Strategies for improving feed and fodder resources and utilization for sustainable milk and meat production from livestock in India

Ramaprasad J and Suhas Sourie

1 Ambo University, Ethiopia
2 Apotex Research Centre, India

India with 328.73 million hectares geographical area is endowed with 485 million diverse livestock wealth. Currently, India is the largest milk producer in the world with 105 million metric tons per annum. Despite this, there is deficit of milk and meat production to meet the recommended daily allowances (RDA) of milk and meat consumption for human. Hence, there is a need to enhance livestock production, which justifies the increasing the livestock population. But the main impediments are low genetic makeup of indigenous livestock and qualitative and quantitative insufficiency of feed and fodder resources for livestock feeding.

The Government of India has initiated several research projects to enhance feed utilization. To meet the gigantic and challenging task of feeding livestock with quality forages, there is a definite need to increase forage production per unit area through encouraging high yielding fodder crops and forages, in an integrated crop- livestock farming systems. General strategies for utilization of available crop residues, agro industrial by products (AIBP) and non conventional feed resources (NCFR) is by proper harvesting at right time, processing and storage, besides, conservation and judicious usage. Nutritional strategies include the development of complete rations for effective utilization of feed resources. Compressed feed blocks and use of expander-extruder processing of complete feeds is another strategy. Development of package of practices by strategic supplementation of specific deficit of nutrients at catalytic level is another measure. Feeding by-pass proteins and by-pass fats in the rations of high yielding cross bred cows is an alternative strategy. Use of bio- technological products, like pro-biotic, pre-biotics and parental application of bovine somototropin (BST) in dairy animals can dramatically enhance the on farm milk and meat production. These strategic measures have potential to ensure sustainable availability of feed and fodder resources as well as their effective utilization for enhanced milk and meat production from indigenous livestock on long term economic basis.

Keywords: Feed, fodder, milk, meat, livestock feeding strategies.

Biography

Ramaprasad J has worked in Sri Venkateswara Veterinary University, at Tirupati, AP in different positions for more than 35 years and retired as professor and University Head of Animal Nutrition department. Under his chairmanship, 14 students accredited for MVSc and 3 students doctoral degree. As principal investigator he completed 8 research projects, sponsored by various national and international organizations. He had an excellent academic record and conferred with honours' like FNAVS (2002), best researcher (2005) and best teacher (2006). He has published more than 87 research papers in reputed journals and serving as an editorial board member of reputed journals. At present he is working as professor, Animal Science, Ambo University, Ambo, Ethiopia.

ramaprasadjin@yahoo.com
Detection of antisperm antibodies in serum of repeat breeding cows

S K Srivastava, S Mehrotra, Med Ram Verma and H Kumar
Indian Veterinary Research Institute, India

Investigation was carried out to ascertain the influence of antisperm antibodies in causing repeat breeding in cattle. Antibodies were detected by tube plate agglutination test in the serum of 9 repeat breeding crossbred cows and 14 heifers which served as control. Serum of 16 normal as well as 16 pregnant cows was also subjected for detection of antibodies. The animals were screened for specific (IBR and brucella) as well as nonspecific (uterine) infection before detection of antibodies to exclude the other causes of repeat breeding. The antibodies level was ascertained in 1:1, 1:5 and 1:10 serum dilutions. Frozen semen of crossbred bulls having 5 million spermatozoa and 50 percent progressive motility was used during investigation. Semen was mixed with diluted serum and clumping of spermatozoa was observed under phase contrast microscope after incubation at 37°C for 45 minutes. Number of clumped spermatozoa was 8.71±1.42; 18.82±1.33; 26.33±1.77 and 14.06±1.33 in 1:1 diluted serum in heifer, normal breeding, repeat breeding and pregnant cows respectively. It was 4.36±0.82; 10.37±0.77; 16.44±1.03 and 8.06±0.77 in 1:5 serum dilution whereas 2.78±0.51; 8.15±0.47; 10.33± and 5.06±0.47 in 1:10 dilution among above groups respectively. There was significant difference (p<0.01) in the number of agglutinated spermatozoa of repeat breeding cows as compared to heifer, normal breeding and pregnant cows in all the three dilutions. Percent agglutinated spermatozoa were also calculated and value was 10.74; 21.28; 31.46 and 15.20 percent in 1:1 dilution. The percent agglutination was 6.50; 14.70; 19.31 and 9.38 in 1:5 dilutions as well as 4.06; 10.66; 12.56 and 6.33 in 1:10 dilutions in above groups respectively. Percent agglutinated spermatozoa in repeat breeding cows was also significantly different (p<0.01) as compared to heifers and pregnant cows in all the dilutions. Thus it is concluded from the study that presence of antisperm antibodies in serum may be a reason of repeat breeding condition in crossbred cattle.

skivri6@gmail.com
Supply of quality green forages throughout the year for the livestock is becoming difficult due to reduction of cultivable land, short supply of saplings and seeds of fodder crops, preference of cash crops over fodder crops by the farmers and many other reasons. Therefore to ensure the supply of high quality nutritive fodder it is very essential not only to grow best varieties of fodder crops but also harvest it completely at one go.

The prevalent practice in many part of the country is cutting off the required quantity of fodder daily and that is being fed directly to livestock. The major drawback of this practice is the non availability of essential nutrient throughout because of over matured herbs and harden stems that possessed high percentage of crude fiber. Moreover the land under fodder cultivation in small holder farmers is also very limited.

A technology of anaerobic fermentation of fodder crop and other fresh non conventional feed to prepare composite silage in containers that are convenient for small holders was developed. Silage making as a tool for conservation of fodder is not a new concept, but was not very popular with small holder because of labor intensive activity. Normally silage making in silo pits or in trench or tower silo has got their own limitation because of requirement high quantum of fodder crop. The silage in small containers like in bamboo make containers or in plastic bags has become very popular with the farmers with small herd size and adopted by large number of livestock owners. The composite silage with vegetable waste in different proportion of by-product of distillery such as maize brans and also with fruit waste, mixed with perennial grass is also proved to be beneficial in cutting lost on feed stuff.

The capacity of different type of silage is as under:
Bamboo Containers: 1000 kg
Specially made bags with inner lining: 500 kg
Plastic containers: 80 - 100 kg
Plastic Pouches: 10 - 15 kg

Addition of silage inoculants will help in reducing the incubation time and fermentation process. The palatability of the resultant silage was very good.

Biography
Mirza Ismail Baig has worked as the Professor and Head at prestigious Veterinary College till October 2013. Under different projects he has developed the cost effective composite silage making process. Similarly he has developed the package and practices for rearing male buffalo calves for breeding purpose. He has published more than 25 research papers in reputed journals. He is Life member of five Scientific Associations.

mirzaib@rediffmail.com
Effect of replacing inorganic zinc with a lower level of organic zinc (zinc propionate) on performance, biochemical constituents and mineral status in buffalo calves

D Nagalakshmi, K Sridhar, M Satyanarayana and L Vikram
Sri Venkateswara Veterinary University, India

Zinc is a component of more than 300 metallenzymes and thus an important trace mineral for livestock affecting all phases of production. It is also one of the most deficient mineral in soil, feeds, foders and animals in many geographical regions of India and World. The trace minerals in majority are supplemented in animal diets as inorganic forms (sulphates or oxide salts), which suffer from high rates of loss due to dietary antagonism resulting in low production and thus these mineral salts are supplied in excess to meet their requirement. However, an excess of supplemental inorganic minerals leads to waste and environmental pollution. Organic source of trace minerals have higher bioavailability and thus could be supplemented at lower levels, reduce excretion and environmental pollution. Thus the present study of 150 days duration was carried out to investigate the effects of replacing inorganic (ZnSO₄) with at lower level of organic zinc (Zn propionate) on growth performance, biochemical constituents and mineral status in buffalo calves. Twelve buffalo calves with an average body weight of 193.3±19.63kg (14-24 months), were randomly allotted to a control (80ppm Zn from ZnSO₄) and experimental (60ppm Zn from Zn-propionate) diet. The calves grew with an average daily gain of 514.6 and 541.7 g, with dry matter intake of 4.96 and 5.12 kg/d, respectively on inorganic and organic zinc and were comparable. The fortnightly body weights, dry matter and nutrient intake, efficiency of nutrient utilization, mineral (Zn, Cu, Mn, Fe) concentration in serum of calves fed Zn-propionate (60ppm) was comparable to those on ZnSO₄ (80ppm). The serum total protein and globulin concentration improved with organic Zn supplementation. Supplementation of Zn-propionate significantly (P<0.05) increased alkaline phosphatase activity and superoxide dismutase activity by 23%, compared to ZnSO₄, both being markers of Zn status in animals, indicating higher bioavailability of Zn from Zn propionate. Serum total protein (P<0.01) and globulin (P>0.05) concentration improved with organic Zn supplementation. The study indicated that organic Zn could be included at lower levels i.e., at 75% of inorganic mineral supplementation in buffalo calves.

Biography

D Nagalakshmi has completed her Masters and PhD in Animal Nutrition from Indian Veterinary Research Institute, Bareilly, India. She is having 15 years of teaching and research experience and presently working as Professor and Head, Department of Animal Nutrition in College of Veterinary Science, Korutla in Andhra Pradesh. She has received many National and State Awards for her contributions in field of Animal Nutrition. She has published more than 80 papers in reputed Journals and is referee for many reputed Journals.

dnlakshmi@rediffmail.com
Relationship between plasma IGF I, body weight and age at puberty in low body weight male Murrah calves and effect of supplementation of fermented yeast culture in the improvement of productive parameters

Anand Laxmi and Sehgal J P
National Dairy Research Institute, India

The onset of puberty has been shown to be a complex interaction between sex steroids and insulin-like growth factor I (IGF-I) in humans, sheep and in cattle. Aim of the present study was to find the relationship between plasma IGF I, Haptoglobin with body weight and age at puberty in male Murrah buffaloes. To evaluate the effect of supplementation of fermented yeast culture (Saccharomyces cerevisiae) to low body weight calves, for improvement in body weight of low body weight calves and in advancing the age of puberty through plasma parameters. The proposed research work was carried at National Dairy Research Institute, Karnal Haryana, India. In the present study twelve male Murrah calves with low body weight (110 ± 10 Kg), at ten months of age were selected. The concentration of plasma IGF I and Haptoglobin were estimated. Weekly blood samples were collected and monthly body weights were recorded. The male calves were divided equally in to two groups. The experiment was conducted till they attained fourteen months of age. In one group calves were supplemented with commercial fermented yeast culture (Saccharomyces cerevisiae) at 12g/animal/day along with the concentrate. They were provided with wheat straw based diet and concentrate in the ratio 1:1 at 3kg/100kg BW. Similarly fermented yeast culture was supplemented at 24g/animal/day from fourteenth month till they attained puberty. Calves or bulls which did not receive supplementation of yeast culture served as control. The age of the bulls was recorded on attaining puberty. Blood plasma was separated. Plasma IGF I Haptoglobin and Testosterone were measured by enzyme immuno assay (EIA). Dry matter intake and feed conversion efficiency were also estimated, based on feed intake and feed refusal per day.

On supplementation of yeast culture for four successive months the concentration of plasma IGF I, was significantly more (P<0.05) in the supplemented group where as concentration of plasma Haptoglobin was not significantly different between the groups. The average daily gain in the body weight of animals (≥700g /day) was observed in supplemented group whereas in non supplemented group the average daily gain was observed to be at ≤500g/day. The estimated DMI/Head/day or DMI/Head/Day/100kgBW was not significantly different between the groups. The feed conversion efficiency was observed to be significantly greater (P<0.05) for the supplemented group. After fourteen months of age the average daily gain in the body weight of animals was ≥400g/day whereas in the non supplemented group it was ≤500g/day. The plasma IGF I and testosterone concentration was also significantly more in the supplemented group (P<0.05) throughout the course of the study. After fourteen months of age a positive relationship was observed between the two. Highest concentration of testosterone was observed during peripubertal period with in a group and age related increase in IGF I concentration was observed with in a group, but concentration was always greater in the supplemented group. Three out of six bulls attained puberty at the age of 22 ± 2 months and two attained puberty at the age of 24 ± 2 months. In the control group none of the bulls attained puberty till 28 months of age. This is a non invasive biotechnological tool which can be imparted for increasing the productive performance of male Murrah buffaloes.

Biography
Anand Laxmi is working as principal scientist in the field of dairy animal reproduction. She joined National dairy Research Institute since 1993 as scientist and has twenty research publications in national and international journals and has authored several popular articles and technical books in Hindi Language. She is also a member of SAPI and ISSRF scientific bodies. Besides working on ruminant’s productivity, by different means, and have also worked on fibroblast cell culture and on transfection and expression of IFN-tau gene under externally funded project by Department of Biotechnology where they had developed an indigenous estrus synchronization technique which was applied at field level in collaboration with Dairy Extension division, NDRI.
Mineral interrelationship of soil, feeds and fodders and dairy animals in Mahaboobnagar district of Andhra Pradesh

S Ramesh, D Nagalakshmi, Y Ramana Reddy and A Rajashekher Reddy
Sri Venkateswara Veterinary University, India

A survey was conducted to evaluate the mineral status of dairy animals of Mahaboobnagar district of Andhra Pradesh. Four villages were selected for the survey that truly represented the animal husbandry practices of the district. The soils in the surveyed villages were adequate in Ca, Mg, Mn, Fe and Co while deficient in P. About 32.5 % samples had Cu and Zn levels below the critical level. The supply of minerals from water was negligible. The dry and green roughages on average were deficient to marginally adequate in Ca (0.20–0.46%), adequate in Mg (0.19 – 0.36 %), Co (0.20 – 0.30 ppm), reasonable in Mn (24.78–155.74ppm) and quite excess in Fe (103.3 – 525.8 ppm), while deficient in Cu (1.52 – 9.91ppm) and P (0.12 – 0.32 %). The dry roughages were deficient in Zn (16.98 – 30.28 ppm), while greens were adequate. The brans were rich in P, Fe, Mn and Co; moderate in Cu, Zn and Mg, while maize grain was deficient in most of the minerals except P, Fe and Co. Ragi straw and horse gram were good sources of Ca. The blood hemoglobin content in animals was within the normal range of 8-12 g%. Inspite of adequate intake of Ca, deficiency of Ca was observed in stall fed milch (20-25%) animals, due to high P intake and major supply of Ca was from paddy straw (46%). P deficiency was observed in animals maintained on dry roughages and grazing grass that were grown on P deficiency soils. Though the plasma Cu and Zn concentration was above the critical levels, its deficiency was observed in 12.5–41.02% and 15.79 - 29.62 %, respectively, among various categories of animals due to lower intake of these minerals compared to the requirement and interference with their absorption due to excess Fe in the diet. The plasma Mg, Mn, Fe, and Co levels in all categories of animals were well above the critical levels. Area specific mineral mixture could be formulated with CuSO4, ZnSO4 and calcite powder and fed at 30g daily to animals. To obviate P deficiency in grazing animals, supplementation of brans, chunies or oil seed cakes is recommended.

Keywords: Ca-Calcium, Mg-Magnesium, P-Phosphorous, Cu-Copper, Zn-Zinc, Mn-Manganese, Co-Cobalt, Fe-Iron, CuSO4- Copper Sulphate, ZnSO4-Zinc Sulphate.

drrameshsg@gmail.com
Nutritional quality of Indian rapeseed meal

Karthik Masagounder¹, Kiran Doranalli¹, Markus Wiltafsky² and Girish Channarayapatna¹

¹Evonik Industries, Singapore  
²Evonik Industries, Germany

Pricing of soybean meal (SBM) is highly volatile and continue to increase. Rapeseed meal (RSM) is a commonly used alternative protein source in poultry. However, in order to use RSM effectively in poultry diets, it is critical to have updated knowledge on their nutrient profile as well as anti-nutritional factors, as the values tend to change over time. Objectives of this paper were to determine the content of essential amino acids (EAA) and proximate nutrients of Indian origin RSM samples collected during 2013. In addition, metabolisable energy (ME) content of RSM was estimated for poultry using prediction equation based on proximate nutrients. Total glucosinolate contents of Indian RSM samples were also analyzed during the study period. A total of 3073 samples were analyzed for EAA and crude protein and 1743 samples were analyzed for other proximate nutrients. Results indicate that Indian RSM, on 88% standardized dry matter basis (mean ± 1 SD), contained 37.09±0.71% crude protein, 1.76±0.07% Lys, 0.69±0.02% Met, 1.64±0.04% Met+Cys, 1.49±0.03% Thr, 0.50±0.01% Trp, 2.32±0.09% Arg, 1.43±0.03% Ile, 2.48±0.05% Leu, 1.81±0.04% Val, 1.01±0.04% His and 1.46±0.03% Phe. Crude protein level ranged from 34.9% to 39.62%, with low (<5%) coefficient of variation (CV) observed for all EAA. The analyzed AA contents were found to be higher than the previously reported book values (e.g., 1.73% Lys, 0.68% Met, 1.45% Thr; Indian RSM average from AMINODat® 4.0, 2010), indicating the importance of using the actual values in feed formulations. Mean concentrations of ether extract, crude fiber, and crude ash were estimated to be 2.76%, 10.45%, and 6.98%, respectively while their CV ranged between 4.14% (fiber) and 12.32% (ether extract). Based on Rostagno’s energy prediction equation, ME (mean ±1 SD) of RSM was calculated to be 1743±19.79 kcal/kg. Glucosinolate content (mean ±1 SD, n=29) was found to be 20.10 ± 8.80 mg/g with values ranging from 6.89 mg/g to 35.76 mg/g. Huge variation observed in the glucosinolate content may explain the discrepancies observed in the performances of broilers when feeding Indian RSM. In India, RSM and mustard meal varieties are often mixed and used without considering quality with regard to ANFs and this warrants further investigation. Data of this study serve as a reference when formulating diets with RSM for poultry.

Biography

Karthik Masagounder has obtained his Bachelors in Fisheries Sciences from Tamil Nadu Veterinary and Animal Sciences University and Masters in Aquaculture from Central Institute of Fisheries Education, Mumbai. He completed PhD from the University of Missouri, USA focusing on animal nutrition. He then continued his postdoctoral research in the area of bioenergetics for another 1.5 years in the USA. He has published more than 10 papers, many popular press articles and abstracts in the areas of fish and poultry nutrition. He has been working for Evonik Industries since Jan 2012 as a Regional Technical sales manager.

karthik.masagounder@evonik.com
Formulation of balanced feed for working equids under field conditions

Jogen Kalita
Brooke Hospital for Animals, India

Owners in India often experience difficulties with availability and affordability of appropriate feed for working equids. Owners' lack of knowledge and awareness of deleterious effects of nutrient deficiency/imbalanced feed may lead to ailments including nutritional hyperparathyroidism with symptoms of bilateral facial swelling, dyspnoea, intermittent shifting lameness, joint pain on palpation.

The Brooke Hospital for Animals, India developed software that predicts the optimal nutritional contents of different types of feed based on analyses of equids’ nutritional needs. The computer based feeding software (CBFS) is a simple tool which calculates the actual feed requirement of an equid based on body weight, work type and work duration in terms of essential nutrients such as- dry matter, digestible energy, crude protein, carbohydrates and minerals like calcium and phosphorus. This analysis facilitates a discussion with the owner regarding any potential gaps in current diet. This software was piloted on 14 equids in Manpur village of Bulandsahar district over a 4 week period. During this process, the owners were encouraged to combine suitable ingredients (e.g. maize, gram husk, barley) in a user friendly balanced feed formula considering seasonal availability, cost and nutritional requirements. Owners observed their equids to have shinier body coat, enhanced work efficiency and increased alertness. Feed palatability also seemed improved. CBFS feed formulated also halved their current investment i.e. INR 20/- against INR 40/-per kilogram.

The local regional equine welfare association of 12 villages organised exposure for other owners to Manpur, resulting in adoption of this practice by 100 additional owners.

Biography

Jogen Kalita, a veterinarian from Assam Agricultural University (AAU) started his career with a reputed Indian social sector NGO-PRADAN in 2000. He worked in Purulia and Bankura districts of West Bengal for enhancing livelihoods of the poorest communities through organizing them into SHGs, clusters and federations. In PRADAN, he was promoted as Team Leader in Vidisha (Madhya Pradesh) in 2008. In 2011, he joined Brooke Hospital for Animals, India (an international charity working for welfare of working equids) as Program Development Manager that involves leading a region comprising of 10+ district units and extending strategic, administrative and operational support.

jogenkalita@yahoo.co.uk
Persistence of heavy metals in Mathura (birth place of Lord Krishna), India: Risk assessment to animal health

Atul Prakash, Shaikh Mohd Zoheb, Rajesh Mandil, Anu Rahal and Satish K Garg

U P Pandit Deen Dayal Upadhyay Pashu Chikitsa Vigyan Vishwavidyalaya Evam Gau Anusandhan Sansthan, India

Introduction: Rivers present a potential source of environmental pollution in India. River Yamuna is the largest tributary of the holy river, Ganga in North India and is responsible for surface water supply of several cities located on its way downstream viz. Delhi (Capital of Republic of India), Mathura (birth place of Lord Krishna), Vrindavan and Agra. It also serves as a major drain for these cities.

Methods: The present study was conducted to assess the degree of heavy metal contamination of surface water, agricultural soil and the fodder crops grown in the catchment area of river, Yamuna in the Mathura district of Uttar Pradesh (India). Surface water, soil and fodder samples were collected from different villages in Mathura District, processed and analyzed for lead, copper, cadmium, mercury, arsenic and iron using Atomic Absorption Spectrophotometer (AAnalyst 400 Perkin Elmer).

Results: The results showed presence of all the heavy metals beyond the national and international permissible limits in soil and fodder samples. Levels of arsenic and cadmium in soil (269.83-1891.38 ppb; 11.88–28.26 ppb) and fodder (498.71-6843.84 ppb; 0.82–11.51 ppb) in soil and fodder samples were evident in the villages nearby Mathura oil refinery area suggesting an additional load attributable to the refinery. The health risk index for cadmium (127.88) was remarkably high followed by iron (60.19) and arsenic (31.38) as compared to lead (5.01), copper (0.46) and mercury (0.06).

Discussion: Urgent attention is needed to devise and implement appropriate means of monitoring and regulating industrial and domestic effluent, and develop alternate water resources for surface water for human and animal consumption and agricultural irrigation.
Effect of different dietary levels of selenium on immunity and keeping quality of meat in growing Nellore ram lambs

K Sushma, Y Ramana Reddy, N Nalini Kumari, T Raghunandan and P Baswa Reddy
Sri Venkateswara Veterinary University, India

An experiment was conducted on 24 male growing Nellore lambs (15.75 ± 0.47 kg) which were randomly divided into four groups of six animals in each group. These animals are supplemented with 0, 0.45, 0.9 and 1.8 ppm selenium (Se) in the form of sodium selenite (inorganic salt) in the concentrate mixture which is fed to the animals to assess effect of selenium on the immunity and shelf life of meat after slaughter. Lambs were fed the respective concentrate mixture at 1 per cent of their body weight along with ad lib roughage under stall feeding throughout the feeding trial of 120 days. The basal diet (DM basis) contained 0.09 ppm of Se in green fodder, 0.11 ppm of Se in dry roughage and 0.19 ppm of Se in concentrate mixture.

To assess the humoral immune response the enterotoxaemia vaccine is given along with the booster dose on 14th day and blood is collected from the animals on 0th, 14th, 21st and 28th day. Serum was separated and ELISA is conducted to get the titre values. To see the cell mediated immune response the animals are immunized with sheep pox vaccine and then the response is seen by injecting the PHA-P intradermally by DTH reaction. Keeping quality (TBARS) of meat from different groups is evaluated at 0, 3 and 6 days post slaughter.

The humoral immune response against enterotoxaemia was higher in the selenium supplemented lambs (0th, 14th, 21st and 28th day of post sensitization) than the unsupplemented lambs. There was significant difference (p<0.05) among the groups for the immune response. At the starting of the experiment there was variation in the titre values but the response was linearly increased up to end of the experiment. The titre values were highest in the group supplemented with selenium of 1.8 ppm (T4). The cell mediated immune response was significantly different (p<0.05) among the groups and the skin fold thickness (mm) was highest in the group supplemented with selenium at 1.8 ppm (T4) after 24 h of injection.

Supplementation of Se at different levels had no effect on the quality of meat post slaughter assessed by estimating TBARS concentration in meat but linear response was observed among the groups.

Keywords: Selenium, supplementation, immune response, meat quality, sheep.

drsushmajayachandra@gmail.com
Efficacy of *Bacillus subtilis* probiotic on growth performance, fecal microbiota and intestinal morphology of broiler chickens

Kiran Doranalli, T C Loh and C K Girish
1 Evonik Industries (SEA) Pte Ltd, Singapore
2 University Putra Malaysia, Malaysia

The study evaluated the effects of feeding probiotic (*Bacillus subtilis*; BS) or antibiotic growth promoter (AGP) alone or in combination on growth performance and intestinal morphology of broilers. A total of 480 day-old male Cobb-400 broilers were grouped into 4 treatments and fed different diets: (1) corn-soybeanmeal based control (C), (2) C+AGP (100 ppm of oxytetracyclin and neomycin), (3) C+BS (500g/MT) and (4) C+ BS+AGP. At day 42, feeding BS or AGP alone numerically improved body weight gain (BWG, by 40 and 60 g, respectively) of broilers compared with control whereas feeding both BS and AGP resulted in higher BWG (by 90 g) relative to control indicating a synergistic effect. Feed conversion ratio improved (*P*≤0.05) when broilers were fed BS (by 9 points), or BS+AGP (by 10 points) diets compared with C diet. Significant increase in duodenal villus height (VH) was observed when broilers were fed BS or AGP alone compared with those fed C diet. Feeding BS or BS+AGP diet increased (*P*≤0.05) the VH of jejunum and ileum compared with C diet, whereas VH was reduced in ileum of broilers fed AGP diet. Furthermore, there was a significant increase in fecal lactic acid bacteria (LAB) and decrease (*P*<0.05) in *Enterobacteriaceae* (ENT) counts in broilers fed BS compared to control. A combined effect of feeding AGP and BS was observed as indicated by highest LAB counts. It can be concluded that inclusion of BS based probiotic alone or in combination with AGP to broiler diets improved growth performance and small intestinal morphology. Supplementation of BS showed its effects on modulating microbial populations, which was evidenced by increased amounts of LAB, mostly accounting for beneficial gut microbiota and reduced counts of ENT, the latter group containing gut pathogenic bacteria like *Eischerichia coli* and *Salmonella*.

Biography

Kiran Doranalli holds a Doctor of Veterinary Medicine and Master Degree in Animal Nutrition from University of Agricultural Sciences, Veterinary College, Bangalore, India. He completed his PhD program from University of Saskatchewan, Department of Animal and Poultry Science, Canada. He has published 12 scientific research articles in peer reviewed journals and 4 popular press articles, presented and published 27 abstracts in scientific meetings and conferences. Currently, he is working with Evonik industries as the Regional Technical Manager for Asia south region from the past 3 years.

kiran.doranalli@evonik.com
Advancing global health with one health concept

Kumar Venkitanarayanan
University of Connecticut, USA

A majority of human diseases in the last century has been linked to direct or indirect contact with domestic and wild animals. Recognizing the close association of humans, animals and the environment, One Health concept - a global strategy integrating interdisciplinary partnership from human medicine, veterinary medicine, and environmental science for attaining optimum health was initiated. One Health approach has been applied as an important disease control and prevention strategy by several international agencies, including the Food and Agricultural Organization, World Health Organization, and the United States Centers for Disease Control and Prevention.

Veterinarians play a critical role in implementing One Health due to their occupational interaction with a multitude of animal species. In addition, animals are often the first subjects showing symptoms of a new disease outbreak; thus recognizing and controlling the disease in animals is critical for preventing its transmission to humans. This is particularly crucial since a great majority of emerging and re-emerging human diseases are zoonotic in nature. Finally, the extensive use of antibiotics in animal agriculture has partly contributed to bacterial antibiotic resistance, thus highlighting the critical function of veterinary medical professionals in curbing this global health hazard.

This talk will provide an overview of One Health, including its need, mission, history and advantages. Additionally, examples of success stories on controlling human diseases after implementation of One Health will be discussed. Finally, the role of veterinarians in implementing One Health, and the need for including One Health in veterinary medicine curriculum will be discussed.

Biography

Kumar Venkitanarayanan received his Bachelor of Veterinary Science and Master of Veterinary Science degrees from Kerala Agricultural University and Tamil Nadu Agricultural University, respectively, after which he practiced as a veterinarian for a year. In the US, He obtained his MS in Food Science (University of Nebraska-Lincoln) and PhD in Animal Science (University of Connecticut). He later worked as a Postdoctoral Research Associate at the Center for Food Safety, University of Georgia. He has published 80 peer-reviewed journal manuscripts, 10 book chapters and characterized five new bacterial genes. Having successful in garnering more than 5 million dollars as funding for his research, Venkitanarayanan serves on the editorial board of multiple international journals, and is currently supervising one post-doctoral scientist, five PhD candidates, and five MS students.

kumar.venkitanarayanan@uconn.edu
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Brucellosis in cattle & buffaloes in and around Bikaner, Rajasthan, India

R K Tanwar
Rajasthan University of Veterinary and Animal Sciences, India

Cattle and buffaloes are valuable and prestigious component of rural household having great socio-economic importance. Brucellosis is endemic throughout India. Economic losses are considerable in India. There is no organised and effective Brucellosis control program. Plans for a large scale control programme, including calf hood vaccination are underway. A major constraint of a control programme is that slaughter of cows is banned in India and the segregation of seropositive cows until their death will therefore be necessary but very costly. Blood samples were collected from 200 cattle and 200 buffaloes each for seroprevalence studies. Brucellareactors were determined by using Rose Bengal Plate Test (RBPT) and Avidin-Biotin Enzyme Linked Immunosorbent Assay (A-B ELISA). Out of 200 serum samples of cattle examined 29 and 38 samples showed seropositivity with RBPT and Avidin-Biotin ELISA, respectively. Maximum seroprevalance was found with Avidin-Biotin ELISA (19 per cent), followed by RBPT (14.5 per cent). Likewise blood samples of 200 buffaloes were also collected for seroprevalence studies for brucellosis.

Out of 200 serum samples of buffaloes screened for brucellosis, 15% of buffaloes were found positive for brucellosis by Avidin-Biotin Enzyme Linked immunosorbant assay (A-B ELISA) followed by RBPT (9.0%). Prevalence of brucellosis was higher in cattle than buffaloes. The results of the present investigation indicated that A-BELISA is more efficient in detecting the brucellosis as compared to RBPT.

Biography
R K Tanwar completed his PhD in Veterinary Medicine at the age of 39 years from Haryana Agricultural University, Hisar, Haryana. He served as Director of Clinics in Rajasthan University of Veterinary and Animal Sciences, Bikaner, Rajasthan. He also served as Head of Department of Epidemiology and Preventive Veterinary Medicine, College of Veterinary and Animal Science, Bikaner. He has published more than 140 papers in reputed Indian and Foreign Journals and serving as executive editor of Journal of Veterinary Practitioner and Journal of "Camel Practice and Research”. He is also co-author of the book entitled “Veterinary Jurisprudence”.

rktanwardr@yahoo.com
Generation of gateway clone library of virulence associated genes of zoonotic buffalopox virus: State-of-the-art resource for proteome analysis

B C Bera, Taruna Anand, Sanjay Barua, Rajesh K Vaid, Nitin Virmani, Riyesh T, Sunita Kundu and Praveen Malik
National Research Centre on Equines, India

In recent times, frequent epidemics of buffalopox virus (BPXV), a close variant of vaccinia virus in buffaloes, cows and humans in India is posing a potential public health concern following the cessation of smallpox vaccination globally. Currently lack of effective prophylaxis against BPXV infections warrants the need for BPXV proteome analysis so as to identify potential vaccine candidate, as well as to elucidate the host–pathogen interactions. In this context, Gateway clone library of Open Reading Frames (ORFs) of virulence associated genes of zoonotic buffalopox virus (BPXV) was generated and preserved in the repository of Veterinary Type Culture Collection, Hisar, Haryana, India. This study involved the development of biological resource collection in the form of gateway entry clones of 19 virulence associated ORFs (C3L, crmB, B28R, cbp, B29R, IL-18, C7L, ZFA, N1l, K1L, K3L, E3L, A39F, B5R, L5R, D8L, A21L, A27L & B1R) of BPXV. The targeted ORFs have been amplified by two rounds of PCRs using ORF-specific primers without stop codons and having lambda phage att sites. The amplicons were cloned into Gateway vector-pDONR221 (Invitrogen) by homologous recombination and recombinant clones were selected by antibiotic resistance and suicidal action of ccd gene of the vector. The generated Gateway entry clones were validated by sequencing the ORFs and preserved in the repository. This is the only available flexible Gateway entry clone library of BPXV which will serve as state-of-the-art resource to scientific community for high-throughput proteome analysis of BPXV with the futuristic aim of development of 3rd generation vaccines against BPXV.

Biography
B C Bera has completed his PhD at the age of 28 years from Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh. He is working as scientist at Veterinary Type Culture Collection, Hisar, Haryana. He is working in the area of molecular epidemiology of animal viruses especially on equine influenza virus, buffalopox & Camelpox viruses. He has published more than 17 research articles in reputed journals.

bcbpatent@gmail.com
Evaluation of neem leaf powder along with spirulina as an alternative to antibiotic growth promoter in broiler production

K Bharavi, K Ravi, P Ravi Kumar and D Narendranath
Sri Venkateswara Veterinary University, India

The study aimed to evaluate the performance and health parameters after administration of shade dried Neem leaves powder [NLP] along with Spirulina powder in the feed as an alternative to antibiotic growth promoter. A total of 270 Vencobb strain, day old broiler chicks were randomly divided into 6 groups. 45 chicks from each treatment were wing tagged to form 3 replicates of 15 chicks each in a completely randomised design. Group I was normal control fed with only basal feed without any growth promoter, group II chicks were antibiotic control fed with 0.05% of TM 200 (Oxytetracyclin), group III chicks were fed with 1% NLP, group IV chicks fed with 1% NLP & 1% Spirulina, group V chicks were fed with 0.05% TM 200 & 1% spirulina and group VI were fed with 1% spirulina along with feed. The feed intake was significantly increased in all the groups compared to normal control and body weight gain and feed conversion efficiency was significantly higher in group IV and group V compared to other groups. The peroxidation markers such as TBARS and protein carbonyls are significantly less and antioxidant markers such as GSH and SOD are significantly high in group IV and group V compared to other groups. There is significant improvement in disease resistance and favourable effect on liver and kidney function markers. The results of current study indicated that supplementation of feed with 1% NLP alone does not have significant beneficial effect. However NLP in combination with spirulina has significant beneficial effect on performance and health parameter of broiler.

Biography

K Bharavi BVSc, MVSc, PhD had 20 years of experience in teaching, research and extension in veterinary profession. Presented oral and poster presentation in many national and international conferences. Published 15 research papers in reputed journals of India and has been serving as research article reviewer of Indian journal of Pharmacology.

kbharavi@yahoo.com
Relative bioavailability of methionine hydroxy analog calcium salt compared to DL-methionine in broilers under heat stress

Kiran Doranalli, K Masagounder and C K Girish
Evonik Industries (SEA) Pte Ltd., Singapore

Bioavailability of methionine hydroxy analog (MHA) has been reported to be about 65% relative to DL-Methionine (DL-Met) for broilers under normal growing conditions. However, there is limited information on their bioavailability under heat stress conditions. The objective of the present study was to determine the bioavailability of MHA calcium salt (MHA-Ca) compared with DL-Met under heat stress conditions. A total of 450 day-old Arbor Acres Plus male broiler chicks were randomly allotted to 9 dietary treatments with 10 replicates per treatment and 5 birds per replicate. Dietary treatments included a basal corn-soybean meal diet, and two set of diets containing graded levels (0.03, 0.06, 0.10 and 0.15%) of DL-Met or MHA-Ca on a product basis. The basal diet was formulated to meet essential amino acid levels according to Evonik recommendations except for methionine and methionine+cystine. The experimental period consisted of three phases as follows: starter (d 1 to 14); grower (d 15 to 28); and finisher (d 29 to 42). Birds had ad libitum access to water and feed. Housing temperature during the experimental period was above the breeder’s (Arbor Acres) recommendation which has likely contributed to high feed conversion ratio (FCR) (2.1-2.4) recorded across all the treatments. Dose response data for both the methionine sources followed a non-linear trend, and slope-ratio analysis revealed that bioavailability of MHA-Ca relative to DL-Met was 68, 67, 56, and 57% for body weight gain, FCR, carcass weight and breast meat yield, respectively. In conclusion, this study showed that product (weight-to-weight) basis relative bioavailability of MHA-Ca compared with DL-Met is about 65% and offer no additional benefits even under heat stress conditions.

Biography
Kiran Doranalli holds a Doctor of Veterinary Medicine and Master Degree in Animal Nutrition from University of Agricultural Sciences, Veterinary College, Bangalore, India. He completed his PhD program from University of Saskatchewan, Department of Animal and Poultry Science, Canada. He has published 12 scientific research articles in peer reviewed journals and 4 popular press articles, presented and published 27 abstracts in scientific meetings and conferences. Currently, he is working with Evonik industries as the Regional Technical Manager for Asia south region from the past 3 years.

kiran.doranalli@evonik.com
Prevalence of *Mycoplasma gallisepticum* infection in Indian poultry farms

M R Reddy, Lini P Mathew and T R Kannaki
Directorate of Poultry Research, India

Present study was conducted in order to determine the prevalence of *M. gallisepticum* (MG) in Indian poultry farms. Choanal cleft swabs and serum samples were obtained from Commercial Layer, Broiler Parent and Commercial Broiler farms located in major poultry growing areas in different geographical regions in the country. The isolation of MG from choanal swabs was performed using standard culture techniques and identified by Polymerase Chain Reaction (PCR) technique. Selected PCR products were sequenced for confirmation. Detection of specific antibodies against MG using the ELISA techniques was performed. Based on the isolation and PCR results, 178 (10.38%) out of 1715 samples tested were positive for MG. The prevalence of MG in different regions was 18.64% in Central, 01.00% in East, 1.76% in North and 11.25% in South. The prevalence of MG was 12.45% in Commercial Layers, 09.20% in Broiler Parents and 7.85% in Commercial Broilers. Out of 64 flocks tested, 17 (26.56%) were found positive for MG. Region-wise flocks positive for MG were 31.82% in Central, 10.00% in East, 13.33% in North and 25.93% in South. The prevalence of MG in different categories of flocks was 31.03% in Commercial Layers, 20.00% in Broiler Parent and 10.00% in Commercial Broiler.

Out of 1827 serum samples from a total of 86 flocks, 803 (43.95%) samples were found positive by ELISA. The overall region-wise seroprevalence observed was 49.89% in Central, 56.50% in East, 57.61% in North and 31.54% in South. The serological data of three types of birds tested was revealed the overall prevalence of 54.39% in Commercial Layers, 39.61% in Broiler Parents, and 20.80% in Commercial Broilers. When evaluating serological data by flock, 67 out of 86 (77.91%) flocks tested were found positive for MG antibody. Region wise flocks positive for MG antibody were 77.27% in Central, 70% in East, 84.62% in North and 75.00% in South. Serology data by flock type revealed prevalence of 91.67% in Commercial Layers, 77.50% in Broiler Parent and 30.00% in Commercial Broiler flocks. This study demonstrated the high prevalence of MG infection in Commercial Layers, Broiler Parents and Commercial Broilers in all major poultry growing areas of the country. Therefore, the high prevalence and wide distribution of MG infection warrants immediate attention and preventive strategies to minimize economic impact of MG infection.

rmaddula@yahoo.com
Novel feed resources for poultry industry: Potentials, problems & prospects
Naga Raja Kumari Kallam
NTR College of Veterinary Science, India

For expression of maximum genetic potential of the birds’ health, management and nutrition plays important role. Among these 70% of the cost of production is due to nutrition. Last 5-6 years there is an increasing demand towards soy and maize, increased import cost and lack of availability in turn increased the cost of production of the feed. To overcome these problems, potentials, and prospects of utilizing alternative feed stuffs in poultry industry has to be focused. Research findings showed that alternative feed resources, particularly novel feed resources, were available and could be safely used in poultry nutrition. Several researches indicated their suitability, a few envisaged the limitations to their effectiveness and some attempted to offer hints on their improvement. Alternative to energy sources like starch roots (Casava, yam) and tubers (potato), protein sources like pulses , nuts and seeds(beans), Animal products like fats and oils and miscellaneous like molasses, sugars, sugarcane scrapings etc are to be utilized in routine practices of poultry production without effecting the performance of the birds. Novel alternative feed stuffs like fruits and fruit by products, leafy plants, poultry and animal products, insects and worms, mollusk, miscellaneous like synthetic amino acids, vitamins premix etc are available to formulate the ration. Need of the hour is scientific documentation, maximum and minimum levels of incorporation and creating awareness for immediate adoption by prospective poultry farmers.

Biography
K Naga Raja Kumari, is pursuing her PhD, completed research work, from Sri Venkateswara Veterinary University in the field of amino acid nutrition in commercial layers. She is Head of the Department of Poultry Science, at NTR College of Veterinary Science Gannavaram. She has published more than 15 papers in reputed journals and 58 popular articles. She received gold medal in her P.G studies for securing highest OGPA. She is a member in 3 national and 2 state level scientific associations.

nkkallam3@gmail.com
Efficacy of tulsi and turmeric as antioxidants in combating heat stress in broilers

Bomu Swathi
Sri Venkateswara Veterinary University, India

A study was undertaken to investigate the efficacy of herbals tulsi (Ocimum sanctum) and turmeric (Curcuma longa) in ameliorating the oxidative damage induced by heat stress with 216 day old vencobb broiler chicks in 2 batches in hot summer months. In each batch, 108 chicks were divided into 9 groups, consisting of 12 chicks in each group. Group (G-I) was given basal diet (BD) without any antioxidant. While G-II was given BD with vitamin E (200 mg/kg) supplement and for G-III selenium was supplemented @ 0.15 mg/kg along with vitamin E (200 mg/kg). Group IV, V, VI and VII were given tulsi (0.25%), tulsi (0.5%), turmeric (0.2%) and turmeric (0.4%), respectively as supplements to BD. Group IV, V, VI and VII were given tulsi (0.25%), tulsi (0.5%), turmeric (0.2%) and turmeric (0.4%), respectively as supplements to BD. Combination of both herbals were supplemented with BD in G VIII [(tulsi (0.25%) +turmeric (0.2%)] and G-IX [(tulsi(0.5%) +turmeric (0.4%)]. Additionally, a control group of 12 chicks was raised separately in stress free environment. Plasma samples were obtained at 4th and 6th wk of age and assessed for enzymatic (glutathione peroxidase (GSH_Px), superoxide dismutase (SOD) and catalase and non enzymatic (reduced glutathione (GSH) antioxidants status. The data generated from the 2 batches was averaged and analyzed. Heat stress significantly (P≤0.01) reduced the antioxidant status in heat stressed birds fed on BD without any antioxidant supplementation compared to control birds. Among all the antioxidant supplemented groups, Se along with vitamin E had shown higher (P≤0.01) antioxidant status, followed by vitamin E inclusion. Herbals tulsi and turmeric improved the antioxidant status. Higher inclusion levels of tulsi (0.5%) and turmeric (0.4%) were effective (P≤0.01) in improving the antioxidant status than when supplemented with lower doses (0.25% and 0.2% respectively). Combination of herbals (G-VIII and IX) had not shown any additional benefit than their independent inclusions. The present study indicated that herbals tulsi and turmeric supplemented at 0.5 and 0.4% levels, respectively in broiler diets could be used as safe alternatives to synthetic antioxidants to combat heat stress.

swathibn@yahoo.co.in
Isolation and molecular identification of *Moraxella ovis* and *Moraxella* spp. from Infectious Keratoconjunctivitis in sheep in India

Rajesh Kumar Vaid, Taruna Anand, Bidhan Chandra Bera, Brihaspati Narayan Shukla, Dinesh Kumar Nagar, Gagandeep Singh, Nitin Virmani, Sanjay Barua, Birendra Kumar Singh and Raj Kumar Singh
National Research Centre on Equines, India

Infectious keratoconjunctivitis (IKC) is a disease of worldwide economic importance causing blepharospasm, corneal opacity and conjunctivitis in ruminants. Recovered animal may develop corneal opacity and blindness. Although, *Moraxella bovis* is the major cause of IKC in bovines, *Moraxella ovis* has been implicated in epizootics of IKC in sheep and goats worldwide. Isolation of *M. ovis* has been reported from both healthy sheep and those with IKC; however we confirm for the first time, isolation and molecular confirmation of *M. ovis* and *Moraxella* spp. isolates from IKC cases in sheep in India. Out of a free-ranging nomadic herd, six cases of IKC in sheep were randomly sampled. Conjunctival swabs for bacterial culture were plated on 5% Columbia blood agar and MacConkey agar. Out of twenty isolates 10 oxidase-positive isolates which showed microscopic morphology of Gram-negative cocci in pairs were biochemically processed. Three non-motile, nitrate positive, indole negative and non-saccharolytic isolates were identified as *Moraxella ovis*. Two isolates subjected to 16S rRNA PCR sequencing. Clones of 16S rRNA gene were sequenced to complete >1.5 bp, which was subjected to phylogenetic analysis. By RDB database analysis sequence showed a sequence similarity of 99.24% with *Moraxella ovis* ATCC33078, and formed a cluster with *M. ovis* strains, however the other isolate *Moraxella* spp. clustered close to *Moraxella boevrei* DSM14165. The *M. ovis* isolate was resistant to penicillin and cloxacillin. Phenotypic, biochemical, molecular and phylogenetic evidence identified isolates as *M. ovis* and *Moraxella* spp. This isolate with first molecular confirmation of *M. ovis* isolation from sheep in India, and has been accessioned in VTCC repository.

Biography
Rajesh Kumar Vaid has completed his PhD at the age of 37 years from Govind Ballabh Pant University of Agriculture and Technology, Pantnagar, Uttarakhand, in the area of Veterinary Public Health. He is appointed as Principal Scientist at Veterinary Type Culture Collection, Hisar, Haryana. He is working in the area of Veterinary Bacteriology with interest in Bacterial identification, culture collection and genomics related to bacteria and animal microbial biodiversity. He has published research articles in reputed journals.

rk_vaid@yahoo.com
Tomato pomace: Alternative feed resource for poultry

Kavitha Pathakamuri
Sri Venkateswara Veterinary University, India

Consumption of poultry meat has consistently increased globally over the years. Poultry is one of the fastest growing segments of the agricultural sector in India today. Such growth in the poultry industry is having a profound effect on the demand for feed and raw materials. With increasing feed cost the poultry sector is searching for alternative feed resources to conventional feeds, especially agricultural and industrial by-products. The wastes from fruit and vegetable industry can be used as a potential source of newer cheap feed resources. With a view to investigate the nutritional efficiency, growth performance and carcass characteristics of broilers fed on diets containing different levels of dried tomato pomace (DTP) with or without enzyme supplementation the study was carried. Two hundred and forty Vencob day-old male broilers were fed broiler starter (0-4) and finisher iso-caloric and iso-nitrogenous diets with 0, 5, 10 and 15 per cent levels of DTP without (T1, T3, T5 and T7) and with (T2, T4, T6 and T8) enzyme supplementation. There was no significant difference in body weight gain and feed intake between different levels of DTP inclusion and with enzyme supplementation. The feed efficiency decreased significantly (P<0.01) with increase in level of DTP inclusion from 5 to 15 per cent (2.04 to 2.14). The per cent nitrogen utilization significantly (P<0.01) decreased with increase in DTP inclusion from 5 to 15 per cent and significantly (P<0.01) increased with enzyme supplementation in both the phases of growth. The serum cholesterol level decreased significantly (P<0.05) with increase in level of DTP inclusion. The LDL cholesterol level significantly decreased (P<0.01) with increase in level of DTP inclusion. The enzyme supplementation has shown significant (P<0.05) increase in serum LDL cholesterol level. The breast and thigh muscle cholesterol levels significantly (P<0.05) decreased with increase in level of DTP inclusion. There was significant (P<0.05) increase in breast and thigh muscle cholesterol level with enzyme supplementation. The breast muscle cholesterol (41.15 mg / 100 g of meat) and thigh muscle cholesterol (99.34 mg / 100 g of meat) contents were found to be the least in the birds fed on diets containing 15 per cent DTP inclusion without enzyme supplementation. Feed cost per kg gain showed significant (P<0.01) decrease with increase in the level of DTP inclusion. The feed cost/kg gain (Rs.16.09) was found to be the least in the birds fed diets containing 15 per cent DTP with lower serum and muscle cholesterol levels. There were no deleterious effects in the birds fed diets containing DTP even up to 15 per cent level. The study indicates that DTP can safely be included up to 15 per cent level in broiler diets for economical growth and to produce meat with low cholesterol.

Biography

Kavitha Pathakamuri is working as Assistant Professor in the Department of ILFC, College of Veterinary Science, Sri Venkateswara Veterinary University, India since two years. She has two gold medals (Andhra Bank Gold Medal and Nestle Purina Gold Medal) for achieving highest OGPA during MVSc. She has 4 research publications and many popular articles.
Epidemiological analyses of Haemorrhagic Septicaemia (HS) and Foot and mouth disease (FMD) are prerequisite for planning, execution, monitoring and control of these diseases which ranks first in bacterial and viral disease, respectively. In the present study, epidemiological analysis of HS and FMD in southern states of India was carried out. Secondary data collected from published reports were analyzed for total outbreaks, seasonal occurrence and prevalence and case fatality rates. Spatial mapping of HS and FMD outbreaks was undertaken to know the geographical spread. In southern states, total number of outbreaks occurred during 2002-12 was Haemorrhagic Septicaemia (5372), Foot and mouth disease (9894) and showed decreasing trend. Highest number of HS outbreaks occurred in Andhra Pradesh during 2002-07 and in Karnataka during 2007-12. HS outbreaks occurred mostly during monsoon and post monsoon period during July, August and September months. HS prevalence rate per 104 populations was highest in Karnataka (0.12) and lowest in Tamil Nadu (0.0034). Case fatality rate in HS was highest in Tamil Nadu (89.47%) and lowest in Kerala (23.96%). FMD outbreaks occurred more in Karnataka than other southern states and occurred throughout the year. FMD prevalence rate was highest in Kerala (12.12) and lowest in Karnataka (2.85). Case fatality rate was highest in Tamil Nadu (10.31%) and lowest in Karnataka (1.42%) for FMD. Case fatality rate was high in HS than FMD, whereas prevalence rate was high in FMD than HS. Control measures have to be prioritized in highest prevalence and case fatality rates states to minimize the loss due to HS and FMD.

Biography

P Krishnamoorthy did his BVSc and MVSc (Veterinary Pathology) from Madras Veterinary College, TANUVAS, Chennai and PhD from Veterinary College, KVAFSU, Bangalore. He is currently working as Scientist, National Institute of Veterinary Epidemiology and Disease Informatics, formerly PD_ADMAS, Bangalore. He has specialized in epidemiology, nutritional pathology and laboratory animal management. He is recipient of ICAR outstanding Team Research Award as member of team during 2010 and Fellow of Academy of Sciences for Animal Welfare (FASAW). He has 30 research publications in peer reviewed journals and book, book chapters, technical bulletins, training manuals, and completed one external and seven Institute funded, research projects.

krishvet@gmail.com
Common diseases encountered in back yard poultry

K Lakshmi and K Padma
Sri Venkateswara Veterinary University, India

Common diseases encountered among backyard poultry that presented at the Veterinary Ambulatory clinic Mylardevpally are fowl pox, Ranikhet disease, coryza, curl toe paralysis, infectious coryza, Bumble foot, Bascillary white diarrhoea, Vitamin B complex deficiency diseases. The details will be discussed in detail.

drlakshmi1@gmail.com
Epidemiology of avian influenza in India

R Sridevi, P Krishnamoorthy, K P Suresh and H Rahman
National Institute of Veterinary Epidemiology and Disease Informatics, India

Highly pathogenic avian influenza (HPAI) H5N1 virus first reported in 1996 in domestic geese. The upsurge of HPAI H5N1 epizootic waves linked to changes in agricultural practices, intensification of the poultry sector, and globalisation of trade in live poultry and poultry products. Fourteen Indian states were affected with H5N1 AI outbreaks since 2006. Most of the H5N1 AI outbreaks were restricted to Eastern and North Eastern states of India. Among the affected states, maximum number of outbreaks occurred in West Bengal & in Murshidabad district. Totally forty six districts affected. Majority of the outbreaks occurred in 2008 involving three Eastern and North Eastern states leading to huge loss. Outbreaks occurred in almost all months except in June. Case Fatality Rate (CFR), Morbidity rates & Mortality rates ranges from 37.2% - 100%, 0.15% - 93.05%, 0.15% - 92.4%. H5N1 Prevalence ranged from 0.21% to 13.53%. The overall prevalence was 1.68%. Ten outbreaks from poultry farms, five from wild bird species and others from backyard poultry. Outbreaks were more during winter season which has very low temperature enhancing survivability of virus in environment. Phylogenetic analysis of HA region of H5N1 outbreak isolates reveals that clade 2.2 viruses were circulating from 2006 onwards and clade 2.3.2 viruses during 2011. Apart from H5N1, H9N2, H4N6, H11N1, H4N2, H9N3, H2N2, H3N2 viruses isolated from different bird species/ducks from different places in India. Isolation from wild water/migratory birds indicates they may be the reservoir without any symptoms and may act as source of infection for other species.

Biography
R Sridevi has completed MVSc and PhD in Bacteriology & Mycology in Indian Veterinary Research Institute (IVRI), Bareilly (UP). She joined in Indian Council of Agricultural Research (ICAR) system in 2009. She worked as scientist in High Security Animal Disease Laboratory (HSADL), Bhopal, Madhya Pradesh for about four years in avian influenza diagnosis and research. Currently she is working as scientist in National Institute of Veterinary Epidemiology and Disease Informatics (NIVEDI), Bangalore, Karnataka. She has 12 publications in reputed journals related to avian influenza, rabies, West Nile, Pasteurella multocida, Candida albicans etc. She is life member of scientific communities/societies - Indian Association for Veterinary Microbiologists and Immunologists, Indian Association for Advancement of Veterinary Research, Society for Biosafety and annual member in Indian association for microbiologists in 2011. She is a fellow of Society for Biotechnology (2012).

sriderajang@gmail.com
Sub-acute ruminal acidosis: A herd problem

K Padmaja and K Lakshmi
Sri Venkateswara Veterinary University, India

A dairy herd comprising of around 390 female animals had mortality among the age group of 7 months and above. Out of six affected animals, three animals died after exhibiting the signs of ataxia, staggering and sudden recumbency. The animals were administered intra venous fluids (glucose, calcium), B complex injections without any improvement leading to the death of animals. Postmortem examination was conducted which revealed pneumonia.

The herd was offered Total mixed ration (TMR) dewormed and vaccinated regularly. Clinical examination of the ailing animals was conducted which revealed normal temperature and conjunctival mucous membranes. Palpation of rumen revealed ruminal atony (0/3 minutes), and impaction. Dung was hard and scanty. Upon palpation of hoof, the animals exhibited pain, and when animals were casted for examination and released the animals were unable to get up. Upon support, they were able to stand but could not bear weight which resulted in staggering and recumbency. Blood, urine and rumen fluid were collected for investigations. Results will be discussed in detail.

satyaja35@yahoo.co.in

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Heat stress is one of the most important stressors especially in tropical regions of the world. Exceptional challenges faced by grazing large ruminants in arid and semi-arid environments of India are numerous, but heat stress is one of the major challenges apart from fodder scarcity that animals have to deal with for a longer period of the year. High ambient temperatures outside the thermo-neutral zone cause significant changes in physiological processes including feed intake, production and reproduction. Alterations in ROS levels during severe heat stress are necessary for the regulation of several key physiological mechanisms including cell differentiation, apoptosis, cell proliferation and regulation of redox-sensitive signal transduction pathways. At molecular level heat stress evokes changes in gene expression of heat shock proteins and many other proteins. Altogether these physiological, biochemical and molecular responses makes the native animals to adapt, survive and produce better in harsh environments.
Food safety in India: Current status

Food safety has become a major global concern. Increased incidences of food borne illnesses are threatening the food security of millions of people worldwide. In order to establish and implement a comprehensive food safety system, it is necessary for a country to enact and enforce appropriate laws and regulations. Food, safety standards can be defined as the requirements and practices for food producers manufacturers, handlers, processors, food supply outlets and food consumers for the purpose of ensuring food safety in terms of hygiene and health. India being a developing country needs to focus on food safety more rigorously. Hence, the Food Safety and Standards Authority of India (FSSAI) has been established under Food Safety and Standards Act, 2006 which consolidates various acts & orders that have hitherto handled food related issues in various Ministries and Departments. Various central Acts like Prevention of Food Adulteration Act, 1954, Fruit Products Order, 1955, Meat Food Products Order, 1973, Vegetable Oil Products (Control) Order, 1947, Edible Oils Packaging (Regulation) Order 1988, Solvent Extracted Oil, De-Oiled Meal and Edible Flour (Control) Order, 1967, Milk and Milk Products Order, 1992 etc. have been repealed and amalgamated under the Food Safety and Standard Act. The Act has also established a single reference point for all matters relating to food safety and standards, by moving from multi- level, multi- departmental control to a single line of command. To this effect, the Act has established an independent statutory Authority – the Food Safety and Standards Authority of India with head office at Delhi. Food Safety and Standards Authority of India (FSSAI) and the State Food Safety Authorities are responsible for enforcing various provisions of the Act.

Biography

N N Zade has completed his PhD in 1995 from Chaudhari Charan Singh Haryana Agricultural University, Hisar in Veterinary Public Health & Epidemiology. He has published more than 150 research papers in reputed journals. He has guided more than 15 post graduate students in Veterinary Public Health. He has more than 30 years of teaching, research and extension experience to his credit. Presently he is working as Director of Extension Education and Training at Maharashtra Animal & Fishery Sciences University, Nagpur. He is a fellow of Indian Association of Veterinary Public Health Specialists and member of various professional bodies. He is also an expert member in the panel of Food Safety and Standard Authority of India.

n_zade@rediffmail.com
The potential for plant-derived antimicrobials for controlling zoonotic and food-borne diseases

Zoonotic and food-borne diseases represent a significant portion of infectious diseases causing morbidity and mortality in humans worldwide. This is further exacerbated by the emergence of antibiotic resistance in many pathogens, thereby underscoring the need for safe and effective alternate strategies for controlling them. Plant-derived antimicrobials represent a diverse group of compounds that have been traditionally used as dietary constituents as well as active components in a number of herbal and traditional medicines. The antimicrobial properties of several plant-derived essential oils have been demonstrated, and a variety of active components of these oils have been identified. Since plant derived antimicrobials contain different chemical functional groups in their structure, their antimicrobial activity is attributed to multiple mechanisms, thereby limiting the development of bacterial resistance against these compounds. This talk will provide extensive results from multiple research projects showing the efficacy of several plant-derived molecules for controlling the colonization of zoonotic pathogens in food animals, and attenuating their virulence and disease outcome in humans using cell culture and in vivo models. The pathogens discussed will include *Salmonella Enteritidis*, *Escherichia coli* O157:H7, *Listeria monocytogenes* and *Clostridium difficile*.

Biography
Kumar Venkitanarayanan received his Bachelor of Veterinary Science and Master of Veterinary Science degrees from Kerala Agricultural University and Tamil Nadu Agricultural University, respectively, after which he practiced as a veterinarian for a year. In the US, He obtained his MS in Food Science (University of Nebraska-Lincoln) and PhD in Animal Science (University of Connecticut). He later worked as a Postdoctoral Research Associate at the Center for Food Safety, University of Georgia. He has published 80 peer-reviewed journal manuscripts, 10 book chapters and characterized five new bacterial genes. Having successful in garnering more than 5 million dollars as funding for his research, Venkitanarayanan serves on the editorial board of multiple international journals, and is currently supervising one post-doctoral scientist, five PhD candidates, and five MS students.

kumar.venkitanarayanan@uconn.edu
Economics of feeding sheanut cake based complete diets in lactating buffaloes

M Kishan Kumar
Sri Venkateswara Veterinary University, India

Two complete diets were formulated using palm press fibre (PPF) (20% and 15%) and chopped jowar straw (20% and 25%) as roughage source and sheanut cake (18.5% and 28%) along with locally available concentrate ingredients (roughage concentrate ratio, 40:60) and processed into mash (RII) and (RIII) and compared with conventional ration to (RI) chopped jowar straw, green jowar fodder and concentrate mixture fed separately to study the cost economics in three groups of graded Murrah buffaloes in each comprising of 4 animals for an experimental duration of 120 days. The mean values of cost of feed /kg milk yield were non significantly lower with complete diet RIII (Rs.9.86) and diet RII (Rs. 10.55) than RI (Rs.10.56). Marginal decrease in feed cost was observed with RIII (Rs. 0.70/kg milk) and RII (Rs.0.01/kg milk) when compared to RI which might be due to lower DMI and better utilization of nutrients on complete diet (RIII). The results of the present study indicated that the complete diet (RIII) containing Jowar Straw (25%), palm press fibre (25%) and sheanut cake (28%), showed positive tendency in improving milk yield, milk fat yield, 6% FCM yield and decreased cost of milk production. Furthermore, incorporation of sheanut cake in complete diets has reduced the cost of feed by 4.6%.

Biography
M Kishan Kumar completed his MVSc (Dairy production) from ANGRAU, Hyderabad and PhD (LPM) from SVVU, Tirupati. He is presently the Professor and Head at Instructional Livestock Farm Complex, College of Veterinary Science, Korutla. He published 30 research papers in reputed journals and 100 popular articles. One book of his was published by LAP Lambert Academy International, Germany. More than 50 of his Television programmes were telecasted. 15 Radio programmes were also broadcasted. He received the Best poster presentation Award during the International Buffalo conference held at New Delhi, India in February 2010. He also received the Rythu Bandhu Award at Hyderabad, India in June 2013. He guided more than 10,000 livestock farmers.

drkishan9@yahoo.com
Association of SNPs in exon 3 of leptin (LEP) gene with growth traits in Nilagiri Sheep of Tamil Nadu

D Cauveri, S N Sivaselvam, S M K Karthickeyan, K G Tirumurugaan, K Kumanan and R Venkataramanan
Tamil Nadu Veterinary and Animal Sciences University, India

Nilagiri sheep, a dual purpose breed used for meat and fine wool production, was evolved during 19th century and contains unknown levels of inheritance of Coimbatore, Tasmanian Merino, Cheviot and South Down breeds of sheep. LEP gene is one of the potential genes involved intricately in the metabolism and growth of animals association of polymorphic candidate genes with economic traits will help breeders to search for some genetic marker. The LEP gene consists of three exons and two introns. The Exon 3 is 2731 bp length (Gene Accession Number NC_019461 and Gene ID 443534). Characterization of Exon 3 of LEP gene in Nilagiri sheep revealed two SNPs, 16973 G>A (SNP-L1) and 17476 C>T (SNP-L2). Both SNPs were transitions identified in the untranslated region. For the SNP-L1, all the animals screened were of AA genotype. The SNP-L2 showed a restriction site for the enzyme BsrDI, and PCR-RFLP was used for genotyping the Nilagiri population. The frequency of CC and CT genotypes were 0.73 and 0.27 respectively. TT genotype was absent. The C allele had a frequency of 0.87 and T allele 0.13. Data pertaining to growth traits viz., birth weight, weaning weight, weaning weight, 6-months weight, 9-months weight and yearling weight were collected and pre-weaning and post-weaning ADG calculated. Using the least-squares analysis of variance, it was found that the post-weaning ADG in Nilagiri sheep was significantly (P<0.05) associated with this SNP. Animals with CC genotypes had a higher post-weaning ADG of 46.88 ± 2.28 g as compared to the animals of CT genotypes with 36.63 ± 3.62 g suggesting that most of the impact of LEP is realized after weaning.

Biography
D Cauveri is working as Assistant Professor in the Department of Animal Genetics and Breeding, Madras Veterinary College, TANUVAS for the past eight years. She has submitted her PhD thesis on genetic variability of growth hormone (GH) and Leptin (LEP) genes in sheep breeds of Tamil Nadu. The abstract is part of the thesis of the first author and she has 10 research publications and 20 research abstracts to her credit. She has served in various Committees in organising Seminar/Symposium/Workshops conducted in TANUVAS.

cauveri@tanuvas.org.in
Differential thermotolerance and gene expression in Vechur, Kasargode and crossbred cattle during heat stress

Muhammed E M, Aravindakshan T V, Raghavan K C, Anil Kumar K, Joseph M and George S
Department of Animal Husbandry Government of Kerala, India

Global warming and climate change are imminent threat to livestock production. The present study was designed with the objective of evaluation of the expression levels of HSP 70 and ATP1A1 genes following different levels of heat stress in Vechur, Kasargode (both thermotolerant) and crossbred cattle (thermosensitive). Six adult animals each of Vechur, Kasargode and crossbred cattle were selected and gene expression was studied using quantitative real time PCR (Q-RTPCR). The between breed fold increase of HSP 70 expression at 8.00 a.m were 0.18, 0.79 and 4.4 while at 10.00 a.m were 0.08, 1.72 and 22.58 in Kasargode and Vechur, crossbred and Vechur and crossbred and Kasargode, respectively. But at the end of the experiment at 12.00 noon it increased to 0.67, 17.23 and 25.67 in Kasargode and Vechur, crossbred and Vechur and crossbred and Kasargode animals respectively. The results of the present study suggest that Vechur and Kasargode cattle have superior thermotolerance as compared to crossbred cattle and for crossbreds the ability to acclimate is limited as they have maximized their transcriptomic safety factors, which do not allow for further adjustments to even current changes in climate. The results are important for within and between breed selections and are most indicated for the use in animal breeding programmes in hot and humid tropical conditions.

Biography

Muhammed E M has completed his PhD in Animal Breeding, Genetics and Biostatistics from Kerala Veterinary and Animal Sciences University and done part of his doctoral research work at University of Western Australia, Perth, Australia. He is the District Epidemiologist at Wayanad district under the Department of Animal Husbandry, Government of Kerala. He has published articles in reputed journals and is the recipient of prestigious Crawford fellowship from Australia.
Successful induced breeding and hatchery development of *Pangasianodon hypophthalmus* (Sauvage, 1878) under controlled conditions of Raipur, India

A K Pandey¹, C S Chaturvedi² and W S Lakra² and R K Singh³
¹National Bureau of Fish Genetic Resources, India
²Central Institute of Fisheries Education, India
³Chhattisgarh State Fisheries Department, India

*Pangasianodon hypophthalmus*, commonly known as striped (sutchi, iridescent shark) catfish, fetches high price in markets. Culture of this species is growing day-by-day in Bangladesh, Indonesia, India and Vietnam, the latter being the top producer and exporter of the species in more than 100 countries, mainly in European Union, Russia, South-east Asia and USA in the form of white fillets. It has been introduced in Singapore, Philippines, Taiwan, Malaysia, China, Myanmar, Bangladesh, Nepal and India. In India, it was brought in West Bengal through Bangladesh during 1997. Initially, its culture was carried out in Andhra Pradesh and West Bengal in private sector but the Government of India permitted aquaculture of *P. hypophthalmus* in year 2010-11. *P. hypophthalmus*, the fast-growing exotic catfish, has vast potential for freshwater aquaculture in India. Females attain maturity at the end of third year while male mature in two years. It is a highly fecund fish, seasonal spawner and breeds once in a year in flooded river. The females were found to be larger than males. Recently, the striped catfish has been bred successfully in Mekong Delta region of Vietnam by using high doses of human chorionic gonadotropin (HCG). In the present experiment, 10 females and 5 males were induced bred by dry stripping method under agro-climatic conditions of Raipur (Chhattisgarh). For induced breeding, ovaprim was administered @ 0.5 ml/kg to female and 0.3 ml/kg male brooders and spawning occurred after 10-12 hour of the injection with 60-80% fertilization success. Since the eggs were sticky in nature, cow milk, multani mitti (soil) and black soil were used for removal of stickiness. Hatching of the fertilized eggs took place in vertical jar hatchery in 26 hours at 28±1°C. Out of 40 lakh fertilized eggs, 28,80,000 hatchlings, 15,14,000 early spawn and 10,50,000 fry were obtained. After rearing of 30-40 days in nursery ponds, 6,30,000 fingerlings of *P. hypothalamus* were obtained and stocked @ 25,000-30,000/ha for aquaculture.

**Keywords:** *Pangasianodon hypophthalmus*, induced breeding, seed production, Raipur, India.

**Biography**

A K Pandey completed his PhD (Zoology, Comparative Endocrinology) from the University of Gorakhpur in 1990. Presently, he is Principal Scientist at National Bureau of Fish Genetic Resources (ICAR), Lucknow. He has published 234 research papers in journals of repute. Most of his papers are widely cited by eminent scientists of the world. He is editorial board member of a number of national journals.

akpandey.ars@gmail.com
Molecular genetic characterization of Dahlem red layers

Shivaprasad Ch, B Ramesh Gupta, and R N Chatterjee
Sri Venkateswara Veterinary University, India

A total of one hundred Randomly Amplified Polymorphic DNA (RAPD) markers were utilized to detect the DNA polymorphisms in a total of 48 full sib mated, half sib mated and non-in bred groups of Dahlem Red birds. Twenty one percent of the primers tested yielded distinct polymorphic RAPD profiles. Out of 341 amplified bands 204 bands (59.82 %) were found to be polymorphic. The genetic similarity based on band sharing within group ranged from 83.94 to 87.90 %, based on band frequency ranged from 81.14 to 85.25 % full sib group showed higher genetic similarity when compared to the non-in bred group. The genetic similarity based on band frequency ranged from 88.07 to 90.18 %, based on band frequency varied from 72.78 to 79.53 percent. The full sib and half sib groups showed maximum genetic similarity. The genetic distance between full sib and non-inbred groups was found to be the maximum (0.3176), while the minimum genetic distance (0.2290) was observed between full sib and half sib groups.

prasadshivach21@gmail.com
Isolation and characterization of lytic bacteriophages against bacteria of veterinary importance

Taruna Anand, Rajesh K Vaid, B C Bera, Sanjay Barua, Riyesh T, Neeraj Yadav, Gagandeep Singh, Dinesh Nagar and Praveen Malik
National Research Centre on Equines, India

Phage therapy involves the targeted application of bacteriophages that, upon encounter with specific pathogenic bacteria, can infect and kill them. With the long term goal of therapeutic usage for treatment of animal diseases, isolation of bacteriophages was initiated from soil and sewage samples collected from animal farms and ponds used by animals in Haryana region. Bacteriophages were isolated against pathogenic *Escherichia coli* (O12 serogroup), *Aeromonas* spp., *Bacillus* spp. and *Staphylococcus sciuri*. The bacteriophage culture enrichment from sewage/soil samples was achieved by incubating the sample aliquot with the host bacteria followed by centrifugation and filtration finally plating in molten agar with host bacterial culture. The incubated plates were examined for the presence of plaques. The purified phage preparations were used for large scale preparation of phage stocks. Pancreatic DNaseI and RNase were used to degrade any host DNA and bacteriophage particles were precipitated using PEG8000. Phages were classified to myoviridae, podoviridae, siphoviridae and inoviridae families on the basis of transmission electron microscopy. Protein profile of phage isolates was generated in 18%-20% SDS-PAGE gels, which was found to be specific for each phage isolate. Further phages of myoviridae group were characterized by PCR amplification of gp23 gene; it's sequencing and phylogenetic analysis. These phage isolates were found to belong to genus –T4 like virus. The present study illustrated isolation of phages in different bacterial phylogenetic divisions from soil, sewage and water samples of animal interventions which can find therapeutic use in animal diseases.

Biography

Taruna Anand has completed her PhD at the age of 28 years from National Dairy Research Institute, Karnal, Haryana, in the area of Biotechnology (Animal Sciences). She is appointed as scientist at Veterinary Type Culture Collection, Hisar, Haryana. He is working in the area of microbiology and molecular biology related to bacteria and animal viruses and has published research articles in reputed journals.

tarunandri@gmail.com
Application of MLVA-15 genotyping for typing of *Brucella abortus* isolates from India

Gita Kumari, Avinash Reddy, Raja Gunalan and D K Singh
Indian Veterinary Research Institute, India

Brucellosis is considered as one of the most widespread zoonosis in the world. For complete eradication of infection from herds, strain-specific identification is essential to know the source of infection. In the present study, MLVA-15 genotyping scheme was applied to differentiate the field strains of *B. abortus*. A total of 13 *B. abortus* strains along with 4 representative reference strains (*B. abortus* 544 (ATCC 23448), *B. abortus* strains S19, S99 and 1119-R) were taken from the repository of the Brucella Laboratory, Div. of VPH, IVRI, Izatnagar. For MLVA-15 genotyping, 15 sets of primers (8 minisatellites and 7 microsatellites markers) were used for the amplification of 15 VNTR loci in all the strains that resulted in 13 different genotypes. Of these, 10 profiles were unique while remaining 3 profiles were shared by at least 2 strains. In *B. abortus*, Bruce 6, 8, 11, 21, 42, 43, 45 and 55 were found to be most conserved with no length polymorphism. Bruce 4, 9, 12, 16 and 18 showed moderate length polymorphism. Bruce 7 showed significant length polymorphism whereas highest length polymorphism was seen at locus Bruce 30. The dendrogram based on MLVA data was generated using the UPGMA clustering method implemented by START vs. 1.05 software. Through clustering analysis using UPGMA, the *B. abortus* isolates were grouped in 6 clusters showing a 90% similarity. Allelic diversity for each of the locus was calculated using HGD index. In the present study, the MLVA-15 genotyping clearly discriminated Indian field isolates of *Brucella abortus*.

Biography
Gita Kumari has completed her PhD from Division of Veterinary Public Health, Indian Veterinary Research Institute, India. She has published 11 papers in reputed journals. Presently she is working as Touring Veterinary Officer in Govt. of Animal and Fisheries Resources, Bihar, India.

drgita.kumari@rediffmail.com
Genomic information a tool for assessment of genetic diversity in Mithun

Anupama Mukherjee, Sabyasachi Mukherjee, A O Adebambo Imsusoang Longkumer and Moonmoon Mech
National Research Centre on Mithun, India

The Mithun (Bos frontalis) according to Phanchung and Roden (1996) is believed to have its origin from Gaur (Bos gaurus). The Mithun looks more like a transition between cattle and buffalo, but genetic analysis of the Mithun’s chromosomes by Winter et al. (1984), Gupta et al. (1995) and Mukherjee et al. (2012) shows a diploid number 58 (2n) compared to 60 in cattle and 48+ in buffalo. Mithun is specifically reared by the tribal community and is reared on free range, grazing at altitudes of between 1000-3000m AMSL.

The currently available HD Genotyping Bead Chip panel provides extensive genome coverage and map resolution and has the potential to perform beyond other molecular markers resulting in much improved accuracy in exact QTL identification. The prime objective is to determine the diversity and variation existing in the Mithun population so as to generate information for future conservation and utilization of the animal.

Mean MAF ranges from 22.4 (Manipur) to 27.7 (Nagaland). At MAF p≥0.05 (common allele), Nagaland population markers exhibited lowest minor allele frequency of 85%, while all other populations had no MAF. Identity by state (IBS) was least among Mizoram strain and highest among Manipur mithun. The majority of polymorphic SNPs were found to be in HWE, Percentage SNP deviation from HWE (p≤0.05) was least among Manipur mithun and highest among Nagaland mithun.

The level of polymorphism in mithun population has not been known and analyzed. Prior to this study, no SNPs have been described for these populations. In this study, we report the first preliminary findings on SNP variation in the population of Bos frontalis (mithun) in north-east region of India. Determination of the population structure of the mithun based on the 770k Illumina Bovine HD chip was first step in genomic improvement programme.

The low number polymorphic loci (167,215) derived on outgroups (water buffalo, yak and gaur) corroborate our finding in this work (127,432). This means a successful use of bovine SNP chip will not be achieved. This preliminary study being the first of its kind on mithun has been able to show that 80% of the SNPs on the array have MAF < 0.05, so approximately 20% are polymorphic (1/5).

The Inclusion of mithun genome in future design will aid enough to infer as a tool for selection purpose in mithun improvement program. For the purpose of conservatory program of the mithun it is recommended that genome wide SNP analysis can be successful along with a whole-genome sequence.

writetoanupama@gmail.com
Animal disease surveillance and control: Need of an integrated approach

Barkha Sharma, Parul, Waqar Ahmed and Basanti Bist
UP Pandit Deen Dayal Upadhyay Veterinary University, India

Animal diseases cause major economic losses through mortality, reduced productivity, lower fertility, condemned products and restricted access to potential markets. Newly emerging diseases including non-contagious animals diseases having potential to cross over from animals to human population or back are being encountered on almost daily basis. This has been time and again proved by emergence of various epidemics like SARS, avian influenza and swine flu. Approximately 60% of all known pathogens and 75% of emerging pathogens are zoonotic in nature, with about 70% of all emerging zoonotic pathogens being vector-transmitted diseases. Main animal diseases that pose challenges in today’s world are FMD, RP, CBPP, TB etc. Some of them are even classified under Transboundary animal diseases (TADs). The international trade in animal and animal products has become a sensitive issue for both developed and developing countries by posing an important risk for the spread of animal and human pathogens whilst at the same time being an essential activity to ensure world-wide food security and food safety.

Integrated efforts of various mentioned organizations are thus laying an important role in combating the challenges posed by unchecked multilateral trade in animals and animal products. The importance of overall integrated efforts may be cited by the success of Global RinderPest Eradication Program (GREP) started by Emergency Prevention System (EMPRES) that has been able to eradicate RP from the world in 2011. Global Health Agencies like the OIE, WHO, FAO etc are continually striving towards achieving an environment supportive for health and in their effort, are being well supported by various regional organizations.

But all this represents just a short stretch of road to global health. Rest of the journey still lies ahead of us. In this review, we have tried to assess the role played by various national and international agencies in animal disease surveillance, how far they have come in achieving this goal and what still remains to be done.

Keywords: Health, zoonoses, disease control and surveillance, OIE, veterinary information systems.

manubarkha@yahoo.com
Antibiotic resistance and strategies to develop new antibiotics

D J Kalita
Assam Agricultural University, India

The use of low levels of antibiotics as growth promoters in animal feeds and indiscriminate use of antibiotics to treat human or animal infections are thought to be the cause of an alarming increase in antibiotic resistance among bacteria. Antibiotic resistant have been posing increasingly serious concern to the public, health specialist and animal raw and processed meat producers. These problems are now in high alarming state and scientist across the world are now focusing on alternative, yet effective means of preventing and treating emerging and reemerging diseases caused by different microbes.

Host defense peptides are prevalent throughout the nature as a part of the intrinsic defenses of most organisms and have been proposed as a blueprint for developing novel antibiotics. In order to design the antimicrobial peptides, the most common approach is either to retrieve the required genomic sequences from NCBI or to sequence the novel antimicrobial peptide gene. After that prediction of peptide is done from all these sequences to find out the consensus region, specific pattern of amino acid distribution and trace out the mature peptide for synthesis. On the basis of amino acid sequence of natural host defense peptides, various analogues can also be prepared by replacing with desired amino acid. Solid phase methodology can be used for synthesis and have to evaluate structurally and functionally. Designing and synthesis of antimicrobial peptides represents a promising strategy for the development of a new class of drugs to different infections cause by various microbes.

Biography

D J Kalita has completed his PhD from Indian Veterinary Research Institute (IVRI) in the year 2007 and completed his Post doctoral training from Institute for Animal Health, UK under DBT CREST AWARD in the year 2012. He has published more than 35 papers in reputed journals and serving as an editorial board member of repute. Presently, he is working as Associate Professor in Faculty of Veterinary Science, Assam Agricultural University, Guwahati, Assam and is working as PI and Co PI in several externally funded project.

djkalita@rediffmail.com
Influence of strain on carcass characteristics of guinea fowl at different ages

K Premavalli, N Ramamurthy, A V Omprakash, V Balakrishnan and V Appa Rao
Tamil Nadu Veterinary and Animal Sciences University, India

A biological experiment was conducted to find out the influence of age and strain on carcass characteristics of Guinea fowl. A total of 320 one day old Guinea fowl keets of Pearl and White strains belonging to a single hatch were randomly divided into two treatment groups (T1 and T2) with four replicates of 40 chicks each under intensive system of management for 16 weeks. Standard nutritional and managemental condition was followed throughout the experiment. A total of 144 birds comprising twenty four birds from each strain per age group were randomly selected at 12, 14 and 16 weeks of age and subjected for carcass studies. The mean per cent New York dressed weight and eviscerated weight showed significant (p<0.01) increase at 16th week of age. Pearl strain had significantly (p<0.01) higher per cent eviscerated carcass weight and dressing percentage at 12, 14 and 16 WOA. White strain showed significantly (p<0.01) higher mean pre slaughter live weight and mean per cent New York dressed weight. Among cut up parts, White strain showed significantly (p<0.01) higher mean per cent neck weight. The other cut up part yields viz., breast, back, thigh, drumstick and wing were did not differ statistically between strains. It can be concluded that the optimum age for marketing Guinea fowl is between 14 to 16 weeks and males can be marketed at 14 weeks and females at 16 weeks of age and White Guinea fowl can be reared under intensive system for meat production.

Keywords: Guinea fowl, carcass characteristics, age, strain.

drpremavalli@gmail.com
Genomic selection in animal breeding: A promising future for faster genetic improvement in livestock

Indrasen Chauhan, S S Misra, Arun Kumar and G R Gowane
Central Sheep & Wool Research Institute, India

The success of an animal breeding programme largely depends on the accuracy of selection process employed. The traditional breeding through selection based on only phenotypic data has proved to be of limited efficiency in exploiting the genetic variations existed in the population. With the advent of molecular genetic techniques, Marker Assisted Selection (MAS) coupling the variation at the nucleotide level with phenotypic performance produced remarkable results in trait specific improvement. But, it was not encouraging for most of the quantitative traits controlled by many minor genes with smaller effects. Genomic selection (GS), given by Meuwissen (2001), is one form of MAS with extended scope and opportunities on a genome wide scale. The cost effectiveness of genotyping a large number Single nucleotide Polymorphisms (SNP) spread across the entire genome paved the way to estimate their effects simultaneously. A prediction equation to calculate the Genomic Estimated Breeding Value (GEBV) is developed in a reference population having accurate phenotypic data of the trait(s) and genotyping information through whole genome SNP array. The association between the SNP and phenotypic data is validated. It then can be applied to estimate the genomic breeding values of a new group of genotyped animals whose phenotypic performances are not available. Then, the best animals can be selected based on their GEBV. Besides, having higher accuracy of selection, GS can reduce the generation interval by selecting individuals at the early stage of life, can be used for traits difficult to measure as well as traits with low heritability. Ultimately it will lead to faster and increased genetic progress. GS is being applied successfully in cattle, pig and poultry breeding programmes in different countries. It also has a huge scope of application in small ruminant breeding programmes.

Keywords: Genomic selection, SNP, GEBV, genetic improvement.
Is it enough to use rumen magnet once a life to permanently prevent hardware disease in buffaloes?

Ashraf M Abu-Seida¹, Oday, S Al-Abbadi² and Salam M Al-Hussainy²
¹Cairo University, Egypt
²Ministry of Agriculture, Iraq

Buffaloes are an important part of livestock agriculture in Asia since 5000 years, producing milk, meat, hides and draft power. Hardware disease of bovine is still a matter of concern in different veterinary practices all over the world and its prevention still constitutes a challenge. Therefore, the aim of the present study was to assess the role of rumen magnet given once a life as a permanent preventive measure for hardware disease in buffaloes. In the present study, 3100 buffaloes were divided into two groups. In group I, 1200 hardware diseased buffaloes were surgically treated with rumenotomy, given reticular magnets and followed up to 7 years for a possible recurrent hardware disease. In group II, 1900 clinically normal buffalo heifers were given rumen magnets orally then followed up to seven years for a possible occurrence of hardware disease. All buffaloes showed signs of hardware disease were treated by rumenotomy. Data were statistically analyzed using chi-square test. The results of this study showed that hardware disease was recorded in 110 animals (10.8%) and 155 animals (8.9%) in groups I and II. The incidence of developing a hardware disease during the first 4 years after the use of magnet was 0% in both groups. Starting from 5th year, a time dependent increase in the proportion of buffaloes developing a hardware disease was noticed in both groups (P < 0.05). The use of magnets in group I provided the same level of protection as that of group II since the overall proportions of the occurrence of hardware disease during 7 years post magnet use were not statistically different (P > 0.05). In conclusion, Administration of rumen magnet once a life is not enough to permanently prevent hardware disease in buffaloes and animals at high risk should be given a new rumen magnet every 4 years.

Biography

Ashraf Abu-Seida is a full Professor of Surgery, Anesthesiology & Radiology at Faculty of Veterinary Medicine, Cairo University. He was born in Fayoum (Egypt) on June, 9 1971 and received his veterinary medical degree at Faculty of Veterinary Medicine, Cairo University in 1994, Master (1998) and PhD (2002) in veterinary sciences. He was appointed to Assistant Professor in 2007 and Professorship in 2012 in the same university. He has authored or coauthored > 33 peer reviewed articles. He has the memberships with many scientific veterinary associations. He presented numerous presentations and lectures in the fields of Veterinary Surgery, Radiology & Anesthesiology. He has supervised > 30 Master and PhD Theses. He is serving as an editorial member and reviewer of > 10 reputed journals. He has been bestowed by various national awards for excellence in research.

ashrafseida@cu.edu.eg
Effect of orientation, ventilation, floor space allowance and cooling arrangement of cattle shed on the microclimate of shed and milk yield of dairy cattle in Goa

S K Das1, M Karunakaran2 and S B Barbuddhe3
1ICAR Research Complex for Goa, India
2National Dairy Research Institute, India
3National Institute of Biotic Stress Management, India

Ten farmers consisting of large, medium, small and marginal from each of six taluka i.e. Pernem, Bicholim and Ponda taluka of North Goa district; Salcete, Canacona and Sanguem talukas of South Goa district in total sixty farmers from six talukas were considered based on cattle population for this study. Farmers were interviewed for collecting information on housing and production aspect of dairy cattle. Subsequently farmers were grouped according to type of dairy house. Data on microenvironment of cattle shed and daily milk yield of cows were recorded besides feeding and disease occurrence. Data analysis revealed that orientation of cattle shed had significant (P < 0.05) effect on av. daily milk yield, av. daily air temperature, av. daily relative humidity, while highly significant effect (P < 0.01) on av. daily temperature humidity index. Lesser heat stress and more milk yield were observed in cattle house having east – west orientation. Ventilation of cattle shed had highly significant (P < 0.01) effect on av. daily milk yield, while significant effect (P < 0.05) on av. daily air temperature, av. daily relative humidity and av. daily temperature humidity index. Significantly higher milk yield (9.896 ± 0.090 kg), significantly lower air temperature (27.62 ± 0.13°C), significantly lower relative humidity (79.43 ± 0.35 %) were observed in cattle shed with good ventilation. Floor space provision inside cattle shed had highly significant (P < 0.01) effect on av. daily milk yield and all the microenvironments. Average daily milk yield (9.736 ± 0.085 kg) was significantly higher while av. daily relative humidity (79.88 ± 0.37 %) was significantly lower in cattle shed where standard floor space of minimum 5m2 per cattle was maintained. Cooling arrangement in cattle house had highly significant (P < 0.01) effect on av. daily milk yield and all the microenvironmental parameters. It was inferred that besides manual and mechanical cooling if false ceiling is made inside cattle house cow would feel more comfort with higher milk yield.

dasicargoa@gmail.com
Combating malnutrition through school milk program by APDDCF in Andhra Pradesh, India

Madhusudana Rao
Andhra Pradesh Dairy Development Cooperative Federation Ltd., India

Childhood under nutrition is an important public health and development challenge in India. Undernourished children have significantly higher risk of mortality and morbidity. Besides increasing the risk of death and disease, under nutrition also leads to growth retardation and impaired psychosocial and cognitive development. With appropriate nutritional and clinical management, many of the deaths can be prevented.

A scheme in the name of Indiramma Amrutha Hastham, has been launched in 103 high risk integrated child development services with an outlay of Rs. 100 crore to reduce the incidence of low birth babies, malnutrition among children, reduce the incidence of infant and maternal mortality. An estimated 3.5 lakh pregnant and lactating women will be provided “one full meal” under the programme.

Keeping in view of the nutritional status of the children, as per the request of the APDDCF, Government of Andhra Pradesh has accepted the proposal to include milk as one of the item in the menu for the children in Anganwadi Centres.

The scheme took off well and now Vijaya Milk is being made available in the highly risk ICDS projects in the districts of Andhra Pradesh. The Tribal Welfare Department in khammam district has accorded permission to supply of vijaya milk in 6 layer tetrapack to all the 119 tribal institutions in the District.

Further, the ICDS projects in a few districts such as Nalgonda, Khammam have opted for supply of Double Toned Vijaya milk in tetrapacks, to ensure quality milk to the children.

Biography

Madhusudana Rao was the gold medallist in BSc Dairy Technology and completed MSc Dairy Technology, MBA (HRM), PG Diploma in Rural Development in first Division. He served the APDDCF for 20 years in Milk Procurement Wing and was instrumental in reviving Dairy Activity through Women Self Help Groups in Chittoor District. He is a regular writer on topical issues in various Telugu magazines. With the passion to serve in rural development sector, he is working on deputation as Assistant Project Director, with District Water Management Agency in Adilabad, which is predominantly a tribal area.

madhuapdairy@gmail.com
A case report: Visceral smallpox in a sheep flock in Andhra Pradesh, India

Supriya Botlagunta
Sri Venkateswara Veterinary University, India

Sheep pox was a contagious viral disease of small ruminants. This disease may be mild in indigenous breeds living in endemic areas, but are often fatal in newly introduced animals. Economic losses result from decreased milk production, damage to the quality of hides and wool, and other production losses. Sheep pox virus and Goat pox virus are closely related to the virus that causes lumpy skin disease in cattle. Many Sheep pox virus isolates are specific for sheep, and many Goat pox virus strains are specific for goats, but some strains of these viruses readily affect both species. Animal first presented to the clinic with dyspnea and febrile condition with no specific pock lesions on the skin except some erythema at the base of the tail and it died in 12 hrs after started showing the symptoms. The affected other animals showed clinical signs such as altering body temperature, lymphnode swelling, edema of the eyelids, nasal discharge, inappetence, arched back, lacrimation, coughing, salivation, pneumonia, hypersensitivity and scanty urine. In the present case reported morbidity rate was 23% and the mortality rate was 10%. The autopsy of the animals with visceral smallpox revealed extensive pock lesions along the length of trachea, on the heart and lungs. According to the history, abnormal clinical signs and diagnostic PCR report by animal disease diagnosis laboratory visceral sheeppox was diagnosed. Animals should be vaccinated regularly as this disease was acute. The Infected herds and sick animals should be isolated for at least 45 days after they have recovered from clinical signs.

supriyabotlagunta@gmail.com
Lantana camera associated hepatic and renal toxicity in bullocks: Case report

B Anil Kumar, G Ambica and Vanitha Sree
Sri Venkateswara Veterinary University, India

Two bullocks were brought to the Teaching Veterinary Clinical Complex, College of Veterinary Science, Korutla with the history of anorexia and voiding scanty feces since 3 days and owner has reported that unknowingly two bulls had entered the nearby village and grazed on lantana plants one entire day. Detailed clinical examination has revealed icteric conjunctival mucous membranes, decreased rumen motility with profuse frothy salivation. Among the two one bullock was very weak, dull and conjunctival mucous membrane was very much icteric and from that animal dung, urine, blood samples were collected for detailed laboratory investigation. Dung smear was negative for parasitic ova but urine sample was positive for bile salts. Serum analysis showed increased levels of serum total bilirubin (0.84 mg%) and BUN (71.26 mg%) indicating both hepatic and renal insufficiency. Animal was treated with Inj. DNS 1350 ml IV, Inj. Histanil 20 ml IM, Inj. Enrocin 20 ml IM and Inj. Belamyl 20 ml IM Treatment with IV fluids and antibiotics was repeated for two more days, where as antihistamines and supportive treatment with Belamyl was continued for 5 days and prescribed hepatoprotectant Live-52 syrup @ 20 ml orally BID for 15 days. Two bullocks started responding from next day onwards and recovered in 10 days.
Biochemical and therapeutic studies of postpartum indigestion (ppi) in buffaloes
K Padmaja, D S T Rao, P Ameer Hamza, K Sadasiva Rao and A Gopala Reddy
Sri Venkateswara Veterinary University, India

Out of 320 recently calved buffaloes with the history of reduced feed intake and decreased milk yield, 90 buffaloes were found suffering with postpartum indigestion basing on detailed clinical examination. These 90 animals were subjected to urinalysis to find the occurrence of PPI in relation to hepatic insufficiency and subclinical production diseases (subclinical hypocalcaemia and subclinical ketosis). Basing on the cow side urinalysis, the animals were grouped in to different groups and compared with healthy animals. Biochemical and therapeutic studies were conducted. Results in detail will be discussed.

satyaja35@yahoo.co.in
Ectoparasites of dairy animals including lice (Damalinia, Haematopinus, Linognathus), mosquitoes (Aedes, Culex), flies (Tabanus, Stomoxys, Haematobia), ticks (Rhipicephalus, Hyalomma) and mites (Demodex, Psoroptes) cause a major threat to sustainable dairy industry in a tropical country like India where the warm, humid climate favours their perpetuation and propagation almost throughout the year. Heavy infestations produce direct losses like anaemia, reduced growth rates and milk production; hide damage and toxicosis along with the indirect loss in terms of transmission of various economically important bovine diseases (tropical bovine theileriosis, bovine babesiosis, anaplasmosis, trypanosomosis). Large scale repeated use of chemical insecticides viz., organochlorines, organophosphates (OP), synthetic pyrethroids (SP), amidines and macrocyclic lactones (ML) have predominantly been used to control arthropods on domestic animals worldwide. In India, presently the most commonly used insecticides include coumaphos, dichlorvos, diazinon, malathion (OPs), amitraz (amidines), fenvalerate, deltamethrin, cypermethrin, flumethrin (SPs), ivermectin (ML). However, application of these chemical insecticides have limited efficacy in reducing ectoparasite infestations and is often accompanied by serious drawbacks, including the development of resistance, environmental contamination, and contamination of milk and meat products with insecticide residues. Indiscriminate use of acaricides has led to resistance particularly in one-host tick Rhipicephalus (Boophilus) microplus to almost all currently used acaricides whereas; resistance in multi-host ticks (Hyalomma anatolicum) is less widespread. As the availability of new chemicals for the control of resistant ectoparasites is scarce, and there are concerns over resistance and residues problems, it becomes the urgent need of the hour to formulate and implement alternative pest management strategies for effective control of these ectoparasites.

Keywords: Chemotherapeutics, dairy animals; ectoparasite control; India, insecticide resistance.
Quality characteristics of set yoghurt blended with tender coconut water-milk: Carrageenan

Swarnalatha G
Sri Venkateswara Veterinary University, India

New and innovative type of yoghurts and yoghurt products are being marketed resulting in a phenomenal increase in the per-capita consumption of this product. TCW is popular because of its healing property such as oral and intravenous rehydration during loss of body fluids due to acute gastrointestinal infections and in combating intestinal worms and relieving stomach problems. Therefore, an investigation was undertaken on the feasibility of use and comparative efficiency of carrageenan to enhance consumer acceptability of set yoghurt. Set yoghurt was prepared using carrageenan at 0.15-0.25%, tender coconut water (TCW) - milk blends at 10:90, 20:80, 30:70 using 1% Streptococcus thermophilus(ST) and Lactobacillus bulgaricus(LB) and control without carrageenan and TCW. Carrageenan increased the wheying off in TCW- milk blended yoghurt considerably, especially at higher concentration (0.25%). However, the results showed the beneficial effect of carrageenan in improving the firmness of set yoghurt when it is used at an appropriate level (0.05-0.15%). Therefore, the lower levels (0.05%-0.15%) were used for further studies. The firmness improved at 0.05% of the carrageenan at 10:90 TCW – milk blends. Penetration value, setting time, syneresis was evaluated. Sensory attributes were evaluated by 5 judges on 100 points for firmness, syneresis, flavour, body & texture. Viability of cultures was studied in yoghurt by withdrawing samples at 0, 3 and 0, 5, 10, 15 days at room and refrigerated temperatures respectively. Sensory scores were maximum for 10:90 TCW-milk 0.05% carrageenan compared to control. As concentration of carrageenan increased setting time decreased (280 to 270 min.) While, increased with increase in concentration of TCW-milk blends. Syneresis decreased with increase in concentration of carrageenan (1.5 ml /35 ml of yoghurt). Quality characteristics were non-significant (P ≥ 0.05%) between control and treated samples. Initial counts of ST and LB were ≥ 107cfu/g, after 3 & 15 days of storage at room (30±2°C) & refrigerated temperature (5±2°C), these were 105cfu/gm respectively. It is concluded that carrageenan may be used at 0.05% in 10:90 TCW-milk blends to prepare nutritionally superior yoghurt.

Biography
Swarnalatha G is working as the Assistant Professor in the Department of Dairy Chemistry, Sri Venkateswara Veterinary University, Tirupati, Andhra Pradesh.

swarna2411@gmail.com
Nutritional influence on composition and nutraceutical properties of milk

Manoj Kumar Tripathi, Prabhat Tripathi and U B Chaudhary
Central Institute for Research on Goats, India

The major deriving forces for manipulating the composition of milk included the aims of improving the manufacturing and processing of milk and dairy products, altering the nutritional value of milk to conform the dietary specifications and using milk as a delivery system for nutraceuticals with known benefits to human health. The opportunities of improving milk productivity and altering the milk composition through nutritional interventions has been proposed. The increase in the nutraceutical value of milk is expected through dietary modifications of the animal. Feeding high concentrate diets combined with dietary fat can be used to modify the FA profile of milk, without negative effect on milk yield and milk fat or protein contents. Their effects may be complementary, at least for trans fatty acids. The profile of trans isomers relative to total trans-C18:1 seems dependent on the source of dietary fat. Feeding oilseeds and/or novel fat supplements to ruminants can be used to modify the lipid metabolism in the mammary gland in modulating the secretion of fat and the profile of milk fatty acids. Feeding novel fatty acid sources the nutritive value of milk can be enhanced by decreased antherogenic saturated FA in milk and increased t11-C18:1 (trans vaccenic acid), and c9,t11-C18:2 (geometric and positional isomer of conjugated linoleic acid (CLA) in milk, which are considered as positive for human health. Feeding bypass/ rumen protected sources of fatty acids and amino acids may help in meeting the need of higher milk production, and in modulating milk composition through increase availability of fatty acids and amino acids in circulation with synchronized extraction of desired nutrient by mammary gland for milk constituents synthesis. Milk could be use as delivery system of anticarcenogens (CLA and polyphenols) for human health. Therefore, nutritional manipulations have several opportunities in improving milk production, modifications of milk composition and fatty acid profile, and other health promoting bioactive constitutes.

Biography

Manoj Kumar Tripathi has completed his PhD from GBPUA&T, Pantnagar during 1999 and postdoctoral studies from INRA France from 2002-03. He was the visiting scientist at CSIRO, Australia from 2001-12. He is Principal Research Scientist of ICAR under Agricultural Research Services at Central Institute for Research on Goats. His research interest has been feed biotechnology, metabolic functional of rumen microbiota, nutrition and production. He has published more than 80 papers in reputed journals, has filed four patents and has been serving as an editorial board member of five research journals of repute.

mktripathi@gmail.com
Successful management of Haemorrhagic septicemia in a Holstein Friesian Cow: A case report

K Lakshmi and K Padmaja
Sri Venkateswara Veterinary University, India

A five year old pleuriparous cow was presented to the Veterinary Ambulatory clinic Mylardevpally with the history of reduced feed intake, reduced milk yield, salivation, cough, swelling of neck and bilateral mucopurulent nasal discharges. Upon clinical examination, the cow was dull and depressed with higher temperature, congested mucosal membranes, labored breathing and had ruminal atony(0/3minutes). Blood smear examination revealed bipolar organisms. The cow was treated with Inj. Enrocin@5 mg/kg b.wt IV, Inj. Melonex power @ 3ml IM, Inj. Tribivet @ 12 ml i/m, Inj. DNS@1 litre slow IV. The above treatment was continued for 5 days and clinical improvement was noticed after 3 days.

drklakshmi1@gmail.com
Relationship of mineral and hormone profile of bovines with reproductive disorders in organized dairy farms in Karnataka and Tamil Nadu

P Krishnamoorthy1, M R Gajendragad1, J P Ravindra2, D T Pat1, Raghavendra Bhatta1 and H Rahman1

1National Institute of Veterinary Epidemiology and Disease Informatics, India
2National Institute of Animal Nutrition and Physiology, India

Reproductive disorders, one of the important factors causing economic loss in the bovines (cattle and buffaloes) of organized dairy farms was done. Paired sera samples (128, 195, 109 and 138) at one month interval were collected from bovines of organized farms in Dharwad, Bijapur in Karnataka and Pondicherry, Chennai in Tamilnadu. Serum was screened for Brucella and Infectious bovine rhinotracheitis (IBR) antibodies and analyzed for mineral and hormone profiles. The reproductive problems observed were 49 (8.5%), 167 (29.3%), 16 (2.8%) and 7 (1.2%) of abortion, repeat breeding, metritis and anoestrus respectively. Out of 570, 254 (44.6%) and 158 (27.7%) were positive for Brucella and IBR antibodies respectively. Serum copper, zinc, calcium, magnesium, phosphorus were 1.35 ppm, 1.40 ppm, 9.01 mg%, 1.64 mg%, 3.42 mg% and 1.24 ppm, 1.02 ppm, 9.70 mg%, 1.65 mg%, 3.09 mg% in apparently healthy and reproductive problem bovines respectively. The serum zinc and phosphorus levels showed significant decrease in animals with reproductive problems. Serum estradiol and progesterone concentration were 3.50 pg/ml, 2.94 IU/ml and 2.18 pg/ml, 2.46 IU/ml in apparently healthy and reproductive problem animals respectively. Significant decrease in levels of estradiol and progesterone concentrations in bovines with reproductive disorders was observed. There was association between reproductive disorders with minerals and hormone status in bovines of organized dairy farms. Thus, minerals and hormone status evaluation may aid in early detection of bovines with reproductive disorders.

Biography
P Krishnamoorthy did his BVSc and MVSc (Veterinary Pathology) from Madras Veterinary College, TANUVAS, Chennai and PhD from Veterinary College, KVAFSU, Bangalore. He is currently working as Scientist, National Institute of Veterinary Epidemiology and Disease Informatics, formerly PD_ADMAS, Bangalore. He has specialized in epidemiology, nutritional pathology and laboratory animal management. He is recipient of ICAR outstanding Team Research Award as member of team during 2010 and Fellow of Academy of Sciences for Animal Welfare (FASAW). He has 30 research publications in peer reviewed journals and book, book chapters, technical bulletins, training manuals and completed one external and seven Institute funded research projects.
Studies on antifungal role of phytochemicals against *Aspergillus parasiticus*

Umaya Suganthi R, Prasad KS, Sejian V and David ICG
National Institute of Animal Nutrition and Physiology, India

Aflatoxins are toxic secondary metabolites of toxigenic fungi *Aspergillus parasiticus* and *Aspergillus flavus* that commonly grow on various agricultural commodities. Improper storage conditions favor fungal infestation and toxin production on livestock feeds and such contamination is predominant in tropical countries. Consumption of aflatoxin contaminated feed affects liver, kidney and immune system and leads to toxic, mutagenic and carcinogenic effects in animals, thereby causing both health and economic losses in livestock. Management of feed commodities is required to ensure that they remain safe for consumption by animals. In the recent years plant based preservatives are focused as a viable strategy against infection by microbes. Therefore the present study was aimed to assess the potential of various phytochemicals to inhibit the growth of aflatoxin producing strain of *Aspergillus parasiticus* (IMTECH 2797). The phytochemicals β-caryophyllene, piperine, thymol, eugenol, transcinnamaldehyde, basil oil and transcinnamic acid were tested for their inhibitory effect at varying concentrations ranging between 0.01 to 1.0% under *in vitro* conditions in potato dextrose agar media. Among the phytochemicals studied, piperine did not inhibit fungal growth, β-caryophyllene reduced the growth of *A. parasiticus* colonies by 47% at 1% concentration. But basil oil exhibited complete (100%) inhibition of fungal growth at 1% concentration. At 0.2% concentration, transcinnamic acid and eugenol inhibited *Aspergillus* growth completely while thymol and transcinnamaldehyde showed a similar effect at 0.1%. The study indicated the potential of phytochemicals as effective antifungal agents against *Aspergillus parasiticus*.

Biography

Umaya Suganthi R is working as Senior Scientist at National Institute of Animal Nutrition and Physiology, Bangalore. She completed her PhD in 2009. She has published research in peer reviewed journals and is a member of editorial board of various journals of repute.

suganthinaniram@gmail.com
Effects of varying dietary protein and 17α-Methyltestosterone on growth and survival of fry of *Labeo rohita* (Hamilton-Buchanan)

A K Pandey¹, M Sarkar², G Kanungo², C T Mahapatra² and P K Arvindakshan²

¹National Bureau of Fish Genetic Resources, India
²Central Institute of Freshwater Aquaculture, India

Recent studies have demonstrated that the naturally-occurring (testosterone, 11-ketotestosterone) as well as synthetic androgens (dimethazine, norethandroline) do have anabolic (growth-promoting) effect in salmonids, common carp and tilapia. Contrary to these findings, no significant growth differences could be recorded in the channel catfish treated with synthetic steroids (stanozolol and methandrostenolone). Growth improvement of cultured organisms through high protein diet has got restricted application in commercial aquaculture due to the high cost incurred while using this feed in intensive system. In this context, incorporation of various steroids in the diet of cultivable fishes assumes significance. An attempt was made to record the effects of varying dietary protein and 17α-methyltestosterone content on growth and survival of *Labeo rohita* fry under hatchery conditions. Fry were divided into four equal groups – two control (Group 1, 3) and two experimental (Group 2, 4). The control group 1, fry were maintained on the diet consisting of fish meal 10%, groundnut oil-cake (GOC) 35%, soybean oil-cake (SOC) 20%, rice bran 2% and wheat flour 20% (crude protein content 30.8%) whereas the control group 3, fry were fed with diet comprising fish meal 30%, GOC 45%, SOC 20%, rice bran 2% and wheat flour 3% (crude protein content 42.3%). Diets of the fry of both the experimental groups (Group 2, 4) were supplemented with 17α-methyltestosterone (17α-MT) in the dose of 8 ppm. The pelleted (0.2 mm) feed were given at the rate of 3% of body weight once daily for 90 days. Fry of the control as well as experimental groups exhibited 100% survival. Feed conversion ratio (FCR), feed conversion efficiency (FCE), protein efficiency ratio (PER), specific growth rate (SGR) and weight gain percentage (%) of the fishes from all the groups were calculated. Observations of the present study showed that the fry fed with 42.3% crude protein diet (Group 2) registered significantly (P<0.05) higher growth as compared to those fed on 30.8% crude protein diet (Group 1). Interestingly, the fry given 17α-MT-incorporated diets (Group 3, 4) recorded higher growth rate (P<0.05) in comparison to their respective controls (Group 1, 2).

**Keywords:** Dietary protein, 17α- methyltestosterone, survival, growth, hatchery conditions, fry, *Labeo rohita*.

**Biography**

A K Pandey completed his PhD (Zoology, Comparative Endocrinology) from the University of Gorakhpur in 1990. Presently, he is Principal Scientist at National Bureau of Fish Genetic Resources (ICAR), Lucknow. He has published 234 research papers in journals of repute. Most of his papers are widely cited by eminent scientists of the world. He is editorial board member of a number of national journals.

akpandey.ars@gmail.com
Effect of incorporating hydrolyzed gelatin in pre-starter diet on performance and slaughter variables in commercial broilers

T Srilatha\textsuperscript{1}, S V Rama Rao\textsuperscript{2}, M V L N Raju\textsuperscript{2}, A K Panda\textsuperscript{2} and B Prakash\textsuperscript{2}

\textsuperscript{1}Sri Venkateswara Veterinary University, India
\textsuperscript{2}Directorate of Poultry Research, India

An experiment was conducted to study the effects of supplementation of hydrolyzed gelatin (HG) at graded levels (0, 2, 4, 6, 8, and 10\%) in the pre-starter diets on performance and slaughter variables in broilers. A total of 300 male broilers were uniformly distributed in completely randomized design with six treatments and ten replicates in each treatment. Maize-soybean meal based control diets (CD) were formulated to contain 2950, 3000 and 3100 kcal ME/kg and 22.5, 20, 19\% crude protein, respectively during pre-starter (1-11 d), starter (12-28d) and finisher (29-42d) phases and fed ad libitum from 1d to 42 d of age. The results indicated that the body weight gain (BWG) and feed intake improved significantly in broilers fed on diets supplemented with 2 or 4\% HG compared with those fed on the CD. Supplementation of 10\% HG significantly reduced BWG compared to that of CD fed group. At 42 d of age, broilers fed on diets with 6\% HG weighed significantly higher body weight compared with the CD fed birds. Feed conversion ratio and slaughter variables (ready to cook yield, relative weights of breast, liver, abdominal fat and giblet) were not affected with dietary treatments from 1- 42 d of age. It could be concluded from this study that the hydrolysed gelatin can be incorporated up to 6\% in commercial broiler diet during the pre-starter phase without affecting performance and slaughter variables at 42 d of age.

Biography
T Srilatha is the holder of MVSc and PhD degrees in the field of Poultry Science from College of Veterinary Science, Hyderabad, Sri Venkateswara Veterinary University, Tirupati and worked as Guest Faculty for CABM in ANGRAU, Hyderabad. Presently she is working as Assistant Professor in Department of Poultry Science at College of Veterinary Science, Korutlla, Karimnagar. She has published 6 research papers in reputed scientific journals at national and international level.

srilatha.mangalam@gmail.com
Effect of dietary supplementation of phytobiotic on growth and immunocompetence of commercial broilers

A Bhattacharyya, P K Shukla and M Shukla
UP Pt. Deen Dayal Upadhyaya Veterinary Science University, India

A study was conducted to determine the effect of supplementation of phytobiotic on growth and immune competence traits of commercial broilers. 72, one week old, Cobb 400 broiler chickens were distributed into two experimental groups having four replicates of nine birds each. The birds of the control group were fed a basal diet (22.5% CP & 2830 K cal/kg ME) while the other group was offered a basal diet supplemented with a phytobiotic, Superliv liquid (Ayurvet Ltd, Baddi, India) in drinking water @ 5ml/ 100 birds/ day during 1-2 weeks of age, 10 ml/ 100 birds/ day during 2-4 weeks of age and 20 ml/ 100 birds/ day during 4-6 weeks of age. Superliv liquid group birds had significantly higher (P<0.05) body weight compared to the control at 2nd week of age. Further, the weekly body weight of the birds in the phytobiotic fed group was apparently higher compared to the control group throughout the experiment. Total immunoglobulin (log 2) titre values in response to sheep red blood cells (SRBC) was significantly higher (P<0.05) in the phytobiotic group compared to the control group. Further, mercaptoethanol resistant (IgG) and mercaptoethanol sensitive (IgM) (log 2) antibody titer values in response to sheep red blood cells (SRBC) were apparently higher in the phytobiotic group compared to the control group. Cell mediated immune response i.e. in vivo cutaneous basophilic hypersensitivity response to lectin phytohaemagglutinin from Phaseolus vulgaris (PHA-P) determined as foot web index was apparently higher in the liver tonic group compared to the control group. Hence, it may not be unreasonable to infer that phytobiotic, Superliv liquid possesses promising immunomodulatory potential and supplementation of Superliv liquid may elicit growth in commercial broilers.

amitav16@rediffmail.com
Effects of feeding of concentrate mixtures comprising crushed and entire dried *Prosopis juliflora* pods on the performance of arid goats

Ajayvir Sirohi, B K Mathur, A K Misra and J C Tewari
Central Institute for Research on Cattle, India

The experiment was undertaken to assess the performance of arid goats fed on concentrate mixtures having different forms of *Prosopis juliflora* dried pods. Eighteen growing goats (Marwari and Parbatsari) were divided into three groups, having six in each group based on their body weight and genetic make-up. The roughage was offered ad libitum in weighed quantity, which was similar to all the animals of three groups. However, the concentrate mixture was standard for the goats of control group (T0), whereas, 50 percent dried ground *P. juliflora* pods in T1 and 50 percent as such (non-grinded) dried *P. juliflora* pods in T2 were included by replacing the standard concentrate mixture. Animals of all the three groups received iso-nitrogenous and calorific ration. The observations were recorded for a period of fourteen fortnights. The average body weight gain of the animals was 11.7, 9.7 and 9.7 kg in T0, T1 and T2, respectively. Average daily dry matter intake (DMI)/100 kg body weight was 4.53, 4.68 and 4.79 kg in T0, T1 and T2 groups, respectively. The animals in all the three groups lost their body condition and the average change in body condition score (5 point score) was -0.17, -0.25 and -0.50 unit in T0, T1 and T2, respectively. The goats in all the groups exhibited normal heat signs in the breeding season. Five goats from each group were bred which became pregnant and delivered kids normally. The number of seeds per kg of feces voided in goats of T2 was 136. None of the animals among all the groups was found suffering from any problem related with chewing the cud and facial muscle. The results revealed that long term feeding of concentrate mixtures containing 50 percent crushed and entire *P. juliflora* pods to goats did not affect reproduction and cud chewing, however, animals lost their body condition.

Biography

Ajayvir Sirohi has completed his Masters and PhD in Livestock Production Management discipline from Indian Veterinary Research Institute, Izatnagar, India. He is having 11 years of teaching and research experience and presently working as Senior Scientist at Central Institute for Research on Cattle, Meerut Cantt, India. He has published more than 20 research papers in reputed national and international journals. He has been a member of the research team of NAIP subproject entitled Value chain on value added products derived from *Prosopis juliflora* which received appreciation award from ICAR in 2012.

ajaysirohi35@gmail.com
Molecular characterization of extended-spectrum beta-lactamase (ESBL) producing *Escherichia coli* in diverse food producing animals from eastern India

Samiran Bandyopadhyay¹, Debasish Kar, Debabrata Bhattacharyya, Bimalendu Mondal, Indranil Samanta², Achintya Mahanti², Premanshu Dandapat, Promod KNanda, Arun KDasa Tapan KDutta¹ and Subhasish Bandyopadhyay

¹Indian Veterinary Research Institute, India
²West Bengal University of Animal & Fishery Sciences, India
³Central Agricultural University, India

Emergence and dissemination of extended spectrum beta-lactamase (ESBL) producing *Escherichia coli* in both hospital borne and community infection is on the rise for last two decades, a considerable cause of concern for both medical and veterinary practitioners. The ESBL producing *E. coli* can inactivate beta-lactam antibiotics containing oxyimino group specially the third and fourth generation cephalosporins and monobactam. Food producing animals were implicated as a major reservoir of ESBL producers and contributing to further propagation of resistant strains to environment affecting community and public health. In order to determine the occurrence and further characterization of ESBL producing *E. coli* a total of 566 samples (milk and fecal) were collected from diverse food producing animals (cattle, goat, chicken, duck etc.) of eastern India. Of them 41 isolates were confirmed as ESBL producing *E. coli* using phenotypic confirmatory tests like standard combination disc method, ESBL E-test and detection of major ESBL genes blaCTX-M, blaTEM and blaSHV by PCR. The gene blaSHV was more frequently detected followed by blaCTX-M and blaTEM. Many of the isolates were positive for class I integron and sulphonamide resistance gene (sul-1). Added to this, few isolates also carried plasmid mediated quinolone resistance (PMQR) genes and virulence markers of extra-intestinal pathogenic *E. coli* (ExPEC). All the PCR amplified products were cloned and subjected to sequencing for homology analysis and data were submitted to gene bank. All the confirmed ESBL producers were resistant to ceftriaxone, ceftazidime, cefotaxime, aztreonam, cefpodoxime, and cefepirome. Resistance was also frequently noted to other antibiotics as well, like amoxicillin (94%), piperacillin+tazobactam (94%), cotrimoxazole (88%), ciprofloxacin (83%), tetracycline (77%), cefepime (66%) and chloramphenicol (61%). Phylogenetic analysis by ERIC PCR revealed genetic similarity among the ESBL strains isolated from different regions of eastern India. However, no specific trend was observed in respect to source of isolation, virulence or resistance gene profile. This is the first ever systemic study on ESBL producing *E. coli* in food producing animals from India. We also report for the first time ESBL producers carrying markers of ExPEC to the best of our knowledge.
Age effect on feeding and idling behavior of weanling goat reared under stall-fed conditions

Bindu Madhuri S\textsuperscript{1} and N Das\textsuperscript{2}

\textsuperscript{1}Sri Venkateswara Veterinary University, India
\textsuperscript{2}Indian Grassland & Fodder Research Institute, India

Weanling goats are slaughtered in developing countries mostly between the ages 9 to 12 months. Times spent feeding determines the nutrient uptake by goat, which in turn plays a large role in determining both quality and quantity of goat meat. But information on the feeding behavior of goat under stall-fed conditions is very limited. The aim of this study was to observe the feeding behavior of 18 stall housed weanling goats (9 males and 9 females) during each of three periods of their body growth viz. between 3 to 4 (G1), 5 to 6 (G2) and 8 to 9 months of age (G3). The experimental animals had free access to feed and fodder only during the daytime. The time spent eating forage increased significantly (H\textsubscript{2} = 32.32, P < 0.001) with the increase age of animals; the G3 age group spent about 7.45 h day\textsuperscript{-1} in eating forage whereas the animals in the G2 and G3 age groups spent about 5.65 h day\textsuperscript{-1}. However the total time spent eating (both forage and concentrate) was more or less same (about 9 h day\textsuperscript{-1}) in all the three age groups. The total time spent on different idling activities (viz. loafing, resting and sleeping) during daytime was more or less same (about 1.8 h) in both the G1 and G3 goats; whereas it was higher (2.3 h) in the G2 goats.

Keywords: Weanling, goat, behaviour, eating, ruminating, idling.
Assessing green house gas emission from liquid milk production system in Punjab

Anjumoni Mech, Bhatta R and Mallik P K
National Institute of Animal Nutrition and Physiology, India

Works conducted on green house gas emission (GHG) from dairy production system in India are mostly restricted to enteric fermentation and manure management system (MMS). An excel based model was developed to estimate GHG emission from liquid milk production system in Punjab based on the guidelines of Intergovernmental Panel on Climate Change (IPCC, 2006). The bovine population data for Punjab was collected from 18th livestock census report. The information on nutritional parameters, management system and other parameters were collected from published reports. However, certain assumptions were made due to unavailability of information on state specific MMS, distance between farm to consumer and livestock feed store. The respective methane emission factors (kg CH$_4$/head$^{-1}$year$^{-1}$) for indigenous cattle, crossbred cattle and buffalo females were found to range between 10.64 to 26.93, 11.76 to 33.60 and 11.48 to 35.66 whereas for their male counterparts it was estimated at 11.97 to 18.16 for indigenous, 11.49 to 20.30 for crossbred and 14.01 to 27.01 for buffalo. The major source of N$_2$O emission from MMS was found to be direct N2O emission (59 to 99%) whereas indirect N$_2$O emission was insignificant. However, the total emission (CO$_2$ eq/year) from enteric fermentation and MMS of bovines in the state was estimated as 5617.7 Gg. Comparison between different sources of GHG emission from liquid milk production chain revealed that enteric emission is the highest contributor (61.38 to 67.47), followed by emission due to fertilizer application from crop residue and fodder cultivation (29.17 to 35.14), then CH$_4$ emission from MMS (0.55 to 1.73), followed by feed and milk transportation (0.64 to 1.95), whereas N$_2$O emission from MMS (0.22 to 0.27) is the lowest. The highest emission per kg of FPCM (fat protein corrected milk) and per kg milk protein yield was estimated for indigenous cattle.

Keywords: Emission, green house gas, enteric methane, nitrous oxide.

Biography
Anjumoni Mech is presently working as scientist at National Institute of Animal Nutrition and physiology, Bangalore, Kamataka, India. Prior to NIANP she was at NRC on Mithun, Nagaland, for nine years as a scientist. She has done her PhD in livestock production and management from National Dairy Research Institute, Haryana, India. She was involved in various projects like: evaluating lactation performance, growth performance and draught power in Mithun, evaluating apparent absorption efficiency of colostral immunity in Mithun neonates, genetic characterization of microbes available in Mithun rumen fluid, Mithun milk protein and lipid characterization. Recently she has undergone a two months training on life cycle assessment of Agricultural GHG emission at Scotland's Rural College, Edinburgh, Scotland.
Sequencing of envelope glycoprotein (gp85) gene of avian leucosis virus by RT-PCR

Gopala Lunavat, Y Narasimha Reddy and M R K Reddy
Sri Venkateswara Veterinary University, India

The present study was carried out to characterize the ALV isolates from breeder flocks of the chicken by sequencing the enveloped glycoprotein (gp85). In this study, a total of 276 cloacal swabs were collected from the suspected breeder flock with ALV in and around Hyderabad. These samples were confirmed by group specific antigen (p27) capture ELISA and from positive samples, virus was isolated and purified by passaging into chicken embryo fibroblasts. DNA extracted from the lysed tissues and cell solutions and proviral DNA was detected by PCR by employing ALL-ALV F and ALL-ALV R primers. The positive PCR samples were further propagated in CEF and total RNA extracted. The presence of ALV was confirmed by RT-PCR. Complementary DNA was synthesized by using RNA. cDNA of ALV isolate was amplified by ALL-ALV F and ALL-ALV R, ALV F and ALV R primers and Purified PCR products along with two sets of primers were submitted for sequencing of gp85. The phylogenetic analysis was made for gp85 nucleotide and translated amino acid sequences of SVVU-101 and published sequences of seven ALV-J strains. Out of 276 cloacal swabs, 47 samples gave positive. Six strongly positive samples from 47 positive samples were used for isolation, purification and extraction of genome. PCR gave 2579 bps amplified product with ALL-ALV F and ALL-ALV R primers. The partial gp85 nucleotide sequence covers 785 nucleotides out of total 865 nucleotides. The results of the study revealed that the phylogenetic tree constructed the SVVU-101 is closely related and grouped with ALV-J.

lunavatgopala@gmail.com
Seasonal variation in prevalence of trematodes in freshwater fish: Associated food safety issues and control strategies

P K Nanda, Subhasish Bandyopadhyay, Samiran Bandyopadhyay, P Dandapat, A K Das, S C Das and U K Bandyopadhyay
Indian Veterinary Research Institute, India

Prevalence of zoonotic trematodes in fish, being the second intermediate host, is a cause of concern from public health point of view. In this study, screening of fish samples (387) from local market (205) and wastewater fed-ponds (182) revealed an overall incidence of 9.3 % infection of encysted metacercarial stages of trematodes. Fish from wastewater fed ponds (12.08 %) harboured more trematodes as compared to market places (6.83 %). Prevalence of trematode infection (16.3 %) in fish was highest was during post-rainy (Oct-Jan) season as compared to other which could be attributed to seasonal variation in physico-chemical parameters of water (temperature, alkalinity, nitrate content) and biotic factor (snail availability).

Prevalence of such encysted metacercarial stage of trematodes in fish, widely consumed by people, is a cause of concern from public health point, as its chances of transmission through consumption of raw, semi/undercooked fish /fish product/byproduct is very high. Therefore, adoption of good aquaculture practice (GAP) by farmers coupled with an awareness of public through Information, Education and Communication (IEC) campaigns regarding food safety issues is required as a part of control strategies to minimize the risk of trematode infection.

Biography

P K Nanda is working as Senior Scientist in the field of Fish and Fishery Science and posted at Eastern Regional Station of Indian Veterinary Research Institute, Kolkata. He is having more than 15 years of research experience and presently working on fishborne pathogens and their public health significance. He has to his credit twenty five research papers published in peer reviewed national and international journals, two research reviews, three book chapters and has authored more than fifty popular and technical articles. He is a life member of Indian Science Congress and Association of Aquaculturists.
Integrated management approach at weed infested inland fish farms, utilization of weeds to produce valuable fish protein by stocking Grass carp (Ctenopharyngodon idella) for aquatic weed control to improve fish production

Rajani Vadthya
Sri Venkateswara Veterinary University, India

Aquaculture is the farming of aquatic organisms; in India the Telangana possesses many inland water-bodies; make critical contribution to development in the area of employment, fish production; food security, nutrition, often being the cheapest form of animal protein for the poor; trade & export. Most of the water resources are weed-infested and left uncontrolled in this area. Aquatic weeds form serious problem; restrict access to fishing areas; reduce fish harvest, decreased usefulness, attractiveness and aesthetic values of a pond. This study implemented the integrated management approach for improved fish production and utilized the weeds to produce valuable fish protein by stocking grass carp, a herbivorous, exotic fresh water fish species of the family Cyprinidae, cultivated for food in China, and introduced to different countries for aquatic weed control. Grass carp consumed large quantities of small and marginal aquatic weeds, macrophytes including terrestrial grass. The subjects considered in this approach includes, weed utilization, fish age, stocking densities, phytoplankton, zooplankton, zoobenthos, and other fish species associated. Stocking rates vary depending on plant species, distribution, and density. When stocked in composite culture the number was reduced. Feeding was greatest when water temperatures are between 70° F and 80° F and negligible when water temperatures are less than 50° F. As an ideal aquatic plant management tool, the Grass carp provided cost effective control over weeds with great impact on farmer’s economy and no negative side effects on the farm, has yielded better results of 7.2 kg individual weight in 8 months without additional feeding.

Biography
Rajani Vadthya has completed her Post Graduation in Aquaculture, at the age of 22 years from Kerala University of Fisheries and Oceanographic Science and Technology, Cochin. And worked for the Andhra Pradesh Public Service Commission as a Gazetted officer for the Department Fisheries. At present working as a Scientist/ Asst. Professor for Sri Venkateswara Veterinary University, Hyderabad. She has also attended 10th AFAF (Asian Fisheries and Aquaculture Forum) & 4th International Conference on Cage Aquaculture, Based on the Theme “Blue waters – Green fisheries), organized at Yeosu, South Korea, 2013. She has also delivered papers on Biodiversity and conservation.

rajanivadthya@gmail.com

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Rearing of pearlspot (*Etroplus suratensis*) larvae using formulated feed and periphyton in the absence of parental care: A partial success

K P Kumaraguruvasagam, K Ambasankar, S Balachandran and J Syama Dayal
Central Institute of Brackishwater Aquaculture, India

*Etroplus suratensis*, commonly called as pearlspot is an ideal fish for farming in brackish water. Getting appropriate quantity of quality seeds is a bottle neck in farming. Our previous attempts on dietary interventions of the adult fish succeeded in recurrent spawning with single pairs under captive conditions using specialised diets. We observed that termination of parental care is mandatory for forcing the pairs for subsequent spawning. But it was challenging to rear the young ones in the complete absence of the parental care. In this experiment we tried sequential termination of parental care from day 1 to day 30 in the interval of 5 days. We used green water system and periphyton based rearing system to simulate the natural conditions to the growing larvae. Larval feeds like artemia nauplii and formulated micro particulate feed were used to feed the first feeding larvae. Larvae grown in the absence of parental care from day 1 survived >95% up to day 5 in the green water. But there was 100% mortality on day 7. Larvae separated from parents on day 5 and day 10 were fed artemia nauplii for 3 to 5 days and slowly weaned to formulated particulate diet. The survival recorded on 20th day PHF was 10 and 16% for 5th and 10th day respectively. Fourth group of larvae separated on 20th day which fed only with particulate feed survived more than 80%. Research trials are underway to achieve maximum seed production by single pair mating and early parental care termination.

Biography

K P Kumaraguruvasagam has obtained his PhD from CAS in Marine Biology, Annamalai University in year 2006. Latter he served as a R&D manager (nutrition) for Integrated Aquaculture International, USA, in its project centered at Brunei. In 2010 he came back to India, and resumed his post-doctoral research sponsored by UGC and CSIR. In 2012 ICAR offered him a Senior Scientist (Fish Nutrition), and placed at present in Central Institute of Brackish water Aquaculture, Chennai. To his research credit he has published more than 10 papers in peer reviewed international journals.

kumaraguru@ciba.res.in
Occurrence of multiple antibiotic resistant extended spectrum-β-lactamase (ESBL) producing enterobacteria in fresh seafood

Sanath Kumar, Asem Sanjit Singh, Manjusha Lekshmi and Binaya Bhusan Nayak
Central Institute of Fisheries Education, India

Secondary contamination of seafood with pathogens of human health significance is a major problem that compromised the safety of seafood. The problem is confounded when the pathogens found in seafood are also antibiotic resistant. In the present study, the prevalence of extended spectrum β-lactamase producing enterobacteria in seafood in Mumbai was studied. All samples of seafood, comprising of shellfish and finfish, harboured enterobacteria. A total of 215 isolates of enterobacteria were obtained, the predominant species being *E. coli* (30.69%). Using chromogenic medium and antibiotic disc diffusion methods, the ESBL-positive phenotype was detected in 169 (78.60%) of the isolates. Of these, 165 (97.63 %) isolates were resistant to cefotaxime, followed by 156 (92.30%) to cefpodoxime, 154 (91.12%) to ceftazidime, 109 (65.08%) to aztreonam and 69 (40.82%) to piperacillin/tazobactam. Resistance to imipenem was observed in 18 (10.65%) isolates, while 27 (15.97%) isolates were resistant to ciprofloxacin. PCR analysis of ESBL-encoding genes detected blaCTX, blaSHV, blaTEM and blaNDM genes in resistant isolates. blaCTX gene was the most common ESBL gene detected in 76.92% of the isolates. Multiple ESBL genes were found in majority of the isolates. The recently discovered New Delhi metallo-β-lactamase gene (blaNDM) was found in 4 seafood isolates of enterobacteria. The NDM gene from *E. coli* (EC-114) which was resistant to cephalosporins, fluorquinolones, carbapenems but sensitive to aminoglycosides, colistin, polymyxin B and nitrofurantoin was sequenced and was found to be NDM-5 variant gene. The widespread occurrence of multiple antibiotic resistant enterobacteria is a health concern and compromises the safety of seafood and may implicate seafood as potential carriers of antibiotic resistant bacteria.

sanathkumar@cife.edu.in
Are we meeting the amino acid needs of rohu *Labeo rohita*?

Karthik Masagounder¹, Shivenanda Murthy², Nilima Priyadarshini², Himanshu S Swain² and Girish Channarayapatna¹

¹Evonik Industries, Singapore
²College of Fisheries, India

Fish depend mainly on feed for the ten essential amino acids (EAA) and if the feed is inadequate in any EAA, growth (protein accretion) will be impaired, regardless of the dietary protein level. The objectives of the study were to understand the amino acid profile of commercial carp feed in India and to evaluate the growth performance of rohu *Labeo rohita* fed the diet containing levels of essential amino acids (EAA) found in commercial diet (control) versus the diet containing EAA levels recommended by Evonik (AMINOCarp™). Between 2011 and 2012, 25 commercial feed samples (14 starter feed and 11 grower feed) collected from India were analyzed for amino acid levels. Two feeding trials were conducted, one for juvenile rohu (starter) and the other for grower rohu. In trial 1, control diet was formulated to contain typical industry levels of EAA found in starter feed, 0.53% Met, 0.99% Met+Cys, 1.57% Lys and 1.11% Thr, while the AMINOCarp based diet was formulated to contain 1.07 Met, 1.54% Met+Cys, 1.98% Lys, and 1.22% Thr. Both the diets were formulated to contain 4000 kcal gross energy with their crude protein (CP) levels being 31–32%. Each diet was fed twice daily to six replicate groups of rohu (~11g, 25 fish / replicate tank) for 90 days to their apparent satiation. There was no difference in weight between the two groups on day 0, but, on day 90, rohu fed AMINOCarp-based diet showed significantly higher body weight gain (99.6 g vs. 89.8 g) and better FCR (1.31 vs. 1.53) than did the control group. In trial 2, control diet was formulated to contain levels of EAA found in typical grower feed (e.g., 0.46% Met, 0.91% Met+Cys, 1.34% Lys and 1.00% Thr) while the corresponding AMINOCarp diet was formulated to contain 0.90% Met, 1.33% Met+Cys, 1.52% Lys, and 0.97% Thr. Both the diets were formulated to contain 3900 kcal/kg gross energy levels with their CP levels being 28%. Each diet was fed twice daily to five replicate groups of rohu (~106g, 10 fish / replicate tank) for 60 days to their apparent satiation. Similar to the trial 1, rohu with similar initial body weights (~106 g) significantly differed on day60, with rohu fed EAA levels based on AMINOCarp recommendations showing much better body weight than the control group (412 vs. 372 g). However, no differences were observed in the FCR between the two groups (1.02 for AMINOCarp vs. 1.04 for control). In both the trials, protein retention improved by 4-5%, when rohu fed the AMINOCarp based diet. The study demonstrated that current industry diet may be deficient of certain essential amino acids and feeding rohu based on AMINOCarp™ recommendations can produce better growth performances.

**Biography**

Karthik Masagounder has obtained his Bachelors in Fisheries Sciences from Tamil Nadu Veterinary and Animal Sciences University and Masters in Aquaculture from Central Institute of Fisheries Education, Mumbai. He completed PhD from the University of Missouri, USA focusing on animal nutrition. He then continued his postdoctoral research in the area of bioenergetics for another 1.5 years in the USA. He has published more than 10 papers, many popular press articles and abstracts in the areas of fish and poultry nutrition. He has been working for Evonik Industries since Jan 2012 as a Regional Technical sales manager.

karthik.masagounder@evonik.com
SNP markers in growth-related candidate genes of Black tiger shrimp and their significance

K Vinaya Kumar, S Jothivel, J Shanmugakarthik, G Gopikrishna, J Ashok Kumar, and R Pradeep
Central Institute of Brackishwater Aquaculture, India

Penaeus monodon (Black tiger shrimp) is an important cultured shrimp species in India. Although Litopenaeus vannamei is dominating shrimp culture and exports in India, the Black tiger shrimp contributed $435.79 million through 34,133 MT of exports in 2013-14 (www.mpedia.com). As the domestication and selective breeding of this species is a concern to the hatchery community, Indian shrimp industry continues to depend on wild broodstock for seed production. Till date, Quantitative Trait Loci information does not exist for growth traits of Black tiger shrimp. Hence the objective of this study was to identify Single Nucleotide Polymorphisms (SNPs) in growth-related candidate genes of Black tiger shrimp and to understand their significance for future association studies. A total of 39,397 EST sequences were downloaded from Genbank maintained at NCBI (http://www.ncbi.nlm.gov) and were assembled to 3,773 contigs using CAP3 software (http://seq.cs.iastate.edu/cap3.html). Putative SNPs were identified by manually screening the contigs in Notepad++ version 6.1.1 text editor (http://notepad-plus-plus.org/) with the following criteria;

A. the contig should have at least four accessions at a SNP base
B. both the SNP alleles should be represented by at least 2 accessions
C. no other SNP should be present within 20 bases on either side of the putative SNP.

The identified SNP containing contigs were pulled out from whole assembly using a script written in Python 2.7.2 machine language (http://www.python.org/downloads/script). The gene identities for these 422 SNP-containing contigs were obtained after a similarity search using blast2go (http://www.blast2go.com/start-blast2go) tool. Based on the gene identities of top blast sequence accessions and their probable functions, various growth-related candidate genes in shrimp were short-listed. A total of 88 mis-sense substitution SNPs coding for non-synonymous aminoacids and one non-sense substitution SNP introducing chain termination codon in 9 genes were documented. The likelihood of these non-synonymous SNPs to cause functional impact on the protein was individually estimated using the PANTHER classification system version 6.1 (www.pantherdb.org) based on substitution position-specific evolutionary conservation score (subPSEC) and Pdeleterious estimates. The non-synonymous SNP in cathepsin B gene might be impairing protein function (subPSEC, -4.77 and Pdeleterious, 0.85). The SNP in beta-tubulin gene that introduces chain termination codon might be producing incomplete protein. The genotype information of these 2 SNP loci is to be considered for future association analyses for growth traits as well as for broodstock selection in commercial seed production.

Biography

K Vinaya Kumar has completed his MVSc and PhD from National Dairy Research Institute, Karnal, India in the subject of Animal Genetics and Breeding. Currently, he is working as scientist at Central Institute of Brackishwater Aquaculture, Chennai, India. He has published 9 papers in reputed journals. His research interests include application of conventional and molecular tools for genetic improvement of candidate aquaculture species.
Augmenting reproductive efficiencies in Mithun through biotechnological intervention

K K Baruah, M Mondal and C Rajkhowa
National Research Centre on Mithun (ICAR), India

Reproductive inefficiency is a common problem of all livestock including mithun. It is not only a source of frustration to the owners but also substantially reduces its profitability. Now a days various techniques have been developed to obtain large number of offspring from infertile or genetically superior animals. Assisted Reproductive Technologies like estrus synchronization with fixed timed artificial insemination, superovulation, embryo transfer, in vitro fertilization, cloning and nutritional management can effectively be used to achieve reproductive efficiency and profitability.

Mithun (Bos frontalis), a rare ruminant species of Southeast Asia, is believed to be originated more than 8000 years ago and considered to be descendents from wild gaur (Bos gaurus). Mithun is an animal of special significance for the tribal people of North Eastern Hills region of India. It is found in Arunachal Pradesh, Nagaland, Manipur and Mizoram of NE Region of India, Bhutan, Myanmar, Bangladesh and China. Mithun is primarily used as a meat animal and it plays an important role in the socio-economic life of the tribal population of NEH region. Presently the existence of this animal is at stake both from social and environmental point of view. The forest area in which these valuable animals inhabited is decreasing day by day due to some faulty agricultural practices like Jhum with shorter cyclic period. Moreover, under the traditional free-range rearing system, Mithun cows are bred by the bulls available in the herd, resulting genetically inferior herd (inbreeding) and crossbreeding with other bovine species causing decline in quality germplasm. Apart from these, the problem of late maturity, silent estrus and long postpartum estrus are also causing hindrances for making the mithun husbandry as a sustainable livestock enterprise. In this context, there is need to understand the basics of mithun reproduction and to develop technologies for augmenting the reproductive efficiency of this species.

Mithun has got a great potential for quality meat, milk and leather production. The quality of meat, milk as well as leather of this animal is very good and there is a great scope to promote this animal as an organic meat and milk producer. There is immense scope to increase meat production to meet the demand of the fast growing population by exploiting the rate of reproductive potential of mithun through judicious application of assisted reproductive technologies. To ameliorate the problems in mithun, we have developed scientific interventions like synchronization of estrus, preservation of Mithun semen followed by AI, standardization of superovulation protocol, cryopreservation of embryos and transfer of embryos in Mithun for conservation and propagation of quality Mithun germplasm as well as for improving the productivity of the traditional Mithun rearing system.

Biography

K K Baruah has completed his PhD from Bulgarian Academy of Science in 1992 and Post Doctoral from University of Wisconsin, USA in 2010. He is serving as Principal Scientist at National Research Centre on Mithun, Nagaland since 2006. Prior to that he had served as Professor in the Physiology Department of College of Veterinary Science, Assam Agricultural University, Khanapara. He has published more than 100 papers in the reputed national and international journals. He has also received nos of awards from different organizations.

kishorebaruah99@gmail.com
Nutrigenomics: A system biology tool for animal health

R V S Pawaiya, U B Chaudhary, Nitika Sharma and N Shivasharanappa
Central Institute for Research on Goats, India

Nutrigenomics and nutrigenetics involve scientific understanding of human or animal genomic/genetic contributions and responses to diet/feed. The nutrigenomics considers how things in diet influence individuals genome, and how this interaction modifies phenotype, i.e., how diet alters biological systems to promote either health or disease. Nutrigenetics, on the other hand, aims to figure out how any one of us is genetically programmed to respond in a particular way to a given dietary nutrient. For example, a thrifty genetic trait can make someone respond extremely rapidly (in terms of weight gain) to a diet with too much fat, increasing risk for obesity and diabetes. The underlying genetic variation (or gene polymorphisms) harmonizes our response to specific nutrients. Ultimately, the nutrigenomics is concerned with the impact of dietary components on the genome, the transcriptome (the sum total of all mRNAs) the proteome (the sum of all proteins), and the metabolome (the sum of all metabolites).

Application of nutrigenomics could help enhance our understanding of how nutrition influences various biological pathways and homeostatic control; how this regulation is disturbed in the early phase of diet-related/deficiency diseases and to what extent individual genetic makeup contribute to such diseases. Numerous studies in humans, animals, and cell cultures have demonstrated that macronutrients (e.g., fatty acids and proteins), micronutrients (e.g., vitamins), and naturally occurring bioactive chemicals (e.g., phytochemicals such as flavonoids, carotenoids, coumarins, and phytosterols; and zoochemicals such as eicosapentaenoic acid and docosahexaenoic acid) regulate gene expression in diverse ways. Although relatively new technologies, the various genomics applications searching for new biomarkers (molecules, receptors and pathways) already have found their way to many nutritional applications.

Nutrigenomics can be used to identify the specific markers to manipulate gene expression through use of nutrients or their combinations so as to improve productive as well as overall animal performance. Nutrigenomics will be a path breaking tool through identification of pathways and candidate genes responsible for dietary induced diseases and ultimately reduction in production losses due to these diseases in animals.

Biography
R V S Pawaiya did his BVSc & AH (1990) from Veterinary College, Jabalpur and MVSc (1993) and PhD (2004) in Veterinary Pathology from IVRI, Izatnagar, UP. He is presently serving the ICAR, Govt. of India as Principal Scientist. He received Jawaharlal Nehru Award of ICAR in 2005 for his doctoral research work. He has published more than 60 papers in reputed journals and currently serving as Chief Editor of the Indian Journal of Veterinary Pathology, a quarterly publication of the Indian Association of Veterinary Pathologists.
Effect of supplementation of concentrate to sweet sorghum bagasse with leaf residue silage on nutrient utilization and nitrogen balance in native sheep

B Vidya, Y Ramana Reddy, D Srinivasa Rao, V Ravinder Reddy, N Nalini Kumari and M Blummel
Sri Venkateswara Veterinary University, India

The present study was carried out to evaluate the effect of supplementation of concentrate at different levels to sweet sorghum bagasse leaf residue (SSBLR) silage on nutrient utilization in Nellore growing ram lambs in a metabolism trial at the end of 120 d growth trial. Sixteen growing Nellore ram lambs (18.3±0.8) were randomly divided into four groups of four each and were inducted into metabolic cages five days prior to collection for acclimatization followed by a seven day collection period. The four groups were supplemented with concentrate mixture at 0.0 (R-I), 0.75 (R-II), 1.0 (R-III) and 1.25 (R-IV) per cent of their live weight in addition to SSBLR silage ad lib during the trial in a Completely Randomized Design (CRD). Significantly (P<0.01) higher total DMI (g/d or g/kg w0.75) was noticed in concentrate supplemented groups. The Organic Matter, Crude Protein and Nitrogen Free Extract digestibility was significantly (P<0.05) higher in lambs fed R-IV ration than those fed R-I ration. No significant difference in the digestibility of Dry Matter, Ether Extract and cell wall constituents was observed among the rations. The Digestible Crude Protein (g/kg) (P<0.01) and Metabolizable Energy (MJ/kg DM) values were increased (P<0.01) as the level of concentrate increased in the diet. Negative and lower (P<0.01) Nitrogen balance (g/d) was noticed in R-I ration. It concludes that sole SSBLR silage couldn’t meet the nutrient requirements and it was appropriate to supplement concentrate mixture at 1.0 per cent of live weight to meet energy and protein requirements of lambs growing at 0.1 kg/d.

Keywords: Silage, sweet sorghum bagasse, supplementation, nutrient utilization; sheep.
Assessment of genetic variability in Marwari breed of Indian meat goat using microsatellite DNA

G C Gahlot, Anoop Singh, Kritika and Moh Asraf
Rajasthan University of Veterinary and Animal Science, India

Marwari goats, a highly prolific breed distributed widely in the western part of Rajasthan of India is well adapted to the arid environment, grows faster, breed efficiently, can tolerate higher salt loads, and requires less water than many other species of livestock in the region. These unique characteristics of this breed require its molecular characterization, genetic differentiation and relationships with other breeds. Fifteen microsatellite markers selected on the guidelines of ISAG and FAO’s DADIS (Domestic Animal Diversity Information System) MoDAD program. The allele and genotype frequencies, heterozygosities and gene diversity were estimated. A total of 74 alleles were contributed by Marwari goat across all 15 microsatellite loci. The number of alleles per locus varied from two (ILSTS-087) to 9 (ILSTS-058) alleles, with a mean of 4.93 whereas the effective number of allele varied from 1.35 (ILSTS-005) to 3.129 (ILSTS011) with a mean of 2.36. The effective number of allele is lesser than observed number at all the loci. Allelic sizes ranged from 125 bp (ILSTS-028 and ILSTS-033) to 650 bp (ILSTS-011 and ILSTS-019). The expected heterozygosity ranged from 0.240 (locus ILSTS-005) to 0.681 (locus ILSTS-011), with an average value of 0.544. The observed heterozygosity (Ho) ranged from 0.1428 (locus ILSTS-087) to 0.9285 (locus ILSTS-034), with an average value of 0.5485 indicates substantial and very good number of heterozygotes, in the population. The highest polymorphic information content (PIC) value (1.1886) was observed at ILSTS-044 locus and least (0.0768) at ILSTS-065 locus for Marwari goat. Reasonably high PIC values observed for most of the marker with an average of (0.78096) are indicative of the usefulness of microsatellites biodiversity evaluation in this breed.

Biography
G C Gahlot is currently Professor (ABG) and Incharge of Molecular Genetics Laboratory, Department of Animal Breeding & Genetics, Principal Investigator of All India Coordinated Research Project on Goat Improvement and Nodal Officer, RAJUVAS, Bikaner (Rajasthan), India. He has completed his BVSc & AH (1984) from University of Udaipur, India and PhD (2001) from Rajasthan Agricultural University, Bikaner (Rajasthan) India. He has more than 25 years teaching/research experience. He guided 7 MVSc students out of which 5 students worked in the field of Molecular Genetics. To his credit he has 38 research publications, 46 Research articles presented/published in symposium/conferences, 9 Technical reports published, 10 T.V. and Radio broadcast, 10 popular hindi leaflets/article, life member of 5 professional associations. He also worked as Principal Investigator of ICAR Research Schemes and DBT projects.

gahlotgcbkn@rediffmail.com
Heat shock proteins as biomarker for selecting thermo tolerance cattle breeds

Rajib Deb and Basavraj Sajjanar
1Central Institute for Research on Cattle, India
2National Institute of Abiotic Stress Management, India

A possible move towards reducing the impact of heat stress on cattle productivity is to perk up genetic programs that select animals with thermotolerance. Genetic differences for thermotolerance at the physiological and cellular levels are documented by a series of studies on Bos indicus and Bos taurus. Heat shock proteins (Hsp) are known to play major role in protection of cells from thermal stress. We have identified that polymorphism within the promoter region of Hsp70.1 may effects on the cellular expression of Hsp70.1 mRNA and associated with the physiological parameters as well as milk production traits in dairy cattle. We have also investigated that Hsp90 expressed differentially in peripheral blood mononuclear cells (PBMC) under heat stress among Sahiwal (Bos indicus) and Frieswal (Bos indicus x Bos taurus) breed of cattle. An allele specific PCR protocol was standardized to identify the single nucleotide polymorphism within the HSP90AB1 gene (SNP g.4338T>C). Our results revealed that TT genotypes had significantly (P<0.01) higher Heat tolerance coefficient (HTC) than CT and CC genotypes among different cattle breeds.

Biography

Rajib Deb is working as a Scientist under Indian Council of Agricultural Research, India. Presently he is working on cellular thermo tolerance genes of cattle and their implication for selecting genetically thermo resistant breeds. Besides these he is also involved in identification of biomarkers associated with improved male fertility traits in cattle.

drrajibdeb@gmail.com
Antioxidant effects of Lichhi fruit pericarp extract in sheep meat nuggets

Arun K Das¹, AK Verma², V Rajkumar², P K Nanda¹, S Bandyopadhyay¹, G Petra³ and S Biswas³
¹Indian Veterinary Research Institute, India
²Central Institute for Research on Goats, India
³West Bengal University of Animal and Fishery Sciences, India

In the present study antioxidant potential of litchi fruit pericarp extract (LFPE) in sheep meat nuggets was evaluated at two different levels 1 and 1.5 % compared to control and butylated hydroxyl toluene (BHT, 100ppm). Antioxidant potential such as total phenolics, radical scavenging activity and ferric reducing antioxidant power of lichhi fruit pericarp extract was evaluated. The different quality parameters and acceptability of the products were also determined. Results showed that LFP extract contains significant amount of phenolics (23.12mg GAE/g dry weight) which have been found to exhibit diverse biological activities. The free radical scavenging activities of 1.5% LFP was found higher than 100ppm BHT. Reducing power of 1% LEPE was comparable to the 100 ppm BHT. Incorporation of both 1 and 1.5% LFPE did not affect pH, cooking yield and sensory attributes of sheep meat nuggets. Total phenolics in product with 1% LFPE was similar to BHT nuggets. Thiobarbituric acid reactive substances (TBARS) number of LFPE nuggets was significantly lower (P<0.01) than control throughout the storage. Although not yet reported in the literature regarding its use in muscle food products, the present study demonstrated that 1.5% Lichhi fruit pericarp extract, being a rich source of various phenolic compounds and antioxidant activity could be incorporated in meat products as sources of natural antioxidants to improve the quality and stability without affecting its acceptability.

arunlpt@gmail.com
Effect of different levels of goat milk, soy milk and cow milk on chemical composition of rasogolla

Gajendra Londhe
Vasantrao Naik Marathwada Krishi Vidyapeeth, India

Rasogolla was prepared using different levels of goat milk and soy milk on the basis of cow milk. In the present study three levels of the two variables were attempted viz. Goat milk 20, 40 and 60% and soy milk 10, 20 and 30%. In total, thirteen formulations were prepared using different proportions of two types of milk on the basis of cow milk as per Central Composite Rotatable Design (CCRD) design using Response Surface Methodology (RSM). The rasogolla samples prepared from all 13 formulations were subjected to chemical analysis using appropriate analytical methods.

The response variables considered were moisture, total solids, fat, protein, carbohydrates and ash content of rasogolla. The results show that, in linear terms as the level of goat milk increases the total solids, fat and ash content of rasogolla increases and moisture content decreases significantly. Whereas, carbohydrate content of rasogolla decreases and protein content increases with non-significant effect as the level of goat milk increases. In quadratic terms, the total solids and carbohydrate content of rasogolla increases and moisture content decreases significantly as the level of goat milk increases. Whereas, fat, protein and ash content of rasogolla decreases with non significant effect as the level of goat milk increases. In linear terms, the moisture and protein content of rasogolla decreases significantly as the level of soy milk increases. Whereas, fat and ash content of rasogolla decreases with non-significant effect as the level of soy milk increases. In quadratic terms, the fat and protein content of rasogolla decreases significantly as the level of soy milk increases. Similarly, the moisture and ash content of rasogolla decreases and total solids and carbohydrate content of rasogolla increases with non significant effect. The interaction effect of goat milk and soy milk shows that as the level of both the milk on the basis of cow milk increases the protein content of rasogolla decreases and carbohydrate content increases significantly. But the moisture and ash content of rasogolla increases and total solids and fat content decreases with non significant effect as the level of both the milk in cow milk increases.

Biography

Gajendra Londhe is Dy. Director Research (Animal Husbandry & Dairy Science) in the Directorate of Research, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani. He was educated at College of Agriculture, Parbhani, receiving B.Sc. (Agri.) and M.Sc. (Dairy Science) degree. He obtained PhD degree from Deemed University, NDRI, Karnal, Haryana. He joined Vasantrao Naik Marathwada Krishi Vidyapeeth as Agriculture Assistant in year 1996 and subsequently he became Assistant Professor (AHD) in 2001. He became Associate Professor (AHD) in 2008 and working as Dy. Director Research (AHDS) from 2012 till to date. Gajendra Londhe has published over 20 research papers on Dairy Science and Animal Science in national and international journals of repute. He has guided 02 PhD and 18 M.Sc. (Dairy Science) students and as Co-Guide of 35 students. He has published 6 manuals. He is a life member of several professional societies, including the Indian Dairy Association and Dairy Technology Society of India.

londheg@rediffmail.com
Clinical management of soya bean associated alkaline indigestion in a bullock: A case presentation

G Ambica, P Nagaraj and J Jyothi
Sri Venkateswara Veterinary University, India

A bullock was brought to Teaching Veterinary Clinical Complex (TVCC), College of Veterinary Science, Korutla with the history of adlib (more than 5 kg) intake of soya bean and owner has reported that animal is dull, not taking feed and not voiding faeces. Animal was treated at nearby Veterinary hospital for 2 days but there was no improvement. Detailed clinical examination was done which revealed slight pale & dry conjunctival mucous membranes, complete atony of the rumen, profuse frothy salivation and the body condition was emaciated with severe dehydration and sunken eye balls. Blood, dung, urine, rumen fluid (with pH 9.5) samples were collected for detailed laboratory examination and results will be presented. Animal was treated with IV fluids, purgatives (Magsulf), rumen acidifying agents (Tamarind water & baking soda), antibiotics, antihistamines and rumentorics for certain period and bullock started defaecating by 2nd day and started taking green grass from 4th day onwards and was recovered fully by day seven.

gadigeambica60@gmail.com
Sikkim black goats: A newly explored germplasm of Sikkim state

N K Verma¹, R A K Aggarwal¹, Rekha Sharma¹, P S Dangi¹ and N T Bhutia²
¹National Bureau of Animal Genetic Resources, India
²Department of Animal Husbandry, Livestock, Fisheries and Veterinary Sciences-Sikkim, India

The goat population of Sikkim state of India is 110120 (18th livestock census, 2007) spread in all the four districts i.e. East Sikkim (18046), West Sikkim (45232), North Sikkim (15018) and South Sikkim (31824). The male and females are almost in equal proportion (56349 and 53771 respectively). Not much information is available on the traits and management of goats of Sikkim state. Therefore, the study was planned to know the phenotype and biometry of Sikkim goats. The visits were made to North, East and West districts of Sikkim to get information on phenotypic and biometric traits of its native goats. The flocks seen during the survey consisted of black, white, brown and mixture of these colours. The goats with stripes on face extending from base of horn to the muzzle mainly constituted the flocks. These goats are called as Singharey by the local people. Apart from this, goats with jet black uniform colour were also seen in the west district of Sikkim. These goats are distinct from Singharey goats in respect of coat colour, type of horns and their size and from Black Bengal in their body size. The phenotypic traits of these goats were recorded by visual observation. These goats come under medium size category. Head is proportionate to body. Nose is slightly roman. The horns are strong, grey in colour, curving backward. Muzzle is black hooves are grey. Beard is seen in few animals but present in both sexes. The measurements of different body traits viz. height at withers, body length, Chest/heart girth, paunch girth, face length, horn length, ear length and tail length were recorded. The body weights were taken with the help of spring balance. The average measurements for height at withers, body length, Chest/heart girth, paunch girth, face length, horn length, ear length and tail length in adult (>18 months) female goats were 45.47, 54.86, 71.40, 83.33, 17.27, 11.73, 11.93, 10.07 cm respectively whereas for males the average measurements were 56.16, 67.33, 81.16, 89.33, 18.17, 18.67, 12.83 and 11.33 cm. The overall average measurements irrespective of sex were 48.47, 58.43, 74.19, 85.05, 17.52, 13.71, 12.19, 10.43 cm respectively. The average body weight for adult females was 25.58 kg and males 32.18 kg. The overall body weight was 32.39 kg. The preliminary study shows that Sikkim black goats are comparatively heavier with longer horns than the Singhary goats.

Flock of size up to 25 animals was observed. These goats are kept on semi extensive management system taking them in the morning for pasture grazing and brought back in the evening. At night they are kept in temporary houses made of wooden logs, bamboos and planks. The floor of such houses is made 3-4 ft above the ground. This type of housing helps in maintaining cleanliness and proper ventilation. At home they are fed with local grass, tree leaves and sometimes supplemented with crushed maize. Breeding is through natural mating. Kidding season is March-April and October-November. Since these goats are reared for meat purpose, milk is not drawn but left for suckling of kids. Twining is very common. As informed by the goat keepers, black goats are used for every religious purpose.

Biography

N K Verma is a Principal Scientist at National Bureau of Animal Genetic Resources (ICAR), Karnal. He obtained his Master degree from National Dairy Research Institute, Karnal and was awarded PhD. degree on the thesis entitled “Serological and Genetical studies on bovine lymphocyte antigens by Kurukshetra University Kurukshetra in 1990. He worked at Central Marine Fisheries Research Institute (CMFRI), Ernakulam (Kerala) from 1987 to 1996 and then goat a shift to NBAGR Karnal. Since then, he is working in the field of characterization and conservation of Animal Genetic Resources. He has published about 80 research papers in national and international journals. He has authored nine breed monographs on Indian goats and several book chapters. He has participated in many national and international conferences and contributed more than 85 research abstracts.

nkverma497@gmail.com
Elf3 and FOXA2 loci, probable putative Trans-QTL for abnormal sperm percentage in cattle: An in-silico analysis

Suneel Kumar Onteru, Varij Nayan and Dheer Singh
National Dairy Research Institute, India

Sperm motility and morphology are usually considered for semen or breeding soundness evaluation of bulls. Currently, there are only two studies reporting three QTL (BTA 20, 21 and 27) for abnormal sperm percentage in Animal QTLdb. No genome wide association studies were performed for this trait as such. Hence, the objective of this in-silico analysis was to identify the putative trans-QTL based on the 134 genes located in the reported QTL. Functional annotation by Panther 9.0 identified that many genes are involved in cellular (42), metabolic (53), binding (37) and catalytic (33) activities. Pathway analysis found that 25 genes are involved in 21 pathways with a major contribution of GnRH pathway members (follistatin, PTGER4, ISL1 and MAP3K1). These observations indicate that structural and functional variations in these genes could cause variation in abnormal sperm percentage in cattle. However, identification of common transcription factors (TF) regulating these genes can provide an opportunity to identify the trans-QTL for this trait. Hence, all the 134 genes were analysed by single site analysis based on human genome by the oPOSSUM 3.0 software. A total of 178 TF were predicted to be regulating at least 2 genes within 5000 bp up-or down-stream of a gene. However, with a Z-score >10 and Fisher-score >7, the ELF3 on BTA16 and FOXA2 on BTA13 were considered to be highly probable TF for at least >45 genes. Hence, the ELF3 and FOXA2 loci could be considered as probable putative trans-QTL for abnormal sperm percentage in cattle.

Biography

Suneel Kumar Onteru has completed his BVSc & AH from College of veterinary science, Tirupati, MVSc in Veterinary Biochemistry from College of Veterinary Science, Rajendra Nagar, PhD in Animal Biochemistry from National Dairy Research Institute, India in 2007. Later, he did postdoctoral studies at Animal Science Department, Iowa State University, Ames, Iowa, USA from 2007-2012. Currently, he has been working as a Senior Scientist at Animal Biochemistry Department, NDRI, Karnal, India from 2013 onwards. He published a total of 29 publications in reputed journals.

suneelvet@gmail.com
Controversies and ethics of animal testing: Emerging issues and new challenges

P V S Kishore
Sri Venkateswara Veterinary University, India

Animal testing was and is and will be an ongoing process as it leads to many scientific breakthroughs. Scientists strongly favour animal testing in spite of repeated protests from animal rights activists. Humans can decide whether to give consent or not which the animals cannot and hence tests are conducted on them. A major ethical issue with animal testing is that it mostly involves pain, suffering and discomfort. Experimenters wherever possible will use anaesthetics but for some types of testing, using a pain reliever can mean an interaction with the drug being tested. The animals therefore experience the effects of that drug and if it involves pain it presents an unpleasant situation. Best experimental designs to reduce the number of animals, proper anaesthesia to reduce pain, and Euthanasia if mandated have to be ensured in justifiable cases. Animal usage for cosmetics testing has to be banned as done in some countries. If it is to continue, animal suffering should be minimised / avoided. The pros and cons of each experiment have to be discussed with a holistic approach. A scientific basis should prevail upon those who resort to experimentation preventing irrational abuse which may lead to allegations. Animal testing is a necessary evil; it is indispensible and inevitable. It should be viewed in a broader perspective in the larger interest of a nation's progress. Laws and regulatory practices of the ethics committees should be strictly enforced. Non scientific socially aware member's opinion should be considered. Transparency should exist which would help reduce any controversies.

Biography

P V S Kishore completed his PhD from the Madras Veterinary College, Chennai, India. He is the Professor & Head in the Veterinary University, Andhra Pradesh, India. He is a CPCSEA nominee of the Ministry of Environments & Forests, Government of India to about 30 different organizations. He is a Fellow of the National Academy of Veterinary Science and Indian Association of Veterinary Anatomists. He has published about 40 papers in reputed journals and has been serving as a referee for various journals and is also an editorial board member of repute.

pvskishore_1963@yahoo.com
Effect of maternal dietary manipulation and vaccination on the neonatal blood biochemical attributes and feed conversion ratio of turkey poults

A Bhattacharyya¹, S Majumdar², S K Bhanja³, B B Dash³ and M M Kadam⁴

¹UP Pt. Deen Dayal Upadhyaya Veterinary Science University, India
²Central Avian Research Institute, Izatnagar, India
³Indian Veterinary Research Institute, India
⁴Maharashtra Animal & Fishery Sciences University, India

Two hundred turkey breeder hens and twenty-four viable toms of 30-35 weeks of age of small white variety were distributed into two treatment groups having four replicates of 25 hens and 3 toms in each treatment. First four replicates were offered turkey breeder diet (Diet A) (NRC, 1994) and other four replicates were offered high immune diet (Diet B) having 115% amino acids, 1% each omega-6 and omega-3 fatty acids, retinol- 4.95 mg, DL-alpha-tocopherol- 199.86 mg, ascorbic acid -150 mg, selenium- 0.5 mg and zinc- 118 mg per kg diet for 8 week duration. After six weeks of experimental feeding, two replicates from each treatment groups were vaccinated with ND (R2B) vaccine. There was no significant difference in the serum SGPT, SGOT, acid phosphatase, alkaline phosphatase and uric acid in day old turkey chicks from breeders maintained on a higher plane of nutrition and vaccinated. However, day old turkey chicks from vaccinated breeders had significantly higher (P<0.05) serum protein levels compared to those from non vaccinated breeders. Similarly, day old turkey chicks from breeders maintained on a higher plane of nutrition had apparently higher serum protein levels compared to those from breeders maintained on Diet A. Poults hatched from breeders fed high immune diet had significantly better (P<0.01) FCR throughout the experimental period compared to those hatched from breeders maintained on NRC diet. Over all, maternally vaccinated chicks had significantly better (P<0.05) FCR compared to those not vaccinated (1.92 vs 2.03) and non-vaccinated chicks had significantly better (P<0.05) FCR compared to those vaccinated (1.9 vs 2.05). Further, high immune diet along with maternal vaccination resulted in better FCR throughout the experimental period. Thus, it may be concluded that day old turkey chicks from vaccinated breeders and maintained on a higher plane of nutrition may have higher serum protein levels due to higher level of maternal antibodies. Further, breeders may be maintained on a higher plane of nutrition and vaccinated to elicit better feed conversion ratio in post hatch turkey poults.

Keywords: Turkey breeder hens, diet, vaccination, serum protein, feed conversion ratio.

amitav16@rediffmail.com

Effect of different protein sources on milk production performance and milk constituents of lactating goats

Manoj Kumar Tripathi, Prabhat Tripathi, U B Chaudhary, Ravindra Kumar and D L Gupta
Central Institute for Research on Goats, India

Protein supplements those are conventionally used in goat feeding includes oil meals of ground nut, soybean meal, linseed and til etc., are very costly and their availability is limited for ruminant feeding as these are most used in pig and poultry rations. However, mustard (Brassica juncea) oil meal, guar korma and urea are available in plenty at cheaper prices. Ruminant animals have unique capability of bioconversion of non-protein nitrogen substances into microbial protein, which can also substitute organic protein supplement. Present study evaluated the effect of linseed oil meal (LSM), mustard oil meal (MOM) and guar korma plus urea (GKU) inclusion as source of dietary protein (16%) in concentrate pellet in lactation goats diet. Twenty-seven lactating goats were divided in three homogenous equal groups and each goat group received one of the three-concentrate pellets at 500 g per day with ad-lib. gram straw and 2 kg green fodder. Experiment lasted for 60 days, during which milk production was recorded at every 7 days and milk constituents were analyzed at fortnightly intervals. Milk yield was similar among three goat groups, which ranged from 673 to 785 ml/day. The pH of milk varied from 6.46 to 6.57, protein 3.07 to 3.15% and lactose from 4.78 to 4.86%, these were not different among goat groups. Milk fat content and daily milk fat yield were however higher (P<0.05) in goats fed LSM containing concentrate pellet, where as MOM and GKU concentrate pellet fed goats have similar milk fat content and daily milk fat yield. Study concluded that utilization of LSM, MOM and GKU in concentrate do not change milk yield and constituents. However, MOM and GKU inclusion reduced milk fat content and daily milk fat yield. Therefore, MOM or GKU could replace conventional protein source in dairy animals feeding, where milk fat content is not an issue.

Biography

Manoj Kumar Tripathi has completed his PhD from GBPUA&T, Pantnagar during 1999 and postdoctoral studies from INRA France from 2002-03. He was the Visiting Scientist at CSIRO, Australia from 2001-12. He is Principal Research Scientist of ICAR under Agricultural Research Services at Central Institute for Research on Goats. His research interest has been feed biotechnology, metabolic functional of rumen microbiota, nutrition and production. He has published more than 80 papers in reputed journals, has filed four patents and has been serving as an editorial board member of five research journals of repute.

mktripathi@gmail.com