dept. of Animal Reproduction, Gynaecology and Obstetrics. Mohanty, D.N.; CVSc & AH, OUAT, Bhubaneswar (India). Dept. of Animal Reproduction, Gynaecology and Obstetrics. Das, S.; CVSc & AH, OUAT, Bhubaneswar (India). Dept. of Animal Reproduction, Gynaecology and Obstetrics. Das, D.; CVSc & AH, OUAT, Bhubaneswar (India). Dept. of Pathology.. Study on Uterine Microbial characteristic in repeat breeding cows with Endometritis. Journal of Interacademia (India). (Apr 2015) v19(2) p.231-234 KEYWORDS: BACTERIA. BACTERIA. ESCHERICHIA COLI. STREPTOCOCCUS. ISOLATION TECHNIQUES. ENDOMETRITIS.

The present investigation was carried out to study the changes in uterine microbial environment in repeat breeding cows with endometritis. Ten repeat breeding cows suffering from endometritis as confirmed by alkaline pH of cervical mucus discharge and positive white slide- test along with ten no. of normal cyclic cows were selected for the study. The mean bacterial load of cervical mucus discharge at estrous increased significantly in endometritic cows. Escherichia coli were the most common bacterial isolate followed by Streptococcus spp. and Staphylococcus spp.

163. Jena, Basanti; CVSc & AH, OUAT, Bhubaneswar (India). Dept. of Animal Reproduction, Gynaecology and Obstetrics. Mohanty, D.N.; CVSc & AH, OUAT, Bhubaneswar (India). Dept. of Animal Reproduction, Gynaecology and Obstetrics. Das, S.; CVSc & AH, OUAT, Bhubaneswar (India). Dept. of Animal Reproduction, Gynaecology and Obstetrics. Das, D.; CVSc & AH, OUAT, Bhubaneswar (India). Dept. of Pathology. Sahoo, G.R.; CVSc & AH, OUAT, Bhubaneswar (India). Dept. of Veterinary Biochemistry.. Study on Haemo-Biochemical profile in Endometritic Cows.. Journal of Interacademia (India). (Apr 2015) v19 (2) p.235-239 KEYWORDS: ENDOMETRITIS. COWS. BLOOD. BIOCHEMISTRY.

The present investigation was carried out to study the changes in haematological and serum biochemical parameters in repeat breeding cows with endometritis. Ten repeat breeding cows suffering from endometritis as confirmed by alkaline pH of cervical mucus discharge and positive white side test along with ten no. of normal cyclic cows were selected for the study. The mean haemoglobin, total

erythrocyte count, packed cell volume, lymphocyte and monocyte count as well as total protein and globulin level in serum decreased significantly in endometritic cows. The total leucocyte count, neutrophil count along with the enzymes AST, ALT, ACP and ALP increased significantly in endometritic cows compared to normal cows.

164. Das, Arvind Kumar; Bihar Veterinary College, Patna (India).Gautam, Avnish Kumar; Bihar Veterinary College, Patna (India).Kumar, Rajesh; Bihar Veterinary College, Patna (India). Dept. of Veterinary Surgery and Radiology.Singh, Manoj Kumar; Bihar Veterinary College, Patna (India). Mange infestations in Rabbits and its therapeutic amelioration. Journal of Interacademia (India). (Apr 2015) v19 (2) p.240-242 KEYWORDS: MANGE. THERAPY. RABBITS.

A study was conducted on 1 to 2 years old New Zealand white rabbits have brought for the treatment suffering from severe dermatitis and alopecia at Teaching Veterinary Clinical Complex, Bihar Veterinary College, Patna.Detailed clinical examination revealed that, the skin was wrinkled and huge dry crust like formation was present on the facial region, upper part of the neck, ears, around the eyes and on nostril. The rabbits were treated with the three doses of subcutaneous injection of Ivermectin (Neomec) (Intas Pharmaceuticals Ltd.) 200 ug/kg body weight on 0 day, 7th day and 14th day from the first injection. Immunomodulator and nutritional supplement Proviboost drop (Petcare Animal Health Divn.) was also used S drops orally twice a day for 5 days as supportive therapy because animal was suffering from the anorexia. A skin lotion Kiskin (Intas Pharmaceuticals Ltd.) was used for the topical application on the lesion for faster recovery in skin texture.

165. Begum, Jubeda; Indian Veterinary Research Institute, Uttar Pradesh (India). Div. of Bacteriology and Mycology.Dutta, Tapan Kumar; College of Veterinary Science and Animal Husbandry, Mizoram (India). Dept. of Veterinary Microbiology.Choudhary, Primal Roy; College of Veterinary Science and Animal Husbandry, Mizoram (India). Dept. of Veterinary Microbiology.Chandra, Rejesh; College of Veterinary Science and Animal Husbandry, Mizoram (India). Dept. of Veterinary Microbiology.Varte, Zomuankima; College of Veterinary Science and Animal Husbandry, Mizoram (India). Dept. of Veterinary Microbiology.. Antimicrobial assay of shigatoxigenic E. coli (STEC) and enteropathogenic E. coli (EPEC) isolated from diarrhoeic faecal samples of piglets and infants in Mizoram. Indian Journal of Animal Sciences (India). (Oct 2015) v.85 (10) p.1067-1072 KEYWORDS: ANTIMICROBIALS. PATHOGENS. DIARRHOEA. MIZORAM. INFANTS.

Antimicrobial resistance is a common problem which is accelerating day by day in veterinary medicine. The main reason is believed to be the indiscriminate and irrational use of antibiotics.

Diarrhoeic faecal samples (584: 320 from piglets and 264 from infants) were collected from different farms and hospitals located in different districts of Mizoram. Out of 1,260 *E. coli* isolates, 65 (5.15%) *E. coli* isolates were found positive for at least 1 virulence gene (*stx1*, *stx2*, *eaeA*, *hlyA*) under the study, of which 40 (3.17%) and 25 (1.98%) were recorded as STEC and EPEC, respectively, when screened by multiplex PCR. All the 65 *E. coli* isolates were subjected to antimicrobial sensitivity test against 12 commonly used antimicrobial agents. Among the isolates from piglets, highest sensitivity was exhibited by chloramphenicol (89.58%) and highest resistance by nalidixic acid (85.41%). On the other hand, enrofloxacin exhibited 100% sensitivity while amoxicillin, polymyxin B and kanamycin exhibited 100% resistance among the infant isolates. It may be concluded that 5.15% isolates were positive for virulence and the isolates showed increased tendency of resistance against many of the commonly used antibiotics reflecting a greater threat to treat the commonly occurring diseases with antibiotics.

166. Kamble, S.Y.; Bombay Veterinary College, Mumbai (India). Dept. of Microbiology Gandge, R.S.; Bombay Veterinary College, Mumbai (India). Dept. of Microbiology Majee, S.B.; Bombay Veterinary College, Mumbai (India). Dept. of Microbiology. Diagnosis of poultry mycoplasmosis by cultural isolation and PCR. Indian Journal of Animal Sciences (India). (Oct 2015) v.85(10) p.1073-1076
KEYWORDS: CULTURAL METHODS. MYCOPLASMA GALLISEPTICUM. POULTRY.

The present investigation was designed for diagnosis of poultry mycoplasmosis by cultural isolation and PCR assay. Clinical specimens (159: 47 lungs, 21 trachea, and 91 choanal cleft swabs) of poultry were simultaneously subjected to cultural isolation of *Mycoplasma* spp., PCR for detection of mycoplasmosis and for isolation of *E. coli*. Isolation of *Mycoplasma* spp. was carried out using pleuropneumonia like organism (PPLO) medium. Identification of genus *Mycoplasma* and differentiation from *Acholeplasma* and *Ureaplasma* was done by conventional methods. A total of 15 isolates were identified as *Mycoplasma* spp. with isolation rate of 9.43%. In MG (*Mycoplasma gallisepticum*) and MS (*Mycoplasma synoviae*) species specific 16S rRNA PCR assay, all 15 isolates were confirmed as MG species. Direct detection of mycoplasmosis in 159 clinical specimens by PCR, targeting MG and MS species-specific 16S rRNA gene, revealed 108 (67.92%) positive specimens. Out of 108, 105 (66.04%) and 3 (1.86%) were positive for MG and MS respectively. *E. coli* was found to be major pathogen associated with poultry mycoplasmosis in 28 MG-PCR positive cases out of 42 *E. coli* isolates recovered. Comparative results of PCR and cultural isolation showed that 16S rRNA MG and MS species specific PCR is superior to cultural

isolation for crucial, rapid, specific and sensitive detection of poultry mycoplasmosis directly in clinical specimens.

167. Shome, R.; National Institute of Veterinary Epidemiology and Disease Informatics, Bengaluru (India) Nagalingam, M; National Institute of Veterinary Epidemiology and Disease Informatics, Bengaluru (India) Shome, B.R.; National Institute of Veterinary Epidemiology and Disease Informatics, Bengaluru (India) Misri, Jyoti; Krishi Bhavan, New-Delhi (India). Div. of animal science Padmashree, B.S.; National Institute of Veterinary Epidemiology and Disease Informatics, Bengaluru (India) Kamal, A.; National Institute of Veterinary Epidemiology and Disease Informatics, Bengaluru (India) Bambal, R.G.; Ministry of Agriculture, New-Delhi (India). Dept. of Animal Husbandry, Dairying and Fisheries. Rahman, H.; National Institute of Veterinary Epidemiology and Disease Informatics, Bengaluru (India). Milk ring test from lab to field: A surveillance strategy for states under brucellosis control program. Indian Journal of Animal Sciences (India). (Oct 2015) v.85 (10) p.1077-1080
KEYWORDS: MILK. BRUCELLOSIS. ELISA. FIELDS.

168. Roy, Rakesh; Darjeeling Krishi Vigyan Kendra, UBKV, West Bengal (India) Tiwari, Rupasi; Indian veterinary research institute, Uttar Pradesh (India) Dutt, Triveni; Indian veterinary research institute, Uttar Pradesh (India). Incidence of important goat diseases and economic losses under field condition. Indian Journal of Animal Sciences (India). (Oct 2015) v.85 (10) p.1084-1086
KEYWORDS: LOSSES. ENTEROTOXINS. POISONING. GOATS. CAPRIPOXVIRUS. MORBIDITY. MORTALITY. PEST OF SMALL RUMINANTS. FIELDS.

169. Kumar, N. Vinod; College of Veterinary Science, Andhra Pradesh (India). Department of Veterinary Microbiology Rao, K. Ananda; College of Veterinary Science, Andhra Pradesh (India). Department of Veterinary Microbiology A. Karthik; College of Veterinary Science, Andhra Pradesh (India). Department of Veterinary Microbiology G. Sudheer Babu; College of Veterinary Science, Andhra Pradesh (India). Department of Veterinary Microbiology. Prevalence of Multiple Serovars of *Leptospira* in Organized Buffalo Farm. Indian Veterinary Journal (India). (Dec 2015) v.92 (12) p.72-73
KEYWORDS: LEPTOSPIRA. LEPTOSPIROSIS.

The present report deals with prevalence of leptospirosis in murrh buffaloes in buffalo research station at Venkataramagudem, Andhra Pradesh. The animals were reported to be showing the symptoms of abortions and haemogalactia. The disease was confirmed by MAT. Out of 10 animals screened by MAT, 6 animals (60%) were found to be positive, out of which 4 animals (40%) were found to be infected with more than one serovars. All the animals were treated with high doses of oxytetracycline intramuscularly. All

the treated animals were recovered after treatment with oxytetracycline.

170. Chandrasekaran, D.; Department of Veterinary Clinical Medicine, Ethics and Jurisprudence, Madras Veterinary College, TANUVAS, Tamil Nadu (India) Kavitha, S.; Department of Veterinary Clinical Medicine, Ethics and Jurisprudence, Madras Veterinary College, TANUVAS, Tamil Nadu (India) Subapriya, S.; Department of Veterinary Clinical Medicine, Ethics and Jurisprudence, Madras Veterinary College, TANUVAS, Tamil Nadu (India) Nambi, P. A.; Department of Veterinary Clinical Medicine, Ethics and Jurisprudence, Madras Veterinary College, TANUVAS, Tamil Nadu (India) Thirunavukkarasu, S. P.; Department of Veterinary Clinical Medicine, Ethics and Jurisprudence, Madras Veterinary College, TANUVAS, Tamil Nadu (India) Vairamuthu; Department of Veterinary Clinical Medicine, Ethics and Jurisprudence, Madras Veterinary College, TANUVAS, Tamil Nadu (India). Haemato biochemical alternations of resistant mastitis in dairy cows. The Indian Veterinary Journal (India). (Dec 2015) v.92 (12) p.11-13 KEYWORDS: BLOOD. BIOCHEMISTRY. GLOBULINS. MEDICAL SCIENCES. VETERINARY MEDICINE. DRUGS.

The present study was undertaken to study the haemato biochemical alterations of drug resistant mastitis in dairy cows. Out of 401 milk samples, resistant mastitis was detected in 234 milk samples accounting to 56.1 per cent with the predominant resistant causative pathogen was E.coli (50.64 per cent) followed by S.aureus (44.25 per cent) and MRSA (5.11 Per cent). Haemato biochemical changes were reduced Hb, PCV, and TEC, leukocytosis with neutrophils, lymphopenia, hypoalbuminemia and hyperglobulinemia. A significant increase in ALP and AST were observed which might reflect the negative energy balance and fatty liver.

171. Nety, Sharddha; Department of Veterinary Pharmacology & Toxicology, College of Veterinary Sciences and Animal Husbandry, Anjora, Durg, Chhattisgarh Kamdhenu Vishwavidyalaya, Chhattisgarh (India) Kalakumar, B.; Department of Veterinary Pharmacology & Toxicology, College of Veterinary Sciences and Animal Husbandry, Anjora, Durg, Chhattisgarh Kamdhenu Vishwavidyalaya, Chhattisgarh (India) Reddy, Gopala. A.; Department of Veterinary Pharmacology & Toxicology, College of Veterinary Sciences and Animal Husbandry, Anjora, Durg, Chhattisgarh Kamdhenu Vishwavidyalaya, Chhattisgarh (India) Chauraisa, Durga.; Department of Veterinary Pharmacology & Toxicology, College of Veterinary Sciences and Animal Husbandry, Anjora, Durg, Chhattisgarh Kamdhenu Vishwavidyalaya, Chhattisgarh (India). Studies of antioxidant and hepatoprotective action of spinach on induced aflatoxicosis in broilers. The Indian Veterinary Journal (India). (Dec 2015) v.92 (12) p.57-59 KEYWORDS: SPINACH.

ANTIOXIDANTS. POISONING. AFLATOXINS. BROILER CHICKENS. WEIGHT GAIN. GLUTATHIONE.

Present experiment was designed to assess the antioxidant activity of spinach against aflatoxin induced toxicity in broilers. Sixty Cobb strain Day-old male broiler were randomly divided into 4 groups (15 each). Antioxidant action was assessed by glutathione enzyme activity, aspartate aminotransferase (AST). Total protein and lipid profile (total cholesterol, triglycerides, HDL and LDL) served as hepatotoxic biomarkers and aflatoxin adversely affected these parameters. Spinach was able to restore all these parameters at par with healthy control group.

172. Gupta, Renu. P. M.; Department of Veterinary Public Health and Epidemiology, College of Veterinary Sciences, LLR University of Veterinary and Animal Sciences, Hisar (India) Kumar, Sandeep; Department of Veterinary Public Health and Epidemiology, College of Veterinary Sciences, LLR University of Veterinary and Animal Sciences, Hisar (India) Folia, G.; Department of Veterinary Public Health and Epidemiology, College of Veterinary Sciences, LLR University of Veterinary and Animal Sciences, Hisar (India). Epidemiological investigation of mastitis in bovines in and around Ludhiana. The Indian Veterinary Journal (India). (Dec 2015) v.92 (12) p.71-72
KEYWORDS: MASTITIS. RISK FACTORS. GENETICS. ANIMALS. QUALITY. CATTLE.

Mastitis result in reduce quantity and quality of milk and the milk products. Total of Rs.1607.20 crores were estimated to be lost due to bovine mastitis in India (Singh and Singh, 1994). The factors associated with its occurrence included environment, genetics and nutrition (Radostits et al., 2000). The present paper reports the risk factors associated with occurrence of mastitis in cattle and buffalo in and around Ludhiana.

173. Kumar, Vinod. N.; Department of Veterinary Microbiology, College of Veterinary Science, Tirupati (India) Rao, Ananda. R.; Department of Veterinary Microbiology, College of Veterinary Science, Tirupati (India) Karthik, A.; Department of Veterinary Microbiology, College of Veterinary Science, Tirupati (India) Babu, Sudheer. G.; Department of Veterinary Microbiology, College of Veterinary Science, Tirupati (India). Prevalence of multiple serovars of leptospira in organized buffalo farm. The Indian Veterinary Journal (India). (Dec 2015) v.92 (12) p.72-73
KEYWORDS: LEPTOSPIROSIS. ANIMALS. ZOONOSES. FARMS. SYMPTOMS. LEPTOSPIRA. INDIA.

The present report deals with prevalence of leptospirosis in murrha buffaloes in buffalo research station at Venkatarama, Andhra Pradesh. The animals were reported to be showing the symptoms of abortions and haemogalactia. The disease was confirmed by MAT. Out of 10 animals screened by MAT, 6 animals

(60%) were found to be positive, out of which 4 animals (40%) were found to be infected with more than one serovars. All the animals were recovered after treatment with oxytetracycline.

174. Palanisamy, M.; Ezakial, Napoleon; Selvaraju, R.; Balasubramanian, M.; Krishnakumar, G.A.; Manokaran, K.S. Efficacy of immunomodulators, Lugol's Iodine and PGF₂ on the bacterial load in the endometritis affected cows. *Indian Veterinary Journal (India)*. (Jul 2015) v.92 (7) p.56-58 KEYWORDS: IODINE. PROSTAGLANDINS. BACTERIA. COWS.

The present study was conducted to assess the efficiency of immune modulators in controlling the microbial load in endometritis cows in comparison with Lugol's Iodine (LI) and Prostaglandin A total of 72 crossbred cows divided equally into six groups viz. Group I - treated with 30 ml of 2 per cent Lugol's iodine for 3 days, Group II, III and IV - single intrauterine dose of 30 ml PBS containing 100g of LPS, 2 mg of LYZs and 500 mg of OG, respectively, Group V - 25 mg of and Group VI - control cows given 30 ml of PBS intrauterine. The bacterial colony counts recorded were significantly ($P < 0.01$) reduced after treatment. The elimination of bacterial load was better in the immune modulator treated groups than other groups. *E. Coli* LPS was found to be most effective in controlling uterine infections followed by LYZ and OG.

175. Jayanthi, D.; TANUVAS, Pottaneri (India). Mecheri Sheep Research Station. Murali, N.; TANUVAS, Pottaneri (India). Mecheri Sheep Research Station. run, L.; TANUVAS, Pottaneri (India). Mecheri Sheep Research Station. Senthilkumar, P.; TANUVAS, Pottaneri (India). Mecheri Sheep Research Station. Udhayavel, S.; TANUVAS, Pottaneri (India). Mecheri Sheep Research Station. Rekha, B.; TANUVAS, Pottaneri (India). Mecheri Sheep Research Station. Correction of rectal prolapsed in Salem Black kid.. *Indian Veterinary Journal (India)*. (Jul 2015) v.92(7) p.63-64 KEYWORDS: DIGESTIVE SYSTEM DISEASES. DISEASE CONTROL.

A five weeks old Salem black female kid was referred with a history of dullness, cough, straining for defecation/urination and protrusion of red colored mass from the anus. On clinical examination, protrusion of rectal mucosa was observed. The kid was stabilized; the prolapsed rectal mucosa was cleansed, repositioned and retained by purse-string suture. The animal recovered with normal defecation and urination.

176. Singh, Satyaveer; Mahatma Gandhi Veterinary College, Bhagalpur (India). Department of Veterinary Surgery and Radiology. Bharti, B.; Mahatma Gandhi Veterinary College, Bhagalpur (India). Department of Veterinary Surgery and Radiology. Management of complete hoof capsule avulsion in a Foal: A case

report. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.64-65
KEYWORDS: HOOVES. FOALS. MANAGEMENT.

A six month old foal was presented with the history of accidental injury by automobile on his right for limb and whole hoof get avulsed with bleeding and slight portion of the coronary band was present. Foal was sedated with Xylazinehydrochloride @ 0.5mg/kg b.w.t and Butorphanoltartarate @ 0.01mg/kg b.wt, I/V and treated with inj. - Haemocoagulase 1.5ml, I/V, TetanusToxoid 2.5 ml, I/M, procaine penicillin @ 20000IU/kg bwt, I/M, phenylbutazone @ 4.4mg/kgbwt, I/V and dressing of injured area with help of 0.5% povidone iodine solution and suf cientpadding and bandaging of the exposed sensitive part of foot was done. For the next seven days treatment was continued. Wound was healed and complete recovery occurs after eight months of injury.

177. Manokaran, S.; Veterinary College and Research Institute, Namakal (India). Department of Animal Reproduction, Gynecology and Obstetrics.Palanisamy, M.; Veterinary College and Research Institute, Namakal (India). Department of Animal Reproduction, Gynecology and Obstetrics.Selvaraju, M.; Veterinary College and Research Institute, Namakal (India). Department of Animal Reproduction, Gynecology and Obstetrics.Prabaharan, V.; Veterinary College and Research Institute, Namakal (India). Department of Animal Reproduction, Gynecology and Obstetrics.Napolean Ezakial, R.; Veterinary College and Research Institute, Namakal (India). Department of Animal Reproduction, Gynecology and Obstetrics. Dystocia due to Fetal Giantism with Brachygnathism in a Sirohi Ewe. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.66-67
KEYWORDS: CAESAREAN SECTION. DYSTOCIA.

A rare case of fetal giantism with brachygnathism in a Sirohiewe caused dystocia was treated by cesarean section and is reported.

178. Kumbhakar, N.K.; Chhattisgarh Kamdhenu Vishwavidyalaya, Anjora (India). College of Veterinary Science and Animal Health. Department of Veterinary Parasitology. Dewangan, B.K.; Chhattisgarh Kamdhenu Vishwavidyalaya, Anjora (India). College of Veterinary Science and Animal Health. Department of Veterinary Parasitology. Kumar, Bhupendra; Chhattisgarh Kamdhenu Vishwavidyalaya, Anjora (India). College of Veterinary Science and Animal Health. Department of Veterinary Parasitology. Sanyal, P.K.; Chhattisgarh Kamdhenu Vishwavidyalaya, Anjora (India). College of Veterinary Science and Animal Health. Department of Veterinary Parasitological. Bovine Nasal Granuloma in a non descript Bullock. Indian Veterinary Journal (India). (Jul 2015) v.92(7) p.67-68
KEYWORDS: NOSE. GRANULOMA. BULLOCKS. SCHISTOSOMA.

Nasal granuloma is caused by the blood uke *Schistosoma nasalis* adversely affects the health and production of domestic livestock in various parts of India. The present report describes the occurrence of bovine nasal granuloma in a non-descript bullock from village Handoff Durg (Chhattisgarh). Clinical examination revealed mucopurulent bloody nasal discharge, snoring sound and cautioner like granulomatous growth in the nasal cavity. Microscopicalexamination of nasal discharges revealed boomerang-shaped eggs of *S. nasalis*. The bullock was treated with anthiomaline @ 20 ml deep i/m injection on three occasions at intervals of 1 week. The bullock responded well and recovered completely after the 3rd injection. MocnaexusTin in Tsucin CaAto A.

179. Rangasamy, S.; Madras Veterinary College, Chennai (India). Department of Aniaml Reproduction, Gynecology and Obstetrics. Sarath, T.; Madras Veterinary College, Chennai (India). Department of Animal Reproduction, Gynecology and Obstetrics. Balasubramanian, S.; Madras Veterinary College, Chennai (India). Department of Animal Reproduction, Gynecology and Obstetrics. Clinical management of Multiple Vaginal Tear in Prepartum Vagino-Cervical Prolapse in a non-descript Buffalo. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.69-70 KEYWORDS: VAGINAL DISEASES. WATER BUFFALOES.

A pluriparous non-descript buffalo at nine months of gestation was presented to Madras Veterinary College Teaching Hospital with history of continuous straining and frequent Prolapsed of vagina and cervix for the past Vedas. Under epidural anesthesia, vaginal examination revealed blood clots and raw blood oozing out from the vaginal tear. Following Surgical repair, the mass was reduced and repositioned. The animal had an uneventful Recovery following treatment with antibiotic, anti-in ammatory and anti histamine for ve Consecutive days.

180. Jarora, V.; Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (India). College of Veterinary Science. Department of Veterinary Gynecology and Obstetrics. Singh, A.K.; Guru Angad Dev Veterinary and Aniaml Sciences University, Ludhiana (India). College of Veterinary Science. Department of Veterinary Gynecology and Obstetrics. Zodinsanga, V.; Guru Angad Dev Veterinary and Aniaml Sciences University, Ludhiana (India). College of Veterinary Science. Department of Veterinary Gynecology and Obstetrics. Singla, V.K.; Guru Angad Dev Veterinary and Aniaml Sciences University, Ludhiana (India). College of Veterinary Science. Department of Veterinary Gynaecology and Obstetrics. Brar, P.S.; Guru Angad Dev Veterinary and Aniaml Sciences University, Ludhiana (India). College of Veterinary Science. Department of Veterinary Gynaecology and Obstetrics. Singh, T.; Guru Angad Dev Veterinary

and Aniaml Sciences University, Ludhiana (India). College of Veterinary Science. Department of Veterinary Gynaecology and Obstetrics. Fetal Arthrogryposis causing Dystociaina in a Mare. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.74-75 KEYWORDS: DYSTOCIA. MARES. MANAGEMENT.

A rare case of dystocia in a mare due to fetal arthrogryposis and its successful management is described.

181. Madhav Mugale, N.; Tamil Nadu Veterinary and Animal Sciences University, Chennai (India). Madras Veterinary College. Department of Veterinary Pathology. Balachandran, C.; Tamil Nadu Veterinary and Animal Sciences University, Chennai (India). Madras Veterinary College. Department of Veterinary Pathology. Dillibabu, V.; Tamil Nadu Veterinary and Animal Sciences University, Chennai (India). Madras Veterinary College. Department of Veterinary Pathology. Kirubharan, John; Tamil Nadu Veterinary and Animal Sciences University, Chennai (India). Madras Veterinary College. Department of Veterinary Pathology. Dhinkar Raj, G.; Tamil Nadu Veterinary and Animal Sciences University, Chennai (India). Madras Veterinary College. Department of Veterinary Pathology. Sridhar, R.; Tamil Nadu Veterinary and Animal Sciences University, Chennai (India). Madras Veterinary College. Department of Veterinary Pathology. Selvasubramaniam, S.; Tamil Nadu Veterinary and Animal Sciences University, Chennai (India). Madras Veterinary College. Department of Veterinary Pathology.. Hepatic Abscess in Sheep and Goat caused by O26 Escherichia Coli serotype: An emerging pathogen.. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.76-79 KEYWORDS: LIVER DISEASES. ABSCESSSES. SHEEP. GOATS. ESCHERICHIA COLI. Liver abscess is a major economic problem in meat industry due to condemnation of edible part of carcass. In this study, an incidence 0.224 % (56/25000) of hepatic abscess was recorded. *Escherichia coli* was isolated in highest number of cases which showed metallic sheen on eosin ethylene blue agar in 12 cases (21.48%) Serotype O26 *E. coli* was indentified and recognized a sanemerging pathogen. Other pathogens isolated were *Streptococcus* spp., *Fusobacterium necrophorum*, *Staphylococcus* spp., *Corynebacterias* spp. and *Pseudomonas* spp. Grossly, singleton multiple and minute to large creamy-yellow colored abscesses of varying sizes were found on both parietal and visceral surfaces of liver. Histologically, the abscesses consisted of central areas of liquefactive necrosis surrounded by numerous polymorph nuclear neutrophils, few mononuclear cells, calcied centers and colonies of bacteria.

L74 Miscellaneous animal disorders

182. Kumar, Vijay; National Dairy Research Institute, Karnal (India). Chakravarty, A.K.; National Dairy Research Institute, Karnal (India). Genetic disorders in dairy cattle: An Indian perspective.. Indian Journal of Animal Sciences (India). (Aug 2015) v.85 (8) p.819-827
KEYWORDS: GENETIC DISORDERS. DAIRY CATTLE. INDIA.

Genetic diseases have always been present in the animal population but their significance has increased in recent decades. In some breeds, the occurrence of inherited anomalies has become frequent and economically important. Some of autosomal recessive disorders are Holstein specific. The present review article describes prevalence of the most important autosomal recessive disorders in Holstein and its crossbreds as compared to their occurrence worldwide. Mainly five disorders namely, bovine leukocyte adhesion deficiency (BLAD), deficiency of uridine monophosphate synthase (DUMPS), bovine citrullinaemia, complex vertebral malformation (CVM) and factor XI (FXI) deficiency syndrome, are being screened in Indian Holstein and its crossbred cattle with the major objective to reduce the incidence of genetic disorders in cattle population and reduce the economic losses to the organized farms. Detection of heterozygote carriers enables their selection, and therefore, the control and prevention of the spread of recessive diseases in the population.

183. Mohapatra, A.K.; CVSc & AH, O.U.A.T., Odissa (India). Dept. of Veterinary Pathology. Das, D.; CVSc & AH, O.U.A.T., Odissa (India). Dept. of Veterinary Pathology. Jena, B.; CVSc & AH, O.U.A.T., Odissa (India). Dept. of Agro. Panda, S.K.; CVSc & AH, O.U.A.T., Odissa (India). Dept. of Veterinary Pathology. Mohanty, D.N.; CVSc & AH, O.U.A.T., Odissa (India). Dept. of Agro.. Incidence of various reproductive disorders in Canines in and around Bhubaneswar.. Journal of Interacademia (India). (Apr 2015) v19 (2) p.227-230
KEYWORDS: REPRODUCTIVE DISORDERS. DOGS. PYOMETRA.

The current study was undertaken to study the incidence of various reproductive disorders in canines in and around Bhubaneswar. Among various reproductive diseases in dogs, pyometra showed highest incidence of 41.66% followed by transmissible venereal tumour (21.15%), mammary tumour (17.95%), abortion (8.97%), ovarian cysts (2.56%), vaginal hyperplasia (1.28%), cervical tumour (0.64%), testicular tumour (3.2%) and cryptorchidism (2.56%). Obtaining knowledge regarding various reproductive disorders is essential to adopt preventive measures and for developing therapeutic measures for controlling the most prevalent reproductive disorders in canines.

184. Gawade, U. A.; Department of Livestock Production and Management Maharashtra Animal and Fishery Sciences University, Nagpur (India) Bhorke, M. S.; Department of Livestock Production and

Management Maharashtra Animal and Fishery Sciences University, Nagpur (India) Khanvilkar, V. A.; Department of Livestock Production and Management Maharashtra Animal and Fishery Sciences University, Nagpur (India). Effect of different housing systems on reproductive disorders and performance in crossbreed cows. Indian Journal of Animal Production and Management (India). (Dec 2015) v.31 (3-4) p.112-114 KEYWORDS: DISORDERS. HOUSING. COW MILK. PRODUCTION. FEEDING. DATA. INDIA.

The effect of housing systems on reproductive disorders and performance were studied on Sixteen advanced pregnant Holstein Fresian cows and randomly divided equally into two groups of eight animals each (Group A as under conventional tie barn housing system and Group B as under loose housing system). Both the groups were reared under similar system of feeding and management except housing system. Most of the major parameters of reproductive disorder and reproductive performance showed non-significant ($P < 0.05$) differences between conventional and loose housing system. Total cost involved per day was significantly higher ($P < 0.05$) in case of conventional housing when compared with loose housing system. Cost of fodder, treatment and miscellaneous items were did not differ significantly between housing system. Average weekly milk production was significantly higher ($P < 0.01$) in loose housing (19.54 ± 0.26 kg/day) than in conventional housing system (18.26 ± 0.25 kg/day) rearing of cows under loose housing gives better milk production without affecting reproductive performance with minimum occurrence of reproductive disorders and minimum time utilization for feeding and cleaning except during milking time, than conventional housing system. Moreover, the rearing of cattle under loose housing system was cost effective than the conventional housing system.

M01 Fisheries and aquaculture - General aspects

185. Infantina Amali, J.; Fisheries College and Research Institute, Thoothukudi (India). Department of Fisheries Economics. Jayaraman, R.; Fisheries College and Research Institute, Thoothukudi (India). Department of Fisheries Economics.. Constraint analysis of problems of fishermen in motorized fishing sector in Ramanathapuram district of Tamil Nadu.. Indian Veterinary Journal (India). (Jul 2015) v.92 (7) p.87-89 KEYWORDS: CONSTRAINTS. STATISTICAL METHODS. FISHERMEN. TAMIL NADU.

Indian fisheries sector plays a crucial role in the socio-economic development of the country through its consistent contribution to the GDP employment, export earnings nutritional and livelihood. The increased efforts in fish production led to the stagnation of catch forcing the government to intervene and impart management measures for the sustenance of the marine resources. Though notable increase in production from the marine sector was achieved with the implementation of these management measures, nevertheless, it has had significant impact on the social and economic wellbeing of the fishermen over the years. The aim of this study is to understand the constraints of fishermen operating motorized crafts; both owners and labourers and reasons for indebtedness in Ramanathapuram district, Tamil Nadu.

186. Saxena, Neha; ICAR-Central Institute of Fisheries education, Mumbai (India) Dube, Kiran; ICAR-Central Institute of Fisheries education, Mumbai (India) Patiyal, Rabindar Singh; ICAR-Directorate of coldwater Fisheries Research, Bhimtal (India) Tiwari, Virendra K.; ICAR-Central Institute of Fisheries education, Mumbai (India). Meristic and Morphometric Differentiation in Wild Populations of *Barilius bendelisis* (Hamilton 1807) from Kumaon Region of Uttarakhand, India. Fishery Technology (India). (Oct 2015) v.52 (4) p.205-212 KEYWORDS: BARILIUS BENDELISIS. STATISTICAL METHODS.

In this study, differentiation in the morphological traits of an important ornamental cyprinid fish, *Barilius bendelisis* (Hamilton, 1807) was investigated. A total of 134 individuals were collected from River Gaula and Kosi between November 2013 to March 2014 in Uttarakhand region of Central Himalaya; 6 meristic and 24 morphometric characteristics were recorded for each specimen. Principal component analysis (PCA), discriminant function analysis (DFA) and univariate analysis of variance (ANOVA) were used for differentiating the population. 16 significant morphometric variables ($p < 0.001$) were considered for multivariate analysis. The principal component (PC) for 16 morphometric variables generated seven components accounting for 71.84% of the total variation between the populations. First principal component alone accounted for 35.24% of

total variation. The step wise discriminant analysis retained one factor showing highest variation in body depth, length of pectoral fin, dorsal fin base length, sub orbital width, head length and snout length. Using these variables, 82.7% of individuals were retained into their original groups (82.7% under a leave-one-out procedure). This study hypothesizes that the phenotypic variation between these close populations could be attributed to environmental and genetic factors.

187. Solomon, S. G.; Uni. of Agriculture, Makurdi (Nigeria). Dept. of Fisheries and Aquaculture Tiamiyu, L.O.; Uni. of Agriculture, Makurdi (Nigeria). Dept. of Fisheries and Aquaculture Fada, A; Uni. Of Agriculture, Makurdi (Nigeria). Dept. of Fisheries and Aquaculture Okomoda, V.T.; Uni. of Agriculture, Makurdi (Nigeria). Dept. of Fisheries and Aquaculture. Ovaprim Dosage on the Spawning Performance of *Cyprinus carpio*. Fishery Technology (India). (Oct 2015) v.52 (4) p.213-217 KEYWORDS: OVIPOSITION. CYPRINUS CARPIO. FERTILIZATION.

The aim of the present study was to evaluate the fecundity and hatchability of common carp administered ovaprim diluted with 0.9% saline water at a ratio of 1:1, 1:2, 1:3, 1:4, 1:5, 1:6, 1:7, 1:8 1:9 and 1:10 with 1:0 serving as the control. The diluted hormones were injected to brood fish at a dose of 0.5 ml kg⁻¹. The study observed that latency period lasted between 8th and 11th h after hormonal administration and higher dilution levels delayed striping time compared to the control and the first two dilution levels. *Cyprinus carpio* did not respond to 1:9 and 1:10 dilutions of ovaprim. Consequently fecundity and hatchability decreased as the level of dilution increases. The optimum dilution of ovaprim to induce ovulation for reducing the cost of hatchery operation in common carp was found 1:5 in 0.9% normal saline. Beyond this dilution, fecundity and hatchability are greatly affected.

188. P. Minu; ICAR-Central Institute of Fisheries Technology, P.O.Matsyapuri, Cochin (India) Shaju, S.S.; Nansen Environmental Research Center, Cochin (India) Souda, V.P.; ICAR-Central Institute of Fisheries Technology, P.O.Matsyapuri, Cochin (India) B. Usha; Sree Kerala Varma College, Thrissur (India). Dept. of Zoology Ashraf, P. Muhamed; ICAR-Central Institute of Fisheries Technology, P.O.Matsyapuri, Cochin (India) B. Meenakumari; ICAR, Pusa New-Delhi (India). Hyperspectral Variability of Phytoplankton Blooms in Coastal Waters off Kochi, South-eastern Arabian Sea. Fishery Technology (India). (Oct 2015) v.52 (4) p.218-222 KEYWORDS: PLANKTON BLOOMS. ARABIAN SEA.

Ocean colour radiometry offers cost-effective, frequently acquired synoptic data pertaining to phytoplankton biomass in surface waters and is of considerable value in monitoring and better understanding of algal blooms. Algal blooms have occurred frequently

in coastal waters resulting in severe negative impacts to local marine ecosystems and communities. Remote sensing reflectance [Rrs (l)] and absorption coefficients of phytoplankton blooms were measured in coastal waters off Kochi, Southeastern Arabian Sea, to investigate differences in the absorption and reflectance of different types of blooms. Peaks of the Rrs (l) spectra of *Trichodesmium* spp. bloom were at 490 nm, while those of nonbloom areas were 482, 560 and 570 nm. The absorption maximum of phytoplankton were at 435, 437, 438 and 439 nm in the blue region and 632, 674, 675 and 635 nm in the red region respectively for *Trichodesmium* spp., *Chaetoceros* spp., *Dinophysis* spp. and *Prorocentrum* spp. blooms. The study showed that the variation of aph (l) with Chl a dominates the behavior of the Rrs (l) peak in these blooms.

189. K. V. Aneesh Kumar; Center for Marine Living Resources and Ecology, Cochin (India)P. Pravin; ICAR-Central Institute of Fisheries Technology,P.O.Matsyapuri, Cochin (India)Khanolkar, S. Paresh; ICAR-Central Institute of Fisheries Technology,P.O.Matsyapuri, Cochin (India)Baiju, M. V.; ICAR-Central Institute of Fisheries Technology,P.O.Matsyapuri, Cochin (India)B. Meenakumari; ICAR, Pusa, New-Delhi (India). Performance Assessment of Tuna Longline Fishing in Lakshadweep Sea, India. Fishery Technology (India). (Oct 2015) v.52 (4) p.223-227 KEYWORDS: BYCATCH.

Experimental tuna longline operations were carried out in the Lakshadweep Sea on board modified Pablo boats which are originally used for pole and line fishing for skipjack tuna (*Katsuwonus pelamis*). Catch composition, size frequency and CPUE of the tuna longline operations were analyzed. Sharks, tuna, sailfishes and miscellaneous fishes were the catch. Shark contributed 67.6% of the overall catch followed by tuna (18.7%). Hooking rate of tuna was 4.6 1000-1 hooks compared to (16, 3.4 and 2.2 for sharks, sailfishes and miscellaneous fishes, respectively). Silky sharks (*Carcharhinus falciformes*) alone contributed 89.9% to the total shark catch. Overall hooking rate was better during evening compared to morning. There was no significant difference in the overall catch rate between pre-monsoon and post-monsoon operations.

190. Madhu, V. R.; Central Institute of Fisheries Technology, P.O. Mastyapuri, Cochin (India)Raphael, Leena; Central Institute of Fisheries Technology, P.O. Mastyapuri, Cochin (India)B. Meenakumari; ICAR, Pusa, New-Delhi (India). Influence of Codend Mesh Size on Bycatch Composition of Two Trawls Operated off Veraval, Gujarat, India. Fishery Technology (India). (Oct 2015) v.52 (4) p.228-236 KEYWORDS: TRAWLING. BYCATCH. GUJARAT.

The deleterious impact of bottom trawling on benthic ecosystem is widely reported and attempts are made to reduce bycatch generated by trawling through technical and operational

measures. Systematic baseline data on the quantity and type of bycatch will help in comparing the changes that have occurred to the fish community structure. This study compares the bycatch generated by two trawling systems with 15, 20, 30 and 40 mm mesh size codends off Veraval during 1991-92 and 2005-06. Analysis of quantity of bycatch generated and changes in species composition, analysis of diversity and multivariate analysis were carried out to elucidate the changes on the community structure along the Veraval coast. The percentage of total bycatch generated in trawl systems during 1991-92 were 25.69 ± 4.28 and 31.03 ± 1.58 with 15 and 30 mm codend meshes respectively while the values were 67.77 ± 3.22 and 22.15 ± 2.44 respectively for 20 and 40 mm codends during 2005-06. *Acetes* spp and *Otolithes ruber* contributed the major share of bycatch in the 15 and 30 mm codends, whereas *Trichiurus lepturus* and *Rhopilema* spp were the major species caught during 2005-06 in the 20 and 40 mm codend mesh respectively. Highest diversity was observed in the 15 mm codend as indicated by both the indices of diversity ANOSIM test revealed that the difference in the assemblage structure during the years were significant with a global value of 0.176. The results of the SIMPER analysis showed that the average dissimilarity between the bycatch assemblages during the years 1991-92 and 2005-06 was noticed to be 87.23%. It was evident from the studies that there are changes in the quantity and assemblage structure of the bycatch generated by different trawling systems over the years. This study also shows the utility of increasing the mesh sizes as a technical measure to reduce impacts of trawling on biodiversity.

191. R. Yathavamoorthi; Central Institute of Fisheries Technology, Cochin (India). Nithin, C.T.; Central Institute of Fisheries Technology, P.O.Matsyapuri, Cochin (India) Ananthanarayanan, T.R.; Central Institute of Fisheries Technology, Cochin (India). Mathew, Suseela; Central Institute of Fisheries Technology, Cochin (India) Bindu, J.; Central Institute of Fisheries Technology, Cochin (India). Anandan, R.; Central Institute of Fisheries Technology, Cochin (India)Gopal, T. K. S.; Central Institute of Fisheries Technology, Cochin (India). Supercritical Carbon Dioxide Extraction of PUFA Rich Oil from Freeze Dried Tuna Red Meat. *Fishery Technology (India)*. (Oct 2015) v.52 (4) p.237-241
KEYWORDS: SUPERCRITICAL FLUID EXTRACTION. DRIED PRODUCTS. TUNA.

Supercritical fluid extraction (SFE) is an emerging technology for extraction and isolation of valuable compounds from natural products. Supercritical carbon dioxide (SCO₂) is one of the most commonly used solvents in SFE and has gained importance as a green or environment friendly solvent. In this study, polyunsaturated fatty acid (PUFA) rich oil from freeze dried yellowfin tuna (*Thunnus albacares*) red meat was extracted using supercritical carbon dioxide. Red meat, a by-product obtained from tuna processing forms about 9-

11% of the total body weight of tuna. Lipid extraction from freeze dried tuna meat was performed at a temperature of 60°C and pressure of 35 MPa for 3 h. The flow rate of CO₂ was kept constant at 175 l h⁻¹. The extracted oil was collected in two separators both held at 5 MPa pressure and temperature of 50°C and 40°C respectively. The antioxidant tocopherol (0.5%) was added to the extracted oil and stored at 2-4°C for further analysis. The yield of oil obtained was 5% and it was found to be rich in polyunsaturated fatty acids like docosahexaenoic, eicosapentaenoic and arachidonic acid constituting 31, 5 and 4% of the total fatty acids respectively. Palmitic and stearic acid were the most abundant saturated fatty acids present constituting 23 and 15% of total fatty acids respectively. Oleic acid contributed 18% of the total fatty acids. SFE was effective in extraction of fatty acids from tuna red meat with minimal losses.

192. Murthy, L.N.; Central Institute of Fisheries Technology, Navi Mumbai (India) Mumbai Research Center Mohan, C.O.; ICAR-Central Institute of Fisheries Technology, P.O.Mastyapuri, Cochin (India) Badonia, R.; CIFT, Veraval (India). Veraval Research Centre.. Trace and Heavy Metal Accumulation in Squilla (*Oratosquilla nepa*) off Saurashtra Coast. Fishery Technology (India). (Oct 2015) v.52 (4) p.242-245 KEYWORDS: HEAVY METALS. PROXIMATE COMPOSITION. MALACOSTRACA.

Information on the concentration of trace metals in stomatopod crustaceans is scarce. In the present investigation, an attempt was made to determine the proximate composition, mineral and heavy metal content of stomatopod *Oratosquilla nepa* (squilla) off Saurashtra coast. The moisture, crude protein, total lipid and total ash contents of squilla were 81, 10.15, 0.6 and 5.1%, respectively. Potassium, sodium and iron content in squilla were 86.09, 76.45 mg% and 42.03 ppm respectively. Comparison of trace and heavy metal residue accumulation in squilla weighing 5-8 and 8-12g were compared for gut, exoskeleton and edible meat portion. Significant difference ($p < 0.05$) was observed between the two size groups in the accumulation of copper and nickel contents in gut. No significant variation was observed in exoskeleton between the two size groups. Higher level of cadmium (1.94 ppm) was observed in the gut of squilla; however other heavy metals like mercury and lead and trace metals like cobalt were below the detectable limit.

193. A R Sudha Devi,; Mary Matha Arts and Science college, Wayanad (India) Smija, M. K.; Mary Matha Arts and Science college, Wayanad (India) Latha, N.P.; Mary Matha Arts and Science college, Wayanad (India). Fatty Acid Composition of the Freshwater Crab *Travancoriana schirnerae*. Fishery Technology (India). (Oct 2015) v.52 (4) p.246-251 KEYWORDS: FATTY ACIDS. CRABS. MEAT.

This study determined the fatty acid profile of claw and body meat of adult male and female *Travancoriana schirnerae*, an edible freshwater crab abundant in the wetlands of Wayanad, Kerala, India. Gas chromatography- mass spectrometry analysis of the fatty acid profile detected totally eleven fatty acids, which include saturated (SFAs) (39.91±4.20%), mono (MUFAs) (23.45±2.46%) and polyunsaturated fatty acids (PUFAs) (36.63±0.97%). The major SFAs were arachidic (C20:0) and behenic acids (C22:0) followed by palmitic (C16:0), stearic (C18:0) and myristic acids (C14:0). The MUFAs identified were palmitoleic (C16:1) and erucic (C22:1) acids and the PUFAs include linoleic acid (C18:2 w-6), linolenic acid (C18:3 w-3), eicosapentaenoic acid (C20:5 w-3) and docosahexaenoic acid (C22:6 w-3). This study indicated that the freshwater crab *T. schirnerae* is a good source of unsaturated fatty acids, especially w- 3 (26.17%) and w-6 (10.45%) essential fatty acids.

194. Vishnu, K.V.; Central Institute of Fisheries Technology, P.O.Matsyapuri, Cochin (India)K. K. Ajeesh Kumar; Central Institute of Fisheries Technology, P.O.Matsyapuri, Cochin (India)K. K .Asha; Central Institute of Fisheries Technology, P.O.Matsyapuri, Cochin (India)K. R .Remyakumari; Central Institute of Fisheries Technology, P.O.Matsyapuri, Cochin (India)Ganesan, B.; Central Institute of Fisheries Technology, P.O.Matsyapuri, Cochin (India)Anandan, R.; Central Institute of Fisheries Technology, P.O.Matsyapuri, Cochin (India)Chatterjee, Niladri Sekhar; Central Institute of Fisheries Technology, P.O.Matsyapuri, Cochin (India)Mathew, Suseela; Central Institute of Fisheries Technology, P.O.Matsyapuri, Cochin (India). Protective Effects of *Echinorhinus brucus* Liver Oil against Induced Inflammation and Ulceration in Rats. *Fishery Technology (India)*. (Oct 2015) v.52 (4) p.252-257 KEYWORDS: INFLAMMATION. ECHINORHINUS BRUCUS. LIVER.

Anti-inflammatory and anti-ulcer activities of Bramble shark (*Echinorhinus brucus*) liver oil were examined in rats. The oil showed significant proportion of n-3 polyunsaturated fatty acids (PUFAs), the percentages of EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid) being 16 and 18% respectively. The study also revealed that liver oil had a very favourable n3:n6 ratio of 4.7. Oral administration of shark liver oil at 1g kg⁻¹ concentration significantly attenuated the formalin-induced paw edema in experimental rats. It exerted potent anti-ulcer effect against acid-ethanol mixture mediated lesion formation in the rat gastric mucosa.

195. Manjusha, K.P.; Cochin Unvi. of Science and Technology, Kerala (India).School of Industrial FisheriesMathew, Saleena; Cochin Unvi. of Science and Technology, Kerala (India).School of Industrial Fisheries. Isolation and Characterization of Glycosaminoglycans from Squid (*Loligo duvauceli*) and Cuttlefish (*Sepia pharaonis*). *Fishery*

Technology (India). (Oct 2015) v.52 (4) p.258-264 KEYWORDS: GLYCOSAMINOGLYCANS. CARTILAGE. LOLIGO DUVAUCELI. SEPIA PHARAONIS. Glycosaminoglycans (GAGs) have wide applications in biomedical,

Pharmaceutical and cosmetic field. The present study was aimed at isolation and characterization of glycosaminoglycans from selected tissues of two important species of cephalopods, *Loligo duvauceli* and *Sepia pharaonis*. The isolation protocol developed was based on the stability of the GAGs at temperatures beyond ambient conditions, as well as their property as water soluble heteropolysaccharides. Among all the tissues analyzed, the cranial cartilage of both the cephalopod species contained glycosaminoglycans with a yield of 80 g kg⁻¹ dry defatted tissue. The FT-IR peak intensities confirmed that the predominant GAGs of both the cephalopod species studied were chondroitin sulphate type, with variations in their sulphation pattern. The squid and cuttlefish cranial cartilages hitherto considered as processing discards, have great potential as a source of chondroitin sulphate – GAGs.

196. Kumaran, Mariappan; ICAR-Central Institute of Brackishwater Aquaculture, Chennai (India) Jangam Ashok Kumar; ICAR-Central Institute of Brackishwater Aquaculture, Chennai (India) Periyakaruppan Anand; ICAR-Central Institute of Brackishwater Aquaculture, Chennai (India) Paul, Johnson; ICAR-Central Institute of Brackishwater Aquaculture, Chennai (India). Training Needs of Extension Personnel in Pacific White Shrimp (*Litopenaeus vannamei*) Farming. Fishery Technology (India). (Oct 2015) v.52 (4) p.265-270 KEYWORDS: TRAINING. AQUACULTURE. ADVISORY OFFICERS. LEARNING. FARMING SYSTEMS.

Assessment of training needs and subsequent capacity enhancement are important for the efficient performance of extension workers. An investigation was conducted among the field level extension workers to identify the gaps in their technical skills pertaining to farming of *Litopenaeus vannamei* shrimp. The study indicated that extension personnel lacked skills in on-farm disease diagnosis and management, water quality management, shrimp seed selection, pre-stocking water culture and biofloc technology concerned with *L. vannamei* shrimp farming. Study also indicated that differences in the socio-personal attributes of the respondents did not influence the training requirements. It was suggested that an onfarm experiential training programme using & lsquo; group learning mode’ with appropriate training curriculum needs to be arranged at different locations covering the coastal states. Further, in the absence of strong research-extension linkage, ICT aided tools like expert system, mobile application and a knowledge portal on *L. vannamei* farming need to be developed, validated and uploaded by

ICAR-CIBA for the capacity enhancement of field level extension workers.

M11 Fisheries production

197. Debnath, Biswajit; KVK, South Tripura (India) Biradar, R.S.; ICAR-Central institute of fisheries education, Mumbai (India) Krishnan, M.; ICAR-Central institute of fisheries education, Mumbai (India) Pandey, S.K.; ICAR-Central institute of fisheries education, Mumbai (India) Debnath, C.; ICAR, Tripura centre (India) Srivastava, S.K.; NIAP, New-Delhi (India) Das, S.C.S; CIFRI, Allahabad (India). Economic evaluation on fish production and demand in Tripura – strategic options. Indian Journal of Animal Sciences (India). (Oct 2015) v.85 (10) p.1139-1145 KEYWORDS: DEMAND. ELASTICITY. FORMULATIONS. EFFICIENCY. FISH. TRIPURA.

Tripura witnessed an impressive growth in fish production during the past decade, because here fish culture is recognized as a vital activity for economic development. The state is presently undergoing a transitional phase and developing several plans to achieve self-sufficiency in fish production. The present study aims to workout strategic options that harmonize production and consumption. Stochastic frontier production function and technical efficiency of fish production estimates yielded positive coefficients for majority of factors of production. It showed significantly higher mean technical efficiency for adopted villages than that for non-adopted villages. At consumption front, demand estimation using multiple budgeting framework of household showed significant and positive income elasticities of demand for local carps, local non-carps, inter-state non-carps and small weed fish. But income elasticity for inter-state carps was less and insignificant among all selected choice fish groups (CFGs). Demand for the fish under the baseline scenario (base year 2004) is likely to grow at an annual rate of 3.38% for the State. The demand for fish by 2015 was projected as 80,153 mt of which nearly 50% (40,624 mt) is constituted by local carps. The study suggested prioritizing technological and management options after synchronizing present policy of the fisheries development, institutional environment, support services and profile of different stakeholders of the state.

M12 Aquaculture production and management

198. Singh, Vikram; IP&TM Unit, ICAR, New-Delhi (India) Chakraborty, Kajal; Central marine fisheries research institute, Kerala (India). Fisheries technology management at Indian Council of Agricultural Research (ICAR): An IPR perspective. Indian Journal of Animal Sciences (India). (Oct 2015) v.85 (10) p.1146-1153 KEYWORDS: PATENTS. FISHERY MANAGEMENT.

Technology management in intellectual property rights (IPR) is a procedure, which incorporates technology production, promotion and their commercialization. Indian Council of Agricultural Research (ICAR) is an autonomous organization, and is the apex body for coordinating, guiding and managing research and education in agriculture in the entire country. With the aim of utilizing the vast research and development facilities and knowledge available with its institutions, ICAR has started a technology management and business incubation drive, intended for the Indian agricultural sector to promote agribusiness. This apex body has established a three-tier IP management system, which is presently giving a scope of demonstrated results by securing its research assets with different IP tools like patents, trademarks and designs; and commercializing its research outcomes. Six ICAR fisheries research institutes filed 84 patent applications, out of which 55 were filed during the last 5 years. Seven patents were conceded to 3 of these establishments, which fall under the IPC classifications A, B, C and E. Eight trademarks were additionally enlisted at the Indian Trademark Registry for diverse fish based products. To commercialize the fisheries research outcomes, including 142 technologies, 207 partnerships were developed by various institutes with 135 national and international organizations. IP protected technology commercialization is on its higher side with 21.12%, achieved within a short time span. These endeavors of technology management at ICAR, coupled with an effective technology protection and commercialization of the vast and diversified ICAR knowledge base, gave a renewed boost and a decent way for the Indian fisheries research and a new agribusiness paradigm.

Q01 Food science and technology

199. Yadav, Devbrat; ICAR- National Dairy Research Institute, Karnal (India) Kumar, Harish; - National Dairy Research Institute, Karnal (India). Center for food science and Technology, Banaras hindu university, Varanasi (India) Kumar, Arvind; Center for food science and Technology, Banaras hindu university, Varanasi (India) Jha, Alok; ICAR- Headquarters, New Delhi (India) Goyal, Arun; Maharana Pratap university of agriculture, Udaipur (India). Optimization of polyphenolic fortification of grape peel extract in stirred yogurt by response surface methodology. Indian Journal of dairy Sciences. (Jan 2016) v.69(1), p.41-49 KEYWORDS: POLYPHENOLS. FORTIFIED WINES. PEEL. EXTRACTS. GRAPES. MILK FAT.

Black grape (*Vitis vinifera*) peel possesses a huge amount of nutraceuticals. In the present study, dried grape peel extract (DPE), milk fat and powdered sugar levels in stirred yogurt were optimized with the help of response surface methodology involving central composite rotatable design of three independent variables. Four

important parameters, total phenolic content, antiradical activity, textural properties and sensory characteristics were chosen for the optimization process. It was found that the antiradical activity and total phenolic content increased exponentially with increase in OPE levels. Textural and sensory attributes like consistency, cohesiveness, flavour and overall acceptability of yogurt was found directly proportional to the milk fat. On the other hand, the pH and Titrable acidity were found to be inversely proportional to the Concentration of OPE in yogurt. On the basis of interactive studies, grape peel extract, milk fat and sugar were optimized as 1.00, 4.00 and 10.00%, respectively. The optimized product possessed 85.627%, DPPH inhibition, 56.034mg of total phenolic content, 0.37g of consistency, 30.845g of cohesiveness and 7.42 flavour scores.

200. Yadav, Devbrat; ICAR-National Dairy Research Institute, Karnal (India) Kumar, Harish; ICAR-National Dairy Research Institute, Karnal (India). Center for food science and Technology, Banaras hindu university, Varanasi (India)Kumar, Arvind; Center for food science and Technology, Banaras hindu university, Varanasi (India)Jha, Alok; ICAR-Headquaters, New Delhi (India)Goyal, Arun; Maharana Partap university of agriculture, Udaipur (India). Optimization of polyphenolic fortification of grape peel extract in stirred yogurt by response surface methodology. Indian Journal of dairy Sciences (india). (Jan 2016) v.69 (1),p.41-49 KEYWORDS: POLYPHENOLS. FORTIFIED WINES. PEEL. EXTRACTS. GRAPES. MILK FAT.Black grape (*Vitis vinifera*) peel possesses a huge amount of nutraceuticals. In the present study, dried grape peel extract (GPE), milk fat and powdered sugar levels in stirred yogurt were optimized with the help of response surface methodology involving central composite rotatable design of three independent variables. Four important parameters, total phenolic content, antiradical activity, textural properties and sensory characteristics were chosen for the optimization process. It was found that the antiradical activity and total phenolic content increased exponentially with increase in GPE levels. Textural and sensory attributes like consistency, cohesiveness, flavor and overall acceptability of yogurt was found directly proportional to the milk fat. On the other hand, the pH and titrable acidity were found to be inversely proportional to the concentration of GPE in yogurt. On the basis of interactive studies, grape peel extract, milk fat and sugar were optimized in 1.00, 4.00 and 10.00%, respectively.

S01 Human nutrition - General aspects

201. Bhoite, M. Rachana.; Deptt. Of Foods and Nutrition, Faculty of Family and Community Sciences. The Maharaja Sayajirao University of Baroda, Vadodara (India) Iyer, M. Uma.; Dept. of Food and Nutrition, Faculty of Family and Community Sciences, The Maharaja Sayajirao

University of Baroda, Vadodara (India). A cohort study on the growth dynamics of rural school children. The Indian Journal of Nutrition and Dietetics. (Apr 2016) v.53 (2) p.172-183 KEYWORDS: MALNUTRITION. SCHOOL CHILDREN. RURAL AREAS. PHYSICAL ACTIVITY. GROWTH. GROWTH. DIAGNOSIS.

The prevalence of malnutrition is very high in children of rural India. It is necessary to keep a track of the data to tackle the problem. The aim of the study was to analyse the dynamics of growth and weight transitions in a cohort for rural school children from Vadodara. Using random sampling method 2282 children were selected from the school list of the industrial area of Vadodara, Gujarat. Weight and height were measured at three time point. The paired data of 465 children aged 5-16 years were analysed for the study. The interval between each survey was one year. The prevalence of underweight, stunting and thinness was 73.3, 11.8 and 67.3 % respectively in the first year according to CDC standards. The corresponding figures in the second year were 64.3, 10.7 and 62.7% respectively. The prevalence was lower as regards to WHO 2007 classification as compared to CDC standards. The mean increase in weight per year for children ranged from 2.8-2.7 kg. The increase of height per year ranged from 6.1 to 5 cm. During the study period of two years, the underweight population contracted by 13 %. In the same period, the normal population has grown by 6 %. Multipronged approach should be adhered to tackle the situation. Growth monitoring and health tracking can go a long way in improving the nutritional status.

S20 Physiology of human nutrition

202. Sonali, Raut. Deptt. of Foods and Nutrition, College of Home Science, Vasantrya Naik Marathwada Krishi Vidyapeeth, Parbhani (India) Vijaya, Nalwade.; Deptt. of Foods and Nutrition, College of Home Science, Vasantrya Naik Marathwada Krishi Vidyapeeth, Parbhani (India). Assessment of Nutritional status of menopausal women. The Indian Journal of Nutrition and Dietetics. (Apr 2016) v.53 (2) p.184-193 KEYWORDS: WOMEN. NUTRITIONAL STATUS. HAEMOGLOBIN. WEIGHT GAIN. GROWTH. INDIA.

The present study was undertaken to assess the nutritional status of menopausal women. Anthropometric measurements and biochemical parameters such as serum calcium and haemoglobin level of blood was estimated. Results indicated that mean values of body weight, BMI and hip circumference were significantly more among post menopausal women than that of pre menopausal and peri menopausal women whereas height of peri menopausal women was significantly more than that of pre menopausal and post menopausal women. On the other hand, waist hip ratio was significantly more among pre menopausal women than the other two groups of menopausal women. Mean value of serum calcium level was more in

pre menopausal than that of peri menopausal and post menopausal women but significant difference was noticed among only in serum calcium level of peri menopausal and post menopausal women. More per cent of the pre menopausal women were having normal serum calcium (mg/dl) level than that of peri menopausal women and post menopausal women. Mean haemoglobin level in the blood of the menopausal women in the three stages did not differ significantly ($p>0.05$) and the mean value of haemoglobin of all the three groups of selected menopausal women was less than normal values. Whereas more per cent of pre menopausal women were found to be under normal haemoglobin category than that of peri menopausal and post menopausal women. On the whole the results indicated that women tend to gain body weight as they tend to reach towards the menopausal stage.

203. Nagargoje, M. Kondiram.; Yashwantrao Chavan Academy of Development Administration, Pune (India) Waghray, Kavita.; Yashwantrao Chavan Academy of Development Administration, Pune (India). Prevalence and covariates of severe under nutrition among tribal and non-tribal preschoolers from Ahmednagar district, Maharashtra, India. The Indian Journal of Nutrition and Dietetics. (Apr 2016) v.53 (2) p.206-218 KEYWORDS: FOOD ADDITIVES. CHILDREN. APPETITE. GENDER. WEIGHT. PROCESSING.

The study aimed to assess the level of under nutrition among children of 0-6 year age as influenced by their communities, gender, age group, and caste and socio economic status of parents. All 14 Tahasils of Ahmednagar District of Maharashtra State, India were considered for the study. Preschoolers of 0-6 year age with Median-3SD weight for age by WHO standards and were in grade III and IV level of under nutrition by IAP classifications were the participants. The higher proportion of girls and particularly children from tribal and socially deprived castes viz. Scheduled Tribes (ST), Scheduled Caste (SC) and Nomadic Tribes (NT) were found severely under nourished. More children of age group 12-35 months were found to be severely under nourished. The lower and middle socio Economic status and severe under nutrition exhibited strong Association.

U40 Surveying methods

204. Sone, Poornima; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Bardhan, D.; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Kumar, Avadhesh; Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (India). Role of goats in livelihood of rural poor in Uttarakhand hills: An analysis based with special reference to multivariate typology of households based on farm and socio-economic characteristics,. Indian Journal of Animal

Sciences (India). (Aug 2015) v.85 (8) p.913-919 KEYWORDS: STATISTICAL METHODS. RUMINANTS. GOATS. FARMS.

The present study was conducted on a sample of 100 goat farmers randomly drawn from 2 administrative blocks in Almora, Uttarakhand to analyze the role of goats in the livelihoods of rural households. Farm household typologies were constructed by using 2 multivariate statistical techniques, viz. principal component analysis (PCA) and cluster analysis (CA). PCA was used to transform linearly an original set of 17 variables, representing farm and socioeconomic characteristics, into a smaller set of uncorrelated variables (factors) that represents most of the information in the original set. The factors retained from the PCA were used for cluster analysis. Five homogenous groups (clusters) were obtained. Cluster 1 (20%) was identified as households with high farm family labour involvement and low female labour involvement in goat husbandry, Cluster 2 (21%) as households with high income from agriculture and dairying, Cluster 3 (18%) as households with low income from agriculture and dairying, Cluster 4 (22%) as households with high farm family labour involvement and high female labour involvement in goat husbandry and Cluster 5 (19%) as female headed households. Contribution of income from goat in animal husbandry income, farm income and household's total income for all clusters combined was 61.45, 14.23 and 7.01 %, respectively. Share of income from goat was highest for cluster 3, implying that small ruminants like goats are most important for livelihood security of resource poor farmers. Hence, any improvement in goat production enhances the socio-economic status of the farmers, specially the rural poor.

205. Singh, Mohan Das N.; ICAR- Indian Agricultural Statistics Research Institute, New Delhi (India). Paul, A.K.; ICAR- Indian Agricultural Statistics Research Institute, New Delhi (India). Paul, Ranjit Kumar; ICAR- Indian Agricultural Statistics Research Institute, New Delhi (India). Selecting appropriate nonlinear growth models using Bootstrap technique. Indian Journal of Animal Sciences (India). (Aug 2015) v.85 (8) p.920-922 KEYWORDS: GROWTH. MODELS. RESEARCH. STATISTICAL METHODS.

Growth is an important phase in the life of animals which influences the different forms of production such as milk, meat etc. The relationship between body weight and age is important particularly in meat producing animals. Many works have already been done for fitting of non linear growth models and choosing best model to describe growth pattern. In the present study, attention is given to the study of statistical properties of goodness of fit criteria for selecting best model to describe the growth pattern by using bootstrap technique. The distributions of the goodness of fit criteria R^2 (determination coefficient), RMSE (root mean square error) and ARR (absolute reduction ratio) are found to be non-normal. Based on

these statistical measures the best model is selected to describe growth pattern in given body weight data of goat. On comparison of 3 nonlinear growth models, viz. Logistic, Gompertz and Yon bertalanffy model, the third one was found to be the best model.

206. Mandal, Shila; DumDum, Kolkata (India). Dum Dum Motijheel College. An enquiry into the well-being and deprivation of slum dwellers- a case study. *Journal of Interacademia (India)*. (Apr 2015) v19 (2) p.249-254 KEYWORDS: SLURRY. POVERTY. EXPENDITURE.

We studied the quality of living and level of deprivation of some typical slum dwellers of an area under Dum Dum Municipality of West Bengal. To this end, we analyzed their population structure, income and expenditure patterns, nature of employment, access to housing, safe-drinking water, sanitation and electricity, educational - and health attainment, credit worthiness, and physical possession of some basic amenities in life. Excepting access to safe-drinking water and electricity, they lacked all the vital components for leading a decent living including medical facilities. Eighty per cent of the households and 86.4% of the population of the slum under consideration were living below the poverty line requiring immediate Government interventions.

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- 5) Central Institute for Research on Goats, Mathura
- 6) Central Institute of Brackishwater Aquaculture, Chennai
- 7) Central Institute of Fisheries Education, Mumbai
- 8) Central Plantation Crops Research Institute, Kasargod
- 9) Central Potato Research Institute, Shimla
- 10) Central Research Institute for Dryland Agriculture, Hyderabad
- 11) Central Research Institute for Jute & Allied Fibres, Barrackpore
- 12) Central Sheep & Wool Research Institute, Avikanagar
- 13) Central Soil Salinity Research Institute, Karnal
- 14) Central Tobacco Research Institute, Rajamundry
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- 19) Directorate of Wheat Research, Karnal
- 20) Indian Agricultural Research Institute, New Delhi
- 21) Indian Agricultural Statistics Research Institute, New Delhi
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- 23) Indian Institute of Sugarcane Research, Lucknow
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- 28) National Centre for Integrated Pest Management, New Delhi
- 29) National Dairy Research Institute, Karnal
- 30) National Institute of Research on Jute & Allied Fibre Technology, Kolkata
- 31) National Research Centre for Equines, Hisar
- 32) National Research Centre for Sorghum, Hyderabad
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- 43) Indian Society of Agricultural Economics, Mumbai
- 44) Journal of Interacadamecia Society, Kalyani
- 45) Fisheries Society, CIFRI, Barrackpore
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