

Clinical Session

Technical session: 10:00 - 11:45

Venue: Main Auditorium, Plant Genetic Resources Centre

Chairperson: Prof. I.D. Silva

TIME	TITLE	PAGE
10:00	<p>CANINE URINALYSIS WITH DIPSTICKS DESIGNED FOR HUMANS: USES AND LIMITATIONS</p> <p><u>H.M.H.S. Ariyaratna</u>, M.R.C.K. Mallawa, T.P.M.S.D. Bandara, W.R. Jayaweera, A. C. Karawita, A.M.R. Bandara, I.D. Silva, A. Arulkanthan and G.S.P.de S.Gunawardena</p>	1
10:15	<p>MANAGEMENT OF HUMP-NOSED VIPER (<i>Hypnalespp.</i>) ENVENOMATION IN DOGS IN SRI LANKA</p> <p><u>A.M.R. Bandara</u>, M.P.U. Liyanage, H.E. Abeygunawardhana, A.M.D.S. Karunaratne, A. M.S. M. Wickramaratne, I.D. Silva, A. Dangolla, I.B. Gawarammana and D.D.N. de Silva</p>	2
10:30	<p>DIAGNOSIS AND MANAGEMENT OF GASTROINTESTINAL OBSTRUCTIONS IN DOGS AND CATS</p> <p><u>Umasha Hemachandra</u></p>	3
10:45	<p>UTERINE TORSION IN CATTLE AND BUFFALOES: A CASE STUDY</p> <p><u>W.A.S.M. Premaratne</u>, K. Nizanantha, W.U.C. Gunasekera, A.M.P. Abeyasinghe, A.A.A.W.K. Amarasinghe, A. Pushpakumara, L.N.A. de Silva and P.A.B.D. Alexander</p>	4
11:00	<p>IDENTIFICATION OF MEAT SAMPLES OF MOUSE DEER (<i>Moschiola meminna</i>) BY A POLYMERASE CHAIN REACTION TECHNIQUE</p> <p><u>K.M.S.G. Weerasooriya</u>, G.A. Gunawardana, M.D.N. Jayaweera, W.M.S.P. Weerasinghe and R.M.S. Malkanthi</p>	5
11:15	<p>ATOVAQUONE/ AZITHROMYCIN COMBINATION: AN ALTERNATIVE TREATMENT FOR CANINE <i>Babesia gibsoni</i> INFECTION</p> <p><u>W.A.D.C.H. Wickramasinghe</u>, D.M. Siriwardane and N. Obeyesekere</p>	6
11:30	<p>UREA TOXICOSIS IN A GROUP OF DRY COWS IN AN UPCOUNTRY DAIRY FARM</p> <p><u>J.M.R.V. Wijayarathna</u>, W.M.D.S. Wanninayake, Y.H.P.S.N. Kumara, K. Nizanantha, W.U.C. Gunasekara and L.N.A. de Silva</p>	7

Animal Health Session

Technical session: 10:00 - 11:45

Venue: Small Auditorium, Plant Genetic Resources Centre

Chairperson: Dr. S. Sivasothy

TIME	TITLE	PAGE
10:00	SEROSURVEILLANCE OF BOVINE VIRAL DIARRHOEA AND INFECTIOUS BOVINE RHINOTRACHEITIS IN NORTHERN AND EASTERN PROVINCES OF SRI LANKA <u>S.A.E. Abeyratne</u> , H. Kothalawala, S. Puvanendiran, J.M.K.G.K. Jayasundara, H.A. Wijithasiri, G.B.K .Dilrukshi, S. Methananda, W.M.M.B.K. Jayathilake and M.M.P.S.K. Chandrasena	8
10:15	SEROGROUPS OF VIRULENT <i>Escherichia coli</i> STRAINS ISOLATED FROM CHICKEN <u>U.K.S.P. Alexander</u> , M.D.N. Jayaweera and J.K.H. Ubeyratne	9
10:30	SEROLOGICAL AND MOLECULAR CHARACTERISATION OF <i>Salmonella enterica</i> ISOLATES FROM POULTRY OF DIFFERENT GEOGRAPHICAL LOCATIONS IN SRI LANKA <u>G. A. Gunawardana</u> , G.K.C.N. Fernando, H. Kothalawela and S. Puvanendiran	10
10:45	ANTIMICROBIAL RESISTANCE PATTERNS IN CAUSATIVE AGENTS OF BOVINE MASTITIS IN THE RATNAPURA DISTRICT <u>D.L.N. Kumudinie</u> , D.S. Mahaarambe and R.W. Ratnayake	11
11:00	SUBCLINICAL MASTITIS: A COMPARISON OF PREVALENCE BETWEEN A MID-COUNTRY AND A LOW-COUNTRY DAIRY FARM <u>D.L.N. Kumudinie</u> , S.M.T.S. Manchanayake, N. Liyanagunawardena, S. De Alwis, and P.S. Fernando	12
11:15	ISOLATION AND CHARACTERISATION OF TOXIGENIC <i>Clostridium perfringens</i> FROM INTESTINES AND LIVERS OF BROILER CHICKEN <u>Tilusha Manchanayake</u> , Palika Fernando, Roshan Priyantha, Shyamali De Alwis, Nilukshi Liyanagunawardena and Shalika Perera	13
11:30	CAUSES OF MORTALITY OF LEOPARDS (<i>Panthera pardus kotiya</i>) IN THE SOUTHERN AND UVA WILDLIFE REGIONS OF SRI LANKA <u>B.V.P. Perera</u> , V.P.M.K. Abeywardana and K.P. Samarakoon	14

Animal Health Session

Technical session: 11:45 - 13:15

Venue: Small Auditorium, Plant Genetic Resources Centre

Chairperson: Dr. S. Sivasothy

TIME	TITLE	PAGE
11:45	<p>SURVEILLANCE FOR <i>Aeromonas</i> spp. IN HEALTHY GOLDFISH IN A FISH BREEDING CENTRE AT RAMBODAGALLA IN SRI LANKA</p> <p><u>K.U.E Perera</u>, J.K.H. Ubeyratne, M.D.N. Jayaweera, K.G.R.N Karunaratne and N.D. Karunaratne</p>	15
12:00	<p>COMPARISON OF GAMMA INTERFERON AND COMPARATIVE PPD TESTS FOR DETECTION OF <i>Mycobacterium bovis</i> INFECTION IN CATTLE</p> <p><u>M.A.R Priyantha</u>, P.S. Fernando, N. Liyanagunawardana, L. Epakanda, C. Karunaratne, D.L.N. Kumudinie, K. Abeyrathne, P.S. De Alwis, S.A. Thalagoda, G. Wijewardana, and G.B.K. Dilrukshi</p>	16
12:15	<p>PREVALENCE OF <i>Salmonella</i> IN RETAIL RAW TABLE EGGS IN KANDY MUNICIPAL AREA</p> <p><u>D.I.G. Rajapaksha</u>, D.S. Thilakarathne, P. Abeynayaka, P.S. Fernando and R.S. Kalupahana</p>	17
12:30	<p>IMPLICATIONS OF BITES BY OWNED, COMMUNITY-ROAMING DOGS ON RABIES POST-EXPOSURE PROPHYLAXIS IN HUMANS</p> <p><u>D.W.D. Subasinghe</u> and K.K.R. Malkanthi</p>	18
12:45	<p>A PRELIMINARY STUDY OF THE SEROPREVALENCE OF LEPTOSPIROSIS IN DOMESTIC DOGS IN SUBURBS OF COLOMBO, SRI LANKA</p> <p><u>M.G. Thammitiyagodage</u>, P. Somaratne, K.C.R. Perera and M.A. Roshan Priyantha</p>	19
13:00	<p>ANTIMICROBIAL SUSCEPTIBILITY PATTERN OF STAPHYLOCOCCI ISOLATED FROM BOVINE MASTITIC MILK IN THE CENTRAL PROVINCE OF SRI LANKA WITH SPECIAL REFERENCE TO METHICILLIN RESISTANCE</p> <p><u>D.S. Thilakarathne</u>, W.S.N. Gunawardana, D.I.G. Rajapaksha, P. Abeynayake, I.S. Abeygunawardana and R.S. Kalupahana</p>	20

Animal Production, Reproduction and Genetics Session

Technical session: 10:00 - 11:45

Venue: Auditorium, Institute of Continuing Education

Chairpersons: Dr. B.M.A.O. Perera & Prof. S.P. Gunaratne

TIME	TITLE	PAGE
10:00	SEMEN QUALITY AND FERTILITY OF DONOR BULLS AT THE CENTRAL ARTIFICIAL INSEMINATION STATION, SRI LANKA <u>W.W. Abeygunawardana</u> , W.D. Abeywansa, P.A.B.D. Alexander and P.G.A. Pushpakumara	21
10:15	COMPARISON OF DIFFERENT OVULATION SYNCHRONISATION PROTOCOLS ON PREGNANCY RATES OF BUFFALO AND CATTLE <u>E.D.M. Lasantha</u> , U.P.K. Dissanayake, Indunil Pathirana, and Noritoshi Kawate	22
10:30	FIELD LEVEL PERFORMANCE EVALUATION AND ESTIMATION OF HERITABILITY OF GROWTH AND FERTILITY TRAITS OF PROGENY OF AI BULLS IN KANDY DISTRICT, SRI LANKA <u>S.A. Seelanatha</u> , C.M.B. Dematawewa and B. Sivayoganathan	23
10:45	EVALUATION OF GROWTH TRAITS OF PROGENY OF AI BULLS IN THALAWAKELE VETERINARY RANGE, SRI LANKA <u>S. Sukumar</u> , C.M.B. Dematawewa and S.Sheromiha	24
11:00	PRELIMINARY INVESTIGATION OF MICROBIOLOGICAL AND COMPOSITIONAL QUALITY OF DIFFERENT TYPES OF LIQUID COW MILK AVAILABLE IN KANDY CITY LIMITS <u>A.M.H. Abeykoon</u> , P. Abeynayake and R.S. Kalupahana	25
11:15	GOAT PRODUCTION IN DIVULAPITIYA DIVISIONAL SECRETARIAT AREA: CURRENT STATUS, CONSTRAINTS AND POTENTIAL FOR DEVELOPMENT <u>M.C. Kalpani</u> , C.J. Samarasinghe, R.M.S.B.K. Ranasinghe and R.M.C. Deshapriya	26
11:30	PREVALENCE OF SUBCLINICAL MASTITIS IN DAIRY COWS IN WATTEGAMA MILK COLLECTING RANGE, SRI LANKA <u>K.M.G.M.K.K. Kulathunga</u> , N.K. Jayasekara and G.A. Gunawardana	27

Animal Production, Reproduction and Genetics Session

Technical session: 11:45 - 13:30

Venue: Auditorium, Institute of Continuing Education

Chairperson: Prof. S.P. Gunaratne

TIME	TITLE	PAGE
11:45	RELATIONSHIP BETWEEN LAMENESS SCORES AND PRODUCTIVE AND REPRODUCTIVE PARAMETERS IN A MILKING HERD OF AN UPCOUNTRY DAIRY FARM <u>Y.H.P.S.N. Kumara</u> , A.M.P. Abeysinghe, M.P.K. Sanjeeva and P.G.A. Pushpakumara	28
12:00	EFFECT OF DIETARY TRYPSIN INHIBITOR ACTIVITY ON SEVERITY OF SUBCLINICAL NECROTIC ENTERITIS AND PROTEIN DIGESTIBILITY IN BROILER CHICKENS <u>M.W.C.D. Palliyeguru</u> , S.P. Rose and A.M. Mackenzie	29
12:15	GROSS AND HISTOPATHOLOGICAL FINDINGS IN CATTLE AND GOATS SLAUGHTERED AT KANDY MUNICIPAL COUNCIL ABATTOIR: A PRELIMINARY SURVEY <u>G.I.S. Perera</u> , S.M.T.S. Manchanayake, H. Kothalawala, H. Weerakoon and N.A.Y. Wasantha Kumara	30
12:30	THE PREVALENCE OF CLINICAL AND SUBCLINICAL MASTITIS IN DAIRY COWS IN THE BADULLA DISTRICT OF SRI LANKA <u>S.J.M.R.R. Samarakoon</u> and W.M.S.K. Karunarathne	31
12:45	CHARACTERISTICS OF LACTATION CURVES OF CROSSBRED CATTLE IN THE THALAWAKELE VETERINARY RANGE, SRI LANKA <u>S. Sukumar</u> , C.M.B. Dematawewa and S.Sheromiha	32
13:00	EVALUATION OF NUTRITIONAL AND GRADING QUALITY OF LOCALLY PRODUCED MAIZE <u>W.A.S.D. Weerasooriya</u> , N. Priyankarage, S.P. Gunaratne, S.S.P. Silva, H. Atapattu and R.A.T. Chandima	33
13:15	THE USE OF SIMPLE HEAT TREATMENT AND MICROWAVE TREATMENT AS METHODS TO CONTROL HYDROLYTIC RANCIDITY IN RICE BRAN <u>W.A.D.V. Weerathilake</u> , S.S.E. Ranawana, N.R. Abeynayake and A.N.F Perera	34

Posters

Technical session: 13:00 - 14:30

Venue: Lobby, Plant Genetic Resources Centre

TITLE	PAGE
<p>AN OUTBREAK OF HAEMONCHOSIS DUE TO POSSIBLE ANTHELMINTIC RESISTANCE IN A GOAT FARM IN THE NORTH WESTERN PROVINCE OF SRI LANKA</p> <p>A.M.H. Abeykoon, J.K.H. Ubeyratne, M.D.N. Jayaweera, N.D. Senasinghe, J.M.R.V. Wijayarathna, A.M.D.S. Karunaratna, L.M.P. Wijemanne and G.M.C.R. Karunaratne</p>	35
<p>ADAPTATION AND PROPAGATION OF FOOT AND MOUTH DISEASE VACCINE SEED VIRUSES FROM LOCAL FIELD VIRUS ISOLATES</p> <p>S.A.E. Abeyratne, H. Kothalawala, S. Puvanendiran, J.M.K.G.K. Jayasundara, H.A. Wijithasiri, W.M.M.B.K. Jayathilake and M.M.P.S.K. Chandrasena</p>	36
<p>METHYLENE BLUE STAINING FOR IDENTIFICATION OF LYMPHOCYSTIS DISEASE VIRUS IN GOLDFISH (<i>Carassius auratus auratus</i>)</p> <p>D.P.N. De Silva and J.L.C.S. Perera</p>	37
<p>SURGICAL REMOVAL OF INFILTRATIVE LIPOMA IN IRIDESCENT SHARK (<i>Pangasianodon hypophthalmus</i>)</p> <p>S.R.D. Fernandopulle, N.U. Aluthgedara, S. Batuwita and U. Edirisinghe</p>	38
<p>A CASE OF PERITONEAL PERICARDIAL DIAPHRAGMATIC HERNIA IN A DOG</p> <p>H.A.S. Hapuarachchi, R. Hettiarachchi, J. Balasubramaniam, T. Mathota and S.C. Wanniarachchi</p>	39
<p>ARTERIAL THROMBOEMBOLISM CAUSED BY <i>Strongylus vulgaris</i> LARVAL MIGRATION IN A THOROUGHBRED HORSE: A CASE REPORT</p> <p>A.C. Karawita, H.M.H.S. Ariyaratna, W.D.D. Fernando, K. Nizananthan, A.A.A.W.K. Amarasinghe, L.N.A. de Silva, R.P.V.J. Rajapakse, W.R. Jayaweera and G.S.P. De S. Gunawardena</p>	40

CANINE URINALYSIS WITH DIPSTICKS DESIGNED FOR HUMANS: USES AND LIMITATIONS

H.M.H.S. Ariyaratna¹, M.R.C.K. Mallawa², T.P.M.S.D. Bandara¹, W.R. Jayaweera¹,
A. C. Karawita¹, A.M.R. Bandara², I.D. Silva², A. Arulkanthan¹ and
G.S.P.de S.Gunawardena¹

¹*Department of Veterinary Pathobiology, Faculty of Veterinary Medicine and Animal Science,
University of Peradeniya, Peradeniya*

²*Department of Veterinary Clinical Studies, Faculty of Veterinary Medicine and Animal Science,
University of Peradeniya, Peradeniya*

Urinalysis with commercial dipsticks is quick and relatively inexpensive, but dipsticks currently used by veterinarians in Sri Lanka are designed and validated only for human use. We analysed the accuracy, precision and limit of detection (LOD) of two commercial dipsticks (A and B) for four parameters (specific gravity, pH, protein and nitrite).

Dipstick readings were made by three observers using pooled catheterised urine from healthy male dogs. All parameters except protein were comparatively analysed using gold standards. Gold standards for SG, pH and nitrites respectively were refractometry, pH meter readings and culture of samples inoculated with known quantities uropathogenic *Escherichia coli*. SG was manipulated with NaCl and distilled water, and pH manipulated with NaOH/ HCL. Known quantities of bovine serum albumin (BSA) or pooled dog serum (PDS) were measured by dipsticks for proteinalysis. Precision was compared using means and standard deviations; accuracy compared using percentage errors (PE); and LOD identified by t-tests.

Both dipsticks had markedly higher levels of precision for all parameters. Highest PEs for SG were +1.99% and +2.07% for A and B respectively. With 0.1 g/l BSA, PE was +66.8% and +100% for A and B respectively, and < 50% for other concentrations. PE was > 50% for all concentrations of PDS. LODs ($P < 0.05$) for A were 0.1 g/l and 0.7 g/l with BSA and PDS respectively; similar values for B were 0.3 g/l and 0.9 g/l. Nitrites were detected as “trace” by A and “unremarkable” by B with bacterial counts of 0.85×10^5 CFU/ml. Counts of $\approx 2.0 \times 10^5$ CFU/ml were detected as “trace” and “positive” by A and B respectively and higher counts were positive with both sticks.

Despite low PE, use of both dipsticks is not recommended for SG analysis as the impact of added errors may affect clinical interpretation. Use is limited for albuminuria with both dipsticks and users need to be cautious when making diagnoses of proteinuria at marginal levels. Both dipsticks show high accuracy with pH analysis and can be useful in nitrite detection when the bacterial counts are $\geq 0.85 \times 10^5$ CFU/ml.

MANAGEMENT OF HUMP-NOSED VIPER (*Hypnale* spp.) ENVENOMATION IN DOGS IN SRI LANKA

A.M.R. Bandara¹, M.P.U. Liyanage¹, H.E. Abeygunawardhana¹, A.M.D.S. Karunaratne¹,
A.M.S.M. Wickramaratne¹, I.D. Silva¹, A. Dangolla¹, I.B. Gawarammana² and
D.D.N. de Silva¹

¹*Veterinary Teaching Hospital, Department of Veterinary Clinical Sciences, Faculty of Veterinary
Medicine and Animal Science, University of Peradeniya, Peradeniya*

²*Department of Medicine, Faculty of Medicine, University of Peradeniya, Peradeniya*

Hump-nosed viper (*Hypnale* spp.) bites are the commonest type of snake bites of humans in Sri Lanka. Most bites cause predominantly local reactions such as severe pain and swelling at the site of the bite. Although hump-nosed viper bites are not uncommon in dogs, reports on medical management of affected dogs are scarce in Sri Lanka.

This study was performed during the period September 2011 to February 2013. Demographic information and clinical signs of nine dogs bitten by hump-nosed pit vipers were recorded. Blood and urine samples were collected hourly for biochemical tests and urinalysis respectively, which were repeated until they normalised. As auxiliary treatments, adrenaline was administered subcutaneously and hydrocortisone, antihistamines, antibiotics, and fluid therapy were administered intravenously. Patients were also given a single dose of tetanus toxoid intramuscularly. None of them were treated with anti-venom, which is contraindicated for hump-nosed viper envenomation.

All patients were admitted within two hours of being bitten and the majority (n=7; 78%) had been bitten during 18:00 to 06:00 h. The majority were males (n=8; 89%) less than one year of age (n=5; 56%). Signs of severe pain were observed from all patients. Main sites of fang marks were the face (rostrum, mandible, lips) and neck regions. Marked local swelling was observed in eight (89%) patients. A haemorrhagic bulla was observed on the left medial crus of one patient; this subsequently necrosed and the limb was amputated. Prolonged oozing of blood from the bite site was recorded from two patients and all clinical signs disappeared seven hours after initiation of the treatment. Two patients developed acute renal failure and recovered within 72 hours of hospitalisation.

In conclusion, we report preliminary evidence that most hump-nosed viper bites are likely to occur at night, male dogs are more likely to be affected and the facial area is the commonest site of bite. As local reactions, acute renal failure or clotting disorders may develop patients should be closely monitored and treated to prevent acute toxic damage to kidneys. In this study all patients recovered with auxiliary treatment which is a cost-effective management measure.

DIAGNOSIS AND MANAGEMENT OF GASTROINTESTINAL OBSTRUCTIONS IN DOGS AND CATS

Umasha Hemachandra

Pet Vet Clinic, 421/5, Malalasekera Mawatha, Colombo 07

Gastrointestinal (GI) obstructions are common in animals but diagnosis is challenging and delayed diagnosis can often result in complications with increased fatality. Of nine cases presented during a six month period, two were of cats (aged 2-3 years) and seven were of dogs (puppies < 1 year, n=5; adults > 5 years, n=2).

Pica was a common complaint in the puppies (n=4) and over-grooming was present in one cat. Common clinical signs exhibited by the majority of cases were depression, anorexia, vomiting (at frequencies ranging from 4-7 times per day) and abdominal discomfort upon palpation. Infrequent signs were fever ranging from 103-105°C (n=4), absence of defecation (n=2), and respiratory distress (n=1). Haematological tests, liver and kidney function tests, and radiographs were performed in all but one of the cases that died within 24 h. Haematology was normal while four radiographs revealed foreign body (FB) obstruction of varying degrees. Abdominal ultrasound scans were performed in two cases which revealed alterations in GI motility in a cat and dog respectively.

Two cases were treated with oral laxatives until subsequent radiographs showed absence of the FB. The other cases were treated surgically, with explorative laparotomy performed in four and enterotomy performed in two cases. Four patients died during or after surgery, while others recovered with either surgical or medical treatment.

As many of the common signs seen in the above cases are non-specific signs of GI diseases, obtaining an accurate history and careful abdominal palpation is important in diagnosis of GI obstructions. Haematological, liver and kidney function tests are useful in ruling out differential diagnoses which may cause similar signs such as vomiting. Radiography and ultrasound scanning are useful in definitive diagnosis. Many cases require surgical correction whereas medically manageable cases need careful follow-up including radiographs.

UTERINE TORSION IN CATTLE AND BUFFALO: A CASE STUDY

W.A.S.M. Premaratne, K. Nizanantha, W.U.C. Gunasekera, A.M.P. Abeysinghe,
A.A.A.W.K. Amarasinghe, A. Pushpakumara, L.N.A. de Silva and P.A.B.D. Alexander

*Department of Farm Animal Production and Health,
Faculty of Veterinary Medicine and Animal Science, University of Peradeniya, Peradeniya*

Uterine torsion (UT) is twisting of the gravid uterus along its longitudinal axis. In cattle and buffalo, most cases of UT are observed during the first stage of labour. Oversized foetuses, the act of getting up, falls, and foetal movements during late gestation are suggested causes of UT.

Of eleven dystocia cases presented during January to May 2012, seven cases were diagnosed as UT. Common presenting clinical signs were non-progressive labour, frequent getting up and lying down, slightly elevated base of the tail, dullness, depression and restlessness. During per-rectal and per-vaginal examinations, distinctly disoriented broad ligaments were palpated along with displaced gravid uteri. In three cases, uteri were rotated 90° - 180° , of which two uteri were rotated anticlockwise. All three torsions were corrected by rolling the cow while holding the foetus per-vaginally and live calves were recovered. In remainder of the cases (n=4), uteri were twisted 360° clockwise and cows presented a varying degree of toxemia. Caesarean sections were performed after stabilisation with intravenous infusions, NSAIDs and parenteral antibiotics. In three cases, uteri were ruptured, and none of the animals recovered despite removal of putrefying foetuses. These animals had started showing signs of parturition 2-3 days before presentation. A live foetus was recovered and the dam recovered uneventfully following surgery in the fourth case which was presented less than a day of onset of parturition.

Determination of the degree and direction of the twist helps in deciding the correct direction of rolling. If the dam is severely ill and the twist is $> 180^{\circ}$, caesarean section after stabilisation is a better option. Strangulation of foetal blood supply and subsequent placental detachment could be the cause of foetal death in twists of $\geq 180^{\circ}$. Therefore, early diagnosis and intervention can increase the survivability of both dam and calf.

IDENTIFICATION OF MEAT SAMPLES OF MOUSE DEER (*Moschiola meminna*) BY A POLYMERASE CHAIN REACTION TECHNIQUE

K.M.S.G. Weerasooriya, G.A. Gunawardana, M.D.N.Jayaweera, W.M.S.P.Weerasinghe and
R.M.S.Malkanathi

Veterinary Research Institute, Gannoruwa, Peradeniya

The Indian Mouse Deer, *Moschiola meminna* (also known as White-spotted Chevrotain), is a protected species in Sri Lanka. The Flora and Fauna Protection Ordinance of Sri Lanka prohibit the sale of meat of protected species. Meat samples suspected to be of *M. meminna* have been frequently submitted by legal authorities for further confirmation, but up to now, an appropriate technique for confirmation has been unavailable. Therefore, the present study was conducted with the objective of developing a Polymerase Chain Reaction (PCR) technique to identify meat samples of *M. meminna*. DNA was extracted from raw meat samples (n=4) suspected to be of *M. meminna* and from carcasses (n=2), identified phenotypically as *M. meminna*. DNA obtained from meat samples confirmed as spotted deer (*Axis axis*), sambhur (*Rusa unicolor*), cattle (*Bos primigenius*), buffalo (*Bubalus bubalis*), pig (*Sus scrofa domesticus*), goat (*Capra aegagrus hircus*) and dog (*Canis lupus familiaris*) were also used to check the specificity of selected primers. Two primer sets (P1-F 5' CACCACCCGAAAATCCCACCCA 3', P1-R 3' ACGCCAGCCCCTTCAGAAGA 5' and P2-F 5' GGTTCCCAGTGGGCCGTGTC 3', P2-R 3' TGTGGGCCACTCGGTCTCGG 5') were designed from a published partial sequence of cytochrome b-like gene of *M. meminna* in India. By altering DNA, primer and MgCl₂ concentrations with annealing temperature gradients an effective PCR protocol was identified. Among the two primer sets, P2 successfully amplified genomic DNA from samples of *M. meminna* and a high resolution band at the expected level (1000 bp) was observed with 100 ng of DNA, 1.8 mM of MgCl₂ and 0.3 μmol of primer concentration at an annealing temperature of 54°C. During the test of specificity carried out using DNA from other species, there was no amplification of DNA with the selected protocol. Thus, the present study has developed a reliable, simple, PCR method to differentiate meat samples of *M. meminna* from other species; namely spotted deer, sambhur, cattle, buffalo, pig, goat and dog. Further modifications to increase the sensitivity of the test are being undertaken.

ATOVAQUONE/ AZITHROMYCIN COMBINATION: AN ALTERNATIVE TREATMENT FOR CANINE *Babesia gibsoni* INFECTION

W.A.D.C.H. Wickramasinghe, D.M.Siriwardane and N. Obeyesekere

PetVet Clinic, 421/5, Malalasekera Mawatha, Colombo 07

Babesia gibsoni infection is a common tick-borne protozoal disease of dogs in Sri Lanka. Although diaminazine aceturate (DA) is the most widely used drug for treatment of babesiosis, it has several limitations such as narrow therapeutic range, hypersensitivity, hepatotoxicity, neurotoxicity and emerging resistance. Previous studies have shown ten days of atovaquone (13 mg/kg t.i.d.)/ azithromycin (10 mg/kg s.i.d.) combination results in negative PCR reactions and effectively reverses critical anaemia without significant adverse effects.

This retrospective study was undertaken to assess the efficacy of atovaquone/ azithromycin (A/A) treatment in lieu of DA, using 19 confirmed cases of babesiosis presented to a veterinary clinic in Colombo during 2012/ 2013. Cases with multi-parasitic infections, cases where other drug combinations were used, and cases referred with unclear history were excluded from this study. Of the 19 cases; DA alone was used in five, A/A alone used in eight, while DA was followed by A/A in six cases.

Of the 11 cases where DA was used, five were pups less than six months and three developed neurotoxicity. In the remaining six cases, two doses of DA showed inadequate responses or relapses/ re-infections; thus they were followed by A/A treatment. None of the adults developed nervous signs or hypersensitivity.

In 6/8 cases where A/A alone was used, although initial recovery was remarkable by day 10, relapse/re-infection was observed after two weeks to three months and required a second course. Two adults recovered completely after two doses at 4 mg/kg six days apart.

In conclusion, A/A appears to be a useful and safe substitute for DA in specific situations but has limitations. Other concerns with A/A use are its high cost, poor availability in Sri Lanka, and the possibility of resistance/ relapse are of concern. Further, the efficacy of A/A in multi-parasitic infections is unclear. Further studies are required to ascertain if extended treatment protocols can prevent relapse; if recurrence of infection is in fact relapse or re-infection, and to verify if A/A can actually sterilise infection.

UREA TOXICOSIS IN A GROUP OF DRY COWS IN AN UPCOUNTRY DAIRY FARM

J.M.R.V. Wijayarathna¹, W.M.D.S. Wanninayake², Y.H.P.S.N. Kumara², K. Nizanantha¹,
W.U.C Gunasekara¹ and L.N.A. de Silva¹

¹*Ambulatory Hospital, Department of Farm Animal Production and Health, Faculty of Veterinary
Medicine and Animal Science, University of Peradeniya*

²*Ambewela Livestock Farms (Pvt) Ltd., Ambewela*

Urea, a popular Non-Protein Nitrogen (NPN) supplement for cattle, is recommended at the rate of 0.1 g/kg body weight/ day (1% of urea in concentrate). Excess consumption or sudden dietary addition of urea results in production of large quantities of ammonia which is rapidly absorbed from the rumen causing toxicity. This report describes a case of possible urea toxicosis in an upcountry dairy farm.

On 10th January 2013, 12 out of 120 dry cows at an upcountry dairy farm developed acute illness after ingesting concentrates. The affected cows developed shivering, stiffness, frothy salivation, bloat and lateral recumbency 15-30 minutes after feeding. The affected animals were the last to feed on the farm-mixed concentrate ration supplemented with 1% urea granules. Concentrates were provided from freshly opened bags in clean feed troughs. A similar occurrence was reported five months prior to this incident. Based on the tentative diagnosis of urea poisoning, 2-5 litres of vinegar and 25 litres of water were administered orally. Bloat was relieved and intravenous fluid, calcium, atropine sulphate, meperasone maleate and a combination of cyanocobalamine and butaphosphan was administered. Six animals were severely affected, out of which five died, while the rest recovered after treatment.

Detailed necropsy performed on two carcasses revealed generalised congestion, haemorrhages and pulmonary oedema. Histopathology showed visceral haemorrhages and coagulation necrosis of the renal tubular epithelium. Hypertrophy of oligodendroglia, vascular congestion of the brain and diffuse mucosal epithelial detachment of the small intestine were also noted. Feed analysis did not indicate elevated NPN levels probably because the sample was not representative. Blood ammonia levels were not checked because plasma has to be separated within 30 minutes after collection, which was impractical under field situations.

Treatment with vinegar was effective, with the exception of the severely affected animals. Since these cows were the last to feed, it is possible that the urea pellets had sedimented while transportation, resulting in the ingestion of a toxic urea dose. Re-mixing feed immediately before feeding was recommended to prevent uneven distribution of urea pellets. After the implementation of this practice, so far no other case has been reported.

SEROSURVEILLANCE OF BOVINE VIRAL DIARRHOEA AND INFECTIOUS BOVINE RHINOTRACHEITIS IN NORTHERN AND EASTERN PROVINCES OF SRI LANKA

S.A.E. Abeyratne, H. Kothalawala, S. Puvanendiran, J.M.K.G.K. Jayasundara, H.A. Wijithasiri, G.B.K. Dilrukshi, S.Methananda, W.M.M.B.K. Jayathilake and M.M.P.S.K. Chandrasena

Animal Virus Laboratory, Veterinary Research Institute, Polgolla, Kandy

Bovine Viral Diarrhoea (BVD), caused by a *Pestivirus*, is characterised by profuse diarrhoea leading invariably to death. Infection of the bovine foetus may result in abortion, stillbirth, teratogenic effects or persistent infection in the neonatal calf. Infectious bovine rhinotracheitis (IBR), caused by bovine herpesvirus 1 (BoHV-1) can cause respiratory illness, conjunctivitis, abortion and general systemic infection. These diseases are responsible for huge economic losses in the global cattle industry and form barriers to international trade.

There have been no studies in Sri Lanka on the sero-prevalence of BVD and IBR. Hence, the objective of this study was to determine the sero-prevalence of BVD and IBR in cattle in the Northern and Eastern provinces.

A total of 360 blood samples were collected from cattle and buffaloes from 36 veterinary ranges in Northern and Eastern provinces. Commercial enzyme-linked immunosorbent assay (ELISA) kits (LSIVET, LSI 69380, Lissieu, France) were used to detect antibodies against BVD and IBR. Blocking ELISA was performed for BVD and indirect ELISA was performed for IBR. All samples were tested against both diseases.

Only 0.6% of samples (2/360) were positive for BVD, whereas 33.3% of samples (121/360) were positive for IBR. As no vaccination is carried out against these two diseases in Sri Lanka, it can be assumed that positive reactors are due to exposure by the infectious agent. As test specificity was 99%, the two positive reactors for BVD may be false positives and the population sampled may be considered to be negative for antibodies against BVD. As a considerable percentage of animals were reactive to IBR, continuous screening and disease monitoring should be undertaken as control measures. It is recommended to initiate island-wide surveillance for both these diseases.

SEROGROUPS OF VIRULENT *Escherichia coli* STRAINS ISOLATED FROM CHICKEN

U.K.S.P. Alexander, M.D.N. Jayaweera and J.K.H. Ubeyratne

Central Veterinary Investigation Centre, Veterinary Research Institute, Gannoruwa, Peradeniya

Infections caused by virulent strains of *Escherichia coli* cause high mortality in commercial poultry. The objective of this study was to determine the virulence potential and serogroups of avian pathogenic *E. coli* in chicken in Sri Lanka. A total of 96 *E. coli* isolates, collected during January to December 2011, from dead-in-shell chicken embryos (n=17), imported, dead, day-old breeder chicks (n=22), and clinical cases of colibacillosis (n=57) were used.

The virulence potential of each isolate was tested *in vivo* by inoculating 1×10^6 cfu/ml subcutaneously to a group of day-old chicks (n=5). Isolates producing 60-100% mortality, 20-40% mortality and < 20% mortality were identified as high, moderate and non-virulent, respectively. We identified 57 highly virulent and 18 moderately virulent isolates: 47 from cases of colibacillosis, 18 from day-old chicks and 10 from dead-in-shell embryos. Virulent strains were serogrouped using somatic antisera O78, O18ab, O1, O2, O20 for boiled cultures and O55, O145 antisera for slide agglutination.

Thirty six of the 75 *E. coli* isolates were grouped into seven O serogroups (O78, O18ab, O1, O2, O20, O55 and O145). We were unable to type 39 strains (isolates from: colibacillosis n=25, day-old-chicks n=8, dead-in-shell n=6) with available sera.

Predominant serogroups associated with *E. coli* infections were O18ab (44.44%) and O78 (30.55%). *E. coli* from cases of colibacillosis mainly belonged to the serogroups O18 (21.27%), O78 (17.02%) while serogroups O1, O2, O20, O55 were represented by a single isolate each. Serogroups of *E. coli* isolated from dead-in-shell embryos were O78 (5.5%), O18 (2.7%), O145 (2.7%). Isolates from day-old chicks belonged to O18 (13.8%), O2 (5.5%), O55 (5.5%) and O78 (2.7%) serogroups.

Virulence potential tests revealed that the majority of serogroups (77.77%) are highly virulent strains with 100% chick lethality. Certain isolates of O18ab and O1 strains were only moderately virulent. Of the 39 untyped serogroups, there were 10 and 29 moderately and highly virulent strains, respectively.

This study confirms the presence of a variety of virulent *E. coli* serogroups in poultry in Sri Lanka. Vaccination with homologous strains will be less efficient in the control of poultry *E. coli* infections in the future.

SEROLOGICAL AND MOLECULAR CHARACTERISATION OF *Salmonella enterica* ISOLATES FROM POULTRY OF DIFFERENT GEOGRAPHICAL LOCATIONS IN SRI LANKA

G. A. Gunawardana, G.K.C.N. Fernando, H. Kothalawela and S. Puvanendiran

Veterinary Research Institute, Gannoruwa, Peradeniya

Salmonellosis in poultry re-emerged in Sri Lanka during 1996 and the number of cases reported increased subsequently. Characterisation of poultry *Salmonella enterica* isolates is essential to understand the epidemiological picture, in order to plan future control programs.

Objectives of the present study were to determine the prevalent serovars and to identify genetic relatedness among causative strains of *S. enterica* from different outbreaks. A total of 122 isolates obtained from poultry carcasses during 1999-2005 and one isolate from a dead pigeon, were serotyped by the Kauffman-White Scheme. Repetitive Extragenic Palindromic Polymerase Chain Reaction (REP-PCR) was performed using oligonucleotide primers, REP 1 R-1 (5' IIIICGICGICATCIGGC 3') and REP 2-1 (5' ICGICTTATCIGGCCTAC 3') on 21 isolates selected to represent main serovars, different time points and locations.

Out of 123 isolates, 84 (68%) were *S. enterica* serovar Gallinarum and 32 (26%) were *S. enterica* serovar Enteritidis. Six isolates (4.9%) were found to be of other motile serovars of group D. The pigeon isolate was of group E.

Three different PCR groups based on REP-PCR profile similarities were identified with tested isolates. All 15 isolates in group I were *S. Gallinarum* and three subgroups were differentiated. Strains originating from several suburbs of Kandy, Matale, Gampola, Polonnaruwa, and Panduwasnuwara were found to be genetically identical and had been isolated at different times during 1999 – 2005. Strains of group I subgroup were from Hettipola. Four isolates of PCR group II were *S. Enteritidis*, of which three with identical profiles were from Nittambuwa (1999), Eppawala (2001) and Kandy (2003). The other related strain was from Weligalla (1999). Group III comprised two *S. Gallinarum* strains obtained from Matale and Kandy.

In this study, the most prevalent poultry serovar was *S. Gallinarum* and the emergence of serovars of public health importance was revealed. Three clonal lineages were identified among 21 strains of *S. enterica*. The clonal spread of *S. enterica* in various geographical locations with a temporal switch was revealed. The methods used in this study can be applied to detect the source and transmission links of salmonellosis outbreaks.

ANTIMICROBIAL RESISTANCE PATTERNS IN CAUSATIVE AGENTS OF BOVINE MASTITIS IN THE RATNAPURA DISTRICT

D.L.N. Kumudinie¹, D.S. Mahaarambe² and R.W. Ratnayake²

¹*Veterinary Research Institute, Gannoruwa, Peradeniya*

²*Veterinary Investigation Centre, Muwagama, Ratnapura*

Poor response of mastitis to antimicrobial treatment is reported frequently in the Ratnapura district. Therefore, a retrospective study was conducted using existing laboratory records to assess antimicrobial resistance patterns in causative agents of mastitis in the Ratnapura District.

We analysed records of 126 milk samples from clinical mastitis cases submitted for testing during March to December 2012. Isolation and identification of causative agents were done using conventional techniques. Antimicrobial susceptibility was measured by standard methods using sulfa-trimethoprim, cephalexin, cloxacillin, gentamicin, doxycycline, enrofloxacin, amoxicillin, streptomycin, penicillin G, neomycin and oxytetracycline. Selection of antimicrobials was based on infection history.

The three main aetiological agents of mastitis were *Streptococcus* spp. (44%) *Escherichia coli* (33%), and *Staphylococcus* spp. (17%). All tested isolates of *Streptococcus* (n=23), *Staphylococcus* (n=9) and *E. coli* (n=12) showed 100% resistance for penicillin G. There was high resistance to amoxicillin with 100% of *Streptococcus* (n=20) and *Staphylococcus* (n=8) and 75% of *E. coli* (n=12) isolates being resistant. With neomycin, 87%, 75%, and 70% resistance was shown by *Streptococcus* (n=23), *Staphylococcus* (n=8) and *E. coli* (n=10) isolates respectively. Isolates of *Streptococcus* (n=17), *Staphylococcus* (n=9) and *E. coli* (n=13) showed 76%, 67% and 69% resistance to cephalexin, respectively. Resistance to cloxacillin was 69%, 75% and 82% among *Streptococcus* (n=16), *Staphylococcus* (n=8) and *E. coli* (n=11) isolates respectively. Percentages resistant to oxytetracycline were 66%, 67% and 50% among *Streptococcus* (n=35), *Staphylococcus* (n=15) and *E. coli* (n=18) isolates respectively. 73% of *Streptococcus* isolates (n=11) were resistant to sulpha-trimethoprim.

More than 80% of *Streptococcus* and *E. coli* isolates were susceptible to streptomycin and enrofloxacin, but susceptibility was lower in *Staphylococcus* (27% and 58% respectively). The highest levels of susceptibility among all three organisms were to gentamicin ($\geq 95\%$). Thirty eight (32%) isolates were resistant to > 3 antimicrobials tested.

The results indicate emergence of multidrug resistance among causative agents of mastitis. This may lead to treatment failure and a greater public health risk unless steps are taken to implement an effective control programme.

SUBCLINICAL MASTITIS: A COMPARISON OF PREVALENCE BETWEEN A MID-COUNTRY AND A LOW-COUNTRY DAIRY FARM

D.L.N. Kumudinie, S.M.T.S. Manchanayake, N. Liyanagunawardena, S. De Alwis, and P.S. Fernando

Veterinary Research Institute, Gannoruwa, Peradeniya

Mastitis is the most prevalent production disease in dairy cows worldwide and causes major economic losses. The present study was conducted to study the prevalence of subclinical mastitis in farms located in different climatic zones with different management systems.

Milking cows of a mid-country (MCF) and a low-country (LCF) dairy farm were screened using California Mastitis Test (CMT), from June to October, 2012, to determine the prevalence of mastitis. Sterile, quarter milk samples were collected from CMT-positive animals after morning milking. Somatic cell counts (SCC) were performed and bacterial agents isolated and identified using standard methods.

The prevalence of subclinical mastitis was 42% (13/31) and 12% (8/64) at cow level in MCF and LCF respectively. At quarter level, the prevalence was 24% and 4% for MCF and LCF respectively. The majority of cases in MCF were reported in 7-8 year-old cows in their third or fourth lactation, with 1-2 quarters affected. Aetiological agents identified were *Staphylococcus* spp. and *Streptococcus* spp. In LCF, 50% of cows had udder fibrosis of one or two quarters. Organisms isolated from LCF were *Escherichia coli*, *Staphylococcus* spp. and *Streptococcus* spp. SCC counts were not correlated with CMT scores. In both farms there was a rise of SCC with CMT scores of 1-2. SCC were lower with a CMT score of three when compared with a CMT score of two, and lowest in clinical samples.

Prevalence and pathophysiology of mastitis was distinctly different between the two farms in this study. This may have been due to differences in climate and management practices in the two farms.

ISOLATION AND CHARACTERISATION OF TOXIGENIC *Clostridium perfringens* FROM INTESTINES AND LIVERS OF BROILER CHICKEN

Tilusha Manchanayake, Palika Fernando, Roshan Priyantha, Shyamali De Alwis,
Nilukshi Liyanagunawardena and Shalika Perera

Veterinary Research Institute, Gannoruwa, Peradeniya

Necrotic enteritis, an acute enterotoxaemic disease, primarily affecting broiler chicken aged 2-5 weeks, is caused by a gram-positive, anaerobic bacterium, *Clostridium perfringens*. Toxigenic strains of *C. perfringens* type A (and to a lesser extent, type C) cause the disease in poultry. Toxins of *C. perfringens* cause intestinal damages, liver necrosis, and mortality, with alpha toxin produced by type A strains being the primary cause of pathology. The objective of this study was to isolate strains of *C. perfringens* that cause subclinical necrotic enteritis in broiler flocks and to confirm the presence of toxigenic strains by performing Polymerase Chain Reactions (PCR) with primers specific for the alpha toxin gene.

Fresh intestinal samples (from duodenum to large intestine including caeca, n=500) and rejected liver samples with gross necrotic lesions (n=65) were collected from seven broiler processing plants. Organisms were isolated in selective media and incubated at 37°C for 24 hours under anaerobic condition. Bacterial colonies with typical characteristics (black pinpoint colonies with opaque zones) were cross-checked by isolation on blood agar (grayish pinpoint colonies with a double zone of haemolysis). Biochemical tests were also used for confirmation of identity.

C. perfringens isolates from liver (n=9) and intestines (n=18) were used for extraction of bacterial genomic DNA. DNA extracts (n=26) were further characterised by PCR using species-specific and alpha toxin gene-specific primers according to previously described protocols. PCR products of species-specific primers and alpha toxin gene-specific primers produced bands at 105 bp and 324 bp respectively, with gel electrophoresis.

In conclusion, it may be possible to use PCR techniques for identification of alpha toxin-producing *C. perfringens* as a tool in the diagnosis of necrotic enteritis. Isolation and identification of the organism can also be used to determine the prevalence of subclinical necrotic enteritis in poultry.

CAUSES OF MORTALITY OF LEOPARDS (*Panthera pardus kotiya*) IN THE SOUTHERN AND UVA WILDLIFE REGIONS OF SRI LANKA

B.V.P. Perera, V.P.M.K. Abeywardana and K.P. Samarakoon

Elephant Transit Home, Department of Wildlife Conservation, Udawalawe

The leopard (*Panthera pardus kotiya*), an endangered species, is the largest of four wild cat species recorded in Sri Lanka. Due to expansion of human settlements and loss of natural habitat the human-leopard conflict is now a key wildlife management issue in Sri Lanka.

We investigated the causes of mortality in leopards in cases reported (n=13) in the Uva (UWR) and Southern (SWR) wildlife regions from January 2011 to March 2013. Dead animals were subjected to detailed postmortem examination. Animals were also weighed and approximate ages determined based on published literature.

Most deaths were reported in and around Yala National Park (UWR, n=10), with the rest being from Ratnapura district (SWR). Ages ranged from 5 months to > 10 years with the majority being males (n=11). The three cases from SWR were adult males (> 60 kg) and causes of mortality were gunshot wounds, poisoning and injuries due to snares respectively. Their ranges overlapped tea estates in Balangoda, Palabaddala and Kalawana.

Of the 10 animals reported dead from UWR, most were from inside the park (n=9), and mostly from Yala Block 1 (n=8). Ages of cases from UWR ranged from 5 months to 10 years, and included two females (one pregnant). Causes of mortality were: starvation (n=1); injuries caused by intraspecific (n=3) or interspecific (n=1) attacks; traps (n=2); vehicular accidents (n=2); and poisoning (n=1).

It was noticeable that there were a much higher number of deaths reported for males. Male-biased sex-dependent mortality has been reported in previous studies as well. The majority of causes of death in this study were due to human-leopard conflict (n=8). The second-highest cause of death was due to intraspecific strife. As leopards defend territories from same-sex intruders, the high density of leopards in Yala National Park may be the reason for the increased numbers of deaths due to intraspecific strife.

SURVEILLANCE FOR *Aeromonas* spp. IN HEALTHY GOLDFISH IN A FISH BREEDING CENTRE AT RAMBODAGALLA IN SRI LANKA

K.U.E Perera, J.K.H. Ubeyratne, M.D.N.Jayaweera, K.G.R.N Karunaratne and
N.D. Karunaratne

Central Veterinary Investigation Centre, Veterinary Research Institute, Gannoruwa, Peradeniya

Motile *Aeromonas* spp. are common inhabitants of aquatic environments and are considered to be opportunistic pathogens. However, non-motile *Aeromonas* spp. can cause severe infections in breeder fish populations that affect the quality of fish and cause a large economic impact. The objective of this study was to evaluate the prevalence of *Aeromonas* spp. in clinically healthy goldfish (*Carassius auratus auratus*) in a fish breeding centre at Rambodagalla, Sri Lanka.

Goldfish (n=150) were obtained from a group that originated from the same spawning population and shared a common water source. Kidney tissue from each fish was cultured on blood agar and brain heart infusion agar in order to isolate *Aeromonas* spp. The isolates were then subjected to biochemical characterisation.

The only organism isolated was *Aeromonas hydrophila* which had a prevalence of 8.6%. Out of 13 isolates of *A. hydrophila*, 84.6% formed non-haemolytic colonies while 15.4% produced haemolytic colonies. Regular monitoring needs to be carried out to determine the prevalence of *Aeromonas* spp. infections in fish breeding centres.

COMPARISON OF GAMMA INTERFERON AND COMPARATIVE PPD TESTS FOR DETECTION OF *Mycobacterium bovis* INFECTION IN CATTLE

M.A.R Priyantha¹, P.S. Fernando¹, N. Liyanagunawardana¹, L. Epakanda², C. Karunaratne³, D.L.N.Kumudinie¹, K. Abeyrathne¹, P.S. De Alwis¹, S.A. Thalagoda¹, G. Wijewardana¹, and G.B.K. Dilrukshi³

¹*Bacteriology Division, Veterinary Research Institute, Gannoruwa, Peradeniya*

²*Veterinary Investigation Centre, Kundasale*

³*Veterinary Investigate Centre, Wariyapola*

Bovine tuberculosis (TB), caused by the acid-fast bacterium *Mycobacterium bovis*, is considered as an emerging disease with significant zoonotic potential. It also leads to significant economic losses due to low milk yield, premature culling, reduced body condition and eventual death. The comparative purified protein derivative (PPD) and gamma interferon tests are commonly used to screen cattle for identification of infected animals. While the PPD test is cheaper, the gamma interferon test can have higher sensitivity for diagnosis of bovine TB. The objective of this study was to compare the sensitivity of the two tests under local field conditions.

Blood samples (n=177) were collected from cattle in up-country, mid-country and low-country dairy farms for the gamma interferon test ("Bovigam", Prionics Lelystad BV, Lelystad, Netherland). PPD tests were performed on the same animals simultaneously, using commercial PPD antigens (Prionics, Victoria, Australia). Results of the two tests were compared using a Chi-square test.

41.8% of animals tested positive with the PPD test, and 35.6% were positive with the gamma interferon test. There was no significant difference between these two tests (P = 0.6). Therefore, it may be suggested that the comparative PPD test is a cost-effective test that can be used to screen for bovine tuberculosis under local field conditions.

PREVALENCE OF *Salmonella* IN RETAIL RAW TABLE EGGS IN KANDY MUNICIPAL AREA

D.I.G.Rajapaksha¹, D.S.Thilakarathne¹, P.Abeynayaka¹, P.S.Fernando² and R.S.Kalupahana¹

¹*Department of Veterinary Public Health and Pharmacology, Faculty of Veterinary Medicine and Animal Science, University of Peradeniya, Peradeniya*

²*Veterinary Research Institute, Gannoruwa, Peradeniya*

Salmonella spp. is a common cause of food-borne illnesses in humans. As this organism is present in the gastrointestinal tract of many animals, contamination of food of animal origin is a potential risk factor of salmonellosis. The objective of this study was to determine the prevalence of *Salmonella* in retail raw table eggs.

Thirty five eggs were collected from retail shops (5 eggs per sample) located in the Kandy municipal area during a two month period. Eggs were packed in sterile containers and transported at room temperature to the laboratory. Egg shell washings, shell membranes and egg contents were cultured for isolation and identification of *Salmonella* using standard methods. Confirmation of *Salmonella* was done by biochemical tests and agglutination with polyvalent *Salmonella* antiserum.

The overall prevalence of *Salmonella* in retail raw table eggs was 31.42%. The prevalence of detection of *Salmonella* from egg shell washings, shell membranes and egg contents were 28.57%, 2.86% and 8.57% respectively.

The results show a considerable prevalence of *Salmonella* in retail raw table eggs in Kandy municipal area. The highest prevalence was detected in egg shells with an inverse relationship between egg shell cleanliness and *Salmonella* contamination. Further tests, including serotyping, are being performed in order to identify pathogenic serovars of isolated organisms.

IMPLICATIONS OF BITES BY OWNED, COMMUNITY-ROAMING DOGS ON RABIES POST-EXPOSURE PROPHYLAXIS IN HUMANS

D.W.D. Subasinghe and K.K.R. Malkanthi

Blue Paw Trust, No. 30/42, Longdon Place, Colombo 07

Owned, community-roaming dogs (OCRD) in public places pose a potential risk of dog bites to the public. The objectives were to study the implications of bites by OCRD on human rabies post-exposure prophylaxis (PEP).

In this retrospective study 50 OCRD were randomly selected from a total of 511 in the Colombo municipal council area. Of the total, 34 dogs had a known bite history. Caretakers of OCRD were interviewed and discussions with medical officers were conducted from February to March 2013. Data were obtained on community caretakers, OCRD identification and vaccination records, first aid and PEP given to bite victims.

Caretakers are responsible for OCRD identification and vaccination record maintenance. The majority (52%) of caretakers were males aged 31-50 years. Education and employment history varied with 64% of caretakers being employed. Only a minority of caretakers (24%) were able to provide annual vaccination records. There was a significant association ($P < 0.05$) between caretaker readiness to provide vaccination records with the bite history of dogs: caretakers whose dogs had bitten people were unwilling to provide vaccination records. Reluctance to provide vaccine records was mainly due to experiences such as bite victims threatening to remove the dog and/or accusing the caretaker of wrongdoing by owning a community-roaming dog. The majority (85%) of bite victims obtained hospital treatment for bites but only few (35%) washed wounds with soap and water prior to seeking medical treatment.

The majority of dogs (90%) were found to be identified only by their location. As this information was unreliable, medical officers administered PEP vaccines to 91% of bite victims although annual vaccination records were available for dogs of 26% of bite cases. Medical officers who administered PEP stated that reliable methods of OCRD identification (collars, tattoos and microchips) linked with valid vaccination records that can be made available within three hours of a bite are necessary to decide on the most suitable rabies PEP. Thus, proper identification of OCRD could assist medical officers in treatment of bite victims, minimise the cost of PEP and ensure safety to victims.

A PRELIMINARY STUDY OF THE SEROPREVALENCE OF LEPTOSPIROSIS IN DOMESTIC DOGS IN SUBURBS OF COLOMBO, SRI LANKA

M.G. Thammitiyagodage¹, P. Somaratne¹, K.C.R. Perera¹ and M.A. Roshan Priyantha²

¹*Medical Research Institute, No 527, Dr. Danister de Silva Mawatha, Colombo 08*

²*Veterinary Research Institute, Gannoruwa, Peradeniya*

Leptospirosis is an emerging infectious disease in Sri Lanka and increasing numbers of patients are reported every year. Domestic dogs are a potential source of infection if they are not managed properly. Objectives of this study were to determine: vaccination patterns of domestic dogs, habits in relation to keeping dogs, predominant strains of *Leptospira* present in dogs, and antibody titres of vaccinated and unvaccinated dogs in suburbs of Colombo.

Questionnaires were administered to 134 dog owners using six veterinary practices. Dogs aged three months to 15 years were recruited to the study and blood samples collected. Antibody titres and strains were determined using microscopic agglutination tests (MAT).

Based on the questionnaire, 45% of pet owners keep their dogs inside the house, 37% keep them outside and 18% keep them in both conditions. In the surveyed population, 62% vaccinated their dog at least once for distemper, hepatitis and leptospirosis. The vaccinated population was categorised into four main groups: (1) dogs that are < 1 year old and given primary vaccination, (2) dogs given primary vaccination and subsequent booster, (3) randomly vaccinated dogs and (4) regularly vaccinated dogs. Antibody titres ranged from 100 to 3200 in the vaccinated population. Of the vaccinated population, 25% reported negative titres.

Although 38% of surveyed dogs had never been vaccinated for leptospirosis, 56% of unvaccinated dogs had antibody titres ranging from 100 to 3200 indicating acute or convalescent infection. Serum samples were either positive for a single serogroup of *Leptospira* strains (*L. Canicola*, *L. Australis*, *L. Icterohaemorrhagiae*, *L. Djsimea*) or for mixed serogroups. The predominant form of mixed infection was with *L. Australis* and *L. Canicola*.

Free-ranging dogs may contribute to increased incident rate of leptospirosis in Sri Lanka and be the reason for the high antibody titres observed among unvaccinated domestic dogs. Very high antibody titres for *Leptospira* were observed in stray dogs indicating an acute or convalescent stage of infection. As dogs may excrete *Leptospira* spirochaetes in their urine free-roaming/ stray dogs can be a potential source of infection unless their population is managed appropriately.

ANTIMICROBIAL SUSCEPTIBILITY PATTERN OF STAPHYLOCOCCI ISOLATED FROM BOVINE MASTITIC MILK IN THE CENTRAL PROVINCE OF SRI LANKA WITH SPECIAL REFERENCE TO METHICILLIN RESISTANCE

D.S. Thilakarathne¹, W.S.N. Gunawardana¹, D.I.G.Rajapaksha¹, P. Abeynayake¹,
I.S. Abeygunawardena² and R.S. Kalupahana¹

¹*Department of Veterinary Public Health and Pharmacology, Faculty of Veterinary Medicine and Animal Science, University of Peradeniya, Peradeniya*

²*Department of Basic Veterinary Sciences, Faculty of Veterinary Medicine and Animal Science, University of Peradeniya, Peradeniya*

Staphylococci are the commonest bacteria isolated in bovine milk and *Staphylococcus aureus* is the predominant pathogen involved in bovine mastitis. Emergence of antimicrobial-resistant Staphylococci including methicillin resistant Staphylococci (MRS) has been frequently reported. Methicillin resistant *Staphylococcus aureus* (MRSA) is an important nosocomial and community-acquired pathogen while coagulase negative MRS is the natural reservoir of methicillin resistant gene, *mec-A*. Since cows with subclinical or chronic mastitis are the main source of MRS in milk, a study was conducted to determine the methicillin resistance pattern of Staphylococci in bovine mastitic milk.

Milk samples of 78 mastitic cows (subclinical n=55 and chronic n=23) in the Central province of Sri Lanka were investigated for Staphylococci. MRS were identified using cefoxitin susceptibility test and identified organisms were tested for multi-drug resistance against four beta-lactam and five groups of non-beta-lactam antimicrobials.

Altogether 133 *Staphylococcus* isolates (coagulase-positive *Staphylococcus*, CPS, n=63 and coagulase-negative *Staphylococcus*, CNS, n=70) were obtained. The overall prevalence of MRS was 6% (n=8) which comprised 0.7% MR coagulase-positive isolates (MRCPS, n=1) and 5% MR coagulase-negative isolates (MRCNS, n=7). Susceptibility profiles indicated that the MRCPS isolate was resistant to erythromycin and tetracycline while it was intermediately resistant to chloramphenicol. Almost all MRCNS isolates were susceptible to non-beta-lactam antimicrobials tested except one isolate. This isolate was resistant to erythromycin, gentamicin, and ciprofloxacin and intermediately resistant to tetracycline and chloramphenicol.

The prevalence of MRS (6%) in mastitic milk is low compared to occurrence of human MRSA (47%) cases in Sri Lanka. The very low isolation rate of MRCPS (0.7%) is well below the prevalence of MRSA in mastitic cows reported in several other countries. This low figure may be due to the selected population, geographic area or procedures used for identification of MRS. In order to confirm the prevalence of MRS in bovine mastitic milk, all the isolates are being tested using a more sensitive Polymerase Chain Reaction (PCR) technique to identify the presence of *mec-A* gene. Despite the low prevalence of MRS observed in this study continuous surveillance of methicillin resistance is important.

SEMEN QUALITY AND FERTILITY OF DONOR BULLS AT THE CENTRAL ARTIFICIAL INSEMINATION STATION, SRI LANKA

W.W. Abeygunawardana¹, W.D. Abeywansa², P.A.B.D. Alexander³ and P.G.A. Pushpakumara³

¹*Central Artificial Insemination Station, Kundasale*

²*Veterinary Research Institute, Gannoruwa, Peradeniya*

³*Department of Farm Animal Production and Health, Faculty of Veterinary Medicine and Animal Science, University of Peradeniya, Peradeniya*

The fertility of stud bulls used for artificial insemination (AI) plays a major role in improving the genetic make-up of the existing cattle population in Sri Lanka. As there is the sparse information on fertility of donor bulls, the present study evaluated semen characteristics and field performance of seven Friesian and ten Jersey bulls reared at the Central Artificial Insemination Station, Kundasale.

Routine semen samples collected from stud bulls were used to record the semen volume, sperm concentration and sperm motility. The hypo-osmotic swelling (HOS) test was used to test membrane integrity of sperms in fresh and post-thawed semen samples. Field performance was assessed using AI and calving registers from randomly selected veterinary ranges in the Central, Northern, North Western and Uva provinces. Means (\pm standard errors) are reported and alpha was set to 0.05 in all statistical tests.

Semen volume was significantly higher ($P < 0.05$) in Friesians (7.18 ± 0.1 ml) when compared with Jersey bulls (5.32 ± 0.1 ml) but sperm concentrations were significantly higher in the latter breed (Jersey: $1026 \pm 22.0 \times 10^6$ / ml; Friesian: $844 \pm 21.4 \times 10^6$ / ml). Sperm motility did not differ significantly ($P > 0.05$) between the two breeds in fresh (Jersey 79.6%; Friesian 78.6%) or frozen-thawed (Jersey 57.9%; Friesian 56.7%) semen. Pooled data for both breeds showed that fresh semen had a significantly higher ($P < 0.05$) percentage of HOS-positive sperms ($79.5\% \pm 1.9\%$) than thawed semen ($72.7\% \pm 1.9\%$).

A total of 12,179 calvings were recorded from 35,226 AI performed during the study period with an overall pregnancy rate (PR) of 34.6%. Mean PR with semen from Jersey and Friesian bulls were 34.2% and 36.5% respectively. There was a significant difference ($P < 0.05$) in PR between different provinces. A positive correlation ($r = 0.52$) was observed between the percentage of HOS-positive sperms in post-thawed semen and PR. Although semen traits studied were within the acceptable range, factors associated with the low PR observed at field level need to be identified.

COMPARISON OF DIFFERENT OVULATION SYNCHRONISATION PROTOCOLS ON PREGNANCY RATES OF BUFFALO AND CATTLE

E.D.M. Lasantha¹, U.P.K. Dissanayake², Indunil Pathirana^{3,4} and Noritoshi Kawate⁴

¹*Government Veterinary Office, Kahawatta*

²*Government Veterinary Office, Nivithigala*

³*Department of Animal Science, Faculty of Agriculture, University of Ruhuna, Kamburupitiya*

⁴*Department of Advanced Pathobiology, Osaka Prefecture University, Izumisano, Osaka, Japan*

Ovulation synchronisation (Ovsynch) is performed by injection of GnRH seven days before and 48 hours after PGF_{2α}. This is followed by timed artificial insemination (AI) 16-20 hours after the second GnRH injection. Intra-vaginal progesterone via controlled internal drug release (CIDR) devices may also be used with Ovsynch.

This study compared pregnancy rates of bovines in three treatment groups: (A) Ovsynch + CIDR followed by AI, (B) PGF_{2α} alone followed by AI and (C) natural oestrus followed by AI. Non-pregnant cows of temperate cross-bred (TMC, n=66) and tropical cross-bred (TPC, n=61) cattle were allocated to each of the three groups (so that n≈20 per group). Buffalo (n=48) were only allocated to groups A and B.

Cows in group-A were injected with GnRH analogue [fertilerin acetate, (FA) 100 μg] intramuscularly (IM), followed by insertion of a CIDR (day 0). PGF_{2α} analogue (cloprostenol 500 μg, IM) was given on day 7 and the CIDR removed. The second dose of FA was given on day 9 and AI performed 16-20 hours afterwards. In cows of group-B, AI was performed three days after a single dose of cloprostenol. Oestrous behaviour was observed in TMC and TPC cows of group-C and AI performed on the day of oestrous. Pregnancy was confirmed by transrectal palpation three months afterwards. Chi-square tests (alpha = 0.05) were used to compare numbers of pregnant and non-pregnant animals between groups.

Pregnancy rates of TPC were significantly higher (P < 0.05) in group-A (65%) when compared with group-B (25%), but there was no difference (P > 0.05) between groups A and C (66.7%). Pregnancy rates of TMC showed a non-significant trend (P < 0.15) of being higher in group-A (60%) than in group-B (31.8%), while there was no difference between groups A and C (54.2%). Although pregnancy rates of buffalo were higher in group-A (50%) when compared with group-B (27.8%) this was not statistically significant.

In conclusion, pregnancy rates were higher with timed AI after Ovsynch + CIDR than after PGF_{2α} alone in TPC. Ovsynch + CIDR may be applied to improve pregnancy rates of buffalo in which oestrous detection is difficult.

FIELD LEVEL PERFORMANCE EVALUATION AND ESTIMATION OF HERITABILITY OF GROWTH AND FERTILITY TRAITS OF PROGENY OF AI BULLS IN KANDY DISTRICT, SRI LANKA

S.A. Seelanatha¹, C.M.B. Dematawewa² and B. Sivayoganathan³

¹*Government Veterinary Office, Teldeniya*

²*Department of Animal Science, Faculty of Agriculture, University of Peradeniya, Peradeniya,*

³*Department of Animal Production and Health, Getambe, Peradeniya*

We evaluated sires used for artificial insemination (AI) with respect to growth and fertility traits of their daughters reared under the Quality Heifer Calf Project (QHCP) in Kandy district. We also estimated heritability of growth and fertility traits.

Fourteen veterinary ranges (Udunuwara, Nawalapitiya, Yatinuwara, Pussellawa, Talatuoya, Gampola, Kundasale, Panwila, Galagedara, Galaha, Hataraliyadda, Wattedegama, Teldeniya and Harispattuwa) were randomly selected for the study. All farmers in the programme practiced small-scale semi-intensive farming. Daughter calves (n=198) were from four Jersey (J-250, J-252, J-253, J-260), one Friesian (F-408), and two Australian Friesian Sahiwal (AFS-974 and AFS-979) bulls.

Body weights (kg) of daughter heifers at 3, 6, and 12 months of age (WT3, WT6, and WT12, respectively) were estimated as growth traits using a standard weigh band. Information on sire, dam, age at first AI (AFI), age at first conception (AFCP) and age at first calving (AFCL) of progeny were individually recorded. The progeny means of sires and sire breeds were compared using analyses of variance (ANOVA) followed by Duncan's new multiple range test (at $\alpha=0.05$). Heritability was estimated for each trait using half-sib analysis (sire model) assuming dams and non-genetic effects as random.

Overall means of WT3, WT6 and WT12 of heifers were 68.0 kg, 124.81 kg, and 216.13 kg, respectively. Over 85% of heifer calves reached the WT12 target (180 kg) of the QHCP project. The highest mean WT12 (220.1 kg) of progeny of the Friesian sire was significantly higher than those of AFS sires but not significantly different from those of Jerseys. The highest mean WT3 and WT12 were recorded in Nawalapitiya and WT6 in Udunuwara.

The AFS breed recorded significantly higher AFI (558.1 days) and AFCP (580.8 days) values compared with Friesian (494.2 and 509.3 days) and Jerseys (511.1 and 507.6 days), respectively. Thus, the Friesian sire was superior in all measured traits. Overall mean AFCL was 804.80 days with no significant differences among sires. The heritability estimates for WT3, WT6, WT12, AFI, AFCP and AFCL were 0.29, 0.16, 0.28, 0.16, 0.21 and 0.07, respectively. Low estimates of heritability for growth traits indicate high environmental variability present at field level.

EVALUATION OF GROWTH TRAITS OF PROGENY OF AI BULLS IN THALAWAKELE VETERINARY RANGE, SRI LANKA

S. Sukumar¹, C.M.B. Dematawewa² and S.Sheromiha²

¹*Government Veterinary Office, Thalawakele*

²*Department of Animal Science, Faculty of Agriculture, University of Peradeniya, Peradeniya*

Artificial insemination (AI) has been carried out for dairy cattle in Sri Lanka for many years, with very little follow up studies to evaluate the field level progeny performance of the individual sires and breeds used. Thus, this study was launched in 51 villages in Thalawakele Veterinary Range to evaluate calf growth traits in progeny of AI bulls.

All farmers considered in this study practiced semi-intensive management, providing CO-3 grass and limited amounts of concentrates to cattle. Information on calf identity, sire breed, sire identity, dam breed, parity, date of birth, weights of calf at birth (BWT), three months (WT3) and six months (WT6) of age were recorded. Sire breed was either Friesian (F-411, F-416, F-417 and F-419, F-420, F431, F-436, F-437, and F-438 sires) or Jersey (J-241, J-262, J263, J-271 and J-273 sires). All dams and other non-genetic effects were assumed to be random.

Half-sib analysis procedure (using sire model) was carried out to estimate variance components and heritability for BWT, WT3, and WT6. All animals were born between years 2008 and 2010. As there were no significant effects of birth year, month or season on traits ($P > 0.05$), these fixed effects were not included in the model. Analyses of variance (ANOVA), followed by Duncan's new multiple range test, was used to compare progeny means of sires for each growth trait. Estimated heritability values (h^2) and progeny means (P) were used to predict breeding value (BV) of each sire for each growth trait using the formula: $BV = [2nh^2/(4 + (n-1)h^2)] * [P - \mu]$, where, n is the number of offspring/sire and μ is the mean of offspring population.

Heritability estimates for BWT, WT3 and WT6 were 0.27, 0.81, and 0.65, respectively. Low heritability for birth weight was due to smaller differences among sires. In general, Friesian sires recorded higher breeding values for all three traits than Jerseys. Specifically, F-419 was the best sire for BWT and WT6 while F-436 was the highest ranked for WT3. As sire rankings were found to change with the three traits, further progeny testing with more data is recommended.

PRELIMINARY INVESTIGATION OF MICROBIOLOGICAL AND COMPOSITIONAL QUALITY OF DIFFERENT TYPES OF LIQUID COW MILK AVAILABLE IN KANDY CITY LIMITS

A.M.H.Abeykoon, P. Abeynayake and R.S. Kalupahana

Department of Veterinary Public Health and Pharmacology, Faculty of Veterinary Medicine and Animal Science, University of Peradeniya, Peradeniya

With the increase of public awareness on the importance of liquid milk, milk consumption patterns in Sri Lanka is changing notably from powdered milk to liquid milk. As many types of liquid milk products have become available the objective of this study was to assess the microbiological and compositional quality of these different types of liquid milk.

We sampled four types of liquid milk (n=30), of which three types were readily available for consumption. Sterilised (n=10), pasteurised (n=6) and boiled (n=8) milk were randomly and aseptically collected from supermarkets and milk outlets in Kandy city limits; raw milk (n=6) for comparison, was also collected from sales points. Microbiological quality was assessed by aerobic plate counts, detection of coliforms, and isolation and identification of *Escherichia coli*; using standard microbiological techniques. Milk composition was assessed using the fat percentage (Gurber method) and solid non-fat (SNF) content.

Mean bacterial counts (CFU/ml) of sterilised, pasteurised, boiled and raw milk were 8.43×10^2 , 2.93×10^6 , 2.26×10^6 , and 7.01×10^6 respectively. The percentages of samples positive for *E. coli* in sterilised, pasteurised, boiled and raw milk were 0%, 33.3%, 25%, and 50% respectively. The fat content of sterilised, pasteurised, boiled and raw milk samples were 2.1%, 3.38%, 2.96% and 4.13% respectively. The SNF content was 7.77%, 7.41%, 7.09%, and 8.00% in sterilised, pasteurised, boiled and raw milk samples respectively.

Based on the requirements stated in the Sri Lanka Standards, the above findings suggest that among the three liquid milk types available as ready-to-drink products, only sterilised milk had an acceptable microbiological quality. Further, all parameters of compositional quality of milk were below standard levels except the fat content of raw milk.

GOAT PRODUCTION IN DIVULAPITIYA DIVISIONAL SECRETARIAT AREA: CURRENT STATUS, CONSTRAINTS AND POTENTIAL FOR DEVELOPMENT

M.C. Kalpani¹, C.J. Samarasinghe¹, R.M.S.B.K. Ranasinghe² and R.M.C. Deshapriya³

¹*Pet World Animal Clinic, 1/110, Giriulla Road, Badalgama*

²*Department of Livestock and Avian Science, Faculty of Livestock, Fisheries and Nutrition, Wayamba University of Sri Lanka, Makandura, Gonawila*

³*Department of Animal Science, Faculty of Agriculture, University of Peradeniya, Peradeniya*

Goat rearing plays an important role in animal husbandry in Sri Lanka. A field survey was carried out in two veterinary ranges (Kotadeniyawa and Marandagahamula) of Divulapitiya Divisional Secretariat area with the objective of collecting basic information on the current status, constraints and potential for development of goat farming. A questionnaire was administered to goat farmers (n=81) from December 2012 to February 2013.

Most farmers (90.1%) reared goats as an extra source of income and reared eight animals on average. Land area of the majority (55%) of farmers was < 60 perches. Most farmers (72.8%) practiced a semi-intensive management system while 24.0% reared goats under intensive management systems. While 97.5% of farmers provided housing for the animals only 44.4% had partitioned houses. Most (90.1 %) farmers used household labour.

The main purpose of goat rearing was to sell kids. Goat breeds reared by farmers were crosses of Jamunapari (33.3%), local crosses (34.6%), and pure Jamunapari (22.2%). Jamunapari goats had the shortest (7.31±2.44 months) and local goats had the longest (9.25±3.05 months) kidding interval. Twin pregnancies were common in Jamunapari (81.3%) but not in local (29.2%) breeds. Thus, farmers obtained more kids per year by rearing Jamunapari goats.

Major constraints were health problems in goats (26.2%), high feed cost (23.3%) and lack of knowledge (17.4%). Other constraints were lack of land availability (14.6%), inadequate manpower (14.6%) and difficulty in finding a reasonable market price (3.9%). The majority of farmers (59.2%) suggested most constraints could be overcome with financial assistance from governmental or non-governmental organisations. Some farmers (21%) were willing to have improved goat breeds instead of local breeds. Other suggestions by farmers for developing goat farming were via training programs (6.2%) and expanded market facilities (4.9%).

Although goat rearing is profitable for farmers in Divulapitiya Divisional Secretariat area they were reluctant to declare actual individual incomes. This study will provide baseline information for authorities in decision-making regarding goat development projects in the future.

PREVALENCE OF SUBCLINICAL MASTITIS IN DAIRY COWS IN WATTEGAMA MILK COLLECTING RANGE, SRI LANKA

K.M.G.M.K.K. Kulathunga¹, N.K. Jayasekara¹ and G.A. Gunawardana²

¹*Department of Basic Veterinary Sciences, Faculty of Veterinary Medicine and Animal Science, University of Peradeniya, Peradeniya*

²*Veterinary Research Institute, Gannoruwa, Peradeniya*

Rejection of milk at collecting centres is a major issue in Sri Lanka. This is largely due to high microbial counts in milk which leads to quick spoilage. Subclinical mastitis (SCM) is amaincause of this problem and information on prevalence and control of SCM is essential for production of better quality milk.

The prevalence of SCM was determined in dairy cows (n=70) of different breeds, ages (2-8 years) and in different stages of lactation, managed under similar conditions in five “Grama Niladhari” areas in Wattegama. Cows were of Jersey (n=7), Jersey cross (n=46), Friesian cross (14) and indigenous (3) breeds. All cows were apparently healthy, with normal udders and milk secretion, except for two blind quarters.

Initially, field screening for mastitis in bulk milk samples was performed using California Mastitis Test (CMT). If positive samples were obtained, CMT was performed on each quarter followed by bacteriological examinations for identification of the causative agents responsible for intra-mammary infections.

Results revealed that 11.4% (n=8) cows were subclinically infected. There were 5.4% (n=15) CMT-positive quarters among the total quarters tested (n=278, excluding 2 blind quarters). Among subclinically infected animals, 87.5% (n=8) were Jersey crosses. A higher prevalence of mastitis (62.5%) was observed in cows at 5 to 10 months of lactation than at other stages. The degree affected varied among quarters testing CMT-positive. Thus, 26.67% of affected quarters had a CMT score of +++, 46.67% had a score of ++, 26.67% scored + and others scored negative. The majority (60%) of affected quarters were hind-quarters.

Causative agents isolated were *Staphylococcus aureus*(9%), pathogenic coagulase-negative *Staphylococcus*spp. (36.36%),nonpathogenic coagulase-negative *Staphylococcus*spp. (45.45%)and *Klebsiella pneumoniae* (9%). Farmers can increase milk production by reducing the prevalence of SCM. Thus, adoption of better management practices and regular monitoring to determine the status of SCM will help farmers to increase profits.

RELATIONSHIP BETWEEN LAMENESS SCORES AND PRODUCTIVE AND REPRODUCTIVE PARAMETERS IN A MILKING HERD OF AN UPCOUNTRY DAIRY FARM

Y.H.P.S.N.Kumara¹, A.M.P.Abeysinghe¹, M.P.K.Sanjeewa² and P.G.A.Pushpakumara¹

¹*Department of Farm Animal Production and Health, Faculty of Veterinary Medicine and Animal Science, University of Peradeniya, Peradeniya*

²*Ambewela Livestock Farms (Pvt.) Ltd., Ambewela*

Lameness in dairy cows has been associated with reduced reproductive efficiency and premature culling of dairy cows leading to large economic losses. The two most important causes of digital lameness are subclinical laminitis and digital dermatitis. Routine observation of cows is important for early detection of lameness. A 5-point scoring system (1, not lame; 2, mildly lame; 3, moderately lame; 4, lame; and 5, severely lame) has been developed based on gait and back posture to score lameness in cows. The main objective of this project was to study the relationship between lameness score (LS) and calving to conception (CCI) interval of milking cows. In addition it was also investigated if lameness score has any effect on parameters such as body condition score (BCS), parity (P), cumulative milk production (CMP) and days in milk (DIM).

All lactating cows in the herd were scored once in three month intervals for five consecutive times. LS and BCS were observed during evening milking as cows went from feeding alleys to the milking parlour. Parity, dates of breeding, pregnancy diagnosis and previous calving and CMP of each cow were obtained for all animals. LS and BCS were recorded for 351 cows while CCI was available for only 215 cows. Data were log-transformed before statistical analysis if necessary.

Prevalence of lameness (LS \geq 2) of each occasion was 25.5%, 21.1%, 32.4%, 44% and 38.2% respectively. The overall prevalence of LS for the study period was 32.23%. Linear regression demonstrated that there was a significant relationship ($P < 0.05$) between LS and CCI. A significant relationship also existed between CCI and average MP and P. A subsequent analysis of variance demonstrated that average LS and DIM had significant ($P < 0.05$) effects on CMP. When cows were categorised as lame ($n=149$) and non-lame ($n=66$), CCI was significantly higher ($P = 0.027$, 183 vs. 150 days) in lame animals. Therefore we suggest that proper hoof care and appropriate management practices should be adopted to reduce the number of lame cows in the herd. This will, in turn, increase the profitability of the farm.

EFFECT OF DIETARY TRYPSIN INHIBITOR ACTIVITY ON SEVERITY OF SUBCLINICAL NECROTIC ENTERITIS AND PROTEIN DIGESTIBILITY IN BROILER CHICKENS

M.W.C.D. Palliyeguru¹, S.P. Rose² and A.M. Mackenzie²

¹*Veterinary Research Institute, Gannoruwa, Peradeniya*

²*National Institute of Poultry Husbandry, Harper Adams University, Newport, Shropshire, TF10 8NB, United Kingdom*

Necrotic enteritis (NE) is re-emerging in subclinical form with withdrawal of antibiotics from poultry feed. Previous studies identified a linear negative relationship with the severity of subclinical NE in broiler chickens with digestibility of dietary protein. Our objectives were to examine the effect of dietary trypsin inhibitor activity (TIA) at three different times of the grower period and their interactions with protein digestibility and severity of subclinical NE in broiler chickens.

Experimental diets contained 200 g/kg full-fat soya. The low-TIA diet had the total amount of full-fat soya as toasted soya and a high-TIA diet had a 100:100 mix of toasted and non-toasted soya. 15-day-old broiler chickens (N=1584) were randomly allocated to 36 pens (44 birds/ pen) and experimental diets fed for 17 days. Four birds randomly sampled from each pen were euthanized on days 5, 10 and 15. Blood, ileal and caecal contents were collected. Mucosal surfaces of duodenum, jejunum and ileum were scored for gross lesions and confirmed with histopathology. Serum was analysed with an indirect ELISA for *C. perfringens* α -toxin antibodies. A repeated-measures ANOVA within a randomised block design was used for data analysis.

There was 13.9% and 14.9% decrease ($P < 0.001$) in growth rate and feed conversion efficiency respectively in birds fed high-TIA. Pancreatic weight was higher ($P < 0.001$) throughout in high-TIA diet birds compared with low-TIA fed birds. On day five, protein digestibility was not different but caecal *C. perfringens* counts and intestinal lesion severity were higher ($P < 0.05$) with high-TIA diets compared with low-TIA diets. Serum antibody levels for α -toxin increased ($P < 0.001$) during the experimental period. Intestinal lesion severity increased up to day 10 with high-TIA diet but on day 15 no difference was observed. Ileal protein digestibility only reduced ($P < 0.05$) on day 10 when intestinal damage was severe in high-TIA birds. *C. perfringens* counts significantly reduced on day 10 in high-TIA birds with a marginal increase in serum α -toxin antibodies. Numbers of *C. perfringens* did not differ thereafter. Therefore, intestinal damage caused by *C. perfringens* could be a cause of poor protein digestibility in chicken fed raw soya diets.

GROSS AND HISTOPATHOLOGICAL FINDINGS IN CATTLE AND GOATS SLAUGHTERED AT KANDY MUNICIPAL COUNCIL ABATTOIR: A PRELIMINARY SURVEY

G.I.S. Perera¹, S.M.T.S. Manchanayake¹, H. Kothalawala¹, H. Weerakoon¹ and
N.A.Y. Wasantha Kumara²

¹*Veterinary Research Institute, Gannoruwa, Peradeniya*

²*Municipal Council, Kandy*

Meat inspection of slaughtered animals is a major responsibility of public health veterinarians to ensure food safety to the public. Usually this is done through detection of gross pathological lesions at slaughter. The objective of this study was to identify gross and histopathological lesions in tissues of slaughtered cattle and goats.

The study was conducted at Kandy Municipal Council abattoir, during August to October 2011, where cattle (n=32) and goat (n=46) carcasses were examined. Tissues with gross pathological lesions were examined macroscopically and samples collected for histopathology. Prevalence of lesions is expressed as percentages out of the total animals examined per species.

Sixteen cattle with pathological lesions were found, with lung lesions being most prevalent. Gross and histopathological examination revealed 9.4% emphysematic lungs (n=3) and 6.2% lungs with a combination of congestion, haemorrhage, emphysema and blood aspiration (n=2). A lung each was detected with abscesses, interstitial pneumonia and haemorrhagic pneumonia (3.1% each). Kidney lesions comprised multiple cysts (6.2%), nephritis (3.1%), infarcts (3.1%) and glomerulonephritis (3.1%). Liver lesions were acute and chronic hepatitis (6.2%), and a spleen was detected with severe congestion (3.1%).

Seventeen goat carcasses with pathological lesions were found. In contrast to cattle, liver lesions were more prevalent in goats. The prevalence of multifocal necrosis with parasitic migration and abscesses in liver was 8.6% (n=4). We found three livers with chronic hepatitis (6.5%), two with cysts (4.3%), and one each with abscesses, caseous necrosis and congestion/ haemorrhage (2.2% each). Lesions in lungs were congestion, haemorrhage, blood aspiration with or without emphysema (6.5%), interstitial and purulent pneumonia (2.2% each). There was multifocal necrosis with parasitic migration in kidneys (4.3%), and a subcutaneous lesion in a thigh revealed an abscess (2.2%).

These results are comparable with similar local studies conducted previously. Although zoonotic conditions have been detected previously they were not found in the present survey. In both species, some conditions were best detected through histopathology, indicating that even minor changes in gross appearance in tissues require adequate attention; hence, thorough meat inspection is essential.

THE PREVALENCE OF CLINICAL AND SUBCLINICAL MASTITIS IN DAIRY COWS IN THE BADULLA DISTRICT OF SRI LANKA

S.J.M.R.R. Samarakoon, W.M.S.K. Karunaratne

Veterinary Investigation Centre, Badulla

There is sparse information on the status of mastitis in dairy cows in Sri Lanka. The objectives of this study were to determine the prevalence and aetiological agents of mastitis in dairy cows in the Badulla district and to recommend treatment based on effective antibiotics.

The study was conducted in 2012. Twelve veterinary ranges in Badulla district and 30 farms/range were selected by random cluster sampling (n=358 farms). Farmers had an average 3-5 cows/unit and a total milk yield of >10 L/day. Questionnaires were administered to gather information on farm management and production. Milk samples (n=1859) obtained from dairy cows (n=745) were tested using California Mastitis test (CMT) for subclinical mastitis (SCM) and by strip cup test for clinical mastitis (CM). Milk samples positive (n=221) for SCM (CMT score > 2+) or CM were cultured and isolated organisms tested for antimicrobial sensitivity.

Farms were from both village-level (38.8%) and estate-level (61.2%). Both intensive (52.2%) and semi-intensive (47.4%) management practices were used. The prevalence of mastitis in farms was 55% (n=197). The majority (59%) of farmers had poor knowledge about farm hygiene and management.

The overall prevalence of mastitis in cows was 37.3% with 31.9% SCM (n=238) and 5.4% (n=40) CM. The prevalence of mastitis in cows managed intensively and semi-intensively was 32% and 29.3% respectively. The highest prevalence of mastitis (67%) was in cows producing > 5 L/day. There were significant associations between presence of mastitis and knowledge of farmers ($P < 0.0001$), management condition ($P < 0.0001$), and shed-hygiene ($P < 0.0001$).

The majority of mastitis cases were caused by *Staphylococcus aureus* (52.4%), which was sensitive to cloxacillin, doxycycline and oxytetracycline. *Klebsiella* sp. was found in 13% of cases and was only sensitive to enrofloxacin. Other organisms isolated were *Escherichia coli* (8.3%), *Streptococcus* sp.(5.3%), *Pasteurella* sp.(4.7%), *Corynebacterium* sp. (4.2%), *Proteus* sp. (2.9%) and *Candida* sp.(1.2%).

Key findings were: high-producers were more prone to mastitis; high levels of antimicrobial resistance in causative agents; mycotic mastitis was unresponsive to antibiotics but was self-limiting. In conclusion, appropriate treatment needs to be coupled with farmer education to control mastitis.

CHARACTERISTICS OF LACTATION CURVES OF CROSSBRED CATTLE IN THE THALAWAKELE VETERINARY RANGE, SRI LANKA

S. Sukumar¹, C.M.B. Dematawewa² and S.Sheromiha²

¹*Government Veterinary Office, Thalawakele*

²*Department of Animal Science, Faculty of Agriculture, University of Peradeniya, Peradeniya*

Performance evaluation is essential to achieve genetic improvement in local dairy cattle. However, complete 305-day lactation records of cows without any missing daily yields are often not available at the field level. Lactation curves built from available daily yields can be used to estimate missing yields, total (305-day) yield, peak yield and performance of individual cows and breeds. Therefore, this study was carried out in 51 villages of Thalawakele veterinary range in Nuwara Eliya district to model lactation curves for pure Friesian, pure Jersey and crossbred cattle at field level.

All cows were managed semi-intensively, and many were fed CO-3 grass with limited amounts of coconut poonac as the main concentrate. All farmers carried out milking twice daily. Morning and evening milk yields (n=12,688) of first parity cows was used for non-linear regression analysis. Wood's formula [$Y_t = at^b \exp(-ct)$; where Y_t is the daily yield at t^{th} day in milk and a , b , and c are parameters] was fitted for morning and evening yields and daily total yields separately for Friesian, Jersey and crossbred cows. Total (305-day) lactation yield and peak yield were derived using the estimated model parameters.

Morning milk yield was found to be about 59.4% of the mean daily total of 11.7 litres per cow. Wood's model was found to fit satisfactorily for daily yields as well as morning and evening yields. For all breeds combined, estimates of parameters a , b , and c were 3.56, 0.24, 0.003 for morning yield, 2.33, 0.25, 0.004 for evening yield and 6.00, 0.25, 0.004 for total yield, respectively. Parameter estimates of a , b , and c for total yield of Friesian cows were 7.45, 0.21, 0.003, while the respective estimates for Jersey cows were 6.17, 0.21, and 0.003. For crossbred cattle, estimates of a , b , and c were 4.23, 0.30, and 0.004, respectively. Friesian cows were clearly superior with a peak yield of about 15 litres compared to a 14 litre peak of Jersey cattle. The present study shows that pure Friesian cows perform much better than pure Jersey and crossbred cows in Thalawakele range.

EVALUATION OF NUTRITIONAL AND GRADING QUALITY OF LOCALLY PRODUCED MAIZE

W.A.S.D.Weerasooriya¹, N.Priyankarage², S.P. Gunaratne³, S.S.P.Silva², H.Atapattu² and R.A.T.Chandima²

¹*Government Veterinary Office, Weerambagedara*

²*Veterinary Research Institute, Gannoruwa, Peradeniya*

³*Department of Farm Animal Production and Health, Faculty of Veterinary Medicine and Animal Science, University of Peradeniya, Peradeniya*

Maize is the main cereal grain used for animal feed, with approximately 60% of the total world maize production utilised for feed production. Due to a recent large-scale maize cultivation programme, almost all the maize requirement of Sri Lanka is now produced locally. Yet there appears to be very little information about quality of local maize which is necessary for accurate feed formulation given the fact that quality may vary depending on factors such as climate, post-harvest handling and storage conditions. The objective of the present study was to gather baseline information on nutritional and grading quality of maize and compare them with reference values.

Maize samples (n=200) were collected from different locations in areas under cultivation during the “maha” season and through the supply chain (maize collectors, dealers, sub-dealers and feed manufacturers). Proximate composition, grading qualities (bulk density, sound seeds, damaged seeds, foreign material), and mineral composition of collected samples were analysed descriptively using Genstat Discovery Edition 3.

Dry matter, protein, fibre, fat, ash and nitrogen-free extract levels of local maize are 89.69%, 7.06%, 2.87%, 4.10%, 1.46% and 74.18 respectively. Ranges of grading qualities are as follows: bulk density 673 – 888; sound seeds 13.8 -100.0%; damaged seeds 0.0 - 83.9%; immature seeds 0.0 – 21.6%; and foreign material 0.0 – 4.3%. Mineral contents of locally grown maize were: calcium 0.323 g/kg; magnesium 0.374 g/kg; phosphorus 2.844 g/kg; zinc 0.035 g/kg; copper 2.020mg/kg; and cobalt 1.027 mg/kg.

Comparison with reference values revealed that there is no significant difference of either nutritional or grading quality between local and imported maize. Higher bulk density was observed in local maize which may be due to the low moisture content in analysed samples. As local maize is comparable to imported maize in terms of grading and nutritional quality, reference values can be used for feed formulation.

THE USE OF SIMPLE HEAT TREATMENT AND MICROWAVE TREATMENT AS METHODS TO CONTROL HYDROLYTIC RANCIDITY IN RICE BRAN

W.A.D.V. Weerathilake¹, S.S.E. Ranawana¹, N.R. Abeynayake² and A.N.F Perera³

¹*Department of Livestock and Avian Science, Faculty of Livestock, Fisheries and Nutrition, Wayamba University of Sri Lanka, Makandura*

²*Department of Agribusiness Management, Faculty of Agriculture and Plantation Management, Wayamba University of Sri Lanka, Makandura*

³*Department of Animal Science, Faculty of Agriculture, University of Peradeniya, Peradeniya*

Rice bran, although available in high quantities, remains underutilized as an animal feed in Sri Lanka due to poor quality. A main reason for reduction in quality is development of rancidity by release of free fatty acids (FFA) during storage. The objective of this study was to evaluate effects of microwave and simple heat treatment of rice bran before storage, on the rate at which rancidity develops.

Raw and parboiled rice bran, obtained by milling raw and parboiled paddy of variety BG 358, were treated with either microwave heat or simple heat (pan roasting) and samples were analysed for FFA at weekly intervals up to eight weeks of storage. The experiment was conducted as a 2×3 factorial design with the main factors being type of rice bran (raw or parboiled) and stabilisation treatment (microwave treatment or simple dry heat treatment). Suitable controls were applied throughout the study and treatment effects were estimated using an analysis of variance. Rice bran with a FFA level of 12% (12 g/100g fat) or more was considered unsuitable even for feeding ruminants.

All three treatments, alone or in combination, significantly ($P < 0.05$) retarded the rate of FFA release when compared to raw, untreated rice bran. The combination of parboiling and microwave treatment was the most effective. Raw and microwave heating was the second most effective treatment followed by parboiled-simple heat and raw-simple heat. Parboiled-microwave treated samples remained below the critical level of 12% FFA even after eight weeks of storage. The time taken for the other combinations to reach this value (12% FFA) was seven weeks for raw-microwave, three weeks for parboiled-simple heat and two weeks for raw-simple heat. In control samples, both parboiled and raw rice bran, reached the critical level within the first week although the parboiled control was an improvement on the raw control.

It was concluded that parboiling, simple heat or microwave heat all retard the development of rancidity in rice bran to different degrees. These findings could be used with suitable modifications in the milling and storage processes to improve the quality of rice bran available for animal feed.

AN OUTBREAK OF HAEMONCHOSIS DUE TO POSSIBLE ANTHELMINTIC RESISTANCE IN A GOAT FARM IN THE NORTH WESTERN PROVINCE OF SRI LANKA

A.M.H. Abeykoon¹, J.K.H. Ubeyratne¹, M.D.N.Jayaweera¹, N.D. Senasinghe¹,
J.M.R.V. Wijayarathna¹, A.M.D.S. Karunaratna¹, L.M.P. Wijemanne² and
G.M.C.R. Karunaratne³

¹*Veterinary Research Institute, Gannoruwa, Peradeniya*

²*Veterinary Investigation Centre, Chilaw*

³*Veterinary Investigation Centre, Wariyapola*

We report the results of an epidemiological investigation of an outbreak of haemonchosis in a goat herd in the North Western province of Sri Lanka. The index case was seen in the 9-10 month age group immediately after the start of the wet season. Three deaths occurred in this age group which comprised 11 animals. The disease spread later to the 1.5 year and < 4 month age groups accounting for two and five deaths of 144 and 45 animals respectively. Clinical signs in affected animals were submandibular oedema (bottle jaw), lethargy, weakness and anaemia. Postmortem examination of three animals revealed large numbers of adult *Haemonchus contortus* in two abomasa and strongyle-type eggs in the faeces of 30/71 animals before treatment with ivermectin (0.2-0.3mg/kg).

Albendazole (7mg/kg) had been routinely used in the farm for kids under three months. This was followed by a combination of levamisole and oxclozanide in the entire adult herd (N=457) at a frequency of three months. Animals of all age groups were allowed to graze on the same field.

Use of ivermectin during the current outbreak reduced mortality and prevented the occurrence of further clinical cases. Faecal samples of 29 animals (12 from animals aged < 4 m; three from animals aged 9-10 m; 14 from adults) and blood samples of 21 animals (five from animals <4m, five from animals aged 9-10m and 11 from adults) were tested two weeks after treatment with ivermectin. Only 14% (n=4) of the faecal samples were positive for strongyle-type eggs but the majority were anaemic despite concurrent supportive treatment with vitamin B-12. Packed cell volumes were < 20% in 86% (n=18) of tested animals, and 47% had haemoglobin levels of <6.5g/dL. Plasma protein levels were within the normal range in most animals but 19% (4/21) had marginally low levels (<6.1-7.5g/dL).

Collation of clinical, laboratory, epidemiological and environmental evidence indicate the possibility that this outbreak of haemonchosis may have been due to development of resistance to routinely used anthelmintics (albendazole, levamisole and oxclozanide). Treatment with ivermectin was effective in controlling this outbreak.

ADAPTATION AND PROPAGATION OF FOOT AND MOUTH DISEASE VACCINE SEED VIRUSES FROM LOCAL FIELD VIRUS ISOLATES

S.A.E. Abeyratne, H. Kothalawala, S. Puvanendiran, J.M.K.G.K. Jayasundara,
H.A. Wijithasiri, W.M.M.B.K. Jayathilake and M.M.P.S.K. Chandrasena

Animal Virus Laboratory, Veterinary Research Institute, Polgolla, Kandy

Foot and mouth disease (FMD) is an endemic viral disease of ungulates in Sri Lanka. This virus (FMDV) has seven serotypes (O, A, C, SAT 1, SAT 2, SAT 3, and Asia 1), of which only “O” is prevalent in Sri Lanka at present. As Sri Lanka is targeting control and eradication of FMD via vaccination, it is important to use field isolates as vaccine strains. Field isolates of FMDV need to be adapted for growth in cell culture for propagation and maintenance as a virus antigen bank to be used in vaccine production. This study was carried out to develop vaccine seed cultures from local field isolates by adapting them to grow in BHK₂₁C₁₃ cell line that was certified to be free from other viruses and *Mycoplasma* spp.

Six samples were obtained from animals suspected to be infected with FMDV from various regions in Sri Lanka. It was determined that these field samples contain FMDV serotype “O” by subjecting them to Reverse Transcriptase Polymerase Chain Reaction (RT-PCR) with type “O” specific primers. A typing ELISA tested negative for types “A” and “Asia 1”.

The samples were then homogenised, centrifuged and 1ml of supernatant was diluted ten times in cell culture medium and adsorbed to a BHK₂₁C₁₃ monolayer. Viruses were adapted to show characteristic cytopathic effects in < 12 hours by carrying out 5-17 passages. These cultures were again subjected to RT-PCR to confirm the presence of FMDV and the infective titre and cell culture infectious dose 50 (CCID₅₀) were determined. Only three of the six samples were able to grow in BHK₂₁C₁₃ monolayer. These three FMDV isolates were then subjected to adaptation in BHK₂₁C₁₃ suspension cell culture. Two of the three isolates showed satisfactory adaptation for growth in suspension cell culture. These two FMDV isolates, which were isolated from Waharai and Oddusuddan, are suitable as seed viruses for vaccine production and one isolate is being used at present for production of the FMD vaccine.

METHYLENE BLUE STAINING FOR IDENTIFICATION OF LYMPHOCYSTIS DISEASE VIRUS IN GOLDFISH (*Carassius auratus auratus*)

D.P.N. De Silva¹ and J.L.C.S. Perera²

¹*Department of Aquatic Resources and Technology, Faculty of Animal Science and Export Agriculture, Uva Wellassa University, Badulla*

²*Sky Pet Animal Hospital, Sri Lanka Air Force, Borella, Colombo 08*

Lymphocystis, a disease caused by Family *Iridoviridae*, results in hypertrophy of fibroblast cells with nodular overgrowths from fish skin. Conventionally, lymphocystis is diagnosed by histopathology, but drawbacks of this method are that it is expensive, time consuming, and needs specialised equipment and training. The objectives of this study were to identify cellular characteristics of lymphocystis disease virus (LCDV) using methylene blue staining and to evaluate the specificity and sensitivity of methylene blue staining for LCDV.

Nodules were surgically removed from goldfish (*Carassius auratus auratus*) infected with LCDV (n=5). Impression smears from nodules of an infected fish were stained with 0.05% methylene blue for one minute. The same sample was used for making haematoxylin and eosin stained histological sections. Five smears from the LCDV-positive samples and five smears from tissue of a normal goldfish were prepared. Three trained investigators who were blind to the disease state assessed the samples. Results were analysed for sensitivity and specificity.

Specific features of LCDV-infected tissues were identified as the presence of hypertrophied fibroblast cells with basophilic, thin, hyaline capsules and irregular intracytoplasmic inclusion bodies. The average sensitivity and specificity of the methylene blue staining method was 0.73 and 0.87 respectively. There were no major differences in detection of LCDV between histopathological sections and methylene blue stained smears but the latter method was rapid and less expensive.

In conclusion, 0.05% methylene blue staining can be applied as an accurate, rapid and less-expensive diagnostic method for lymphocystis in goldfish. It is a further advantage that aquaculturists can be trained to use this method for diagnosis of LCDV as it requires less technical expertise and specialised equipment.

SURGICAL REMOVAL OF INFILTRATIVE LIPOMA IN IRIDESCENT SHARK (*Pangasianodon hypophthalmus*)

S.R.D. Fernandopulle¹, N.U. Aluthgedara¹, S. Batuwita² and U.Edirisinghe²

¹*Four Paws Animal Hospital, 12/22, Pathima Lane, Kochchikade*

²*Department of Animal Science, Faculty of Agriculture, University of Peradeniya, Peradeniya*

Infiltrative lipomas are generally slow growing tumours which are difficult to remove completely by surgical excision because of their infiltrative nature. Therefore, the recurrence rate of such tumours is very high and as they are slow growing, recurrence may not become clinically apparent until after several years.

Two tank-reared, six-year-old iridescent sharks (*Pangasianodon hypophthalmus*) were presented with the complaint of abnormal tissue masses. In one fish, a mass with a diameter of 5 cm was seen mid-ventrally in the abdomen, while the other showed a mass with a diameter of 6 cm at the base of the caudal fin. Surfaces were smooth on external examination and a few small nodules were observed on dorsal and caudal fins. Both fish were clinically normal and showed a good appetite. In addition to these two, several other fish (N=30) from the same pond too showed similar masses.

The fish were put into a 20 litre container with clean water aerated using an aquarium aerator and 100% clove oil was added at the dose rate of 0.05 ml/l. Within four minutes, the fish were sedated and lost balance. The dose was gradually increased by adding 0.05 ml at a time until they were completely anaesthetised. The masses were then surgically removed and absorbable sutures (2-0 vicryl) were used to suture exposed muscles and skin. Tetracycline ointment was applied on the wound, and 40 mg of enrofloxacin was administered intramuscularly, ventral to the dorsal fin. The fish were then transferred into another container with clean, aerated water. They recovered after seven minutes and were transferred to a tank with methylene blue (5ppm). After six days, the wounds had healed well and both fish were discharged. Histopathology of the excised masses confirmed infiltrative lipoma.

A CASE OF PERITONEAL PERICARDIAL DIAPHRAGMATIC HERNIA IN A DOG

H.A.S. Hapuarachchi, R. Hettiarachchi, J. Balasubramanium, T. Mathota and
S.C. Wanniarachchi

PetsVcare Animal Hospitals, No. 35, Staple Street, Union Place, Colombo 02

A one-year-old, male, Rhodesian Ridgeback dog was presented with a complaints of emaciation despite a normal appetite, watery faeces, and frequent vomiting. Haematological parameters were normal and the differential diagnoses included exocrine pancreatic insufficiency (EPI) and the patient was immediately put on a treatment regimen for EPI. Treatment for EPI with “Unienzyme” (Unichem Laboratories, India), 1 tablet t.i.d., with meals, for 14 days showed little improvement and the patient continued to vomit.

Thoracic radiography visualised the heart as a massive lump, yet no enlargement of cardiac muscles was shown with electrocardiography. A barium meal x-ray revealed diaphragmatic hernia with intestinal loops surrounding the heart.

A laparotomy was performed for the surgical correction of the defect. The liver, spleen and loops of the proximal convoluted part of the small intestine were herniated through an opening of the diaphragm to the thoracic cavity. The heart was smaller than normal and completely enclosed within these abdominal organs. During surgery, these ectopic organs were detached carefully and placed in the abdominal cavity. The patient was given intermittent positive pressure ventilation via an endotracheal tube and the diaphragmatic opening was carefully sutured. Negative pressure was re-established inside the thorax before the patient was allowed natural breathing.

The animal was kept under a broad spectrum antibiotic, a sedative and diuretic (ceftriaxone 20 mg/kg, diazepam 1 mg/kg, and furosemide 4 mg/kg, respectively) for one week postoperatively. No oral feeding was allowed during the first three days and the patient was managed by intravenous fluids. Postoperative radiographs showed normal topography of both thoracic and abdominal organs. The patient was discharged seven days post-surgery and regular monitoring over another three weeks showed complete recovery.

ARTERIAL THROMBOEMBOLISM CAUSED BY *Strongylus vulgaris* LARVAL MIGRATION IN A THOROUGHBRED HORSE: A CASE REPORT

A.C. Karawita¹, H.M.H.S. Ariyaratna¹, W.D.D. Fernando¹, K. Nizananthan²,
A.A.A.W.K. Amarasinghe², L.N.A. de Silva², R.P.V.J. Rajapakse¹, W.R. Jayaweera¹ and
G.S.P. De S. Gunawardena¹

¹*Department of Veterinary Pathobiology, Faculty of Veterinary Medicine and Animal Science,
University of Peradeniya, Peradeniya*

²*Department of Farm Animal Production and Health, Faculty of Veterinary Medicine and Animal
Science, University of Peradeniya, Peradeniya*

Strongylus vulgaris, a highly pathogenic nematode in horses, can cause arteritis due to larval migration in the cranial mesenteric artery. This paper describes the clinical and postmortem findings of a thoroughbred horse infected with *S. vulgaris*.

A ten-year-old, male, thoroughbred horse, imported from India, showed sudden signs of severe acute colic after evening exercise. The horse died despite medical treatment and a complete necropsy was performed the following day.

Generalised haemorrhages were observed in viscera of the thoracic and abdominal cavities including the endocardium, mucosal surface of the trachea, and serosal surface of the large intestine and kidneys. A thrombus was observed at the root of the cranial mesenteric artery. The arterial wall of the thrombus attachment site was rough and thickened. Slender nematodes (1.5–2.5 cm in length) isolated from the thrombotic mass were identified as pre-adult larvae of *Strongylus vulgaris* based on morphological characteristics. The mucosal surfaces of the distal ileum and the body of the caecum were reddish-purple indicating necrosis. The caecal contents were mixed with blood.

These findings indicate that larval thromboembolism resulted in the obstruction of the ileocolic branch of the cranial mesenteric artery leading to necrosis of the caecum and distal ileum. This appears to be the first report on arterial thromboembolism caused by *S. vulgaris* larval migration resulting in death of a horse in Sri Lanka. These findings also emphasise the need for control of gastrointestinal nematode infestation in horses.