**BAU Res. Prog. 24, 2013**

# Evaluation of reproductive performance of Black Bengal goats (*Capra hircus*) in arsenic polluted areas of Mymensingh district in Bangladesh

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## Abstract

This research was conducted to evaluate the reproductive performance of the Black Bengal goats (*capra hircus*) in the arsenic affected area of Dhobaura upazila of Mymensingh district. Twenty (20) male and female goats at the age of six months were selected for this study. Based on the reports published by the PHED and FAO (2010), Dhobaura upazila has been declared most arsenic polluted area. Five (5) male, and Five (5) female, goats were collected from the Dhobaura upazila and were considered as target groups and five (5) male, and five (5) female, goats were collected from the Nirlakher Char area of Gouripur upzila of sadar Mymensingh district was considered as control group. Both targeted and control group animals were allowed to free access to natural grasses and allowed to drink from the natural water resources including tube wells. Regular deworming and medical check-up was performed by counseling with the local veterinary surgeons. At the age of 6 (six) month the animals were brought to the laboratory and after killing the animals the reproductive organs of male and female goats were collected aseptically. Gross morphology of the male and female reproductive organs (for male, weight of the right and left testis, epididymis, ductus deferens and for female, right and left ovaries, fallopian tubes, and uterus (length, breadth and thickness), were observed and recorded carefully. For histopathological study, tissues from these organs were collected and processed for making permanent histological slides for light microscopic observation. Hematoxylin & Eosin and Periodic Acid Schiff (PAS) stains were used in this study. Diameters of the seminiferous tubules were measured by calibrated occular micrometer. Gross weight, length, breadth and thickness of the testes, epididymis, ductus deferens, ovaries, fallopian tubes and uterus reveal no significant differences between the target and control group animals. Under light microscopic study, testicular tissues revealed marked histopathological changes characterized by reduced seminiferous tubular diameters, detachment of the spermatogenic cells from the basement membrane in to the lumen of the tubules, thinness of the spermatogenic cell layer, and reduced number of sertoli cell counts in male species. In female, reduced number of the ovarian follicles, increased number of the degenerative ovarian follicles, decreased diameters of the growing and graafian follicles, increased thickness of the theca externa, increased proliferation of the connective tissue in the medulla of the ovary was distinctly observed. This testicular and ovarian morphology strongly indicates the poor reproductive performance of any male and female species. The data was significantly different from those of the control groups ($p<0.01$). From the study, it can be assumed that reproductive performance of Black Bengal goats may severely impaired if the animals exposed for a prolonged period of time to the arsenic polluted areas without taking any appropriate mitigating measures taken by GOB (Government of Bangladesh) and NGOs (Non Government organizations). Further study is needed to explain the damage of reproductive organs of other domestic animals.

**BAU Res. Prog. 24, 2013**

# Synergistic anti-cancer effects of cordycepin and polysaccharides obtained from medicinal mushroom *Cordyceps militaris*

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## Abstract

Mushrooms have various medicinal effects, might be used to prepare novel drugs by biotechnological means. Medicinal mushroom like Cordyceps species (*Cordyceps militaris*) might be used as an alternative medicine to abate the harmful effects caused by formalin (cancer producing chemical) at tissue level. For this purpose, an experiment was carried out at the Department of Anatomy and Histology, BAU, Mymensingh-2202 during July 2012 to June 2013. Twenty four (24) male Swiss Albino mice (*Mus musculus*) at 43 days were used and were grouped into (each group has 6 mice): formalin treated/injected (FI), formalin soaked cucumber (FC) and banana (FB) and the control group (C). For FI, 5% formalin @ 0.25 ml/week, FC and FB was fed with 5% formalin treated cucumber and banana @1/day, respectively, where the control group was reared using normal food and water. Total experimental tenure was 5 weeks. After passing half-time of the experimental tenure, 3 mice from the FI group were separated and fed with mushroom mixed feed (15% of the diet was replaced by freeze-dried mushroom) and continued until 5 weeks following same procedure of the rest half of the FI group. After 5 weeks, samples (testes, kidneys and liver) from all the mice groups including the control group were collected. Then the samples were processed and stained with H & E stain. Gross changes were hydrocyst formation and distortion of the kidney, nodule formation in liver and testes. Histo-pathological changes includes: vacuolation due to massive necrosis in liver parenchyma, fatty change, hyperplasia of hepatocytes, necrosis in kidney and destruction of seminiferous tubules in testes including severe decrease in the number of spermatozoa (FI group). On the contrary, the histopahtological changes were less severe in the mushroom fed FI group indicating medicinal mushroom has positive effects to abate the tissue level destructions caused by formalin.

# Epidemiological investigation of anthrax and determination of efficacy of local anthrax vaccine in Bangladesh

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## Abstract

Repeated outbreak of anthrax in the recent past years caused panic among the people due to affection of people as well as death of valuable animals. The causes of the recent outbreaks are ambiguous. The present study was thus undertaken to reveal out the factors influencing the recent repeated outbreaks of anthrax in Bangladesh. The present study

includes determination of environmental, social and managerial factors as well as isolation and identification of the causal agent and efficacy study of the local anthrax vaccine produced by LRI, Bangladesh. The duration of the project is 3 years (01.07.2011-30.06.2014). As a part of the work plan a colorful leaflet was printed and was distributed among the farmers while visiting any new areas. After surveying 5 thanas of Tangail, Sirajgong, Pabna, Kushtia and Bogra districts were selected for this study. Besides, the leaflet was sent to UNO, ULO and UHO of each thana of the previously affected anthrax areas. Epidemiological investigation and isolation & characterization of causal agent were completed and the outcomes were published in the Thai journal of Veterinary Medicine [43(3): 449-454]. Efficacy study of the local anthrax vaccine in Bangladesh has been started and will be completed by May 2014. We are very much confident that we will be able to complete the tasks in defined time.

# Isolation and molecular characterization of egg drop syndrome (EDS-76) virus in Bangladesh

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## Abstract

A viral disease known as egg drop syndrome (EDS-76) disease characterized by lower egg production associated with the laying of soft-shelled and shell less egg in bird caused by a virus EDS-76. Jahangir *et.al*. first reported the presence of virus in Bangladesh in 2009. Further there is no more research or study on EDS virus. The drop in egg production in layer birds has become a major concern in Bangladesh due to the enormous economic burden faced by the farmers. The loss incurred by poultry industry due to reduced productivity, culling and cost of medicine is considered to be often greater than loss due to mortality. With the view of the points the present study is proposed for serosurveilance and to isolate and characterize the prevalent field strains of EDS virus. For seroprevalence study total 337 sera samples were collected from 5 districts in Bangladesh. For the isolation of virus total 125 samples were collected and inoculated into 11 days old duck embryo and the growth of virus was confirmed by HA tests. Highest seroprevalence was found in Dhaka (85.58%) and lowest in Mymensingh (0.00%). Total 3 isolates were confirmed as EDS-76 virus on the basis of HA tests, propagation of virus in chicken embryo and PCR of EDS-76 specific Hexon gene followed by sequencing and pathogenecity test. The growth of the field isolates in chicken embryo was very weak which is the unique characteristic of EDS virus. The PCR products were subjected to PCR-RFLP and sequencing to differentiate the isolates. All the isolates showed similar pattern of restriction site after digestion with HindIII, XhoI, BstEII, BstYI and TaqαI. The ability of egg production in laying hens suddenly reduced to 60-70% after experimental infection with isolated. Initially the color of the eggs gradually decreased brown to white followed by soft shelled and shell less eggs. Finally we may be concluded that the economic loss due to egg dropping is more severe than the loss due to the death of birds. To overcome this situation we need to develop vaccine using our local isolates.

# Isolation, characterization and protective efficacy of lytic Bacteriophages against poultry pathogens *Salmonella pullorum* and *Salmonella gallinarum*

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## Abstract

*Salmonellae* are an important group of pathogens responsible for human and animal diseases. The etiological agents of fowl typhoid and pullorum disease are *Salmonella enterica* subsp. *enterica* serovar *Gallinarum*, which is divided into two distinct biovars under the serogroup D1, *Gallinarum* and *Pullorum*, which are denoted as *S. gallinarum* and *S. pullorum,* respectively. The present study was undertaken with the aim to identify (biochemical, serological, and molecular) and characterize *Salmonella* serovars isolated from commercial layer (chicken) of Bangladesh. For this purpose a total of 150 cloacal swab samples were collected and were subjected to various cultural, biochemical, and molecular examinations. Among the 11 positive isolates all fermented glucose and maltose and produced both acid and gas. The 11 isolates were non-motile and positive in agglutination test with group D antisera i.e either *Salmonella enterica* biovar pullorum and gallinarum and 5 were motile. Antibiogram using six drugs revealed 54.54% strains to be sensitive to eiprofloxacin. 81.81% isolates were resistant to Amoxycilin, Cloxacilin and Erythromycin, while 18.18% were found sensitive towards Neomycin. In case of Colistine sulphate, 54.54% isolates were resistant. Pulsed-field gel electrophoresis of the *Xba*I-digested genomic DNA exhibited banding patterns that were identical (the similarity coefficient was 100%) for all the tested strains which formed a tight cluster when dendrogram was constructed using the PFGE patterns, suggesting high level of clonal relatedness among them. The data in this study suggest the prevalence of *Salmonella enterica*, which is multidrug resistant and highly clonal for commercial layers of Bangladesh.

# Prevalence and antimicrobial resistance of *Campylobacter* species in local broiler meat in Mymensingh

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## Abstract

*Campylobacter* spp. particularly *C. jejuni* has been recognized as one of the most important causes of food borne bacterial diarrhea in humans worldwide. Since poultry are considered the major reservoir of this food borne pathogen, the prevalence along with the antimicrobial resistance of *Campylobacter* spp. in broiler is a matter of concern. However, relatively little information on the impact of different food animal production practices on the prevalence of antibiotic-resistant *Campylobacter* is available. Hence, the study was designed with a view to isolate, identifies and characterizes *Campylobacter* species from samples (leg muscle, breast muscle and cloacal skin of Broiler) which were collected from KR market at

Bangladesh Agricultural University, Mymensingh. A total of 50 samples were subjected to bacterial isolation and identification by using cultural and biochemical techniques. Furthermore, the isolated *Campylobacter* species were characterized by antimicrobial susceptibility testing. Among the 31 positive *Campylobacter* isolates 70.97% (n = 22) were *Campylobacter jejuni*, and the rest 29.04% isolates (n = 09) were *Campylobacter coli*. *Campylobacter jejuni* were resistant to ampicillin, tetracycline and nalidixic acid and susceptible to gentamicin, chloramphenicol and azithromycin. Furthermore, *Campylobacter coli* were resistant to ampicillin, tetracycline and erythromycin and susceptible to streptomycin and chloramphenicol. Out of 31 *Campylobacter* isolates, 86.36% *Campylobacter jejuni*, and 100% *Campylobacter coli* were detected as multidrug resistant. The findings of the study revealed the presence of multidrug resistant *Campylobacter* species in broiler meat of KR market at Bangladesh Agricultural University, Mymensingh.

# Development of an effective PPR vaccine seed from local isolate and its molecular characterization

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## Abstract

Although PPR has been prevalent in Bangladesh for more than a decade, the properties of the prevalent PPR virus infection has not yet been characterized. To overcome devastating effect of PPR, a live attenuated tissue culture vaccine has been developed against PPR by Animal Health Research Division of Bangladesh Livestock Research Institute (BLRI) to control PPR in Bangladesh. However, incidences of PPR disease were noticed despite the vaccination of goats with this vaccine. Efficacy trial of the local PPR vaccine shows 40 – 60% protective liter. Also, our vaccine virus is almost 20 years old and not characterized at molecular level and its isolation history is not clearly known. Neither molecular characteristics of the local vaccine strain nor the field viruses of Bangladesh are available. The present study was proposed to isolate and characterize the prevalent *peste des petites ruminant* virus field strains of Bangladesh, their molecular characterization, and development of a suitable vaccine seed. Fifteen (15) local isolates of Bangladeshi PPR virus (PPRV) were successfully isolated from post mortem samples of lymph node, spleen and trachea of goats during the year 2008 -2012. Out of 15 isolates, amplified PCR products of partial N gene of 10 isolates and F gene of 8 isolates were sequenced and submitted to the GenBank (Accession No. JF276436, JQ612706, JQ612706, JQ612707, JQ612708, JQ612709, JX220409, JX220409, JX220410, JX220411, JX220412, JX220416, JF276436, HQ898003, HQ898003, HQ898003, JX094437, JX094440, JX094438, JX094439, JX094436, JX220413, JX220414, JX220415). Additionally full-length F gene of one of the isolates was sequenced. It was revealed that PPRVs circulating in Bangladesh for the last five years belonged to ineage IV and they formed a separate cluster with the isolates from South and Southeast Asia (China, India, Pakistan, Nepal and Bhutan). It appeared that the N gene of PPRV is less conserved as compared to the F gene. Two unique amino acid substitutions were observed in Bangladeshi and Chinese isolates in the partial sequence of N protein. On full length sequence analysis of F gene, two unique amino acid substitutions were also found in Bangladeshi isolates, which were not marked in other Asian isolates. Three (3) isolates successfully adapted to Vero cells showed vaculation, rounding and aggregation of cells. Acidophilic intracytoplasmic

and intranuclear inclusions bodies were observed on stained infected Vero cell monolayers on cover slip when examined after 9th passage. A few substitutions in N gene at nucleotide and amino acid level were observed after 9th passage. The viruses are being passaged in Vero cell and so far 58 passages were completed. Molecular methods for the detection of F and N genes are available. Development of an Indirect ELISA, field investigation and further attenuation, monitoring and in vivo evaluation of attenuation and full length sequencing of viruses are in progress. On successful completion of the project, a tissue culture adapted live PPR vaccine seed with known biological and genetic properties will be developed by which an effective thermo-stable PPR vaccine will be prepared. This vaccine will be transferred to the Department of Livestock Services (DLS) of Bangladesh. The farmers could use the vaccine effectively without maintaining cold chain to control PPR in goats that will reduce the mortality tremendously. Also, PPR SARRC regional laboratory will be equipped with technical knowhow of the PPR disease of goat and its diagnosis.

# Calf mortality in large and small holder cross breed dairy cattle: epidemiological and pathological investigation and mitigation

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## Abstract

Calf mortality up to 12 months of age with estimate of 9% under rural and 13.4% under a farm *(Debnath et al.,1995)* conditions have been reported to be mostly associated with gastrointestinal and respiratory diseases in Bangladesh. Exotic and crossbred cattle are highly susceptible to diseases in comparison to local zebu cattle *(Debnath et al.1995).* Considering these facts, this work was designed to determine the etio-epidemiological factors associated with calf morbidity and mortality under a farm and rural conditions in Bangladesh. During this period (Jul'12-Jun'13) period, a total of 250 filled questionnaires had received from Shajadpur, Sirajgonj and analyzed. It was observed that before inception of the research project the overall mortality at the herd level was 44% which was reduced to 1.22% during the reporting period. A total 8 risk factors (i) farmers occupation (ii) new introduction of animals into herd (iii) production purpose (iv) age at first grazing (v) parturition hazard (vi) herd size (vii) Milk feeding practice and (viii) poor physical condition significantly influenced calf morbidity and mortality ($p \leq 0.05$). A total of additional 259 health cards for Shajadpur, Sirajgonj and 112 for Muktagacha, Mymensingh have been distributed to the farmers for recording the health status of newborn calves during regular and emergency visit by the project team. Sick animals were identified and treated either by Veterinary Surgeon or PC/PI. In Muktagacha, Mymensingh, 226 and in Shajadpur 702 cow/calves were affected by different diseases and treated accordingly. A total of 590 (430 from Shajadpur and 160 from Muktgacha) fecal specimens were examined for detection of internal helminth of which 340 samples were found positive for Fasciola, Paramphistomum, Schistosoma, Moniezia, Ascaris, Capilaria, Trichuris, Oesophagostomum, Stomach worms (Haemonchus, Strongyles), Strongyloides, etc. and 241 samples were found positive for protozoa (Eimeria & Balantidium). In Muktagacha the overall prevalence of helminth infection was 74.38% and the infection was higher in cow (89.87%) than calf (59.26%). In Shajadpur, the overall prevalence of helminth was 51.40% where the prevalence was higher in cow (62.96%) than calf

(42.32%). In addition, Rota virus 10%, mixed infection (Rota virus and Corona virus) 5%, *Cl. Perfringens* 30%, cryptosporidium 15%, mixed infection (cryptosporidium and *Cl. Perfringens)* 15% and Giardia 6.67% were also identified from fecal samples of diarrheal calves. Fifty farmers were trained on better calf health management practices. The overall mortality of calves was reduced from 44% to 1.22% probably due to better management practices, early diagnosis and treatment of the sick calves. The proposed study is ongoing.

# *Clostridium perfringens,* the causal agent of necrotic enteritis in chickens with experimental pathological study by local isolate

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## Abstract

The present research work was designed to know the effect of protein rich diet (50% fish meal) on the experimental pathology of necrotic enteritis in broilers. The *Clostridium perfringens* was obtained from the Department of Pathology, Bangladesh Agricultural University. Reconfirmation and recharacterization of *Cl. perfringens* were performed by culturing in different media, microscopic examination, different staining techniques and different types of biochemical tests. The experimental pathological studies were performed with supplementation of protein rich diet and challenged with *Cl. perfringens* in broilers. For drenching of birds, CFU/ml of inoculums was determined that was $1x10^8$ CFU/2.5ml. For experimental purpose, 15 birds of 21 days of age were grouped into 3 (A, B and C) and each group contained 5 birds. Birds of group A were fed with 50% fish meal at a rate of 500gm /kg of feed from day 21 to day 34 and challenged from day 28 to 32 days with $1x10^8$ CFU/2.5ml of inoculums for a total of consecutive 5 days. Birds of group B were fed with normal feed and challenged on day 28 with similar duration of group A. Group C was kept in control. In this study, the experimental birds were observed up to 34 days of age for clinical signs (2 days after 5 consecutive days of drenching of inoculums). In birds of group A the clinical signs were diarrhoea, ruffled feather, less feed intake (moderate, ++) and the incidence rate was 80%. In birds of group B, the clinical signs were diarrhoea, ruffled feather, less feed intake (mild, +) and incidence rate was 40%. There was no mortality in all groups. All the birds were sacrificed at Day 35 (birds sacrificed on day 8 after challenging). The lesions in the birds of group A showed necrosis and hemorrhage in intestine, enlarged liver, and hemorrhage in the base of heart (severe, +++). On average 2-5 bacteria were found in impression smear of intestines in higher magnification (100x), and anaerobic bacteria counted from intestinal content was about $1.51x10^7$CFU/ml. In histopathology, necrosis and reactive cells were found in liver, heart, lung, and also sloughing off intestinal epithelium was found in intestines. The lesions in birds of group B showed moderate (++) compare to the severity of group A and no bacteria was found in impression smears of intestines. Anaerobic bacteria counted from intestinal content of this group were about $1.1x10^7$CFU/ml. In histopathology necrosis, reactive cells were found but moderate (++). The birds of group C were normal in all parameters. However, anaerobic bacteria count from the intestinal content was $0.8x10^7$CFU/ml. From the findings, it may be said that protein rich diet is a predisposing factor for necrotic enteritis in broilers.

# Sustainable Production of Polyclonal and Monoclonal Antibodies to Bovine Pathogens and Immunoglobulins

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## Abstract

Foot and mouth disease (FMD) is an economically important highly contagious viral disease of cattle. Vaccination is commonly practiced to prevent FMD. It is important to monitor antibody response following vaccination using a suitable serological test. Commercial ELISA kits are available for measuring antibody to FMDV, but those kits are highly expensive. The present study was undertaken to adopt the technology of in-house production of reagents for FMDV ELISA. A field strain of FMDV of serotype O was adapted to grow in BHK-21 cell line and the identity of the virus was reconfirmed by RT-PCR. The virus produced typical cytopathic effects in BHK-21 cell culture. To prepare ELISA antigen the virus was concentrated and purified from infected cell culture supernatant by density-gradient ultracentrifugation. The secondary antibody, anti-bovine IgG, produced in rabbit was successfully conjugated with HRPO enzyme. Specificity and potency of the prepared conjugate were checked in a direct ELISA using the plate coated with bovine Ig. A commercially obtained rabbit anti-bovine IgG-HRPO conjugate was used for comparison. The positive result in the direct ELISA indicated that the conjugation process was successful. However, the titre of in-house prepared conjugate was lower than that of the commercial conjugate, the former was $10^3$ to $10^4$ and the latter was $10^5$ to $10^6$. Using an optimized dilution of antigen (1:250) and commercial conjugate (1:15,000), an indirect ELISA protocol was developed for detecting anti-FMDV antibodies in bovine serum. A 1:1,000 dilution of the in-house prepared conjugate gave almost similar result. The successful adoption of the technology of preparing purified antigen and producing HRPO-conjugated antibodies is a significant step forward towards in-house production of ELISA reagents and development of commercializable ELISA kit.

# Epidemiology of snail borne trematode diseases of farm animals and molecular analysis of the trematode and its vector snails

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## Abstract

An epidemiological investigation on snail borne trematode (SBT) diseases of farm animals and molecular analyses of the *Fasciola gigantica* isolates were carried out from January 2011 to June 2013. Faecal sample examination revealed overall 54.7% cattle, 71.71% buffaloes, 36.2% goats and 26% sheep infected with SBTs. The SBT diseases were found to be widely

prevalent in cattle all over the country, flood plains (59.38%) (12% fascioliasis, 53.12% amphistomiasis and 4.26% schistosomiasis), southern coastal areas (56.30%) (6.25% fascioliasis, 49.55% amphistomiasis and 9.38% schistosomiasis), and Barind tracts (54.64%) (10% fascioliasis, 40% amphistomiasis and 22% schistosomiasis) with a little lower prevalence in hilly areas (43.6%) (6.5% fascioliasis, 41% amphistomiasis, 0% schistosomiasis). Examination of faecal form the off shore St. Martin's Island showed 74.36% cattle (2.56% fascioliasis, 58.97% amphistomiasis and 32.05% schistosomiasis) infected with SBTs. The vector snails *Lymnaea auricularia* could not be detected in the hilly areas and Barind tract and *Lymnaea luteola* was not found in the coastal areas. *L. auricularia* and *L. luteola* were recorded as the vectors for *F. gigantica,* while these lymnaeid snails and *Indoplanorbis exustus* was detected as the vector of the *Schistosoma*. In addition to the *L. auricularia*, *L. luteola* and *I. exustus*, for the first time *Bithynia* sp., *Thiara* sp., and *Gyraulus* sp. snails have been documented as the intermediate hosts of amphistomes in Bangladesh. Interestingly, experimental infection in *L. auricularia* with *Fasciola* and duck trematode *Echinostome* miracidia (first larval stage) showed a cercarial antagonism where the echinostome larval stages preclude the development of *Fasciola* larval stages in snails giving a clue for biological control of animal fascioliasis by rearing more ducks by the farmers. Molecular analyses of the *Fasciola* isolates of different hosts from different topographic zones preliminarily showed the prevalence of pure as well as a hybrid of *F. gigantica* in Bangladesh, extensive investigation of which is under way. The results fairly show that the flood plains are the most suitable place for the parasites followed by the coastal areas. Also, SBT diseases and their vectors are transmitted along with the human settlement even in the off shore island. Additionally, recently developed irrigation system has contributed to the dissemination of SBT diseases in the steppe Barind tracts.

# Comparative role of whole milk (WM) and milk replacer (MR) in the amelioration of common helminth infection in calves

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## Abstract

An attempt was taken to investigate the action of homemade milk replacer (MR) in combating helminth infection, a common disease problem of young calves in Bangladesh livestock. Four **(**4) parasite free new born calves were divided into two groups having 2 animals in each as follows- Whole milk (WM) fed: animals received only whole milk without any supplementation; MR fed: animals were fed with milk replacer twice daily. All those animals were reared under a regular conventional farming system throughout the experimental period of 4 months. Body weight and fecal parasitic egg count were recorded after every thirty days and histopathology of intestinal tissues was performed at the end of experiment. Both WM fed and MR fed animals showed significant increase in their body weight with the advancement of age. From the fecal examination, the eggs of Fasciola spp, Paramphistome spp, Strongylus spp were identified. A gradual increase in EPG was recorded in the animals of both groups. The absolute value of eosinophil and neutrophil count was also found to rise little with the course of experiment. There was no remarkable change in the tissue texture of small intestine.

**BAU Res. Prog. 24, 2013**

# Determination of prevalence and economic impact of ovine footrot in Chars of Mymensingh with isolation and molecular characterization of *Dichelobacter nodosus*

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## Abstract

A retrospective study has been conducted to find out the prevalence of ovine footrot in chars of Mymensingh Sadar upazila centered in Paranganj union parishad from July 2012 to August 2013. During the study period all sheep owners of this region were interviewed using a prepared questionnaire and investigation was carried out of the housing and management practices. A total of one hundred and six farmers took part in this study. The farms were monitored for footrot outbreaks and sheep mortality was also recorded during the study period along with the causes of death. The prevalence of ovine footrot was 4.22% among the study group of 687 sheep. Ovine mortality rate was 26.63% in the study population. The prevalence rate varies according to the farm types and housing systems. Higher mortality rate (35.53%) was recorded in subsistence farming. Prevalence of ovine footrot is higher (9.46%) in mixed housing system where sheep and other livestock are housed under the same roof. Causes of the sheep death based on case reports are predators (37%), diarrhea (14%), pneumonia (10%), footrot (3%), sudden death (14%), fetal death (11%), and other systemic infections (11%). Prevalence of footrot was found to be affected significantly by management practices and housing systems. A major portion of farmers (52.83%) depends on sheep farming entirely and significant portion (33.01%) of them is women. The results suggest that improvement of the housing environment and management practices are required to control ovine footrot outbreak.

# Effects of periparturient anthelmintic treatment on the milk yield in cows

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## Abstract

This study was conducted to determine the efficacy of anthelmintics against gastrointestinal parasites in periparturient dairy cows and its effect on milk yield and quality. Sixty mixed breed pregnant cows of 1st & 2nd parity were divided into four groups, A (n=18), B (n=14), C (n=16) and D (n=12). The efficacy of anthelmintic treatment was evaluated by counting faecal

eggs per gram (EPG) compared with pre-treatment values. The milk yield of each cow was recorded in pre- and post-treatment lactations. Group A were treated with Nitroxynil (Dovenix®, MERIAL-17, Bourgelat 69002 Lyon-France) 10 mg/kg body weight subcutaneously 30 days before parturition was due. The average EPG reduced from 506.1 ± 172.3 to 157.8 ± 24.9 within 14 days. Group B were treated with combination of triclabendazole and levamisole (Endex®, Novartis Pharmaceuticals Ltd., Bangladesh) 19.5 mg/kg body weight orally at calving. The average EPG reduced from 967.7 ± 237.1 to 172.0 ± 25.9. Group C were treated with Endex® at calving and 42 days after. The mean EPG fell from 794.6 ± 310.5 to 166.7 ± 26.2. Cows of group D were kept as untreated control and average EPG increased from 791.7 ± 268.5 to 864.2 ± 290.7. The overall percentage of EPG reduction 14 days after treatment was significantly higher ($p<0.05$) in treated (79.1%) cows than control (-9.2%). The average daily milk yield of group A, B, C and D in lactations before and after treatment was 2.3 ± 0.7, 2.6 ± 0.7; 2.5 ± 0.8, 2.7 ± 0.9; 2.1 ± 0.6, 2.8 ± 0.8 and 2.2 ± 0.9, 2.2 ± 0.8 litres, respectively. Average milk yield of group C (2.8 ± 0.8) was significantly higher ($p<0.01$) than group A (2.6 ± 0.7) cows. Similarly, the average milk yield in all the treated cows was significantly ($p<0.01$) higher in the lactation after treatment (2.5 ± 0.7) than in the previous lactation (2.2 ± 0.7). The average milk yield (2.5 ± 0.7) in all treated cows was significantly ($p<0.01$) higher than in the control cows (2.2 ± 0.8). Although milk yields were higher in second parity (2.5 ± 0.7) than the first (2.4 ± 0.7), there was no significant difference ($p>0.05$). The percentage of milk fat, protein, lactose, Solid Not Fat (SNF) and minerals in treated and control groups was 4.4, 4.0; 3.8, 3.5; 5.5, 5.3; 10.1, 10.1 and 0.6, 0.6, respectively. The milk protein percentage was significantly higher ($p<0.05$) in treated group than the control group. There was no significant difference ($p>0.05$) in percentage of other milk components. Periparturient anthelmintic treatment reduced the gastrointestinal parasitic load and improved milk yield and protein percentage.

# Role of platelet rich plasma gel in the wound healing of black Bengal goat

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## Abstract

The study was conducted to evaluate the efficiency of platelet rich plasma (PRP) gel in the healing of skin wound. This experiment was carried out to exploit therapeutic effects of PRP gel on healing process. A total of 72 surgical wounds were made in 12 goats bearing weight 15-20 kg with age 1-3 years. Goats were divided into four groups with three animals in each group. Wounds of four groups were treated with homogenous PRP gel, heterogenous PRP gel, sulphonilamide powder and tincture benzoin. The wounds were 3 cm length and 0.5 cm

depth sutured with cross mattress using nylon. Follow-up observation was recorded from day 1 to day 30 postoperatively. Some morphological characters such as swelling area, elevation of sutured line from the skin surface, width of sutured area and contraction length between 7 to 15 days were recorded to determine the healing process of the wounds. Besides morphological study, histopathological studies were also performed on day 1, day 2, day 3, day 5 and day 15. Homogenous PRP gel showed admirable results in the healing of the wounds produced in goat. All wounds treated with homogenous PRP gel showed no inflammation with dry sutured area and complete healing with massive hair follicular growth within 15-21 days. On histopathological study, demonstrated epithelial tissues with a normal morphology.The dermis showed flabby connective tissue with organized interconnecting collagen fibers running parallel to each other and new hair follicular growth in healed area within 15 days, when wounds were treated with homogenous PRP gel. This study could help to consider natural biomaterial product specially PRP gel homogenous for a good healing of skin wounds. Further studies are necessary for the detail molecular investigation of healing process and proper establishment of commercially available of PRP gel and easiest finding the way of it's application.