ANNUAL SCIENTIFIC SESSIONS
OF
THE SRI LANKA VETERINARY ASSOCIATION

07th April 2011

PROGRAMME AND ABSTRACTS OF SCIENTIFIC PAPERS

(To be published as a supplement to the Sri Lanka Veterinary Journal for the Annual General Meeting in May 2011)

Institute of Continuing Education in Animal Production and Health
Gannoruwa

63rd Annual Scientific Sessions
of
The Sri Lanka Veterinary Association

07th April 2011

Institute of Continuing Education in Animal Production and Health
Gannoruwa

PROGRAMME

08.30 – 09.00	*Registration*
09.00	*Arrival of chief guest: Mr. A.H. Gamage : Secretary, Ministry of Livestock & Rural Community Development*
09.10	*National Anthem, Lighting of oil lamp*
09.20	*Welcome address by the President, SLVA*
09.30	*Address by the Director General, Dept. Animal Production & Health*
09.35	*Address by the Director General, Dept. Wildlife Conservation*
09.40	*Address by the Dean, Faculty of Veterinary Medicine & Animal Science*
09.45	*Address by the Secretary, Ministry of Livestock & Rural Community Development*
10.00 -10.30	*Tea/Refreshment*
10.30	*Keynote address-1: Mr. R. Andrew Wilbey (BSc, MSc, CSci, FIFST)*
11.00	*Keynote address-2: Dr. R. Mahendran (BVSc, MBA)*
11.30	*Keynote address-3: Dr. Prithiviraj Fernando (MBBS, MS, PhD)*
12.00 – 13.00	*Lunch*
13.00 – 15.00	*Scientific Sessions (Parallel Programme)* ▪ *Animal Production – Small Auditorium (First Floor)* ▪ *Animal Health and Clinical Presentations – Main Auditorium*
15.00 – 15.30	*Tea/Refreshments*
15.00 – 17.30	*Scientific Sessions (Parallel Programme)* ▪ *Reproduction and Breeding – Main Auditorium* ▪ *Fish and Wildlife – Small Auditorium (First Floor)*

13.00 – 15.30 ***Animal Production – Small Auditorium (First Floor)***
Chairperson – Dr. Anura P. Jayasooriya
Co-chairperson – Dr. Madura Munasinghe

13.00 – 13.12 Serological Status of Antibodies Against Rinderpest Virus in Areas with Historical Outbreaks
B. D. R. Wijewardane, S. A. E. Abeyratne, H. Kothalawala and H. A. Wijithasiri

13.12 – 13.24 Effect of Storage Time on Quality of Backyard Chicken Eggs in Rathnapura District
K. W. K. B. P. N. K. Kelanibandara, J. K.Vidanarachchi and A.Colonne

13.24 – 13.36 Investigation of Parasitic Infections in a Buffalo Herd at Boralanda Government Farm
S. J. M. R. R. Samarakoon, R. P. V. J. Rajapakse and A. Dangolla

13.36 – 13.48 Topo-Typing of Foot & Mouth Disease Virus Isolates in Sri Lanka by RT-PCR & Genetic Sequencing
S. A. E. Abeyratne, B. D. R.Wijewardane, R. Chanthadee, P. Thongtha, H. Kothalawala and H. A.Wijithasiri

13.48 – 14.00 Fresh Cow Milk Consumption Pattern among Dairy Farmers in Embilipitiya Veterinary Range
M. I. G. Jayathilaka and J. Jayatissa

14.00 – 14.12 Proposed Pathogenesis of Sub-Clinical Necrotic Enteritis Studied in a Spontaneous Disease Model Similar to the Disease Occurrence in the Broiler Chicken Industry
M. W. C. D. Palliyeguru and S. P. Rose

14.12 – 14.24 Preliminary Survey on Household Buffalo Curd Producers in Embilipitiya Veterinary Range
S. M. Dassanayake

14.24 – 14.36 Histomoniasis Causing High Mortality in a Commercial Turkey Farm
U. K. S. P. Alexander, Nimal Jayaweera, Padmani Bandara and Kamalika Uberathna

14.36 – 14.48 A Comparative Study of Haem-Agglutination Inhibition Test (HI) and Enzyme-Linked Immuno Sorbent Assay (ELISA) in Detection of Antibodies against Newcastle Disease Virus in Commercial Chicken
S. A. E. Abeyratne, H. Kothalawala, S. Ralapanawe, H. A. Wijithasiri and G. B. K. Dilrukshi

14.48 – 15.00 Dietary Protein Digestibility and the Severity of Sub-Clinical Necrotic Enteritis in Broiler Chickens
M. W. C. D. Palliyeguru, S.P. Rose and A. M. Mackenzie

15.00 – 15.12 Serological Evidence of Swine Influenza Type A in pigs in Sri Lanka
S. A. E. Abeyratne, H. Kothalawala, S. Ralapanawe, H. A. Wijithasiri, G. B. K. Dilrukshi and K. D. Herathge

15.12 – 15.24 Diagnosis of Poultry Diseases Presented to the Veterinary Investigation Center Pannala in year 2010
L. M. P. Wijemanne

13.00 – 15.00 ***Animal Health and Clinical Presentations – Main Auditorium***
Chairperson – Prof. I. D. Silva
Co-chairperson – Dr. K. A. N. Wijayawardhane

13.00 – 13.12 Rickettsial Infection in Dogs in Selected Locations in Kandy District, in Sri Lanka
R. H. S. L. Ranasinghe, A. W. D. S. Karunarathne, S. Wickramasinghe, and R. P.V.J. Rajapakse

13.12 – 13.24 Diagnosis and Treatment of Congestive Heart Failure due to Dilated Cardiomyopathy in Dogs-Three Case Studies
I. D. Silva, H. K. D. I. A Ratnayake, S. J. Wijesinghe, W. P. T. T. Weerasinghe, W. A. D. C. H. Wickramasinghe, I. N. A. Wickramasinghe, D. D. N. De Silva, T. S. Wanniarachchi and A. Dangolla

13.24 – 13.36 Retrospective Study on Clinical Features, Therapy and Epidemiology of Snake Envenomation in Dogs Admitted to Veterinary Teaching Hospital
M. Gobikrushanth, H. E. Abeygunawardena, A. M. R. Bandara and I. D. Silva

13.36 – 13.48 Aberrant Migration of *Spirocerca lupi* in the Spinal Cord of a Dog
K. A. N. Wijayawardhane, G. S. P. De S. Gunawardena, D. D. N. De Silva, I. D. Silva and A. Arulkanthan

13.48 – 14.00 A Retrospective Analysis of Antimicrobial Resistance among Bacteria Isolated in a Veterinary Microbiology Laboratory
A. W. M. K. K. Bandara, S. S. S. De S. Jagoda, D. R. A. Dissanayake, T. G. Wijewardana and T. P. M. S. D. Bandara

14.00 – 14.12 Treatment with Uterine Irrigation for the Pyometra of Przewalskis Wild Horse (*Equus caballus przewalskii*)
L. A. J. P. K. Jayasekara, D. S. Kodikara, S. Mendis and R. Jayalath

14.12 – 14.24 The Existence of the Concept of Zoonosis in Buddhist Writing
M. J. K. Gunasekera

14.24 – 14.36 Surgical Correction of Chronic, Recurrent Cervico-Vaginal Prolapse in A Sindhi Crossbred Cow by Internal Fixation of the Uterus
B. S. S. Perera, D. M. S. S. Dassanayake, Y. Saranga and D. D. N. L Wimalasooriya

14.36 – 14.48 Ovariohysterectomy of Rabbits Using Isoflurane
H. K. Umasha S. Hemachandra and D. M. Siriwardana

14.48 – 15.00 Use of a Simple Rope Harness in the Correction and Prevention of Vaginal Proplase in Cows
N. Yazeevan, A. M. P. Abeysinghe, A. A. A. W. K. Amarasinghe, G. D. R. K. Perera, P. G. A. Pushpakumara and L. N. A. De Silva

15.30 – 16.30 ***Reproduction and Breeding – Main Auditorium***
Chairperson – Prof. H. B. S. Ariyaratne
Co-chairperson – Dr. M. L. N. R. Deepani

15.30 – 15.42 Comparison of Mineral Status and Haematological Parameters of Friesian Calves Born through Embryo Transfer and Artificial Insemination
K. Kandeepan and B. Alexander

15.42 – 15.54 Effect of Breed, Parity and Type of Semen on Conception Rate of Artificially Inseminated Dairy Cattle in Ehaliyagoda Veterinary Range
M. I. G. Jayathilaka

15.54 – 16.06 Establishment of a Method to Produce Deep Frozen Semen from Bulls in Field Situations
G. I. Nanayakkara, W. W. B. Dilhani and G. D. R. K. Perera

16.06 – 16.18 Birth of the First Female Calf through Sexed-Semen Technology in Sri Lanka
K. G. J. S. Disnaka, G. D. R. K. Perera, K. A. G. Pathmasiri, S. C. Kaduwela, Chandrawansa Pathiraja, R. M. B. Ellegala and Basil Alexander

16.18 – 16.30 The Effect of Pregnant Mare Serum Gonadotrophin and GnRH Injection on the Litter Size of Sows
K. K. Sarath, Basil Alexander, B. M. O. Perera and P. G. Anil Pushpa Kumara

1530 - 1700 ***Fish and Wildlife – Small Auditorium (First Floor)***
Chairperson – Dr. B. V. P. Perera
Co-chairperson – Dr. C. G. Wijesinghe

15.30 – 15.42 Capture and Translocation of Trouble-Making Toque Monkeys (*Macaca sinica*) in Mahakanda: Lessons Learnt
P. P. Jayalath and A. Dangolla

15.42 – 15.54 Prevalence of Tuberculosis among Wild Elephants in Sri Lanka
B. V. P. Perera, Sara Baez Seara, Susan Mikota, B. M. A. O. Perera, P. G. A. Pushpakumara and R. P. V. J. Rajapakse

15.54 – 16.06 Mycobacteriosis: An Emerging Disease in Guppies in Sri Lanka
P. D. V. M. Perera, D. R. A. Dissanayake, A. Arulkanthan, S. S. S. de S. Jagoda and E. A. R. Edirisinghe

16.06 – 16.18 Follow up Study on Information on Elephant Keepers in Sri Lanka
K. L. T. D. Jayawardena, A. Dangolla and P. V. R .K. Kumarasiri

16.18 – 16.30 Environmental Impact of Privately Owned Cattle Inside Bundala National Park, Sri Lanka
R. G. S. T. Aluthwattha, A. Dangolla, K. B. Ranawana and R. Chandrajith

16.30 – 16.42 Changes of Total Protein and Transaminases in Haemolymph of Giant Tiger Shrimp Exposed to Ambient Ammonia
M. N. Mohamed Fouzi

16.42 – 16.54 Stereotypies in Asian Elephants (*Elephas maximus)* in Sri Lanka During Processions
A. M. P. Abeysinghe, Eranda Rajapakse and A. Dangolla

16.30 – 17.30 Posters - Lobby

1 Conservation Breeding of the Sri Lankan Rusty-Spotted cat (*Prionailurus rubiginosus phillipsi*) at the National Zoological Gardens, Sri Lanka
C. G. Wijesinghe and P. Perera

2 Restraining and Immobilizing of an Injured Porcupine for Suturing a Laceration
H. K. Umasha and S. Hemachandra

3 Investigation in to Field Case of Bovine Infectious Keratitis
N. D. T. Sirisena, U. E. Pallegama and M. A. R. Priyantha

4 Cutaneous Fibroma in Two Koi Carps (*Cyprinus carpio*)
A. W. M. K. K. Bandara, S. S. S. De S. Jagoda, A. Arulkanthan, G. S. P. De S. Gunawardena, I. P. G. H. U. Dissanayake and *W. R. Jayaweera*

5 Impact of Three Different Dietary Protein Supplements on the Incidence of Sub-Clinical Necrotic Enteritis in Broiler Chickens
M.W. C. D. Palliyeguru, S. P. Rose and A. M. Mackenzie

6 Disaster Relief Veterinary Assistance to Flood Affected Citizens in Baticaloa and Polonnaruwa Districts in Sri Lanka
S. R. D. Fernandopulle, M. G. C. M. Jayasinghe, D. A. Mapitiya and R. A. D. C. Tennakoon

7 An Unknown Outbreak of Respiratory Infection among Back Yard Poultry in Rakwana Veterinary Range
R. P. M. Pathirathna, M. I. G. Jayathilaka and D. S. Mahaarambe

Theme Seminar on Role of Veterinarian in Economic Development through Dairy Production

Milk Quality – An Opportunity for Sri Lanka to Benefit from UK Experience

Mr. R. Andrew Wilbey

The University of Reading, UK

While total UK milk production at 13 000 ML *p.a*. appears to be similar to that of forty years ago, there have been some dramatic changes in the industry. During this time the number of milk producers has declined to a fifth of those farming in 1970 and the number of dairy cows has almost halved. At the same time the milk production per cow has almost doubled and the average milking herd size has tripled. Major, often interacting, drivers for change over this period have been breed and feed, health issues, economic pressures and technical developments.

The dominant dairy breed in the UK has been the Friesian, with Jersey cows as a popular minority breed providing richer milk. Milk production by Friesians has been 'improved' by breeding with the closely related Holstein stock. Commercial milk production by other species, goats, sheep and buffalo, is at a very much lower level. With larger herd sizes and less manpower, more herds employ zero grazing methods for most if not all of the year and there is great emphasis on grass and maize silages as the basis of the feed – concentrates have become less popular with the increasing pressures on profitability.

Health issues have provided causes for concern as well as celebration when dealt with successfully. Thanks to an eradication programme, the UK has been free of Brucellosis since 1985 and there have been no confirmed cases of Enzootic Bovine Leucosis since 1996. John's disease – caused by *Mycobacterium avium* subsp. *paratuberculosis* is a low-level problem in cattle. There have been outbreaks of Foot and Mouth disease in the last 40 years, a single outbreak in 1981 on the Isle of Wight and a major epidemic in 2001, which resulted in the slaughter of 6% of the national herd. Since then the only other outbreak, in 2007, was around a research laboratory and vaccine plant. Potentially the far more serious problem was the identification of Bovine Spongiform Encephalophy, similar to Scrapie in sheep, in 1986. This resulted in a major slaughter and incineration policy with severe restrictions on the supply of meat for human consumption. Fortunately it now appears to be under control in the UK though it is too soon to be sure of its implications for the human population. Bovine Tuberculosis is providing both a health and a political problem. The original eradication policy, though originally appearing successful, has failed. This is probably due to the pool of infection in the native badger population, a protected native species that is much loved by the public.

Mastitis is a common problem with dairy animals and is of major economic importance as well as threat to animal well-being. Fortunately, a UK project to reduce somatic cell counts (SCC) was started well in advance of European Union initiatives, enabling the UK to be well placed when SCC standards became part of European milk hygiene

regulations with mean levels below 200 000 mL^{-1} though levels of ≤ 100 000 mL^{-1} are optimal for cheesemaking yields.

UK dairy farmers have had some very difficult times. Up until 1994 all milk produced in England and Wales was purchased by the Milk Marketing Board (MMB), which sold on the milk, pooled the income and divided it between the producers. This system was discontinued in the face of EU opposition and replaced by individual contracts between producer and purchaser. The situation was further complicated by over-production within the EU that was controlled by the imposition of quotas – forcing the UK, though a net importer of dairy products, to reduce its milk production.

At the same time, the expansion of supermarkets and their purchasing power was squeezing the dairy industry, reducing margins and taking over milk sales from doorstep delivery and at the same time promoting the sale of their own-brand products. Four supermarket groups now account for 75% of food sales and their demands for good quality milk with a long shelf life has been a major driver for investment in modern, more hygienic dairies, though this has only been possible through improvements in the raw milk supply.

Amidst the political and economic turmoil of the last 40 years there has been a major success in the improvements to raw milk quality that have fed through into better product quality. As with many changes there are many drivers, in this case economics and technology. In 1970 there were still many farms relying on cooling milk in 45 litre churns and these churns were being carried on open lorries. Even in the somewhat cooler UK this was not a good idea and in warm weather there were many cases of sour milk on delivery to the dairy. The change to bulk milk storage on-farm and collection in insulated tankers provided the opportunity to improve hygiene, reinforced by the introduction of automated analysis and payments based on hygienic as well as compositional quality. Providing the farmers with an economic incentive was far more successful than had been envisaged.

Most of the original work on raw milk quality was carried out by a network of central laboratories where traditional analysis was replaced by infra-red spectrometry, though the original filter-based instruments have now been replaced by Fourier-Transform Infra-Red spectrometers. Originally the plate count method for Total Viable Counts was mechanised but has now been replaced by an automated method based on flow cytometry, similar to that used for SCC. The MMB central testing laboratories have now gone but have been replaced by independent laboratories.

Looking back on the developments there are several changes that have been for the better and could be recommended for adoption elsewhere, plus of course a few practices that are best avoided. These include:

1. Education of the farmer to aid improvement of milk production and the hygiene of its handling, including the provision of clean water.
2. Payment based on hygienic and compositional quality, based on data trusted by all parties.
3. Support in maintaining the health of the cattle.
4. Refrigeration of raw milk from milking to its delivery to the dairy.
5. Hygienic handling of the milk through all stages of its treatment in the dairy.

6. Maintenance of the chilled chain, including with the retailer. Alternatively, more sophisticated processing plant to manufacture shelf-stable milks could be installed.

Though changes can be made piecemeal, it is only when the chain is complete that the benefits will show.

Theme Seminar on Role of Veterinarian in Economic Development through Dairy Production

Milk Procurement Issues, Sri Lanka

Dr. R. Mahendran

Consultant Veterinary Surgeon, Cargill's Ceylon PLC, Colombo 01

Milk production and procurement aspects in the dairy industry are inter related. Both complement each other. If the production is high the procurement methods for quality milk also will be high. In Sri Lanka we produce nearly 27% of our requirement and the balance is imported in the form of full cream milk powder and other milk products. The population has adopted to consume the imported and locally produced milk powder for the past three decades. Liquid milk consumption was on the decline due to consumers preferring the milk powder. It is evident that less than 20% of the milk is available for the formal market to collect and process. Nearly 100 mio. Liters said to be consumed in the informal market, which is debatable. There is very high competition among the procurement companies and other small processors. The intensity of the competition increases when the world market price increases and the local collection is cheaper.

The purchase price of milk in Sri Lanka is decided by the Government with the Government owned Milco Company which is the market leader of fresh milk procurement. Once the price is increased by Milco all the other procuring organizations also follow immediately to remain in the business. The organizations that provide inputs like cattle feed; mineral mixtures, deworming drugs etc. also tend to increase their product and services. From 1st of March the price was increased to Rs 50 per litre (total solids 12.5 and above). The increase was nearly 50%. This is the first time that the price is increased to such high level. The increase in previous occasions the consumer was also considered mainly, so that the price increase was very small and was not attractive to the farmer to produce more. We know that the milk procurement prices decide the volumes of production all over the world.

Our formal collection was 137 mio litres in 2010. Another 100 mio. Liters said to have been in the informal market. We have imported 75,482 MT of milk powder which is equivalent to 603 mio. Liters of milk. We have consumed 840 litres last year , percapita consumption is 115 ml. WHO recommends 180 ml and it is very low percapita consumption.

Nearly 80 % of the milk is procured by 2 large companies. There are few other companies and many other processors of value added milk products are also in the field. They follow different systems to increase the market share or even to retain the farmers. Procuring companies have organized milk collecting points at villages and potential location. In some places we find four or five companies competing for milk. Milk chilling centers have been opened in central locations to chill the milk as soon as possible. Milk producers deliver the milk to the collecting points and from the collecting points milk is transported to the CC. Here the milk is chilled to 4 degree C nearly 3-5 hours or more unlike the other countries where machine milking with chillers the milk is chilled within half an hour. Naturally the bacterial count is high in our milk compared to instant chilling. Milk Collecting point manager who has been trained is the one does the

collection. Here the honesty and integrity plays an important role. If he/she is dishonest farmers may not get a better price. The CPM is paid Rs 1-2 per litre which is not sufficient for them, they say. They get about Rs 600- 6,000 per month.

The middlemen also collect milk with their own network in the same area. The middlemen we knew earlier was a collector with a vehicle (lorry, van, motorcycle, push cycle) and a supplier no to any processor. There are some newly created middlemen by milk procuring company have started to collect milk. They accept any milk. No quality check done. They are really a threat to the established well known process companies. These middlemen are professionals who have chilling centers, bowsers processing plants. They get a premium price from the company which created them and supposed to be very rich. The benefit by the farmer is minimum. The binding with the farmer here is the credit given to the farmer. Farmer adulterates and collector accepts. He is compelled to do so. These middlemen encourage the farmers to adulterate the milk by accepting any milk and by paying a flat rate. These middlemen are experts in reducing acidity, increasing density and increasing quantity.

Milk producing COOPs are finding it difficult to continue in the business, though there are people trying to revive them. The COOP could not sustain during competition between two processors. The overheads were high. Some COOP'S trusted a businessman and bought machinery to do value added products and failed. Quality control of milk was not possible due to competition and the members were paid lower rate and the farmers switched over to others. Very big COOP's have collapsed due to these factors.

Milk price in Sri Lanka mainly based on Fat%and SNF which is fixed by Milco followed by others. Consideration for TPC, protein content etc is not considered now. The milk price charts 15 years ago gave a uniform increase for the increase in milk quality. The present chart contains slabs with price fluctuations. Most of the farmers and others are not aware that adulteration of milk will bring low income. Most of the procurement organizations are paying a flat rate to all the farmers in one colleting point or several collecting point. This encourages majority of the farmers to adulterate the milk. The best method to pay the farmers is to check individually and pay accordingly. This will help the organizations to get better quality milk. this is the method followed in India. The middleman benefits from this slab system.

The milk density in Sri Lanka is very low, 10 litres/sq km. (Nuwara Eliya 40 lits)This quantity seems to be very insufficient for so many processors to compete for milk. The milk procurement cost in addition to milk price is high during competition. The competition promotes milk extraction only. Development activities will not be carried out by processors. The processors should spend money for inputs which has to be facilitated by the state.

We have to minimize competition among the processors and rationalize the area of collection. This will encourage the processor to develop the milk and procure the milk at reasonable price equal or more than the national milk price. The farmers can get the inputs and any other welfare schemes provided by the processor. The processor can employ Veterinarians to look after the animal health and breeding aspects of the cattle. The processor is able to collect quality of milk (compositional and microbiological) from the farmers and its quality of finished product is also improved at the same time farmer gets a higher rate for his milk. The procurement cost of the processor also comes down

and the benefit could be passed on to the farmers. Transparency of milk payment could be introduced and each farmer gets his payment according to the quality of milk delivered. This process will discourage the middleman exploiting the opportunity on both sides. Close relationship with the Department of AP&H will help to provide the needs of the farmer.

Keynote Address on Elephant Conservation Issues with Special Emphasis on Population Dynamics and Genetics

Population Dynamics and Genetics of Asian elephants and Management Effects on Elephant Populations

Dr. Prithiviraj Fernando

Chairman, Trustee and Scientist, Centre for Conservation and Research, Sri Lanka and Research Associate (Smithsonian Institution, USA)

The Asian elephant is thought to have originated in Asia from a progenitor that migrated out of Africa. Mitochondrial DNA analysis of Asian elephants suggests a number of range expansion and constriction events that occurred during the glacial epoch. The highest genetic diversity in Asian elephants is found in Sri Lanka, which may have served as a refugium during glaciation events. Current distribution of mitochondrial haplotypes supports the recognition of Sumatran and Bornean subspecies but does not differentiate between the mainland subspecies and the forma typica the Sri Lankan subspecies. The Bornean subspecies was validated through genetic analysis.

The distribution of Asian elephants is thought to have extended from Iraq to China. However such a distribution if at all probably occurred only at the end of the last glaciation event. Currently Asian elephants are distributed in 13 range states and exist in a number of isolated and fragmented populations. Sri Lanka represents less than 2% of Asian elephant range but has over 10% of the population. Within the country, except for some isolated remnants in the wet zone, elephants exist largely as a single contiguous population. However, there are some local differences that may represent isolation by distance.

The past approach to management of elephants in Sri Lanka was based on restricting elephants to protected areas under the Department of Wildlife Conservation and linking them via corridors. Recent research has shown that this approach increases human elephant conflict and is detrimental to elephant conservation. The future of human-elephant conflict mitigation and elephant conservation depends on development and implementation of land-use plans, taking into consideration elephant ranging patterns, behavior and ecology.

Serological Status of Antibodies Against Rinderpest Virus in Areas with Historical Outbreaks

B. D. R.Wijewardane[1], S. A. E. Abeyratne[2], H. Kothalawala[2] and H. A.Wijithasiri[2]

[1] Veterinary Research Institute, PO Box 28, Gannoruwa and [2] Animal Virus Laboratory, Veterinary Research Institute, Polgolla

Rinderpest is a killer disease among even toed ungulates, which causes heavy losses in the livestock industry. Rinderpest was re-introduced to Sri Lanka in late 1980s. This was controlled successfully by vaccination and culling. No clinical cases have been reported for more than a decade.

This study was planned and executed as per OIE guidelines, and commenced in January 2010. It was concluded before declaration of freedom from Rinderpest by Sri Lanka. Main objective of this study was to assess the serological status of Rinderpest in areas where historical outbreaks had occurred, namely Northern and Eastern provinces, where it was not possible to carry out a proper surveillance for more than three decades.

Blood samples were collected from cattle and buffaloes above 2 years of age. Fifteen blood samples were collected (n=945) randomly from each of the functioning Veterinary ranges (65) in Northern and Eastern Provinces.

Samples were subjected to serum separation and tested for antibodies against Rinderpest by using blocking ELISA. Results were analyzed by using prescribed protocol of the manufacturer. From initial ELISA testing 11/945 samples (1.16%) gave positive reaction against ELISA. Samples which gave reaction initially were subjected to two consecutive repeat ELISA tests with duplicate samples. All samples gave negative results for antibodies against Rinderpest virus.

In conclusion, the results indicate that cattle and buffaloes in these areas are free from exposure to the infectious agent. This is corroborated by the fact that there had been no clinical cases reported for more than a decade.

Effect of Storage Time on Quality of Backyard Chicken Eggs in Rathnapura District

K. W. K. B. P. N. K. Kelanibandara[1], J. K.Vidanarachchi [2] and A. Colonne[3]

[1]*Government Veterinary Office, Department of Animal Production and Health, Opanayake,*
[2]*Department of Animal Science, Faculty of Agriculture, University of Peradeniya and*
[3]*Department of Animal Science, Faculty of Agriculture, University of Rajarata*

Egg quality comprises external and internal quality of an egg judged through shell quality, albumen quality and yolk quality characteristics. Storage time and temperature are two most important factors governing the egg quality other than age of the hen, strain, characteristics of shell, nutrition etc. Furthermore, egg quality is important to achieve maximum hatchability, better grading for manufacturing industry and to improve consumer attraction in the market.

The objective of the present work was to study the changes in external and internal egg quality characteristics in backyard chicken eggs with storage time when stored at room temperature (24-28 ^{0}C). The study was conducted in Rathnapura district. Twenty backyard farms are selected using stratified random sampling technique. From each farm, six day zero (first day after laying) eggs were collected to make 160 eggs in total. Eggs were tested at day 3, day 10 and day 17 for external quality where egg weight, height, width, and shell characteristics were measured. The eggs were broke for determination of internal quality characteristics and thick albumen height, thin albumen height, thin albumen area, thick albumen area, yolk height and yolk area measurements were taken for calculation of albumen index, albumen area index, Haugh unit and yolk index. All internal quality parameters (albumen index, albumen area index, Haugh unit and yolk index) tested were significantly changed ($p<0.05$) with storage time, whereas external quality traits remained unchanged. The deterioration of egg quality was more severe during first ten days of storage and the rate declined thereafter. Average weight (g) of a backyard chicken egg was 45.57 ±2.36. There was no weight loss when eggs were stored at room temperature in closed plastic cartons even for 17 days. Similarly, storage had no effect on shape index ($p>0.05$) and average shape index was 0.726 ±110. Average length and width (cm) of a backyard chicken egg was 5.37±0.09 and 3.90 ±0.05 respectively. With respect to the albumen quality, Haugh unit and albumen index were 66.04±2.55 and 6.290±0.453 and eggs were in average quality at day 3. Most of the quality parameters of the backyard chicken eggs deteriorated significantly, even stored for ten days at ambient temperature in Rathnapura district.

Investigation of Parasitic Infections in a Buffalo Herd at Boralanda Government Farm

S. J. M. R. R. Samarakoon[1], R. P. V. J. Rajapakse[2] and A. Dangolla[3]

[1]Veterinary Investigation Centre, Department of Animal Production and Health, Badulla, [2]Department of Parasitology and [3]Department of Clinical Science, Faculty of Veterinary Medicine and Animal Science, University of Peradeniya, Sri Lanka.

The Murrah buffalo herd at Boralanda farm in Badulla district is primarily managed to supply bull calves and heifers to farmers in order to improve the genetic potential of buffaloes in Uva province. The crucial problems identified in this farm include high mortality, lack of response to anthelmintic treatment, continuous diarrhoea, growth retardation and scarcity of proper disease investigation programme for parasitic infections. The main objective of this study was to identify the haemo-parasites and gastrointestinal parasites (both helminths and protozoa) in the above farm. The additional objectives were to monitor the seasonal variation of faecal egg counts and to introduce a cost effective anthelmintic treatment. The study was conducted from July 2009 to June 2010, and a total of 89 buffaloes were included. For convenience the animals were categorized into 3 age groups, such as less than 1 year, 1-2 years and adult groups (>2 years). Dung samples to identify helminth parasites and body weights were taken once a month in all 3 groups except in calves (less than 3 months), which were monitored twice a week. Further, blood smears and dung samples were drawn once from all animals to test for blood parasites and *Cryptosporidium* species respectively. Pasture larval count and nutritional analysis of the pasture were also performed.

The results of this study show that the buffaloes less than one year age were infected with *Toxocara vitulorum, Strongyloides papillosus*, *Strongyle* spp., *Eimeria* spp., and *Cryptosporidium* spp., while *Strongyloides*, *Oesophagostomum*, *Bunostomum, Cooperia*, *Trichuris, Eimeria* and *Cryptosporidium* were found in 1-2 year group. Further, only *Strongyle*, *Trichuris* and *Cryptosporidium* were observed in adult group. The overall prevalence of blood parasites (*Theileria* and *Anaplasma marginale*) was 75% and the highest prevalence was evident in adult animals (52.8%). Highest mean gastrointestinal parasitic egg counts were evident in less than 1 year age group while the overall prevalence of *Cryptosporidium* infection was 59.5% with a highest prevalence (41.5%) in adults. Further, there was a significant association ($P<0.05$) between the presence of *Cryptosporidium* and diarrhoea in animals less than 1 year. No significant changes in body weights in relation to faecal egg counts were observed in any groups. Albendazole and Febantel were satisfactorily effective for *Strongyle* and *Strongyloides* while development of resistance was noted in *Toxocara vitulorum* against Levamisole. Pasture larval count was increased during the rainy season and the levels of crude protein, copper and zinc were low in the pasture.

It appears that the poor performance of buffaloes at the Boralanda farm is a multi-factorial problem that includes parasitism and poor nutrition. Deworming of the animals at the age of 10 days targeting *Toxocara* and another dose of anthelmintic (aiming at *Strongyle* species) at the start of each rainy season, along with mineral supplement and fertilization of the pasture land could be recommended to rectify the problem in the above farm.

Topo-Typing of Foot & Mouth Disease Virus Isolates in Sri Lanka by RT-PCR & Genetic Sequencing

S. A. E. Abeyratne[1], B. D. R.Wijewardane[2], R. Chanthadee[3], P.Thongtha[3], H. Kothalawala[1] and H. A.Wijithasiri[1],

[1]Animal Virus Laboratory, Veterinary Research Institute, Polgolla. [2]Veterinary Research Institute, PO Box 28, Gannoruwa and [3]OIE FMD Regional Reference Laboratory, Pak Chong, Thailand

FMD Virus strains exhibits genetically and geographically distinct lineages based on genome sequence. This can be well demonstrated by analyzing the genetic sequence of 1D region (VP1 producing gene). Depending on the variance in the sequence strains can be broadly categorized in to Topo-types, which is one of the selecting criterions of appropriate vaccine strains, in determining the foci & route of spread of an outbreak and as a diagnostic test for typing. This study was undertaken in order to establish the technology and to identify the Topo-types present in Sri Lanka.

Three foot and mouth disease virus isolates, isolated from 03 different outbreaks, in three different locations during the period from January to December 2010 in Sri Lanka were selected for the study.

The Specimens were appropriately processed and viral RNA was extracted using commercial RNA extraction kit and the target area of the 1D region was amplified by specific primers, by RT –PCR (Reverse Transcription Polymerase Chain Reaction). The products were visualized by the gel electrophoresis and purified using a commercially available PCR purification kit. Purified product was subjected to cycle sequencing by using "Bigdye terminator v3.1" with specific single primer (NK72). The product was further Re-purified by using "Centricep" method to remove excess Bigdye. Products were sequenced by using automated genetic analyzer.

"Genetyx" & "MEGA 3.1" genetic software packages were used to analyze the results. The results indicated that the isolates from Sri Lanka belong to the Topo-type Middle East & South Asia (ME & SA).

Fresh Cow Milk Consumption Pattern Among Dairy Farmers in Embilipitiya Veterinary Range

M. I. G.Jayathilaka[1] and J. Jayatissa[2]

[1]District Veterinary Office, Rathnapura and [2]University of Kelaniya

Dairy husbandry is a major component of the livestock sector in Sri Lanka. It provides an income generating avenue for rural small-holder farmers while providing animal products to meet the domestic consumer demand. Milk is a perfect complement to cereal based diets. Milk and its products (main sources of Calcium) are vital in daily diet to maintain a strong skeleton and good health through out of the life. World Health Organization recommends drinking around two glasses (400ml) of milk everyday to fulfill the daily requirement. Government also has identified the importance of liquid milk promotion and has launched several programmes through the livestock policy of five year dairy development plan for self sufficiency (2011-2015).

Although the availability of fresh cow milk is high in the dairy farming community, the author observed an inadequate consumption of milk among farmers during her routine field investigations and group discussions as a veterinary surgeon. As there was a lack of basic information related to literature regarding milk consumption among dairy farmers, this study was conducted to alleviate this deficiency. The aim of this study was to investigate the cow milk consumption among dairy farmers in Embilipitiya veterinary range in terms of frequency, quantity and to determine the distribution of farmers by adequacy of milk consumed according to the WHO recommendation with a view to generating baseline information. It also refined our current understanding of common reasons which influenced the milk consumption.

The design of the study was Descriptive Cross Sectional. A simple random sample of forty one dairy farmers was selected. Data were gathered using an interviewer administered questionnaire & analyzed manually by frequency distribution method. The survey revealed that about 53.7% of farmers (n=41) consumed milk daily while 14.6% consumed milk only once a week. About 14.6% & 17.1% farmers consumed milk thrice & twice a week respectively. The quantity of milk consumed by farmers in the study sample was varying from one to more than three glasses per day. Most of the farmers (68.3%) consumed only a glass of milk (200ml) per day. About 17.1% consumed two glasses while 14.6% consumed three or more glasses per day. High availability of milk in their vicinity was the main reason for consumption (46.3 %) followed by the fact that the cow milk contains a high nutritive value (36.6%). About 9.8% farmers consumed milk in order to its flavor and taste. Cultural habit was the least common reason (7.3%) for milk consumption. Results showed that only 24% of farmers met or exceeded the recommended level daily while the majority (76%) did not meet the recommended level. It can be concluded that the fresh cow milk consumption among dairy farmers in Embilipitiya veterinary range is not satisfactory with reference to the WHO recommendation.

Proposed Pathogenesis of Sub-Clinical Necrotic Enteritis Studied in a Spontaneous Disease Model Similar to The Disease Occurrence in The Broiler Chicken Industry

M. W. C. D. Palliyeguru[1] and S. P. Rose[2]

[1]Veterinary Research Institute, Gannoruwa, Peradeniya, Sri Lanka and [2]National Institute of Poultry Husbandry, Harper Adams University College, Newport, Shropshire, TF10 8NB, UK

Sub-clinical necrotic enteritis (NE) is a widespread and economically important bacterial disease in the broiler industry. With the presence of the multiple predisposing factors, Causative *C.perfringens* becomes an opportunistic pathogen in the intestines of broiler chickens at 2-5 weeks of their age. The major pathological changes occur in the small intestine and the liver. Median counts above 10^6 cfu of *C. perfringens* per gram of caecal contents give a high probability of concurrent gut lesions. Although identified as a multi-factorial disease, the pathogenesis is not clear. Therefore the objective of this study was to examine the pathological changes in the small intestine of broiler chickens with innate infection of *C.perfringens.*

Sub- clinical NE that directly related to the form in commercial production systems was reproduced through an innate infection provided with the appropriate predisposing factors (un-medicated diets, putative predisposing feeding regimens, housing birds on litter). On day 15, 20, 25 and 30 (post hatch) birds were sampled (36 /day) and the intestinal sections were examined for gross and histopathological changes.

Initial gross lesions in the intestine were white colour focal necroses which could subsequently enlarge. Disease severity could be related to the size of the lesions in the small intestine and this was increased with the increasing number of ceacal *C.perfringens*. Initial histological changes were epithelial cell vacuolation at the villi tips which then separated from the congested laminapropria. The degeneration progressed down the villi in a regular manner but, did not extend beyond the bottom layers of the crypts. Initial damage was followed by the infiltration of heterophilic granulocytes into the border line between the necrotic and viable tissue. Later they were replaced predominantly by lymphocytes. Large rod shaped bacteria were only adhered to the necrotic tissues.

Lesions were partially or completely covered by an adherent irregular, yellowish material composed of necrotic debris which sometimes sloughed off exposing the injured villi so, increasing the severity of the disease. When the whole surface of the mucosa was almost equally affected, debris adhered to those villi were organized into a pseudo-membrane. However, in the 25-30 day old birds, villi regeneration was observed. In the repair process the crypts of Leiberkuhn elongated and the tips of truncated villi regained their structure with a pinching off of the attached debris so, denuding the pseudo-membrane that performed like granulation tissue. However the villi were shortened at the initial repair process. Intestinal villi damage could be a major factor contributes to the poor growth performances observed in sub-clinical NE.

Preliminary Survey on Household Buffalo Curd Producers in Embilipitiya Veterinary Range

S. M. Dassanayake

Government Veterinary Office, Embilipitiya, Sri Lanka

Buffalo farming plays a major role in Sri Lankan livestock sector providing milk and milk products to the nation, while it acts as one of the profitable ways of lively hood among rural communities in Embilipitiya divisional secretary area. This questionnaire based survey was conducted to determine current status of household buffalo curd production. It included socio-economical status of the producers, basic management practice, hygienic level at the production, their constraints and possible ways of uplifting their income. This study comprised with fifty (n-50) randomly selected buffalo curd producers in 40 Grama Niladari divisions of Embilipitiya VS range. During the study period, animals, farms and curd production units were physically examined and a specially prepared questionnaire was filled by interviewing each farmers. Data was analyzed by using Microsoft excel programme.

Majority of buffalo farmers (30%) were in 40 – 50 age group and they had only primary education. However, 48% of the farmers had education level between grade 5-10 and 10% of them had some training on buffalo farming. Only 28% of the farmers are solely engaged in buffalo farming although rest of the others are engaged in paddy, vegetable and banana cultivation despite their main income is from buffalo farming. Majority of curd producers have well–built houses (50%) and own vehicles (48%). Some of the farmers (53%) gained net profit below Rs.30000 per month from curd production. Murrah crosses were the most common breed and average herd size was 27.9 including 25% of milking cows. Extensive management system was practiced for large herd based farms and tethering was practiced only in small farms. Feeding of concentrates and mineral supplements (10%), straw feeding (26%) and cut and feeding of grasses (24%) could be seen mostly in drought season. Almost all of the farmers (94%) used natural breeding while few farmers used artificial insemination along with natural breeding. Vaccination for HS and FMD vaccination is fairly popularized among most of the farmers (90%). Majority of the farmers (72%) were practiced deworming of calves at 1st month of age, when first deworming was missed at day 15. Most of the farmers started to milk after 30 days of calving and milking was done once a day. Average weaning age and average milk yield per cow per day was 8 months and 1.83L respectively. Washing of udder (74%), washing of hands prior to milking (70%), filtering of milk (88%) and having separate incubating cabinet for curd processing (56%) were some of the hygienic measures that were used by farmers. In order to have a good quality curd products to consumers, maximum utilization of their resources and better income for the farmers, they should be guided for proper herd management, optimal breeding strategy and improved hygienic practices of curd production.

Histomoniasis Causing High Mortality in a Commercial Turkey Farm

U. K. S. P. Alexander, Nimal Jayaweera, Padmani Bandara and Kamalika Uberathna

Central Veterinary Investigation Center, Veterinary Research Institute, Gannoruwa, Peradeniya.

A commercial turkey farm was reported to have experienced high incidence of mortality and the VRI was requested to investigate the problem and give necessary advice on treatment. Initially, 10 turkey poults of a 30 turkey flock, aged 6-8 weeks, were reported to have died within 4 - 5 days after showing signs of depression, anorexia, yellowish diarrhea and loss of weight. There was 40% mortality and 50% morbidity in the flock at the time of investigation. The turkey flock was reared in an integrated farming system along with village chickens.

The necropsy findings were the enlargement of the liver with multifocal necrotic lesions, enlarged caeca with thickened cecal wall, caseous cores and ulcerated lesions inside the cecal lumen. Ulcerative lesions were also present in lungs and proventricles of some birds.

Histomoniasis was suspected on the basis of clinical signs and necropsy lesions and diagnosis was confirmed as histomoniasis by histopathological and parasitalogical examinations. Compression smears of hepatic tissues showed typical shape of histomonads. Histopathlogical lesions of hepatic tissues also confirmed the diagnosis. In addition, cecal smears obtained from dead turkeys also showed presence of large number of Heterakis gallinarum eggs.

Treatment was attempted immediately for sick turkeys with 3 birds receiving metranidazole 20 mg/kg intravenously (I/V) while the rest of the birds receiving the same dosage in drinking water for 7 days. Rapid recovery within 2 days was observed in birds received I/V metranidazole while the other group recovered slowly. All gained their appetite gradually. From these results, it was concluded that, when turkeys are reared with chickens, histomoniasis can occur in turkeys and this condition can be effectively treated with I/V and oral metranidazole.

A Comparative Study of Haem-Agglutination Inhibition Test (HI) and Enzyme-Linked Immuno Sorbent Assay (ELISA) in Detection of Antibodies against Newcastle Disease Virus in Commercial Chicken

S. A. E. Abeyratne, H. Kothalawala, S. Ralapanawe, H. A. Wijithasiri and G. B. K. Dilrukshi

Animal Virus Laboratory, Veterinary Research Institute, Polgolla

New Castle Disease (NCD) in birds, caused by mild to highly virulent paramyxovirus virus strains, show a range of clinical signs varying from mild to severe. The highly virulent NCD in chicken caused by serotype avian paramyxovirus type 1 (APMV-1), is an important poultry diseases worldwide and are members of genus Avulavirus in the family paramyxoviridae. New castle Disease virus (NDV) may be employed as an antigen in a wide range of serological tests, enabling neutralization or enzyme linked Immunosorbent assays (ELISA) and HI to be used for assessing antibody levels in birds. Currently, the HI Test is widely used for antibody detection though the longer time taken for reagent preparation, skill of the technician, validation of the process are errors in reading results are its disadvantages. However, many poultry producers use commercial ELISA kits to assess post-vaccination antibody levels. This study was carried out to compare the results of HI and ELISA tests qualitatively in detecting antibodies against NDV in a farm.

Blood samples from 20 birds before and from 80 birds after vaccination were collected from a commercial chicken farm and serum was separated. The serum samples then were subjected to HI Test-as prescribed in OIE Manual and ELISA Test- IDEXX NDV ELISA Kit as prescribed by manufacturer. From among the prevaccinated samples (20), only 1 sample was positive using ELISA test and none of the samples were positive for HI test. Of the results of the post vaccination samples (80), 76 were positive for ELISA test and 79 were positive for HI test. This study clearly shows that competitive ELISA can be used as a screening test to detect antibodies against NDV and in vaccine quality control. The sensitivity of ELISA test was 96.2% and specificity was 95.2 % using the results presented herein.

Dietary Protein Digestibility and The Severity of Sub-Clinical Necrotic Enteritis in Broiler Chickens

M. W. C. D. Palliyeguru[1], S. P. Rose[2] and A. M. Mackenzie[2]

[1]Veterinary Research Institute, Gannoruwa, Peradeniya, Sri Lanka and [2] National Institute of Poultry Husbandry, Harper Adams University College, Newport, Shropshire, TF10 8NB, UK

Sub-clinical necrotic enteritis (NE) is a cause of major economic loss to the broiler industry. A higher incidence of necrotic enteritis is identified in birds fed potato protein-based diets when compared the soya-based diets, perhaps due to lower protein digestibility of potato compared to soya. The aim of this experiment was to identify the effect of protein digestibility in nutritionally complete diets, on the severity of subclinical necrotic enteritis in broiler chickens. Protein digestibility was changed by including non-toasted soya (with high trypsin inhibitor activity) in the diets and compared with a potato protein diet.

A total of 1900 day-old male Ross 308 broiler chickens were reared as a single flock and fed a starter diet containing no antibiotic or anticoccidials. On day 16, the birds were weighed and 74 were randomly allocated to each of 24 pens in a randomised block design with six replicate pens per treatment. Four nutritionally complete diets (three soya based and one potato protein based) were fed up to 31 days. The soya diets had increasing levels (0, 100 or 200 g/kg) of a non-toasted full-fat soya replacing a toasted full fat soya (from the same batch and with the same proximate composition). On days (post hatch) 20 (four birds from each pen), 27, 28, 29 and 30 (two birds per day: eight birds from each replicate pen) were sampled. Blood, intestinal sections and intestinal contents were collected. The intestinal necrotic lesions were scored and the data were compared using analysis of variance in randomised blocks. Aanalysis of repeated measures was used to compare the same data collected on different sampling days.

Increasing levels of the non-toasted full-fat soya gave a marked reduction of protein digestibility ($P<0.001$), weight gain ($P<0.001$) and feed conversion efficiency ($P<0.001$) but an increase in the feed intakes ($P<0.001$). Although the toasting may have had other effects on the composition of the full fat soya, the high trypsin inhibitor activity (TIA) was probably the major cause of the lower protein digestibility. There was a linear increase ($P<0.05$) in sub-clinical NE lesions in the ileum and caecal *Clostridium perfringens* counts with the increasing dietary non-toasted soya. There was a strong negative correlation between the necrotic lesion scores of the ileum with the growth performance and protein digestibility coefficient of the broiler chickens fed soya based diets. Results of this experiment suggest that there is a negative relationship with the protein digestibility of the diets with the incidence of sub-clinical necrotic enteritis in broiler chickens. This may have been due to the increased *C. perfringens* populations in the gut although there may be some direct effect of amount of available trypsin on the pathogenicity of *C. perfringens* toxins.

Serological Evidence of Swine Influenza Type A in Pigs in Sri Lanka

S. A. E. Abeyratne, H. Kothalawala, S. Ralapanawe, H. A. Wijithasiri, G. B. K. Dilrukshi and K. D.Herathge

Animal Virus Laboratory, Veterinary Research Institute, Polgolla

Swine influenza in pigs, caused by Swine Influenza Virus (SIV) of Orthomyxoviridae consists of several sub types. SIV subtype A consists of H1N1, H1N2, H3N1 and H3N2 subtypes which have been isolated in pigs worldwide. SIV at times, could transmit to humans causing zoonotic swine flu for which those with regular exposure to pigs are at high risk. Importantly, human influenza virus can produce novel strains of virus inside pigs leading to pandemic flu, as in 2009. Thus, swine act as a host for genetic re-assortment of influenza virus strains specific to avian, human and swine. In Sri Lanka, serological evidence for swine influenza A infection has not been searched for. This study was designed to examine the serological status of swine influenza sub type A in pigs in Sri Lanka.

The swine population of Sri Lanka is estimated to be 80,000 – 90,000 and is mainly confined to "pig belt" and few other districts. The pigs from districts in provinces of North Western, Western, North Central and Central were used for this study. In addition, Keeles slaughter house in Ekala was used to collect blood samples from pigs.

A total of 360 blood samples (n = 360) were collected from pigs in above provinces and were subjected to indirect ELISA with commercial ELISA kit (LSIVET) to detect antibodies against swine influenza type A, including H1N1 and H3N2. Optical density (OD) values were calculated using an ELISA reader with 415nm wave length filter. All ELISA positive samples were tested repeatedly using the same test. Results were analyzed using specified result calculation formula as instructed by manufacturer.

Initially, 46 out of 360 (12.8%) samples were positive for indirect ELISA while the repeated test confirmed almost all (40). Since vaccination is not practices in pigs in Sri Lanka against swine flu, it can be assumed that all seropositive pigs are exposed to natural infection. It appears that conducting an island wide survey to determine seroprevalence of SIV is important.

Diagnosis of Poultry Diseases Presented to The Veterinary Investigation Center Pannala in Year 2010

L. M. P. Wijemanne

Veterinary Investigation Center, Pannala

Poultry diseases are widespread in Kurunagale district where poultry density is high in Sri Lanka. Diseases in poultry cause mortality and reduced production with great economic losses to the country. The objective of this study was to investigate into the cases presented to the Veterinary Investigation Center (VIC), Pannala in year 2010. This study includes gross postmortem examination of carcasses and laboratory confirmation. The laboratory diagnosis was made on laboratory isolation and identification of bacteria and examination of parasites for the samples collected at postmortem. Antibiotic sensitivity test (ABST) was performed for isolated organisms. The samples for the diagnosis of few viral diseases were referred to the Veterinary Research Institute at Peradeniye. A total of 342 cases were presented to the VIC and the diagnoses made expressed as a percentage of total were; colibacillosis 14%, salmonellosis 13%, infectious bursal disease (IBD) 11%, newcastle disease (NCD) 8%, mycotoxins/fungal contaminated feed 7%, fowl cholera 6%, avian malaria 5% and coccidiosis 5%. In addition, chicken anemia, marek's disease, infectious coryza, brooder pneumonia, pododermatitis, necrotic enteritis, fowl pox, vitamin E deficiency, infectious bronchitis, gout and chronic respiratory disease were diagnosed totaling up to less than 5%. Out of the total cases, 10% were related to poor management practices, while 1% remained undiagnosed. Diagnosis of IBD was based on postmortem examination and 61% of them were between 14 and 35 days of age. Except two cases all diseased flocks were vaccinated more than once against IBD. Some cases of IBD were complicated with coccidiosis, avian malaria and chicken anemia. Out of twenty nine cases of NCD presented during from September to November 2010, 16 were confirmed at the VRI. The mortality rates varied from 1% - 90% in diseased flocks. A total of 847 samples collected from postmortem for bacteriology and 46% of which were culture positive. The percentages of *E. coli*, *Salmonella* (non-motile) and *Pasteurella multocida* isolated were 41%, 25% and 14%, respectively. The other bacteria isolated were less than 4% and included *Pseudomonas* spp, *Staph. aureus*, *Staphylococcu*s spp, *Streptococcus* spp, *Bacillus* spp, *Klebsiella*, and *Proteus* spp. Majority of *E. coli* isolations were from layer farms with poor management and suspected viral infections. All *Salmonellae* isolated were non-motile and 33% of these were from chicks. The ABST performed showed that the percentages of isolated *Salmonella* cultures susceptible to neomycin, tetracycline, sulfa-trimethoprim, doxycyline, enrofloxacin, amoxicillin and oxytetracycline were 29%, 17%, 13%, 10%, 10%, 9%, and 8% respectively. The percentages of isolated *Pasterella multocida* susceptible to neomycin, doxycyline, amoxicillin, enrofloxacin, tetracycline, sulfa-trimethoprim and oxytetracycline were 21%, 16% ,13%, 13%, 10%, 10% and, 7% respectively. Intestinal scrapings and heart blood smears were examined for the confirmatory diagnosis of coccidiosis and avian malaria respectively. This study revealed the high incidence of colibacillosis, infectious bursal disease and salmonellosis in year 2010. Salmonellosis in chicks emphasized the importance of preventing *Salmonella* in the hatchery and in parent farms. Improper vaccination, poor management and biosecurity and congested poultry farms in play a major role in the current disease situation in the area.

Rickettsial Infection in Dogs in Selected Locations in Kandy District, Sri Lanka

R. H. S. L. Ranasinghe, A. W. D. S. Karunarathne, S. Wickramasinghe and R. P. V. J. Rajapakse

Department of Veterinary Pathobiology, Faculty of Veterinary Medicine and Animal Sciences, University of Peradeniya, Peradeniya

Rickettsial infections are classified as zoonoses which can be transmitted through ticks, mites and fleas and man is an accidental host. Wild animals are considered as the reservoir hosts. The domestic dog, which is the natural host of Ixodid species of ticks which transmit rickettsial organisms, show nonspecific clinical signs when exposed to Rickettsial antigen. However, domestic dog appear to gain immunity to the organism rapidly. Rickettsia is a genus of small, motile, non spore forming, gram negative, highly pleomorphic and obligatory intracellular parasites which encloses two genera, "*Rickettsia*" and "*Orientia*". "Epidemiological Reports" published by the Ministry of Health, Sri Lanka reports a substantial numbers of human typhus fever cases, annually. Furthermore, the recent studies have shown that the prevalence of spotted fever (caused by *Rickettsia conorii*) among humans is high in the Central Province. In the present study, we determined the seroprevalence of Rickettsiosis among dogs from 4 selected villages in Kandy.

A total of 76 blood samples were collected into EDTA tubes from clinically healthy dogs in Pilimathalawa, Katugastota, Rajawatta and Thismada areas during the year 2009 and were transported on ice to the laboratory where serum was separated. These serum samples were diluted 1:16 with IFA (immunofluorescence assay) buffer and tested by the indirect immunofluorescence assay using three Rickettsial antigens: *Rickettsia conorii* (Spotted fever group), *Orientia tsutsugamushi* (Typhus group) and *Rickettsia typhi* (Scrub typhus group). Our results revealed that 50.7% dogs had IgG against at least one Rickettsial antigen. 81.6% had antibodies against *R. conorii*, 18.4% against *O. tsutsugamushi* and 5.3% against *R. typhi*. Five dogs (13.1%) had mixed antibodies against both spotted fever group and scrub typhus group. Among seropositive cases, 88% of dogs are either not caged or free at night and living near scrubs.

Highest percentage of tested dogs had antibodies against *R. conorii* which should therefore be the most frequently found. The domestic dogs may act as sentinels of rickettsiosis and their seroprevalence can be used, not only to identify the areas in which the disease is endemic but also to predict the risk of getting Rickettsial infection by people living in those areas.

Diagnosis and Treatment of Congestive Heart Failure due to Dilated Cardiomyopathy in Dogs – Three Case Studies

I. D. Silva, H. K. D. I. A. Ratnayake, S. J. Wijesinghe, W. P. T. T. Weerasinghe, W. A. D. C. H. Wickramasinghe, I. N. A Wickramasinghe, D. D. N. De Silva, T. S. Wanniarachchi and A. Dangolla

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

This presentation describes detailed history, diagnosis, treatment and pathological changes in three dogs with Dilated cardiomyopathy (DCM), presented to the Veterinary Teaching Hospital of the University of Peradeniya. DCM in dogs is the most common form of cardiomyopathy representing an end-stage of myocardial failure, affecting lungs, liver and other body systems. It is a progressive disorder characterised by reduced systolic myocardial contractility leading to reduced cardiac output, which activates compensatory salt and water retention, which in turn results in volume overload and gradual increase in end-systolic diameter of one or both ventricles (compensatory ventricular hypertrophy). The resulting cardiomegaly initially allows the stroke volume and end-diastolic pressure to be maintained but subsequently lead to deterioration of myocardial contractility. The increased blood volume and the limitation in the ability to hypertrophy, contribute to progressive congestive heart failure (CHF). Eventually the atrio-ventricular rings stretch, compromising valvular function leading to mitral and/or tricuspid regurgitation, which will increase the atrial pressure, dilate the atria and elevate pressure in the pulmonary vein and capillaries, causing pulmonary oedema and congestion in the lungs, liver, and other body systems.

DCM should be considered in the differential diagnosis in dogs presented with clinical signs of CHF, which includes dyspnoea, abnormal breadth sounds, cough, tachypnoea, tachycardia, arrhythmia, electrocardiography abnormalities (P wave & QRS complex), syncope, pleural or pericardial effusions, ascites and/or dependent oedema, with other signs, such as, depression, exercise intolerance, inappetance and muscle wastage. DCM could be easily detected by the elevated vertebral heart score (VHS) measured in a thoracic radiograph and confirmed by echocardiographic findings of poor myocardial contraction, low ejection fraction and left ventricular fractional shortening (<16%).

Retrospective Study on Clinical Features Therapy and Epidemiology of Snake Envenomation in Dogs Admitted to Veterinary Teaching Hospital

M. Gobikrushanth, H. E. Abeygunawardena, A. M. R. Bandara and I. D. Silva

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

Though, cases of snake envenomation are frequently presented to Veterinary practitioners throughout the island, the information on clinical features, therapy and epidemiology of envenomation in dogs are sparse. Therefore a retrospective study over 12 months of period was done for detailed analysi of the incidence, signalment, haematological and biochemical changes, therapy, client knowledge and prognosis of 14 confirmed canine envenomation cases presented to the OPD of the Veterinary Teaching Hospital (VTH).

The most frequent snake causing envenomation in the central province was the Russell's viper (57 %) followed by the cobra (43 %). Mongrel dogs were most commonly (64 %) affected by envenomation followed by German shepherd (14 %), and Terrier, Dobermann and Dachshund (7 %) each. Eleven (78 %) dogs were bitten during the warmer months (March to August) of the year and Nine (65 %) had occurred in the evening around 6 pm. Except for two dogs (14 %) all others had a single bite and the common place of bite was in and around the mouth (78 %) followed by limbs (21 %). None of the patients had a previous history of snake bites, and first aid done by owners. The commonest clinical findings of viper envenomation were painful screaming, tachycardia, dyspnoea, hypersalivation, hyperthermia, complete flaccid paralysis and hind leg ataxia, where as cobra envenomation showed dilated pupils, sluggish or absences of pupillary light reflex, proteinuria, haematuria and delayed clotting time. On average, the treatment consisted of 2 vials of antivenin (20 ml) initially given in a drip together with Intravenous hydrocortisone to suppress the cytokine storm, chlorpheniramine maleate to prevent anaphylaxis, Ampicillin as the prophylactic antibiotic, Furosemide to facilitate renal excretion of toxins, Tramadol as analgesic and injection of prophylactic tetanus toxoid. The overall recovery rate after administering antivenin was 71 %. Dogs treated soon after being bitten recovered more rapidly (average of 48 hours) than others. Death occurred only in 4 (29%) dogs as a result of Multi Organ Dysfunction Syndrome (MODS) due to increased time elapse from bite to therapy.

Diagnosis of species-specific snake envenomation is shown to be made on the basis of clinical signs and the recall memory of clients. Antivenin significantly improves the chances of survival of dogs bitten by snakes.

Aberrant Migration of *Spirocerca lupi* in The Spinal Cord of a Dog

K. A. N. Wijayawardhane[1], G. S. P. De S. Gunawardena[2], D. D. N. De Silva[1], I. D. Silva[1] and A. Arulkanthan[2]

[1]Department of Veterinary Clinical Sciences and [2]Department of Veterinary Pathobiology, Faculty of Veterinary Medicine and Animal Science, University of Peradeniya

A two-year-old, intact, male Blood hound dog was presented to the Veterinary Teaching Hospital with a history of acute hind limb paralysis. The dog appeared to be otherwise healthy with pyrexia. Neurological examination revealed decreased bilateral patellar reflex with cross reaction. Palpation revealed hyperesthesia at the region of T10-T13, and caudal to L1 the cutaneous trunci reflex was sluggish. Anal sphincter tone was occasionally present, and the bladder could be easily expressed. Nociception was present in both mildly atrophied hind limbs. The dog was unable to stand without assistance. The paw placement reflex was absent from both hind limbs. Survey radiographs of the thoracolumbar spine appeared normal. Haematology showed a normal haematocrit with leukopaenia (2.18×10^3). Urine and faecal samples appeared to be normal. A provisional diagnosis of spinal trauma and myelomalacia was made on presenting clinical signs. Methyl prednisolone succinate (30mg/kg,IV), Chloramphenicol (50mg/kg,IV), prednisolone (0.5mg/kg, PO), Neurobion (PO) were initiated to reduce the signs associated with spinal injury and ranitidine (20mg/IV) was initiated to counteract the possible corticosteroid induced gastritis. Physiotherapy followed by hydrotherapy was carried out to improve the circulation to maintain the muscle mass of the hind limbs. Though, the dog initially seemed to improve over the first 24 hrs; the dog experienced pain, pressure wounds and cystitis within a period of 3 months after the incident.

Euthanasia was performed and a detailed postmortem examination was performed paying special attention to the central nervous system. Although, gross pathological findings of the cerebrum were without relevant significance, a focal lesion characterized by severe myelomalacia was found at T3-T5 segments of the thoracic spinal cord. Histopathological examination revealed the presence of several sections of a nematode within the spinal cord lesion. The causative nematode was identified as a female *Spirocerca lupi* based on morphological features, such as, thick cuticle, large lateral cords, intensively stained glandular oesophagus and prominent brush border in the intestine. No granulomatous lesions were evident in oesophagus or spinal cord and no aneurismal changes within the aorta. The aetiology of initial fever spikes was suspected due to the inflammatory lesions associated with the migration of the nematode and cause of hind quarter paralysis due to the damage to the spinal cord by the movements of this nematode.

In conclusion, *S. lupi* should be considered as a differential diagnosis in cases presented with clinical signs suggestive of a spinal cord lesion in areas endemic for spirocercosis. As these lesions are compressive and progressive in nature, use of myelography in early detection of the lesion, surgical removal of *S. lupi* nematode from these aberrant sites seems to be the treatment of choice at very early stage. Therapeutic and preventive treatment in the form of doramectin must be instituted to treat aberrant sites and to prevent re-infection. To the author's knowledge, this is the first report of aberrant migration of *S. lupi* in the spinal cord of a dog in Sri Lanka.

A Retrospective Analysis of Antimicrobial Resistance Among Bacteria Isolated in a Veterinary Microbiology Laboratory

A. W. M. K. K. Bandara, S. S. S. De S. Jagoda, D. R. A. Dissanayake, T. G. Wijewardana and T. P. M. S. D. Bandara

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

The emergence of antimicrobial resistance (AMR) among bacteria from animals has raised considerable concern due to the potential for transfer of antimicrobial-resistant pathogens from animals to humans. Indiscriminate and incomplete anti-microbial therapy promotes antimicrobial resistance. The objective of this study was to determine the anti-microbial resistance pattern in *Escherichia coli*, *Klebsiella* species, *Staphylococcus aureus* and Pseudomonas species isolated from samples from the Veterinary Microbiology Laboratory (VML) of the Faculty of Veterinary Medicine and Animal Science, University of Peradeniya.

Data on antimicrobial susceptibility testing of bacteria isolated from clinical samples of dogs, cattle, goats, pigs, elephants and chicken at the VML during a period of five years from January 2006 to December 2010 were evaluated and analyzed retrospectively. The susceptibility testing was performed by Kirby-Bauer disc diffusion method according to Clinical and Laboratory Standards Institute (CLSI) standards for eight commonly used antimicrobials in veterinary practice (tetracycline, amoxicillin, trimethopirm–sulphonamide, enrofloxacin, gentamycin, cephalexin, ciprofloxacin and chloramphenicol).

Altogether 175 isolates (*E.coli*, n=52; *Klebsiella*, n=51; *Staphylococcus*, n=41; Pseudomonas, n=22) were included in the analysis. Up to 91.4% isolates displayed resistance to more than one antimicrobial agent whereas 68% and 22.8% isolates found to be resistant to more than three and five antimicrobials, respectively. It is noteworthy that *Klebsiella* was the predominant isolate and the proportions of antimicrobial resistance for more than one, three and five antimicrobials for *Klebsiella* ranked the highest and were 96%, 84% and 39%, respectively. Proportion of AMR for more than one, three and five antimicrobials for *Escherichia coli* were 96%, 71% and 29%, respectively. *Escherichia coli* is a potential reservoir of resistance genes that could be transferred to other organisms. Pseudomonas and Staphylococcus also displayed a considerable proportion of resistance though the findings can not be generalized due to insufficient sample size.

In this study, resistance to tetracycline among bacteria of animal origin was marked (*E.coli*-57.7%, *Klebsiella*-52.9%, *Staphylococcus*-31.7%). AMR to trimethopirm–sulphonamide combination (*E.coli*-51.9%, Klebsiella -50.9%, Staphylococcus -29.2%) was also seen high. Although extrapolation of the above data to the animal population in Sri Lanka is questionable due to biased sampling, this study highlights the potential threats caused by multi drug resistant bacteria in the future.

Treatment with Uterine Irrigation for The Pyometra of Przewalskis Wild Horse (*Equus caballus przewalskii*)

L. A. J. P. K. Jayasekara[1], D. S. Kodikara[2], S. Mendis[1] and R. Jayalath[1]

[1]National zoological Gardens, Dehiwala and [2]New Animal Clinic, Kohuwala.

A 16 years old female wild Horse (*Equus caballus przewalskii*), in National Zoological Gardens was suffering from severe pyometra with a whitish vaginal discharge in January 2011. The animal was undomesticated and could not be examined or sampled without sedation. The voided vaginal discharge sample collected from the ground was subjected to Antibiotic Sensitivity Test (ABST). Injections of 20ml of Sulphur Trimethoprium (480mg/ml), 10ml of "Flunexin" (Flunexin meglumine), 10ml "Catasol" (Butophosphan and Cynocobalamine) by using CO2 projectile pistal. This treatment was daily repeated for 3 days after which the ABST results was received indicating growths of Klebseilla and Pseudomonas and Ciprofloxacin were the most sensitive antibiotic. Thereafter, Enrofloxacine was daily injected for 5 days and the condition improved.

Nineteen days later, the animal showed same vaginal discharge, samples were submitted for ABST and Enrofloxacin daily injections using the CO2 pistol were started. In addition, the male and the female were separated. The second ABST revealed the growth of Cotromoxasole sensitive Pseudomonas Spp. Therefore, the antibiotic was changed to Cotrimoxisole and continued for the next 7 days consecutively. The condition of the animal improved but she did not regain the appetite.

Suddenly she became very ill with septicemic signs, was in shock, dyspnoeic, shivering, while, rectal temperature was 106.5F. Therefore, she was taken to restraint crush and intravenous fluids treatment was started with normal saline, lactated ringers and Dextrose. In addition, dexamethasone, vitamin B complex, "Flunexin" (Flunexin meglumine), "Broadced" (Ceftriaxone) intravenously and, Enrofloxacine were administered intramusculary. The condition of the animal improved, the temperature did not reduce and therefore, decided to perform uterine irrigation. Accordingly, cervical orifice was located per vaginally and a sterile plastic tube was inserted into uterus through the cervix. A total of 20 bottles (10 litres) of 0.9% sodium chloride was poured into the uterus through the tube and allowed to flow back through gravity. This procedure resulted in 45 litres of, foul smelling fluid, coffee colored liquid from the uterus. The culture report of uterine contents indicated the presence of *E. Coli*. The animal was given "Augmentin"intravenous injection for 5 consecutive days. Normal saline was used twice to irrigate the uterus and later 10 vaginal pessaries of Providone Iodine and 10 vaginal pessaries of Clotrimaxazole were inserted into the uterus . Intravenous fluid therapy was continued and the animal showed signs of speedy recovery within the same day. The rectal temperature reduced to 102ºF, started eating and urinating and subsequently on the following day she was completely normal.

The Existence of the Concept of Zoonosis in Buddhist Writing

M. J. K. Gunasekera

9, First lane, Jambugasmulla Road, Nugegoda

Zoonoses as defined by the World Health organization are "Diseases and infections that transmitted naturally between vertebrate animals and man". Though, the term "zoonosis" was coined by a German physician Rudolf Virchow only 156 years ago, the concept had been in existence in Buddhist texts for at least 2000 years ago. Although the Buddhist teachings are mainly directed towards the total liberation of human beings, until such achievement the Buddha had advised his disciples and lay people about the importance of having a sound health which is considered the best gain. Some of the Suttas and stanzas in Pali canon are extremely conducive to this concept when followed as instructed or chanted appropriately.

The main objective of this study is to explore the areas related to zoonoses in Pali canon and other Buddhist texts. This is a textual study which reveals an interesting link of modern epidemiology to early buddhist writings. Five areas have been selected in order to study this concept. *Khanda Sutta* makes mention of many animals which can harm humans with a special reference to several domestic animals including the rat *(Mūsika)*. *Paccavekkhana* in *Majjhima Nikāya* mentions wearing robes gives protection from adverse climatic conditions as well as gadflies, mosquitoes, etc. These insects play a major role in transmitting zoonotic diseases. Ratana Sutta describes a plague (a zoonotic disease) which had been in epidemic proportion in the city of Vesali which was afflicted with pestilence and famine.

As a commentary to one "Dhammapada stanza" a story (Kumbhaghosaka story) has been written with regard to a plague like disease which is transmitted to humans and animals by rats. This condition is referred to as "*Ahivāthaka*". "Anavum Pirita" is most probably a set of non-canonical hymns which gives a list of animals and other hazards that could be sources of fear, diseases and peril (nānā bhayatō va, nānā rōgatō va nānā upaddavatō va). When these hazards are categorized in to these three groups one group will have animals which cause diseases to humans, vis-à-vis zoonoses. These animals are *Assa* (horse)*, miga* (deer)*, gōna* (cattle), *kukkura* (dog), *sūkara* (pig), *mahīsa* (Buffalo).

Globally, the most important zoonoses as well as a majority of emerging diseases are caused by animals which are mentioned in this paper. Leptospirosis, Hanta Virus Fever, Hendra Virus Fever, Rift Valley Fever, African Horse Sickness, Western Equine Encephalomyelitis, West Nile Virus Fever, Tuberculosis, Anthrax, Bovine Spongiform Encephalopathy, Rabies, Alveolar Echinococcosis, Nipah Virus Fever, Trichinosis, Swine Influenza are among them.

It has been documented that 75% of all emerging diseases that have affected people over past two decades were zoonoses. Though the technological advances facilitate more diagnosis of diseases, many factors such as expansion of human population, international trade and travel, climatic changes, environmental changes and intensive livestock production systems contribute to higher occurrence of zoonoses at present. This study reveals that these diseases had also played a significant role in the past too as mentioned in Buddhist text.

Surgical Correction of Chronic, Recurrent Cervico-Vaginal Prolapse in a Sindhi Crossbred Cow by Internal Fixation of the Uterus

B. S. S. Perera, D. M. S. S. Dassanayake, Y. Saranga and D. D. N. L. Wimalasooriya

Prolapse of The cervix and vagina are usually seen in the last trimester of pregnancy of mature cow. Increased abdominal pressure due to gravid uterus, intra abdominal fat and the distended rumen in combination with relaxation and softening of pelvic girdle and soft tissues around pelvic canal and perineum by increased circulatory estrogen and relaxin predispose a cow to this condition. It is common in intensively managed cows than in free rangeing animals. Chronic vaginal prolapse is accompanied by tenusmus due to cervitis, vaginitis and traumatic wounds in the exposed parts. This is often corrected by applying purse string sutures followed by parenteral antibiotic therapy.

A salvaged Sindhi cow, aged 14 years showed chronic and recurrent cervico-vaginal prolapse for two and half years. During this period, the prolapsed mass was reduced and corrected by appling pressure to push back the prolapsed mass and Appling purse string sutures to prevent the recurrence. The prolapse was corrected in this manner 7-8 times without successes. She was constantly in pain and become easily irritated and aggressive. Disposing the animal for slaughter or euthanasia were not agreed upon by the owner's due to religious inclinations. Further, amputation of prolapsed mass was tried once but abandoned due to excessive hemorrhage.

Only other method available to alleviate this condition was, fixing the uterine body to the lateral body wall. The cow was kept without food for 24 hours. At the time of operation, the animal was sedated by giving 4ml xylazine intra muscularly. Then, 20 ml of lignocain was administered into epidural space. The cow was then placed in right lateral recumbancy and a inverted 'L' block with lignocain was done on the left flank. An incision was made on the left flank caudally about 20cm in length and the uterus was exteriorized. The body wall and the serosal surface of uterus were scarified. Then the scarified surfaces were fixed together with simple interrupted sutures with nylon suture materials. Incised muscles were sutured with lambert sutures. Simple interrupted sutures were applied to the skin. Animal was kept under mild sedation and reduce the amount of roughages given for two days. Antibiotic therapy (long acting penestrep) was continued for ten days. The cow fully recovered at the end of the period.

The chronic and recurrent cervico-vaginal prolapse is incurable. This condition leads to culling of the affected animal. In this particular situation, even though the cow is old and unproductive, it was raised as a pet animal. Therefore, for the owners, its life is as important as any other. In farm animal practice this kind of a surgery is irrelevant. On the contrary, here it spared the owners of mental agony they had gone through. It saved the animal and reaffirms the role of the veterinarian in animal welfare.

Ovariohysterectomy of Rabbits Using Isoflurane

H. K. Umasha S. Hemachandra and D. M. Siriwardana

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

Rabbits are becoming more and more popular as pets in Sri Lanka. However, their increasing reproductive rate can be a problem for clients. Therefore Ovariohysterectomy is essential and can be performed at 6 months of age or after when they are sexually matured.

Two Does were presented to the clinic for ovariohysterectomy. General clinical examination was carried out and they were starved for 6 hours prior to the surgery. Ovariohysterectomy was carried out using Isoflurane. Pre-medication was not used as rapid post surgical recovery was desirable. 2% Meloxicam (0.2-0.6 mg/Kg s/c) was used as an analgesic, since analgesia is very important in rabbits as they are very sensitive on pain. Ranitidine (2-5mg/kg i/m) was used to minimize the incidence of gastritis and few drops of 50% dextrose p/o was used to avoid hypoglycemia due to prolonged starvation. The conscious Doe's face was placed in a facemask with oxygen alone for few seconds under gentle physical restraint followed by gradually increased concentration of Isoflurane gas to induce anesthesia for about five minutes (0.5% - 5%). They were fully anaesthetized within four to six minutes. The anesthetic drug concentration was gradually reduced from 5% up to 3% and maintained within the range of 2% - 3% but further reduced to 1% when skin was sutured.

Struggling of the Doe was noticed during initial exposure of gas and temporary anoxia was noticed with 5% gas. Then the mask was removed until she started breathing. Ventral abdomen of the dorsal recumbent Doe was carefully clipped and disinfected. Sterile procedures were maintained throughout the surgery. 1-2cm midline incision, about half way between pubic symphysis and umbilicus was made. Thin body wall was carefully raised to avoid damage to cecum and the bladder. Uterus was visible cranial and dorsal to the cranial pole of the bladder. Ovaries were legated without clamping. Major vessels of the broad ligament were legated separately and minor vessels were legated using one or two encircling sutures as recommended due to high bleeding tendency of their tract.. Each uterine horn was legated separately just cranial to the cervix as recommended. Abdominal fascia and muscles were closed together and skin was closed using subcuticular sutures. 3-0 absorbable suture material (Vicryl) was used for legating and suturing.

Both recovered within 1-3 minutes after removal of anesthetic mask. However acepromazine could have been used for premedication to reduce initial struggling though it prolongs recovery. 12h-48h post-surgical anorexia, excessive bleeding and fragility of the uterine tract have been identified as common complications in this surgery.

Use of a Simple Rope Harness in the Correction and Prevention of Vaginal Prolapse in Cows

N. Yazeevan, A. M. P. Abeysinghe, A. A. A. W. K. Amarasinghe, G. D. R. K. Perera
P. G. A. Pushpakumara and L. N. A. De Silva

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

Eversion and prolapse of the vagina, with or without prolapse of the cervix, is frequently seen in the cows due to many predisposing factors such as increasing intra-abdominal pressure of late pregnancy and gravity, high level of oestrogenic hormones, tenesmus and some heredity factors. Most of the cows having vaginal prolapse develop complications, if not corrected immediately and effectively. Farmers seek veterinary assistance to correct this problem in their cows and the veterinarians practice different methods and techniques for the correction. The most common method in correction of vaginal prolapse is applying sutures to the vulva after the replacement. Though it is an effective method, certain complications may arise due to the incorrect technique. Extensive vaginal or vulval laceration may result, if sutures were not removed just before parturition. Also vaginal and vulval irritation caused by the sutures and wounds after the correction may lead to persistent straining, resulting in recurrence of the prolapse.

Instead of applying invasive vulval sutures using long needles or vulval clips, a simple rope harness method was used in 10 cows with vaginal and cervico-vaginal prolapse, attended by the Ambulatory Clinic during the past 5 months. In this technique, ropes are applied similar to the Burley's method used for casting cattle. In addition to the Burley's method of application of ropes, this method ensure exertion and maintenance of pressure over the vulva. A cotton rope of approximately 1 cm in diameter and a length of 8 meters was adequate for a medium size cow. The rope is doubled over and the midpoint of the rope was placed on top of the base of the neck. The ends of the rope were crossed over the brisket and a square knot was placed and passed between the two front limbs. The ends were brought up under the axille, over the rib cage and then crossed over the back of the cow. Next the ends were passed between the udder and the thigh and carried towards the ventral commisure of the vulva. Then the 2 free ends of the rope were placed around the vulva and crossed over just above the dorsal commisure. The two ends of the rope were then tied to the rope where it crossed the back. The pressure exerted by the rope on the back and the vulval area will prevent the cow from straining, keeping the vagina in place. This rope harness method has many advantages over the other invasive methods, such as simplicity in application, non-requirement of any instrument, anaesthesia or drugs thus farmers also can apply it. It precludes the danger of vulval tearing in the case of unattended calving. Finally this causes no further irritation thereby prevents persistent straining by the cow. It must be concluded that all the treated animals using this method recovered successfully.

Comparison of Mineral Status and Haematological Parameters of Friesian Calves Born Through Embryo Transfer and Artificial Insemination

K. Kandeepan[1] and Basil Alexander[2]

[1]Department of Biochemistry, Faculty of Medicine, University of Jaffna and [2]Department of Farm Animal Production and Health, Faculty of Veterinary Medicine and Animal Science, University of Peradeniya.

The application of new reproductive technologies such as Embryo transfer (ET) and Artificial insemination (AI) in cattle results in offspring with higher productivity. Pregnancy rate after ET is 60-70% while 30 - 40% following AI. But the cost of production is very high in ET technology. The well being of the calves is important to make the processes a success. Health status of the calves can be determined by serum micro nutrient level, haematological parameters such as erythrocyte, leukocyte, and Differential Leukocyte counts, haemoglobin (Hb) concentration and pack cell volume (PCV) and total plasma protein and albumin levels. The objective of this study was to compare the mineral status and haematological parameters of the Friesian calves produced by ET and AI techniques.

Six clinically healthy calves produced by ET and AI techniques who were 06 month of age and had the same type of feeding regime were selected for this study. The mean plasma calcium, magnesium and copper concentration of the ET calves were 6.74 (± 0.75) mg/dl, 3.05 (± 0.31) mg/dl and 0.48 (± 0.12) µg/ml while those of AI calves were 4.91 (± 0.81) mg/dL, 2.73 (± 0.61) mg/dl and 0.26 (± 0.07) µg/ml respectively. The mean values of PCV [30 (± 3.63)], erythrocyte counts [9.67 (±1.43) x 10^6/µl], leukocyte counts [5329 (±1611) x10^3/µl] and Hb concentration [9.24 (±0.42) g/dL] of ET calves were compared with those of AI calves {PCV [30 (±3.63)], erythrocyte counts [8.44 (±0.59) x10^6/µL], leukocyte counts [4875 (±746) x10^3/µl] and Hb concentration [9.46 (± 0.56) g/dl]}. Further the total plasma protein [5.90 (±0.53) g/dl], albumin [4.04 (±0.70) g/dl], globulin [1.42 (±0.62) g/dl] and fibrinogen concentration [0.45 (±0.26) g/dl] of ET calves were compared with those of AI borne calves {total plasma protein [6.08 (±0.60) g/d], albumin [3.32 (±0.41) g/dl, globulin [2.22 (±0.87) g/dl] and fibrinogen concentration [0.54 (±136) g/dl]}. It was observed that the ET calves had higher levels of calcium, magnesium and copper concentration than AI calves. The plasma calcium level was significantly different (P<0.05) while the plasma magnesium and copper levels did not differ significantly between AI calves and ET calves. No significant difference in heamatological parameters were observed between the ET and AI calves. The result indicated that the reproduction technologies did not influence the serum mineral contents or the haematological parameters.

Effect of Breed, Parity and Type of Semen on Conception Rate of Artificially Inseminated Dairy Cattle in Ehaliyagoda Veterinary Range

M. I. G. Jayathilaka

District Veterinary Office, Rathnapura

Artificial insemination (AI) is the most widely used bio-technology in the world. The success rate of AI in terms of conception rate is a multifactorial condition which is determined by factors related to cow, farmer, semen quality and the AI technician. The purpose of this study was to describe the effect of certain cow and semen factors on conception rate of dairy cattle in order to generate baseline information. The design of the study was Descriptive Cross Sectional. Data were gathered based on the Artificial insemination register maintained at the office. All the Artificially inseminated cows from January to December 2008 in Ehaliyagoda Veterinary Range were used as the study population which consisted of 31% of Jersey crosses, 21% of Friesian crosses, and 42% of local crosses. The data were analyzed manually by frequency distribution method. The overall conception rates were calculated for each breed and the parity of the cow in the study population. Similarly the conception rate for each semen type used to inseminate the cows during that period was calculated. The results revealed that the overall conception rate of Jersey, Friesian, local crosses were 47%, 40%, and 45% respectively. Second parity showed the highest conception rate of 22%, followed by first & fourth parities (19%). The Friesian type of semen showed higher success rate (50%) than the Jersey type of semen (38%). The survey revealed that the cows of jersey breed showed higher success rate than the Friesian & local crosses. The results also indicate that the Friesian type of semen showed a higher conception rate than the other type of semen. Further studies should be conducted in other aspects to evaluate the success rate of Artificial Insemination of dairy Cattle.

Establishment of a Method to Produce Deep Frozen Semen from Bulls in Field Situations

G. I. Nanayakkara, W. W. B. Dilhani and G. D. R. K. Perera

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

The aim of this study was to find out a method for semen collection and cryopreservation under field conditions. There are no any previous studies performed on semen collection and cryopreservation under field condition in Sri Lanka.

A bull generated by Embryo Transfer technique at Bopaththalawa farm was selected for this study. The bull was trained to mount using an estrous cow and semen was collected using an artificial vagina (AV). Semen from two ejaculations was collected at 10 minutes interval and the samples were macroscopically and microscopically evaluated. The wave motion of the first sample was better (+++) than the second sample (++(+)). The percentage of live sperm in fresh semen was 85% in first sample while 70% in the second sample when analyzed using eosin-nigrosin stain.

The semen samples were processed separately to produce deep frozen semen. The ready to use semen extender consisted of one part Triladyl concentrate, three parts of distilled water and one part of egg yolk. After adding extender, the semen was loaded into mini straws (0.25ml) under room temperature. Then straws were cooled to 4^{o}C for two hours and frozen at -196 ^{o}C.

The percentage of live / dead sperm in extended samples were detemined before freezing using eosin-nigrosin stained smears. Live sperm percentage was higher in first ejaculation (83%) than second (69%). The semen was examined for motility, live dead ratio, and abnormalities on day 1, day3 and day 10 post freezing. The percentage of live sperm in post thaw samples showed considerable decrease from 83% to 76% in first ejaculation and 63% to 59% in second ejaculation 10 days after freezing.

In conclusion, the results showed that the collection of bull semen and cryopreservation could be carried out successfully under field conditions.

Birth of the First Female Calf Through Sexed-Semen Technology in Sri Lanka

K. G. J. S. Disnaka[1], G. D. R. K. Perera[2], K. A. G. Pathmasiri[1], S. C. Kaduwela[1], Chandrawansa Pathiraja[3], R. M. B. Ellegala[2] and Basil Alexander[1]

[1]National Livestock Development Board, Narahenpita, Colombo 5, Sri Lanka, [2]Faculty of Veterinary Medicine and Animal Science, University of Peradeniya and [3]Department of Wildlife Conservation, Sri Lanka

Availability of female calves in large numbers is a must to increase the milk production in Sri Lanka. Therefore, a pilot study was carried out with the objective of validating the use of sexed-semen technology in Sri Lanka to produce calves with desired sex at an accurate ratio of 95:5 of female to male calves. Two hundred straws of frozen sexed-semen produced from proven bulls using 'Fluorescence Activated Cell Sorter' which separates spermatozoa into X- and Y- chromosome bearing fractions was imported to Sri Lanka by the National Livestock Development Board..

Virgin heifers (n = 22) were selected in Bopaththalawa farm and estrus synchronization was carried out using intra-vaginal progesterone releasing devices. Following estrus detection, 19 heifers were inseminated using sexed-semen by carefully depositing it in the proximal part of the uterine horn by an experienced technician. Pregnancy was confirmed 60 days post insemination.

Results revealed that 13 of the 19 inseminated animals were pregnant. We report the first birth of female calf 'Tania' through sexed-semen technology in Sri Lanka on 25th January 2011 and was a breakthrough in cattle breeding strategies in Sri Lanka. A total of 4 healthy female calves were born so far at Bopaththalawa Farm and none of the calves was a male. In conclusion, use of sexed-semen can be considered as a valuable breeding tool in generating calves with desired sex and production of female calves will have a great impact on the Buddhist culture of the country.

The Effect of Pregnant Mare Serum Gonadotrophin and GnRH Injection on the Litter Size of Sows

Kahanda Kanaththage Sarath[1], Basil Alexander[2], B. M. O. perera[2] and P. G. A. Pushpakumara[2]

[1]Department of Animal Production and Health and [2] Department of Farm Animal Production & Health, University of Peradeniya

Non pregnant sows (n=32) were injected 500 IU of pregnant mare serum gonadotripn intramuscularly at the time of weaning. Following PMSG injection sows were examined for a few days for estrus signs such as swelling of the vulva hyperemia of the vulva and restlessness.

Back pressure test were applied to confirm the standing heat and artificial insemination was carried out 24 hours after the standing heat using chilled semen. Sows were also injected 50 µg of GnRH intramuscularly at the time of AI. The animals were examined for 21 days for the occurrence of the next heat. If they did not returned to heat looked after until furrowing. In these animals weaning to estrus interval, conception rate, litter size at furrowing, was recorded.

As a control to the experiment 33 sows were observed for natural estrus after weaning. When heat signs were detected AI was carried out as in the PMSG treated group. This group is not given either GnRH or PMSG.

The results were analyzed using Minitab statistical software 14.Means results were compared between two groups using the Student's Test. The weaning to estrus interval in the PMSG treated group was significantly lower ($P<0.05$) than that of control group (4.75 ± 0.5) in PMSG treated group versus (20.1 ± 08) in control group. The conception rate has significantly increase ($P<0.05$) in PMSG and GnRH treated sows (76.6%) when compare with the control group (39.3%).

When consider the three breeds Durock sows had shown significant decrease ($P<0.05$) in Mean litter size (4.33 ± 0.4) after injection of PMSG compare to that of control sows in the same breed (8.72 ± 2.6) and also to that of Land race sows (9.78 ± 1.1), and Large white sows (9.42 ± 0.9). It is concluded that exogenous PMSG can be used to decrease weaning to estrus interval in weaned sows. PMSG and GnRH treatment increase (76.6 %)conception rate in AI bred sows when compare to sows in the control group (39.3%).

Capture and Translocation of Trouble-Making Toque Monkeys (*Macaca sinica*) in Mahakanda: Lessons Learnt

P. P. Jayalath[1] and A. Dangolla[2]

[1]*Postgraduate Institute of Science and* [2]*Department of Veterinary Clinical Sciences, University of Peradeniya*

The Sri Lankan Toque Monkey (*Macaca sinica*), an endemic species, has lead to conflict with humans either as individuals or as troupes. Only negligible actions have been taken by authorities to relieve the public from this annoyance. The public has even killed and poisoned such monkeys in several parts of the country. The capture and translocation, though not properly monitored, has been carried out at several places in Sri Lanka as a short term solution. The aim of this investigation was to examine the social acceptance of capture and translocation of trouble making monkeys in Mahakanda village.

A detailed pre tested, questionnaire which included questions, on crop and property damage by monkeys prior to the translocation program, other disturbance, injury or harm to people done by such monkeys before capturing and the current situation after translocation, was administered in personal interviews with chief of the households in Mahakanda village. The village consists of 789 houses in which a capture and translocation program was done approximately 1 year prior to this investigation. The first house on one end of the village was selected and thereafter conveniently and haphazardly, the houses were visited for the survey until 100 were included.

Majority (67%) of the respondents have been living in Mahakanda village for more than 20 years and 80% from the total sample obviously believe that monkeys are not attracted by food. None of the respondents indicated any benefit from monkeys while 45% observed a benefit in their daily life after capture and translocation. However, 94% respondents believe that capture and translocation did not solve the problem permanently while 62% indicated that the relief was effective only up to 6 months. The Geographical Information Systems (GIS) maps of the area and locations of the traps clearly show that monkeys were temporarily scared to come close to locations in which the traps were kept. This indicates that a permanent and a long lasting solution to the problem must be invented and adopted, if the public is to be relieved.

Prevalence of Tuberculosis among Wild Elephants in Sri Lanka

B. V. P. Perera[1], Sara Baez Seara[2], Susan Mikota[3], B. M. A. O. Perera[4]
P. G. A. Pushpakumara[4] and R. P. V. J. Rajapakse[4]

[1]Department of Wildlife Conservation, Sri Lanka, [2]Royal Veterinary College, UK, [3]Elephant Care International, USA and [4]Faculty of Veterinary Medicine and Animal Science, Peradeniya, Sri Lanka

Tuberculosis (TB) is an infectious, granulomatous disease caused by acid-fast bacilli of the genus *Mycobacterium*. The disease affects practically all species of vertebrates. Limited studies have been conducted for TB surveillance in free ranging wild animals, due to difficulties in applying modern surveillance techniques under such conditions. In the case of elephants ante-mortem diagnosis has been limited by challenges associated with sample collection, test administration and interpretation. TB in captive elephants has been recognized as a re-emerging zoonotic disease since at least the 1996. This study was conducted to determine the prevalence of antibodies to TB among free ranging wild elephants and a semi-captive group in Sri Lanka.

The study was performed using 87 serum samples collected from free ranging elephants from different parts of the country (n=40) and a group of young orphaned elephants being rehabilitated for re-introduction to the wild at the Elephant Transit Home (ETH, n=47). The blood samples of free ranging elephants (ages 15-45 years) were collected after immobilization for treatment or for translocation. The blood samples of young orphaned elephants (ages 1-5 years) were collected while they were sleeping or while being subjected to treatments or transportation under sedation. The serum were separated and stored at -20^{o} C. Samples were assayed with Elephant TB Stat-Pak® (Chembio Diagnostic Systems, Inc., Medford, NY) for antibody detection. The presence of antibody to TB was detected in 2 out of 40 (5%) wild elephants, and in 15 out of 47 (31.9%) orphaned elephants at the ETH. This is the first report of the presence of antibody to TB among wild elephants in Sri Lanka. The high prevalence of TB among orphaned baby elephants may be due to chronic stress that leads to reduction of immunity or to transmission of the disease from elephant keepers.

The dilemma of what should be done with a wild animal that tests positive for TB is a major problem in wildlife conservation. Although previous studies have shown that the Elephant TB Stat-Pak serologic assay demonstrated 100% sensitivity and 95-100% specificity, isolation of the causative bacteria through culture is required for the confirmation of presence of disease. Even after confirming that TB is present in a wild species, eradication of the disease is a huge challenge. TB is considered a disastrous disease for wild animals from the conservation point of view and it can be evaluated in three different ways, based on its impact on the economy, zoonotic importance and the harm done by the infection itself. Firstly, wild animal TB represents a permanent reservoir of infection and poses a serious threat to control and elimination programs. Secondly, as a zoonotic disease, it affects their *in-situ* and *ex- situ* conservation programs as well as tourism industries. Thirdly, a TB epidemic in wildlife has a number of implications on the fecundity, morbidity and mortality of the population. Further studies are warranted on the prevalence of TB in wild and captive elephants in Sri Lanka, and on potential strategies for control of the disease.

Piscine Mycobacteriosis: An Emerging Disease in Guppies in Sri Lanka

P. D. V. M. Perera, D. R. A. Dissanayake, A. Arulkanthan, S. S. S. de S. Jagoda and E. A. R. Edirisinghe

Centre for Aquatic Animal Disease Diagnosis and Research, Department of Veterinary Pathobiology, Faculty of Veterinary Medicine and Animal Science, University of Peradeniya

Piscine mycobacteriosis, a chronic disease transmitted both horizontally and vertically, causes economic losses in terms of poor survival rate, reduced reproductive performance and degraded market value. It is a zoonotic pathogen and causes a condition known as 'fish tank granuloma' in fish handlers. The impact of this condition on national, regional and global aquaculture could not be underestimated due to the risk of trans-boundary movement of mycobacteria via imports and exports. As guppies are the major export variety from Sri Lanka, the objective of the study was to determine the presence of *Mycobacterium* species in guppies (*Poecillia reticulata*).

Eighty five guppies (*Poecillia reticulata*) with the history of poor growth rate and emaciation were collected from different farms located in Kandy, Kurunagala, Kalutara and Polonnaruwa districts. After clinical examination, all fish were humanely euthanized and samples from liver, intestine, gonads, muscles and spleen were cultured on Ogawa egg medium and the mycobacterium isolates were identified at the species level by PCR-RFLP.

Of the eighty five guppies, seventeen (20%) yielded actively growing acid fast colonies which were subsequently identified as *M. fortuitum* (n=9), *M. marinum* (n=6), *M. chelonae* (n=1) and *M. kansasii* (n=1). Mixed infection with more than one species of *Mycobacterium* was not encountered in any fish examined.

The presence of this condition might impede the export value of guppies in future. Therefore, further studies are needed to determine the magnitude of this problem in Sri Lankan ornamental fish culture in order to formulate a sustainable surveillance and control strategy.

Follow up Study on Information on Elephant Keepers in Sri Lanka

K. L. T. D Jayawardena[1], A. Dangolla[2] and P. V. R. K. Kumarasiri [3]

[1]Department of Veterinary Pathobiology, [2]Department of Veterinary Clinical Sciences, Faculty of Veterinary Medicine and Animal Science, [3]Department of Community Medicine, Faculty of Medicine,University of Peradeniya

There are approximately 120 domesticated, privately owned, elephants in Sri Lanka, who participate in cultural, religious and state functions. A study conducted several years ago on keepers of privately owned elephants indicated that they are likely to leave the profession due to several reasons which would hinder the knowledge flow to new keepers from their seniors. Therefore, a detailed pretested questionnaire was administered to 98 elephant keepers who attended to Kandy Esela perehara during August 2010 with the objective of examining the current situation, level of education, knowledge on elephants, family details and their income.

Ninety (91.8 %) of them were Sinhala Buddhists and rest were Tamils (5%) and Muslims (3%). Approximately half (40, 40.8%) were 40-60 years old. , Only two had studied up to Advanced Level classes in school, while 50% (49) of them had studied only up to grade 5. All keepers were excellent in talking and understanding Sinhala language while 35 were poor in their ability to read Sinhala language. Only 2 keepers barely could write and read English language while others were unable to do so. Only 10 keepers had average understanding on writing, reading and talking in Tamil language out of which only 2 were Sinhalese. Married keepers had at least 2 children in their families while the largest family had six children. All children of school attending age were schooling and all parents wanted their children to study to the highest possible level.

Majority (44) have taken the job , because they have no other occupation . A total of 59 keepers have learnt the trade on the job indicating a need for formal training. Eighty (80%) of elephant keepers knew diseases such as diarrhea and constipation and 63 % have not had experience of administration of western medicines to the elephant under their care. Almost all the keepers (91 %) knew a variety of minor herbal medications used for different ailments for elephants. These findings when compared with the previous study clearly show that the current keepers require formal training of the job, if captive elephants are to be provided with better care.

Approximately two third of the (76%) of the keepers consumed alcohol, 60% smoked and 98% chewed beetle leaves all of which enhance the risk of several sicknesses some of which could even be transmitted to elephants. A total of 39% respondents indicated their income to be less than 10,000 rupees per month which indicate that they are likely to keep leaving their professions.

With compared to the previous study, the alcohol consumption and smoking appear to be less common possibly due to their increasing level of education.

Environmental Impact of Privately Owned Cattle inside Bundala National Park, Sri Lanka

R. G. S. T. Aluthwattha[1], A. Dangolla[2], K. B. Ranawana[3] and R. Chandrajith[4]

[1]Postgraduate Institute of Science, [2]Department of Veterinary Clinical Science, [3]Department of Zoology, [4]Department of Geology, University of Peradeniya, Sri Lanka

Bundala National Park (BNP) is an international RAMSAR site and its adjoining area is unique in environmental and cultural values. BNP is one of the dead-end destinations of international bird migratory routes in South Asia. Some activities such as fishing are allowed inside BNP considering traditional and cultural aspects. The cattle farmers living around the park regularly send their animals for grazing within BNP which is illegal. Despite the available legal framework, little or no action has been taken against this activity by the park management. Present study was aimed at identifying the issues related to privately owned cattle grazing inside the park in order to propose remedial measures.

The cattle and buffalo counts were taken during June 2005 to December 2007, in 16 selected sampling points within BNP, once in two weeks. A questionnaire survey was conducted in villages around BNP. The daily cattle and buffalo counts varied between 148-601 and 91-321, respectively. Higher number of cattle and buffalos were encountered during November-January period in both years. The dung and urine of such cattle and buffalos, accumulated causing increased nutrient (NO^{-1}_3, PO^{-3}_4, NH^{+}_4) levels in water bodies favoring eutrophication. It also increased the competition among the grazing herbivores and exceeded the carrying capacity of the park. Cattle and buffalo spread seeds of invasive plant species leading to management problems. Such privately owned animals could introduce and spread infections into wild animals, promote soil erosion and in some places especially near lagoons, increase soil compacting causing micro habitat diversity reduction. Interview with 163 household members revealed that these large numbers of animals are owned by 24 people and it is an organized and a well planned activity.

In helping the parks to function with minimum such disturbances, the establishment of Grazing Grounds in State Lands (GGSL) and allowing farmers to rear cattle in GGSL after licensing, and imposing heavy fines if such animals are sent to national parks, can be recommended.

Changes of Total Protein and Transaminases in Haemolymph of Giant Tiger Shrimp Exposed to Ambient Ammonia

M. N. Mohamed Fouzi

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

Giant tiger shrimp *Penaeus monodon,* which is still the major commodity of shrimp aquaculture, may be subjected to stress when they are exposed to environmental variations such as ammonia levels in water. The present study was undertaken to assess the quantitative changes of the total protein and transaminases in the haemolymph of shrimp that were stressed by exposing them to different levels of ammonia in water. Four groups of experimental tanks each with three replicates were prepared and stocked with sterilized sea water with different levels of total ammonia (TAN), such as 0, 2, 3 and 7 mg/L. All other water quality parameters, except for TAN, were maintained constant in all experimental tanks and each tank was stocked with 30 shrimp with an average body weight of 8.5 ± 0.2 g. The haemolymph samples from two randomly selected shrimp per tank were collected at 0, 2, 4, 6, 8 and 10 days by using 1 ml syringe preloaded with anticoagulant. Haemolymph ALT, AST and total protein were analyzed by an Automatic Analyzer (Hitachi 902, USA) using specific kits for each parameter.

Haemolymph ALT, AST and total protein were interestingly different among shrimp exposed to different concentrations of TAN. The concentrations of ALT (177.5 ± 7.8 U/L) and AST (206.3 ± 16.3 U/L) in shrimp exposed to 7 mg/L TAN were significantly higher ($p<0.01$) compared to other groups at day 10 post treatment. Concentration of ALT and AST was not significantly different ($p>0.01$) among shrimp exposed to 0, 1 and 3 mg/L TAN. The total protein in the haemolymph of shrimp exposed to 7 mg/L TAN (58 ± 7.5 mg/L) was significantly lower than the other groups at day 10 post treatment. This data suggests that the levels ALT, AST and total protein in the haemolymph of shrimp could be used as stress indicators for ammonia pollution in aquaculture ponds.

Stereotypies in Asian Elephants (*Elephas Maximus)* in Sri Lanka during Processions

A. M. P. Abeysinghe[1], Eranda Rajapakse[2] and A. Dangolla[3]

[1]Department of Farm Animal Production & Health and [3]Department of Veterinary Clinical Sciences, Faculty of Veterinary Medicine and Animal Sciences, University of Peradeniya, Peradeniya and [2]Veterinary Medical Teaching Hospital, University of California Davis, USA

Stereotypies can be defined as unvarying, repetitive behaviors that have no obvious goal or function mostly likely due to stress. Elephants kept in circuses and zoos are known to show several stereotype movements such as weaving, swaying back and forth, nodding, head bobbing, trunk (proboscis) swinging, pacing, and occasional lifting of feet.

The present study was designed to examine stereotypic behavior (weaving and head bobbing) of elephants at different stages of processions (perahera) during the year 2009 in Sri Lanka. The study was done at 3 peraheras; Kandy (Maligawa and Wishnudewala), Walpola and Weyangoda with a total of 43 elephants (Males-31, females 12; Juvenile-4, sub adults-21, adults-14 and senior adults-4). During all processions concerned, the first author made all observations and 5 minutes at a time per animal was spent to observe whether the stereotypes were present or absent. All elephants concerned were restrained by their regular keepers using steel chains to both hind legs during perehera and were examined "before dressing" (when they were tied), "after dressing", "at the start of perahera", "during the perahera" (middle stage of perahera) and at the "end of perahera".

A total of 29 elephants (male-21; female- 8; Juvenile-4, sub adults-14, adults-8 and senior adults-3) did not show any sign of stereotypies at any of the perehera, at any of the above stages. Only 14 elephants showed stereotypic behavior in any of the Perahera out of which 10 were males and 6 were sub adults. Only 4 animals showed stereotypes before the perehera started, while they were chained. The numbers of elephant showing stereotypies increased statistically significantly when the perehera started moving and thereafter remained the same. Twelve elephants attended more than one perahera studied, out of which, 6 showed stereotypies in all the perahera they participated. The remaining 6 elephants never showed stereotypies at any of the perahera they participated.

It is apparent that most captive elephants in Sri Lanka are males and most of those who show stereotyping are also males, especially sub adults and adults. Those who show stereotypies will always do so while others never show signs. Since the individual captive elephants showing such stereotypes have been now identified, a detailed study would be helping identify the possible causative factors so that if possible, medical attention can be given.

Conservation Breeding of the Sri Lankan Rusty-Spotted Cat (*Prionailurus rubiginosus phillipsi*) at the National Zoological Gardens, Sri Lanka

C. G. Wijesinghe and P. Perera

National Zoological Gardens, Sri Lanka

The Sri Lankan rusty-spotted cat (*P. r. phillipsi*) faces a high risk of extinction in the wild and is listed as vulnerable in the IUCN Red List and CITES Appendix 2 and considered as a nationally threatened species, mainly due to habitat destruction and fragmentation. *In situ* conservation, by restoration of their natural habitats, studying the population status, reproductive behaviour, physiology and *ex–situ* conservation breeding programs, can play an important role for the conservation of this species.

Though, few species of small cats have been studied in the wild, considerable information on reproduction and behavior has accrued for many from captive studies. Rusty-spotted cat however is an exception with a few of them (50 cats) found in zoos, resulting in a paucity of data. They are largely nocturnal and probably solitary, but nothing is known about their social system. In this study breeding records of the Sri Lankan rusty-spotted cat was analyzed from 2005- 2010 to evaluate the success of this conservation breeding program at the National Zoological Gardens, Sri Lanka.

Captive population of the NZG includes 3.7 (male:female) cats out of which 2.3 are wild caught and 1.4 are captive born. These cats are being reared in two different sections, one exhibiting and eight off-exhibit enclosures. The main purpose of these off-exhibits is to facilitate conservation breeding of this small but charismatic species.

The cats are kept under natural photoperiod and provided with a daily diet of raw chicken meat including bones (supplemented with vitamins and minerals) and once a week live day old chicks.

The cats are housed individually in enclosures (Length 10'-11' x Width 5'-9' x Height 7'-8') that are planted with vegetation and a natural earth substrate covers the floor. Cages are furnished with branches, logs, resting, hiding and nesting places. Cats in the breeding section are in auditory, visual and olfactory proximity to one another. The males are selected and introduced to females for breeding. When pregnancy is detected males are separated from the females. After parturition kittens are kept with the female for about 6 months. Kittens start to feed on chopped meat when they are about 1 month of age.

Captive breeding data at the NZG show that the litter size is 1-3 (mean 2.03. n = 29). These births are not confined to any particular season and can occur in any month, however highest number of births has been recorded in February and no births have been recorded in October. Major causes for infant deaths are due to maternal rejection and infanticidal behavior. In the case of maternal rejection female domestic cats have been successfully used as foster mothers. The conservation breeding and management plan for the *P.r. phillipsi* at the NZG is successful and is a considerable step towards the conservation of the Sri Lankan Rusty-spotted cat.

Restraining and Immobilizing of an Injured Porcupine for Suturing a Laceration

H. K. Umasha S. Hemachandra

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

The Porcupine (*Hystrix indica*) is an ubiquitous species that survives well in suburban areas. They are nocturnal. This combination often results in unexpected encounters with people who are startled into responding with excessive force, as in the case presented. They are rodents; eat roots, tubers and are thus good diggers/burrowers. Therefore, if contained for a short period e. g. for treatment, a cemented wire meshed enclosure is essential to prevent accidental escapes. They have straight, unbarbed quills used in defense which can be formidable for effective handling, restraint and treatment.

A 13kg adult male porcupine was brought from Nugegoda area due to an injury caused by a startled worker in a nocturnal encounter. The animal was depressed and inactive at the time of capture but was able to walk when presented to the clinic. On examination there was a five inch laceration on the head and it had epistaxis with dyspnoea.

The quills were pressed down with the cover of the cat box to allow administration of 10% Ketamin 10 mg/Kg mixed with Diazepam in 1:1 ratio. The recommended area for the injection is the longitudinal muscle that runs along the vertebral column in the lower back. Respiration was closely monitored and was stable. The animal was immobilized after 20 minutes of administration.

The quills of the affected area were clipped and the wound was thoroughly cleaned with normal saline followed by diluted Povidone Iodine solution. 1ml of 2% Lignocaine was infiltrated along the edges of the wound to reduce sensation. Sub cutaneous tissue and skin were closed using 3-0 monofilament absorbable suture with simple interrupted sutures. The skin and the muscles were thick and a challenge to suture.

100mg of enrofloxacin (s/c), tetanus Toxoid (i/m), and 150ml of Lactate Ringer's Solution (s/c) were given post operatively and the artificial heat source was provided till he recovered. The porcupine walked in the cage after 1 hour and 35 minutes post sedation.

It was hospitalized in a cage having a cemented floor and was covered to create a darkened environment. He started to eat coconut, kankun and sweet potatoes on the following night. After four days, the animal was stable and in good condition when discharged and was handed over to the Department of Wildlife.

Investigation in to Field Case of Bovine Infectious Keratitis

N. D. T. Sirisena[1], U. E. Pallegama[2] and M. A. R. Priyantha[3]

[1]Veterinary Investigation Center, Department of Animal production and Health, Chilaw
[2]Emerchemie NB (Ceylon) Limited, Colombo-10 and [3]Veterinary Research Institute, Peradeniya.

Infectious Keratitis (pink eye or blight) of cattle caused by *Moraxella bovis* is not fatal and does not lead to permanent blindness. The organism infects only cattle where the young animals are more susceptible. Solar radiation, flies and dust enhance the effects of the disease. Reduction or loss of milk production and body condition may be caused by the resulting discomfort and feed consumption may reduce due to temporary blindness. Direct cytotoxic activity of the *Moraxella bovis* leads to initiation of the corneal ulceration.

Approximately 4 years old, semi intensively managed 2 Jersey cross-bread cows from a small scale dairy farm in Chilaw, reduced their production from 6 to 2 litres each and showed signs of lacrimation and reduced appetite. In both these the cows had 2 months old calves. The condition originated from one cow and 3 days later, both cows showed signs. Copious watery lacrimation, blepharospasm, photophobia and white opacity in the center of cornea were observed in both eyes of affected cows.

Conjunctivival swabs were collected from both eyes of both cows and subjected to microbiological examination within 2 hours. Culture results revealed a gram negative, aerobic, heamolytic, catalase and oxidase positive organism which was identified as *Moraxella bovis.* According to ABST performed for the cultured organism, gentamycine, oxytetracycline and cloxacillin were the sensitive antibiotics.

Infected cows were isolated from the herd, kept under close observation and treated with Gentamycine eye ointment. Both animals recovered in 5 days without any complications. After a few days, the farmer observed similar signs from both calves which and treated with the same eye ointment with observed complete recovery in 1 week. Similar complaints from number of other farms were received from Chilaw, Arachchkattuwa and Serukele veterinary ranges a few months later for which Gentamycine eye ointment showed satisfactory results. A few farmers had used oxytetracycline eye ointment due to price constraints with good results though recovery took a little longer. It is important to investigate the distribution, seasonality and the source of this infection.

Cutaneous Fibroma in Two Koi Carps (*Cyprinus carpio*)

A.W. M. K. K. Bandara[1], S. S. S. De S. Jagoda[1], A. Arulkanthan[1], G. S. P. De S. Gunawardena[1], I. P. G. H. U. Dissanayake[2] and W. R. Jayaweera[1]

[1]Department of Veterinary Pathobiology and [2]Department of Basic Veterinary Sciences, Faculty of Veterinary Medicine and Animal Science, University of Peradeniya

Neoplastic proliferations are not uncommon in fish and can arise from virtually any tissue of the body. Tumors on skin and fins in ornamental fish alter their aesthetic image thereby significantly lowering their commercial value. Koi carp, an ornamental domesticated variety of the common carp (*Cyprinus carpio*) is one of the highly valued, attractive fish that is extensively used in the freshwater aquaculture industry. They live longer and therefore, the prevalence of neoplasms is comparatively high in this fish.

Two Koi carps referred to the Center for Aquatic Animal Disease Diagnosis and Research (CAADDR) of the Faculty of Veterinary Medicine and Animal Science at the University of Peradeniya with cutaneous growths were used in the study. The first case was a 43.5 cm long, orange colored adult fish reared in a backyard pond for many years and had one, 2 x 2.4 cm, white to pinkish, raised and fleshy, cauliflower like growth on caudal peduncle and two flattened 1.8 x 1 cm plaque like growths on the dorsal surface of the head. The other one was a 48 cm long, bicolored (orange and white), adult fish reared alternatively in earthen and cement ponds. It had one, 2.5 cm, raised and circumscribed, well demarcated, grayish white to pinkish cauliflower like growth on dorsal side of the body just anterior to the dorsal fin. Both fish appeared active, healthy and their appetite was normal. Apart from the presence of the cutaneous tumors, no gross lesions were found in the external examination.

Subsequently, the fish were anaesthetized by immersion in 60 ppm buffered tricane methane sulphonate and the tumors were removed surgically. Then the fish were immersed in 10 ppm potassium permangernate dip for 2 minutes and transferred into a 2 ppm enrofloxacin bath as post operative therapy. Tissue specimens from the tumors were fixed in formal buffered saline and Davidson's fixative and processed for histopathology.

Histological findings of the excised tissue were consistent with that of fibroma and were characterized by a marked hyperplasia of dermis consisted of long spindle shaped and densely stained cells with minimal cytoplasm. Whirling arrangement of fibroblasts/ fibrocytes with dense collagen bundles was predominant in the dermis. Protrusion of folds of dermal fibrous tissue into the epidermis was also prominent and the thickness of the epidermis that covers the tumor was variable from 3-16 layers. The tumor contained proliferating fibroblasts with hyperchromatic nuclei, newly formed blood vessels and few infiltrating lymphocytes. Fibromas are benign tumors of fibrous connective tissue with mesenchymal origin. Further studies are needed to determine the etiology and epidemiology of fibroma in Koi carps under local conditions.

Impact of Three Different Dietary Protein Supplements on the Incidence Of Sub-Clinical Necrotic Enteritis in Broiler Chickens

M. W. C. D. Palliyeguru[1], S. P. Rose[2] and A. M. Mackenzie[2]

[1]Veterinary Research Institute, Gannoruwa, Peradeniya, Sri Lanka and [2] National Institute of Poultry Husbandry, Harper Adams University College, Newport, Shropshire, TF10 8NB, UK

The sub-clinical form of necrotic enteritis is far more common than clinical outbreaks in broiler flocks. The condition is not detected generally, due to the absence of clear clinical signs, therefore it prevails unnoticed apart from a poor growth performance, wet litter conditions and possible contamination of poultry products for human consumption. The damage has been estimated to be £1.8 billion per year to the world's poultry industry. There is evidence that different dietary protein sources affect the proliferation of *C. perfringens* within the caecum. Protein supplements are also a major variable in poultry feed formulations, due to their price fluctuations in local and international markets. Therefore the poultry industry should understand the impact of protein supplements on the incidence of sub-clinical necrotic enteritis.

An experiment was conducted to quantify the effects of three nutritionally complete maize-based diets that contained different dietary protein concentrates (soya-CP 44%, fish-CP 66% or potato- CP 79%) on the incidence of spontaneously occurring sub-clinical necrotic enteritis in broiler chickens. A total of 1,260 birds, those reared as a single flock, without antibiotics and anticoccidial prophylactics in diets, were placed into 18 solid floor pens (70 birds per pen-each treatment replicated 6 times) and fed one of the three experimental diets from 15 to 31 days of age. Body weights gains and the feed intakes of the birds were monitored during the experimental period. In addition, on days 27, 28, 29 and 30 of age, eight birds from each replicate pen (two birds per day) were sampled and gut and liver lesions scored, blood samples, intestinal sections and contents collected for further analysis.

The weight gains and feed intakes of the birds fed the potato and fish diets were lower ($P<0.001$) than those of the birds fed the soya diets. Weight gain: feed intake ratio and mortality rates were not affected ($P>0.05$) by dietary treatments. The birds fed the potato-based diets had a higher ($P<0.01$) incidence of necrotic lesions in the duodenum and proximal jejunum than those fed the soya based diets. The chickens fed the potato-based diet had a higher ($P<0.001$) proportion of moderate to severe duodenal and distal ileal haemorrhages and liver lesions than the birds fed the soya-based diet. There was also a higher ($P<0.05$) level of serum antibody for *Clostridium perfringens* alpha toxin in birds fed the potato-based diet compared to the other two diets. The birds fed the fish-based diet had a similar ($P>0.05$) incidence of NE in comparison to the birds fed the soya-based diet although there was a higher ($P>0.05$) incidence of intestinal haemorrhagic lesions. The differences in incidence of sub-clinical NE were not consistent with the relatively small differences in amino acid content between the three diets or in the contents of non-starch polysaccharides. However, the potato protein based diet had lower lipid content and a higher trypsin inhibitor activity that could have contributed to the increased incidence of sub-clinical necrotic enteritis.

Disaster Relief Veterinary Assistance to Flood Affected Citizens in Baticaloa and Polonnaruwa Districts in Sri Lanka

S. R. D. Fernandopulle[1], M. G. C. M Jayasinghe[1], D. A. Mapitiya[1], R. A. D. C. Tennakoon[2]

[1]Tsunami Animal people Alliance (TAPA) and [2]Government Veterinary Surgeon, Department of Animal Production and Health, Medirigiriya

The Tsunami Animal-People Alliance (TAPA) emerged after the tragic Tsunami, to provide a long-term solution for increasing animal welfare issues. In Sri Lanka, stabilized numbers of annual human deaths due to rabies, largely attributed to stray dog bites, was the main concern of TAPA. In early 2011, after unexpected severe floods in Sri Lanka, TAPA launched a disaster relief assistance program together with WSPA (World Society for Prevention of Cruelty in Animals) and HIS (Humane Society International) in two affected districts namely, Baticaloa and Polonnaruwa. The infrastructure, facilities and human resources of Department of Animal Production and Health (DAPH) was of great assistance for the conduction of this programme. The veterinarians in TAPA, joined with teams of WSPA and HSI and assessed the damage caused to humans and animals. Subsequently, together with the District Government Veterinary Surgeons (DGVS), the needs were identified and assistance to both animals and people were provided with the assistance of other non-governmental organization (NGO).

After the floods, the grasslands were heavily affected and therefore, concentrated feed and shelter for farm animals were provided with high priority. I addition, therapeutics including antibiotics, anti-hematinics and intravenous fluids were also supplied. The team worked in Batticaloa from 26th January to 14th February with the groups of DGVS in Baticaloa town, Eravur, Valachchenai, Vaharei, Pattipolai, Kalladi, Welikanda, Puthukudirippu and Kanchanakuda. Thereafter the team shifted to Polonnaruwa district in which work was carried out during 13th to 23rd March in Madirigiriya, Diyasenpura, Wallikanda and Polonaruwa town.

The numbers of cattle and goat treated in Batticaloa were approximately 300 and 250 while that of Polonnaruwa were 580 and 55 respectively. The most commonly reported health problems in cattle were pneumonia, diarrhoea, malnutrition, foot-rot and skin conditions. Most animals were in very poor body conditions due to lack of feed. Interestingly, the cattle were more prone to sicknesses, diarrhoea in particular, compared to buffaloes. The buffaloes were more prone to respiratory conditions compared to cattle. The cattle and buffalo calves were more frequently affected with sicknesses when compared to their adults.

The veterinary infrastructure, including basic medicaments were found to be insufficient in remote areas in both districts. Therefore, in addition to treatment, the disaster relief team provided essential medicines to all veterinary surgeons in both districts through the DAPH network. This is the first time that TAPA worked in collaboration with DAPH and other NGOs to assist disaster affected individuals and animals and also the first time in which farm animals were treated in relatively large numbers.

An Unknown Outbreak of Respiratory Infection Among Back Yard Poultry in Rakwana Veterinary Range

R. P. M. Pathirathna, M. I. G. Jayathilaka and D. S. Mahaarambe

[1]Department of Animal Production & Health (Sabaragamuwa), Provincial council complex, Rathnapura, [2] District Veterinary Office, Rathnapura, [3]Veterinary Investigation Center, Rathnapura

There was an outbreak of respiratory infection in back yard poultry in the Rakwana Veterinary Range during the period from August to September, 2010. Farmers complained about very high mortality among birds in some locations. The affected flocks were small, scattered in location, not limited to particular age group and not vaccinated against any of the infectious diseases.

Most of the birds showed very brief illness with respiratory signs prior to death. Greenish diarrhea, dispneoa, ruffled feathers, cessation of egg production were the other signs. Most of the farmers were in suspicion that it was an outbreak of avain influenza. As the clinical picture was very similar to that of avian influenza, the Veterinary Investigation Officer and the Veterinary Surgeon visited the area and investigated the problem. The rapid test which was done by Rapid Avian Influenza Virus Antigen Test Kit for Avian Influenza was found to be negative' This test kit is a chromatographic immunoassay for the qualitative detection of avian influenza type A subtype virus antigen in avian cloaca feces or scattered feces. Therefore, after preliminary investigations, postmortem examinations were carried out taking appropriate safety measures. Postmortem lesions observed were emaciation and dehydration of carcasses, swollen head, oro-nasal discharges, reddish wattle, hemorrhagic trachea with fresh blood within the lumen, Proventricular hemorrhages, hemorrhagic caecal tonsils and large number of round and tape worms found in the intestines. Avian Influenza, New Castle Disease and Infectious bronchitis were the diseases suspected. Although, the ducks and chickens were reared together, the ducks didn't show any clinical signs. However, the samples for labrotary diagnosis were collected from both species. Cloacal swabs from ducks, live and dead chickens were collected separately. Serum samples were collected from ducks and affected layers. Tissue samples of trachea, lungs, spleen, liver were collected from the dead birds. All the samples collected in transport media were submitted to the Virology Laboratory at Pologolla and Veterinary Investigation Center of the Veterinary Research institute (VRI) at Peradeniya. The VRI confirmed the tentative diagnosis made in the field as Newcastle Disease by using virus isolation and identification techniques.

The outbreaks were successfully controlled by using the imported lentogenic B1 strain of the Newcastle disease virus as the primary vaccine and the Lasota strain as the booster vaccine.The farmers in the area were also advised on the biosecurity measures to be taken in order to prevent future outbreaks.

Post Exposure Prophylaxis of Rabies in Elephants

D. L. N. Kumudinie

Elephant Transit Home, Department of Wildlife Conservation, Udawalawe

Rabies is a fatal disease in both animal and human. In animals the average incubation period is 2-3 months. However in reported rabies clinical cases of elephants the incubation period varies from 30-45 days.

Two clinical cases of rabies in elephant had been reported in Sri Lanka; first case in Colombo and the second in the Elephant Orphanage at Pinnawala. In both instances the disease had been diagnosed in the clinical phase where no treatment could be attempted.

This paper describes a case report of successful post exposure prophylaxis in elephant which had been done in Elephant Transit Home at Udawalawe. On the night of 23rd of December 2009 two elephant calves were bitten by a rabies suspected dog. One, which was a sick female of 1 ½ months, weighing approximately 65kg, was bitten on the trunk. The other was a 6 months old healthy male weighing approximately 150kg. It was bitten on both the trunk and face where nerve supply is rich. Bites in both animals were superficial and did not bleed.

Immediately after the exposure the wounds were thoroughly washed with soap and water and applied aqueous iodine as the first step of post exposure prophylaxis. Tetanus toxoid was administered intramuscularly. The dog was shot on the heart and the head was sent packed in ice to Medical Research Institute (MRI) for confirmative diagnosis. On 25th, MRI confirmed the diagnosis as rabies both on direct smear and florescent antibody test (FAT). Accordingly it was decided to attempt post exposure vaccination of the bite victims. Due to unavailability of a practicing post exposure vaccination schedule for animals in the country, it was decided to follow one of human post exposure prophylaxis schedules. As there was no registered animal anti rabies vaccine indicated for post exposure treatment, it was decided to use a human preparation ('VERORAB'). Both elephants received 4 doses of inactivated "Wistar Rabies PM/W/138 1503-3M" strain produced on vero cell culture. The vaccination regime followed was: 2 doses; one dose on each thigh on day 0, 1 dose on day 7 and last dose on day 21 on intramuscular route. Chlopheniramine maleate was also administered to avoid possible hypersensitivity. The elephants were kept isolated for a period of 6 months with daily observation for development of any nervous signs. After six months they were sent to the main herd as there were no signs of developing rabies.

Morbidity rate of rabies basically depend on the dose of innoculum, site of the exposure, species concerned and physiological status of the individual. However clinical cases of rabies in elephants have been reported from many countries. Therefore the risk associated is presumed to be high in the two cases observed, as both the victims are calves, the site of bite is close to the brain, rich nerve supply in the bitten regions of the body, and the youngest was possibly in an immunosuppressive stage due to having chronic diarrhea. Still the efficacy of the post exposure prophylaxis regime described should be further tested and necessary modifications included before confirmation.

Diagnosis and Management of Horner's Syndrome in Dogs

T. L. G. S. Peiris, D. Siriwardena and H. K. U. S. Hemachandra

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

Horner's Syndrome, a common condition in Golden Retriever dogs, is a collection of signs that occur when specific muscles of the face lose their stimulation, and is caused by an injury or due to a lesion of the associated nerves. Affected dogs will show miosis, protrusion of the third eyelid, ptosis, enophthalmos. The affected side of the face is usually slightly warmer.

A 13 years old sterilized female Golden Retriever was presented to the Pet Vet. Clinic with signs of conjunctivitis, third eyelid prolapsed, ptosis, and enophthalmos and was suspected to be Horner's Syndrome. The right eye of the patient was normal except excess mucopurulant discharge and exaggerated papillary reflex. All other neurological examinations were normal. Shirmer's tear test value for the affected eye was 0 and no foreging body was found in the third eye lid, when examined after a drop of local anaesthetic eye drop. Later, cornea was stained with fluorescent and was confirmed of no corneal ulcers. 1-2 drops of 10% phenylephrine was applied into both eyes and were examined once in every 10 minutes for a period of an hour. The pupils dilated and the 3rd eye lid prominence resolved within 20 minutes. Therefore, the dog was tentatively diagnosed as having 3rd order Horner's Syndrome.

Idiopathic or 3rd order Horner's Syndrome may be caused by pressure or bruising on the throat, middle ear, thoracic, mediastinal, neck or brainstem either by neoplasia, abscess or a lesion nerves. Ears of this dog was examined using otoscope under mild general anesthesia, which reveled inflammation of the tympanic membrane. Swabs were taken for both fungal and bacterial culture. The dog is currently on phenylepinephrin, chloramphenicol eye drops, tear replacement drops and cyclosporine eye drops. Simultaneously dog is on treatment for the ear and skin infection. She is under observation since it takes 6-8 weeks for the condition to resolve. Recognizing the typical appearance of this syndrome is important for diagnosis as it is similar in clinical presentation to entropion and eye infection.

Maintaining Health Status in A Baby Orangutan *(Pongo pygmaeus pygmaeus)* Infested with Strongyloide Worms

L. A. J. P. K. Jayasekara

National Zoological Gardens, Dehiwela

A baby Borneo Orangutan (*Pongo pygmaeus pygmaeus*), a highly endangered species, was born in National Zoological Gardens Dehiwala on 3rd November 2010, after 29 years. The 11 years old father was separated from the mother (12 years old) immediately after the birth of the baby. Mother appeared to be extremely pocessive of her baby, and did not allow anybody to get close and therefore, monitoring every 2 hours were done from distance visually and using different types of cameras. The relationship between the mother and the baby, frequency of muconeam, defecation and urination, position of head, jaw movements in suckling, grip of hand and crying were frequently noted until the baby was 1 week old. Such daily photographs were monitored on large screens and in addition, colour of lips, skin condition, Eye wetness and body developments, daily fecal analysis of mother and baby (whenever possible, since mother would eat) were monitored. It is known that some mothers would feed the baby with saliva and not milk, hence the baby would gradually become weak and die.

In addition to the mother's normal diet, she was given UHT milk, cashew, cheese, vegetable soup, boiled eggs, bread and additional fruits. Further,the vitamin B complex, vitamin C, Vitamin E, folic acid and calcium were orally supplemented to the mother. One tablet of Metaclopramide (10mg) was given every 12 hours to increase milk letdown and both were restricted to the dent away from public until 6 weeks. The prevailing severe rain during these days was anticipated in increases the worm burden and biosecurity measures had to be carefully implimented.

When the baby was 6 weeks old, both mother and baby were found to be excreting high numbers of Strongyloid type nematode eggs (Length and width micrometers 47-5 and 532-35) and larvae were seen inside the eggs. The baby, in addition, started showing signs of weakness while the mother had diarrhea with high Balantidium count. The mother and the father were given Mebendazole 15mg/kg on 2 consecutive days, Co-trimoxizole 480mg, 2 tablets and Metranidazole (400mg) 2 tablets, twice daily for 4 days. Despite mother's attempts to protect the baby, we were able to administer the baby with Pyrantal pamoate syrup 0.8ml (50mg/ml) on 3 consecutive days using a 1cc syringe. Mother had to be dewormed again and the baby continued to excrete low numbers of eggs, though clinically improved. Both mother and father were given Ivermectin (0.3ml/10kg) with Albendasole (50mg/kg) and baby was given Albendasole100mg and Ivermectin 0.075ml, orally repeatedly with difficulty. The daily oral vitamin and iron supplements were introduced to the baby in 8 weeks.

All mammals in the vicinity were dewormed and new footbaths with saturated salt were introduced to all entrances. High-pressure seawater is used to spray the enclosure routinely. All tortoises were removed from the area, all human workers were also de wormed and all fruits given were carefully and thoroughly washed. Currently the baby is 4 months old, growing well and all biosecurity measures are strictly adhered.

Outbreak of Foodborne Illnesses in Jaffna District

M. Muralithas[1], J. K. H. Ubeyratne[2], K. Kandeepan[3] and R. Surenthirakumaran[3]

[1]Department of Animal Science, Faculty of Agriculture, University of Jaffna.[2]Central Veterinary Investigation Center, Veterinary Research Institute, Gannoruwa, Peradeniya. [3]Department of Community Medicine and Family Health, Faculty of Medicine, University of Jaffna,Jaffna.

Food safety, a worldwide public health issue, is a result of consumer concerns largely on health and on improving food quality. Foodborne illnesses are defined as diseases, either infectious or toxic in nature, caused by agents that enter the body through the ingestion of food or water (WHO: Fact sheet N°237). Such food and water contaminants are found in developed, developing and poor countries, including Sri Lanka. In year 2005, a total of 1.8 million people died from diarrheal diseases (WHO: Fact sheet N°237) of which a substantial proportion has been attributed to consumption of contaminated food and water.

In last two years, including 9 deaths, a total 5079 cases of clinically suspected food and waterborne illnesses in malnourished people were reported from Regional Directorate of health Services (RDHS) divisions and hospitals in Jaffna district (RDHS Jaffna, 2009). Those cases had been treated symptomatically either as inpatients or outpatients by respective medical doctors. It also has been noticed that gastroenteritis either by food poisoning due to contamination of food and water or foodborne pathogens, is a common condition in domestic animals (both pet and livestock) in the area concern.

The potential trend, if confirmed, may be attributed to possible rapid fecal contamination of wells since they are in close proximity to the lavatory pits. Such situation has not been observed in other parts of the country. Moreover, Jaffna peninsula is prone for seasonal floods, especially in the period of November, due to its unique geography. As a result, fecal contamination of drinking water sources would be important in inducing foodborne illnesses, in addition to unhygienic food handling. Further, the intensive agricultural practices involving very high inputs of artificial fertilizers may lead to potential accumulation of inorganic and heavy metals in water resources as well as in vegetation.

Currently, families who left from Jaffna due to civil unrest in the past are returning back and the peninsula is getting tourist attraction. It is the duty of health professionals to identify the public health problems and associated risk factors along with etiology and propose remedial action. Therefore it is suggested that a properly planned study involving all areas must be carried out considering geography and the unique culture in Jaffna. A detailed investigation on potential conditions in humans and animals in Jaffna would be much valuable for their physical, mental and social wellbeing in present and future.

Socio-Economic Impact of Foot and Mouth Disease Outbreak in Kundasala and Teldeniya Government Veterinary Ranges

K. A. C. H. A.Kothalawala[1], P. Wijewantha[1], S. A. Seelanatha[2], B. M. M. Dissanayake[3] and H. A. W. M. R. U. W. K.Udugama[1]

[1]Division of Livestock Planning and Economics, Department of Animal Production and Health, P.O. Box 13,Gatambe, Peradeniya, [2]Government Veterinary Surgeon's Office, Teldeniya and [3]Government Veterinary Surgeons Office, Kundasala

Foot and mouth disease (FMD) is one of the most important livestock diseases in the world in terms of economic impact. The reasons are not only due to the ability of the disease to cause losses of production, but also are related to the activities of the veterinary services and to restriction on the trade of animals and animal products both locally and internationally. According to the (spell out) WTO agreement on animal health and sanitary standards (1994), being free from FMD is a pre requisite for livestock and livestock product exports. FMD, an endemic disease to Sri Lanka, was reported in Kundasala and Teldeniya, both adjacent veterinary ranges in central province in mid 2009. The area was immediately declared as "infected" by the authorities and a "movement restriction" was imposed for 35 days. This situation caused a severe socio economic loss for dairy farmers in the area. Therefore a study was planned and carried out to assess the socio economic impact of FMD outbreak in those two veterinary ranges.

Information was collected from farmers, veterinary office and milk collecting agencies using a structured questionnaire. Direct losses were estimated on all the related activities such as milk withdrawal, cost of treatment, loss on meat, deaths, movement restriction, cost for vaccination, temporary cessation of animal production and health activities. The results revealed that there were 24 affected farmers in Kundasale and 2 in Teldeniya .The average number of infected animals per farm was 4.1 and 4.0 in Kundasala and Teldeniya ranges respectively. The average loss of direct income on milk withdrawal for 35 days was Rs. 6593 in Kundasala and Rs. 5823 in Teldeniya for each farmer. The costs including treatment, man days involved, meat loss and deaths for infected farms was Rs. 24597.75 and Rs.21216.00 in Kundasala and Teldeniya VS ranges respectively. On an average, the cost incurred by the government on vaccines, vaccination, losses on AI, losses on extension and breeding activities were Rs. 10.2 million for both VS ranges. The total estimated economic lossfor the farmers as well as the government was around Rs, 19.6 million for both VS ranges.

Application of Recombinant Arginine Kinase of *Toxocara canis* for Serodiagnosis of Visceral Larva Migrans (VLM) and Evaluation of its Specificity and Cellular Localization

D. G. R. S. Kulathunga, S.Wickramasingh, R.P.V.J. Rajapakse, N.A.N.D Perera and W. R. Jayaweera

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

Toxocara canis is a worldwide distributed round worm of dog. Humans are accidental host. They get infection by ingestion of embryonated *T. canis* eggs in contaminated environments. This condition is known as toxocariasis. There are two major forms of toxocariasis: visceral larva migrans (VLM) and ocular larva migrans (OLM). In VLM syndrome, the larval stages migrate through the visceral organs and/or central nervous system leading to inflammatory reactions by affected organs. The most common method available for serodiagnosis of toxocariasis is an enzyme-linked immunosorbant assay (ELISA) test using *Toxocara* excretory-secretory antigen (TcES). Although the sensitivity and specificity of the method is fairly high there can be cross-reaction with other nematode parasites. Arginine kinase (AK) is a member of phosphagen kinases widely distributed among invertebrates. As this enzyme is not present in mammals, it might be a useful diagnostic marker for VLM.

Escherichia coli JM109 cells with pMAL plasmid, which expresses the *Toxocara canis* AK as a fusion protein with maltose-binding protein was cultured in Luria- Bertani medium. Expression of maltose binding protein (MBP)-*T. canis* AK fusion protein in *E. coli* cells was induced with 1Mm Isopropyl β-D-1thiogalactopyranoside (IPTG) at 25 ^{0}C for 24 hours. The cells were solubilized in extraction buffer and subjected to SDS-polyacrylamide gel electrophoresis (PAGE) in a 10% gel containing a molecular weight marker. SDS-PAGE analysis of the extracts of *E.coli* cells induced and expressed *T. canis* AK which showed a band with a molecular mass of approximately 85 kDa. Specific antigen band in the SDS-PAGE was separated and antigen was purified. These antigen containing gel strips injected to mice subcutaneously and serum was collected after 3 weeks. Serum was collected from control group of mice also. After that, Imunofluorescence Antibody test (IFA) was performed separately with the serum collected for the *Ascaris* and *Toxocara* eggs and *Toxocara canis* and *Ascaris* larvae.

Immunofluorescence was observed in both *Toxocara* and *Ascaris* larvae and in eggs. Embryonated eggs showed more fluorescence than the undeveloped eggs. Besides these in both *Toxocara* and *Ascaris* larvae fluorescence were observed throughout the body of the larvae and fluorescence was more prominent in posterior and middle parts of the body of the larvae. Our results suggest that AK is present in both *Toxocara* and *Ascaris l*arvae and specificity of the enzyme for the serodiagnosis of toxocariasis is questionable. Our future goals are to perform Imunofluorescence antibody test and to find out the specificity of AK enzyme in similar geohelminth infections and also to determine the specific cellular localization of this protein in *Toxocara canis* and *Ascaris* spp.

Abscess of an African Grey Parrot: Medical Management Followed by Excision under Isoflurane

C. G. Wijesinghe[1], D. M. Siriwardena[2] and W. A. D. C. H. Wickramasinghe[2]

[1]National Zoological Gardens, Dehiwela, Sri Lanka and [2] Pet Vet Clinic, 421/5, Malalasekera Mawatha, Colombo 07, Sri Lanka

African Grey Parrots (*Psittacus erithacus*) are sensitive, playful and friendly. Their gentle nature and ability to mimic speech with a variety of whistles, squawks and screams have made them popular pets. They are approximately 30cm long, weigh about 400g, live 50-60 years and are considered a near threatened species. African grey parrots are imported to Sri Lanka, and also there are few places where they are bred in captivity.

A 15 year old African Grey Parrot, imported from France in 1998, was presented to PetVet Clinic with a mass near the crop, subsequent loss of vocalization, reduced activity and appetite. The mass had progressively increased in size despite different treatments over four months. Clinical examination revealed a soft mass at the crop, and about 60 ml of thick sero-sanguinous fluid was aspirated. The aspirate was sent for culture and antibiotic sensitivity testing (ABST). The condition was tentatively diagnosed as an abscess. Augmentin (25 mg/kg BID PO) was started pending ABST results. After two days of treatment, activity, appetite, vocalization had returned to normalcy and the swelling had not re-filled and was firm upon palpation. Culture resulted in a pure growth of *Pseudamonas aeroginosa,* and the antibiotic was changed to Ciprofloxacin (15 mg/kg BID PO) depending on ABST results, and was continued for a week. Three weeks later, the mass had started to re-fill. It was firm, 3ml of purulent material was aspirated and the culture revealed a coliform sensitive to Ciprofloxacin, which was thus re-introduced.

After two weeks of antibiotics, the mass was surgically excised. The bird was physically restrained, induced using 5% Isoflurane by a mask, and maintained using 3%-1% with Oxygen. The skin was prepared with chlorhexidine. An organized tissue mass was excised and the incision closed using intra dermal pattern with 4/0 absorbable sutures. The bird was kept warm throughout using a warm water filled bag, and the eyes were periodically made wet with saline. During surgery, there was a respiratory arrest which was managed by discontinuation of Isoflurane, supplying oxygen and artificial respiration until breathing resumed after 10 minutes. Once stable, the bird was maintained under Isoflurane 2%-1%. The bird was under general anesthesia for approximately 1 hour, and recovered uneventfully five minutes after discontinuation of Isoflurane.

Antibiotic was changed to Ceftriaxone (75 mg/kg IM SID), and oral Carprofen (5 mg/kg PO BID) was introduced post surgically for one week. Histopathology confirmed the tentative diagnosis. Re-examination a week later showed marked improvement without complications.

Importation of Cat and Dog Food into Sri Lanka

S. L. Jayasinghe

Animal Quarantine Office, Colombo

"Pet food" is plant or animal material intended for consumption by pets. It is generally specific to the type of animal and countries such as France, USA, India, Thailand and Singapore dominate the industry. The Cat, being an obligatory carnivore, does essentially require the amino acid Taurine from food and therefore, all commercial cat feed are added with taurine, in addition to plant and animal material, minerals and vitamins.

Though it is generally said that the dogs can thrive on left-over food from people, a reasonable quantity of dog food is being imported. The commercial feed for dogs however, has been available in the market only for the last century. Such importation has been possible under the "Animal Feed Act No.15 of 1986". Currently, 5 trade names of commercial pet feed are imported into Sri Lanka namely, "Pedigree", "Eukanuba", "Nutra Nuggets", "Nutra pets" and "Maxi".

In the year 2007, the proportion of importations for Pedigree, Eukanuba and others had been 55%, 30% and 15% respectively, In 2008, proportions of imports for Pedegree, Eukanuba, Nutra nuggets and others had been 60%, 25%, 10% and 5% respectively while the same proportions changed to 80%, 10% 5% and 5% in year 2009. In addition to the shift among the trade names, the quantity of imports of pet food have been gradually increasing over the past 3 years.

Sri Lanka Veterinary Association

63rd Executive Committee

President: Dr. Ashoka Dangolla

Secretary: Prof. H.B.S Ariyaratne

Assistant Secretaries: Dr. Sampath Lokugalappatti
Dr. Vijitha Perera

Vice Presidents: Dr. Ganga Wijesinghe
Dr. S. Marapana

President Elect: Dr. A. Sivasothy

Treasurer: Dr. Sumudu kariyawasam

Assistant Treasurer: Dr. K. Kulueshwara Kumar

Executive committee: Dr. K.D. Ariyapala
Dr. S.S.P. Silva
Dr. Ravi Dissanayaka
Dr. Mohamed Ijas
Dr. U. Mallawarachchi
Dr. Ranjani Hettiarachchi

Ex officio members: Dr. Athula Mahagamage
Dr. Sumudu Kariyawasam
Dr. Ushan Pallegama

Annual Scientific Sessions 2011

The Executive Committee of the Sri Lanka Veterinary Association gratefully acknowledge the contribution of the following committees

Organizing Committee: Dr. Asoka dangolla (convener)
Dr. K.D Ariyapala
Dr. Athula Magamage
Prof. H.B.S. Ariyaratne
Dr. Ushan Pallegama
Dr. S.S.P. Silva
Dr. Sampath Lokugalappatti

Scientific Committee: Prof. H.B.S. Ariyaratne (convener)
Dr. S.S.P. Silva
Dr. Asoka Dangolla
Dr. A. Arulkanthan

Dr. Sampath Lokugalappatti
Dr. B.D.R. Wijewardana
Prof. R.P.V.J. Rajapakse
Dr. R. Sivakanesan

Fund Raising Committee: Dr. A. Sivasothy (convenor)
Dr. Ashoka Dangolla
Dr. Athula Mahagamage
Dr. Ushan Pallegama
Dr. Sumudu Kariyawasam
Dr. Mohamed Ijas
Prof. H.B.S Ariyarathne
Dr. Sampath Lokugalappatti

Reviewers : Prof. H.B.S. Ariyarathne
Dr. Ashoka Dangolla
Dr. S.S.P. Silva
Dr. B.D.R. Wijewardena
Prof. R.P.V.J. Rajapakse
Dr. Palika Mathew
Prof. R. Sivakaneshan
Dr. Panduka Gunwardena
Dr. R. Wickramasinghe
Dr. Mohamded Fouzi
Dr. A. Arulkanthan
Dr. M.L.N.A.R. Deepani
Dr. S. P. Gunarathne
Dr. Ganga Wijesinghe
Dr. Vijitha Perera
Dr. Basil Alexander
Dr. Indra Abeygunawardena
Dr. Anil Pushpakumara
Dr. Shirani Ranasinghe
Dr. Niranjala de Silva
Dr. Nilmini Jayasen
Dr. Faseeha Noordeen
Prof. V.K. Gunawardena
Dr. Nayana Wijewardena
Dr. Wathsala Edirimanne
Prof. Indira Silva
Dr. Gnana Gunawardana
Dr. Ted Leighton
Dr. Niromi Jayasekera
Dr. Sampath Lokugalappatti

****