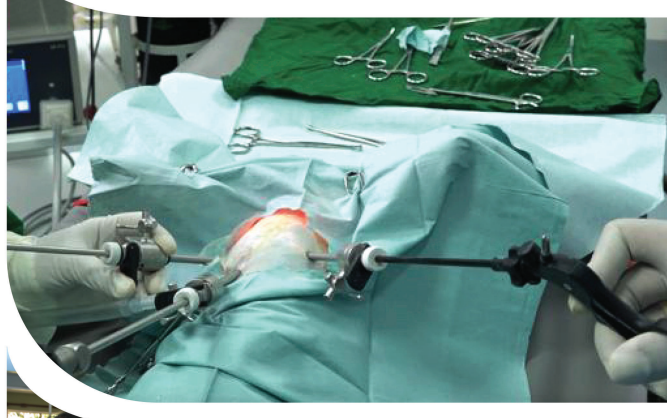
PROCEEDINGS OF

74th ANNUAL SCIENTIFIC SESSIONS 2022

"Harnessing veterinarians' contribution to ensure food security and to strengthen the one health approach"

21st OCTOBER 2022

at Amaya Hills - Kandy



SRI LANKA VETERINARY ASSOCIATION

"Working for the advancement of the veterinary profession since 1940"

74th Annual Scientific Sessions 2022
Sri Lanka Veterinary Association

Programme and Abstracts of the
Annual Scientific Sessions 2022

21st October 2022
Amaya Hills, Kandy
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ANNUAL SCIENTIFIC SESSIONS 2022
SRI LANKA VETERINARY ASSOCIATION

Programme

21st October 2022

08.30 – 09.20	Registration & Refreshments
09.20 – 09.30	Arrival of the Guests and Ceremonial Procession
09.30 – 09.40	National Anthem and Lighting of the Oil Lamp
09.40 – 09.50	Welcome Address by Dr. Susantha Mallawa Arachchi, President, Sri Lanka Veterinary Association
09.50 – 10.00	Address by Dr. Susil Silva "Nutrient Value Calculator; Energy Predictions of Soybean Meals" Head of Animal Utilization- South Asia & Sub-Saharan Africa US Soybean Export Council
10.00 – 10.10	Address by Ms. Deeba Giannoulis "Poultry US Soy Sustainability" Head of US Soy Marketing- South Asia & Sub-Saharan Africa US Soybean Export Council
10.10 – 10.20	Address by the Guest of Honor Professor M.D. Lamawansa Vice Chancellor, University of Peradeniya
10.20 – 10.30	Address by the Chief Guest via a virtual platform Her Excellency Bonnie Horbach Ambassador of The Netherlands to Sri Lanka and the Maldives
10.30 – 10.35	Vote of Thanks by Dr. Chamari Kannangara, Secretary, Sri Lanka Veterinary Association
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11.00 – 11.10	Scientific Sessions Opening Remarks by Professor Anura P. Jayasooriya Scientific Sessions Co-Chair
11.10 – 11.30	Keynote Address by Dr. Sapumal Dhanapala "Integral Role of Veterinarians in Food Security and One Health" Consultant Community Physician National Professional Officer Emergency Risk Management World Health Organization Sri Lanka

11.30 – 11.45 Animal Production Session
Plenary Speech by Professor Anil Pushpakumara

"Key Performance Indicators and Early Embryo Mortality; Two Key Aspects to Consider to Improve the Reproductive Efficiency in Dairy Cows"

Professor in Animal Reproduction and Dean, Faculty of Veterinary Medicine and Animal Science, University of Peradeniya, Sri Lanka
Adjunct Senior Lecturer in Animal Production and Health, School of Veterinary Science, Massey University, New Zealand

11.45 – 12.00 Animal Health Session
Plenary Speech by Professor Udeni B.R. Balasuriya

"The Role of Veterinary Diagnostic Laboratories in Disease Diagnosis and Surveillance in the US, an Application of One Health Initiative"

Director, Louisiana Animal Disease Diagnostic Laboratory (LADDL),
Director, LSU Biosafety Level 3 Core Facility,
Professor of Virology, Department of Pathobiological Sciences,
School of Veterinary Medicine, Louisiana State University, USA

12.00 – 12.15 Veterinary Clinical Session
Plenary Speech by Dr. Dynatra Subasinghe via virtual platform

"A Proactive Approach to Antimicrobial Stewardship in Veterinary Practice within the One Health Agenda"

Director Clinical years of the BVMSci program, Section Head Small Animal Group, Department of Clinical Sciences, School of Veterinary Medicine, Faculty of Health and Medical Sciences, University of Surrey, Guildford, Surrey, UK

12.15 – 13.00 Poster Session

13.00 – 13.45 L U N C H

13.45 – 14.00 Public Health Session
Plenary Speech by Dr. Gayan Hettiarachchi via virtual platform

"The Role of Veterinarians in Food Safety, Productivity and Global Market Access"

Director, Food Safety, Department of Global Affairs,
Champion Petfoods LP, Edmonton, AB Canada

14.00 – 14.15	Wildlife & Aquatic Veterinary Medicine Plenary Speech by Professor Grant D. Stentiford via virtual platform "Sustainable Aquaculture through the One Health Lens" Animal & Human Health Theme Lead at CEFAS, Head, OIE Collaborating Centre for Emerging Aquatic Animal Diseases, Co-Director, Sustainable Aquaculture Futures Centre at the University of Exeter, UK
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74th Executive Committee of the SLVA

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Annual Scientific Sessions – 2022

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74th Annual Scientific Sessions of the Sri Lanka Veterinary Association

21st October 2022		
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Keynote Adress

Integral Role of Veterinarians in Food Security and One Health

Dr. Sapumal Dhanapala
(MBBS, MSc, MD)

National Professional Officer Emergency Risk Management
World Health Organization
Sri Lanka

Veterinarians play an integral role in Food Security and One Health due to their involvement in the dynamic interplay between human, animal and environment interface and their intersectoral correlations. Whether as clinical practitioners, epidemiologists, ecological experts or researchers; veterinarians are essential to advancing One Health and protecting the health and safety of its three pillars: animals, humans, and the environment.

The outbreaks of Severe Acute Respiratory Syndrome (SARS), Avian Influenza and Nipah virus in Asian countries clearly demonstrated that new highly infectious and/or highly pathogenic agents periodically would emerge at the human-animal interface which will continue to occur at heightened frequencies in the decades to come.

The 2003 Influenza A(H5N1) outbreak causing large poultry outbreaks in Asia, alerted global health authorities on a possibility of a next influenza pandemic. This was soon followed by the new strain of Influenza A (H1N1) in 2009.

The COVID-19 pandemic exposed key gaps in our knowledge on how diseases that spill-over from animals to humans (zoonotic diseases) can emerge and re-emerge with devastating impacts across all sectors. The pandemic emphasised the need for enhanced coordination and collaboration among sectors and agencies, nationally and internationally to better prevent, prepare for, and respond to these threats.

Responding to this need, in November 2020 at the Paris Peace Forum, the Ministerial Meeting of the Alliance for Multilateralism called on the Tripartite (FAO, WOAH founded as OIE and WHO) and UNEP (hereafter referred to as 'the Partners') to create a One Health High-Level Expert Panel (OHHLEP). Subsequently, at the 27th Tripartite Executive Annual Meeting in February 2021, the Partners agreed to establish OHHLEP to assist in their support to countries in the framework of their One Health collaboration.

The Partners are committed to using the knowledge generated by OHHLEP, including the analysis of scientific evidence on the drivers contributing to spill-over and subsequent spread of zoonotic diseases, and the development of a risk management framework, a One Health Theory of Change (ToC) to move One Health from concept to practice, and the proposal for an soptimised One Health surveillance system, which they will in turn use to improve systems to better prevent, predict, detect, and respond to global health threats at all levels.

One of the key milestones of collaborative, coordinated action towards One Health in Sri Lanka was the country preparedness efforts towards the 2003 Influenza (H5N1). Sri Lanka began its preparedness against the potential threat in 2004 when the Ministry of Health coordinated with the Ministry of Livestock & Agriculture to establish a joint programme adapting and adopting global guidelines. The National Influenza Preparedness and Response Plan of Sri Lanka was developed and published in 2005 and a revision was carried out in 2006. The role of veterinarians during these

exercises including clearly demonstrated the concerted multi-sectoral effort necessary to a truly 'One Health' approach.

Learning from the past experiences of Influenza A (H5N1) and A (H1N1) pandemic in 2009 and 2010, the Ministry of Health with the support of the Ministry of Livestock and Development updated the National Influenza Pandemic Preparedness Plan (NIPPP) in 2012. The Pandemic preparedness plan identifies the need to have an animal influenza surveillance system and refers to the avian influenza control plan, which was developed by the DAPH in 2006 and updated in 2009 which consists of strategies recommended by Food and Agriculture Organization (FAO) and World Organization for Animal Health (founded as OIE).

There has been collaboration in the recent years through International Health Regulations where the National Action Plan for Health Security 2019-2023, National Strategic Plan for Combating Antimicrobial Resistance in Sri Lanka 2017 to 2022, Food Safety Policy (draft) 2019, Codex subcommittee have all been integral parts of the effort. But with the recent past years of the COVID-19 pandemic, which exposed the systemic deficiencies, gaps and reinforced the necessity of sustained, well-coordinated, multi-sectoral, multi-disciplinary, community-based actions to address emerging disease threats that arise at the human-animal interface has been brought to the forefront.

Veterinary medicine has an increasingly important role in global health, food security, and the post-2015 development goals proposed by a high-level UN panel. Food safety and quality are best assured by an integrated, multi-disciplinary approach, considering the whole food chain. Eliminating or controlling food hazards at source than relying on control of the final product. The education and training of veterinarians, which includes both animal health (including zoonoses) and food hygiene components, make them uniquely equipped to play a central role in ensuring food safety, especially the safety of foods of animal origin. One such important initiative is the Multi-sectoral Integrated Surveillance on AMR-One Health- Food chain and Environment.

It is clear that no single discipline or sector of society has enough knowledge and resources to address the emergence or resurgence of such zoonotic diseases. There is a growing acceptance of 'One Health' concepts and usage of the approach in recent years and countries need to adopt according to country specific requirements and context. The political will is increasing, and more attention is needed on how the broad scope of One Health is translated into practice.

Preventive health services and preventive veterinary services are sdecentralised in Sri Lanka and the Divisional, District and Provincial level efforts need to be coordinated for surveillance, epidemiological investigations and joint efforts at the grassroots level. The goals of controlling zoonotic diseases such as rabies, leptospirosis, and Japanese Encephalitis, tackling food safety issues and antimicrobial resistance will all remain unachievable without the vital element of coordinated and concerted action.

As veterinarians, your strong presence is needed now more than ever to co-lead One Health efforts with the human health sector and other stakeholders. Beneficial interventions will require collaboration between medical, veterinary, agricultural, social, environmental, and wildlife scientists. Veterinary medicine intersects with all these disciplines and for years has promoted the concept of One Health as a technique for promotion of collaboration. The strong laboratory and disease surveillance systems creating early warning to other sectors, strong antimicrobial resistance surveillance systems and good veterinary practices in the food chain will all contribute to the efforts of One Health from the veterinary perspective.

I wish success to the Sri Lanka Veterinary Association in their efforts towards achieving One Health and as the SLVA oath states, 'to use scientific knowledge and skills for the benefit of society through the protection of animal health, the relief of animal suffering, the conservation of livestock resources, the promotion of public health and the advancement of medical knowledge.

Plenary Speech- Animal Production Session

Key Performance Indicators and Early Embryo Mortality; Two Key Aspects to Consider to Improve the Reproductive Efficiency in Dairy Cows

Professor Anil Pushpakumara
(BVSc, PhD, FSLCVS)

Professor in Animal Reproduction and Dean,
Faculty of Veterinary Medicine and Animal Sciences,
University of Peradeniya, Sri Lanka.
Adjunct Senior Lecturer in Animal Production and Health,
School of Veterinary Science Massey University, New Zealand

Domestic milk production in Sri Lanka is still below fifty per cent of its annual requirement. Small-scale dairy farms play an integral part in the dairy industry of Sri Lanka, contributing approximately 90% to the total milk production. Regular calving is an important requirement for the continuous supply of milk for those engaged in the dairy business. Reproduction in dairy cows has two main outcomes: production of a live calf and initiation of a new lactation period. Calving interval of 13-14 months has been considered ideal for medium to small-scale dairy farms. The reproductive efficiency of dairy cows determines the overall profitability of farm operations. Key Performance Indicators (KPIs) could be used to monitor the performance of a dairy farm and two sets of KPIs are available for monitoring postpartum dairy cows: one for the post calving period (PCP) and the other one for the service period (SP). The KPIs of PCP include most of the events that occur during the voluntary waiting period leading to first signs of estrous. The KPIs for SP include a percentage of animals served and also identified as pregnant. The targets for every KPIs could be determined for an individual farm, veterinary surgeon's division, at the provincial level or at the level of the agroecological zone. These KPIs must be in place for commercial dairy farms to evaluate the performance. Timely evaluation of KPIs could identify the potential causes of poor performance and action initiated to rectify deficiencies.

The most useful SP-KPIs are 100 day in-calf-rate and 200 days not in calf rate. The first KPI calculates the percentage of the cows in the herd that become pregnant by 100 days after calving and the second KPI calculates the percentage of cows not pregnant by 200 days after calving. For cattle calving year around, the usual target for these two KPIs are 58% and 13%, respectively. To achieve a high 100 day-in-calf rate, a high percentage of cows in the farm must be submitted to insemination without undue delay after calving, readily conceived following insemination, tested for pregnancy on a regular basis and non-pregnant cows should be subjected to re-ssynchronisation protocols and re-bred. Fixed time artificial insemination (FTAI) is a very useful method for breeding dairy cattle to reduce calving to conception interval and some synchrony protocols in FTAI programmes could be used as treatments(eg. Double Ovsynch) for non-cycling animals in the herd/farm.

Embryo mortality (EM) is known to be the main cause of reducing the reproductive efficiency in dairy cows. Several studies done in the recent past have proved that oestrus response, type of cattle (*Bos indicus* vs *Bos taurus*), parity of the animal and sire have effects on pregnancy losses caused by EM. Reproductive tract position in the pelvic cavity and its size also has a significant influence on the pregnancy rate in dairy cows.

The Role of Veterinary Diagnostic Laboratories in Disease Diagnosis and Surveillance in the US, an Application of One Health Initiative

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The convergence of people, animals, and our environment has created a new dynamic in which the health of each group is inextricably interconnected. Therefore, the health of people is closely connected to the health of animals and our shared environment. Approximately 60% of human infectious diseases are due to multi-host pathogens that have crossed the species barrier from animals to humans (zoonotic diseases). And over the last three decades, approximately 75% of new emerging human infectious diseases have been zoonotic. Our increasing interdependence with animals and their products, as well as the close interactions with them (companion and pet animals), may be the single most critical risk factor to our health and well-being with regard to infectious diseases. Because animals both impact and are impacted by people and the environment, veterinarians play integral roles in protecting not just our animal patients but people and the environment as well. As clinical practitioners, epidemiologists, diagnosticians, educators, and ecological experts, veterinarians are essential to advancing One Health mission and protecting the health and safety of animals, people, and the environment. Today, veterinarians and veterinary laboratory diagnosticians play a vital role in the collaborative effort of multiple disciplines working locally, nationally, and globally to attain optimal health for people, animals, and the environment. Surveillance and diagnosis of endemic, emerging, and re-emerging diseases of animals and humans is paramount for treatment, vaccination, and implementation of control programs to prevent the spread of human and animal diseases, not only transmitted by animals but also by arthropod vectors (i.e., mosquitos and ticks). To this end, in 2002, the United States (US) Congress authorised the US Department of Agriculture (USDA) to coordinate the development, implementation, and enhancement of National Veterinary Diagnostic Laboratory (VDL) capabilities, with special emphasis on disease surveillance planning and vulnerability analysis, technology development and validation, training, and outreach. This led to the establishment of the National Animal Health Laboratory Network (NAHLN), which is a cooperative effort between two USDA agencies—the Animal and Plant Health Inspection Service (APHIS) and the National Institute of Food and Agriculture (NIFA) and the American Association of Veterinary Laboratory Diagnosticians (AAVLD). It is a multifaceted network comprised of sets of VDLs that focus on diagnosing and surveillance of different endemic and Foreign Animal Diseases (FADs), using common testing methods and data standards to process diagnostic requests and share information. The NAHLN is a nationally coordinated network and partnership of Federal (e.g., National Veterinary Services Laboratories [NVSL], State Organisations (e.g., Department of Agriculture, Department of Wildlife and Fisheries, etc.), and state/university associated AAVLD accredited animal disease diagnostic laboratories. NAHLN network laboratories provide animal health diagnostic testing, methods of research and development, and expertise for education and extension to detect biological threats to the nation's animal agriculture, thus protecting animal health, public health, and the nation's food supply. The main activities of NAHLN member

VDLs include early detection of high consequence animal diseases and rapid response to a disease outbreak by increasing the capacity for diagnostic testing and testing of large numbers of samples to confirm freedom of disease following implementation of control and eradication programs. NAHLN laboratories also conduct disease surveillance for existing or known (endemic) diseases in the US. In addition, some VDLs are CLIA (Clinical Laboratory Improvement Amendment) certified to test human specimens for emerging pathogens such as SARSCoV-2 and Monkeypox virus. In summary, veterinary diagnosticians and VDLs play a pivotal role in improving animal and human health in the US through collaboration among multiple professions— veterinary medicine, human medicine, environmental, wildlife, and public health to create innovative programs to improve animal and human health achieving the goals of One Health initiative.

Plenary Speech- Clinical Session

A Proactive Approach to Antimicrobial Stewardship in Veterinary Practice within the One Health Agenda

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The World Health Organization has identified antimicrobial resistance (AMR) as a serious challenge to public health and achievements of modern medicine. A post-antibiotic era in which common infections cannot be mitigated in our animal patients and fellow humans is a real possibility in future. Multiple research and evidence based scientific studies highlight the need for antimicrobial stewardship (AMS) in both human and animal health. This is a one-health problem that does not recognise boundaries between humans, animals and our shared environment. A proactive approach to antimicrobial stewardship (AMS) within all health sectors should be considered and pursued. There is close contact and microbial exchange in animal owning households and production animal settings. There is growing evidence of AMR in the food chain and the environment. Antimicrobial medications used in animals and humans, even if not identical, are very similar. AMR bacteria and their genes in animals and humans are closely related. Responsible use, addressing prescribing drivers in all medical health sectors, including veterinary medicine is a proactive approach to minimising AMR. The presentation will include currently known challenges and the opportunities to explore aspects yet unknown about antimicrobial resistance development due to veterinary practice. Discuss unique opportunities available to veterinarians as a profession of its own standing and as part of one health agenda, where veterinarians can play a major role in Antimicrobial stewardship. As a veterinarian with developing and developed country clinical practice experience, the speaker will explore some challenges faced due to socioeconomic differences and opportunities arising from the same. Presentation will attempt to include a proactive approach to antimicrobial stewardship with an inspiration to identify opportunities despite challenges for antimicrobial stewardship in veterinary practice.

Plenary Speech-Public Health Session

The Role of Veterinarians in Food Safety, Productivity and Global Market Access

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"Access to sufficient amounts of safe and nutritious food is key to sustaining life and promoting good health." This is a common theme among priorities set out by international agencies such as the United Nations, World Health Organization, and Food and Agriculture Organization. About 1 in 10 people in the world are affected by food-borne illnesses and suffer from hunger, while about 420,000 people die every year due to food-borne illnesses. On the other hand, the surging global cost of living, rising inflation, supply-demand imbalances, political unrests, and global conflicts have hugely impacted the post-COVID recovery efforts both domestically and globally. During this economic turmoil, veterinarians can play a vital role not only in ensuring animal health and preventing zoonotic diseases but also in managing food safety hazards, enhancing productivity and reducing food wastage. Furthermore, veterinarians at policy level need to possess effective trade negotiation skills to facilitate access to global markets and contribute to economic growth by reducing the trade deficit between imports and exports.

Veterinarians working in food production systems are faced with challenges of managing existing and emerging food safety risks, in addition to managing animal health, mitigating zoonotic and foodborne diseases. These food safety risks include biological, chemical, and physical food safety hazards and food safety risks related to intentional adulteration (food defence risks) or unintentional adulation of food products with the objective of economic gain (food fraud risks). The presence of pathogenic organisms, toxins, the emergence of antimicrobial resistance and spongiform encephalopathies are some of the main biological hazards that need to be managed and controlled in food production systems. The pesticide, drug and hormone residues, genetically modified organisms (GMOs), industrial and environmental contaminants are some of the emerging chemical risks, that could impact both export market access and food safety. Physical hazards include metals, glass, hard plastics or other foreign material contaminations, which are not expected to be present in the food. Veterinarians working in food production systems must be familiar with the principles of the Hazard Analysis and Critical Control Point (HACCP) food safety management system in order to conduct risk assessments for the aforementioned food safety hazards and determine effective preventive control measures to eliminate or reduce the hazards to an acceptable level either at primary production level or during food processing value chain. In order to contribute to the economic development of the country, veterinarians should be equipped with knowledge of technological advancements to enhance productivity. This includes the use of novel feed and food additives to reduce mortality rates, increase production yields and apply effective food preservation techniques and risk-based decision-making processes to reduce wastage during food production.

Veterinarians working at the policy level should have an updated knowledge of animal health, welfare, and public health requirements and priorities of the importing countries and develop effective trade negotiation skills. It is very important to build a strong working relationship and trust with trading partners and foreign veterinary services by being transparent and demonstrating good governance in veterinary services. Knowing importing countries' thresholds for different food safety

hazards and incorporating those verifications into veterinary regulatory systems is another important aspect of building trust among veterinary services. Being an island, Sri Lanka has some unique opportunities to protect its livestock from foreign animal diseases (e.g., Bovine Spongiform Encephalopathy, Highly Pathogenic Avian Influenza, African Swine Fever, etc.), which are huge obstacles to global market access to animal-based food products. Veterinary services should be transparent with one another by communicating disease outbreaks and self-declaring disease-free status with the World Organization for Animal Health [formerly known as the Organization for Animal Health (OIE)]. When it comes to trade negotiations, veterinarians should incorporate disease control mechanisms (e.g., disease surveillance, compartmentalisation, zones) into trade negotiations so that in the event of the occurrence of an animal disease outbreak of public or animal health significance, export market access is somewhat protected, depending on the origin of animal products versus the disease outbreaks. Veterinarians can be very valuable contributors to Sri Lanka's socioeconomic development by adapting to new realities and finding innovative solutions to challenges.

Plenary Speech- Wildlife and Aquaculture session

Sustainable *A*quaculture through the One Health *L*ens

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Aquaculture is the fastest growing and highly traded global food sector - set to dominate the supply of aquatic protein by 2050. To deliver significantly enhanced volumes of food sustainably, an appropriate account needs to be taken of its impacts on the environment, the health and welfare of organisms cultured, and human health outcomes of consuming seafood from the sector. The One Health Aquaculture concept argues for an evidence-policy refresh, bringing a wider array of industry, government and societal stakeholders together to ensure key 'success metrics' spanning human, environmental and organismal health are 'designed-in' to supply chains - effectively operationalising a One Health approach to food production from the sector. Success metrics, applied to given sub-sectors of the industry (e.g., seaweed, molluscs, shrimp, finfish) and assessed according to availability of research, evidence, policy, and legislation provides a framework around which potential negative impacts of production can be defined, reduced or averted. Enhanced focus on identifying and controlling chemical and pathogen hazards which interact with, and impact, aquatic food supply chains will form a particularly important element of this as we increasingly rely on intact and healthy aquatic systems as locations in which we wish to grow our food. As aquaculture positions to dominate supply of seafood, application of One Health principles provides a means to optimise the benefits associated with food production from water. In addition, recognition of aquaculture in broader food systems necessitates new debate on its interaction with land-based food production sectors – and appropriate national and international science and policy strategies which support improved food system design from land and water. Intricate relations between aquatic animals and their environment should drive closer alignment of environmental and food policy especially relating to the impact of aquatic chemical and pathogen hazards on safe and sustainable aquatic food supply.

Flow Cytometric Analysis of Antigen Specific $CD4^+$ and $CD8^+$ T Cell Responses Induced by an Irradiated *H. contortus* Larval Vaccine in Saanen Goats

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Haemonchus contortus is an abomasal nematode causing severe economic losses in the goat industry in Sri Lanka. An effective vaccine against *H. contortus* will be promising and a cost-effective way of controlling the parasite. Flow cytometric analysis was performed to determine the antigen-specific $CD4^+$ and $CD8^+$ T cell responses, induced by an irradiated *H. contortus* larval vaccine in Saanen goats. Animals were reared under nematode-free conditions. The live attenuated oral vaccine was prepared by irradiating 10,000 *H. contortus* third-stage larvae under Cobalt 60 gamma (200 Grey) irradiation. Animals in the test group (n=10) received two vaccines on days 0 and 35. The challenge infection was performed on day 49, with 10,000 infective larvae per goat orally and the trial continued until day 70. A control group (n=10) was maintained without the vaccine or challenge. Blood samples were collected from each goat weekly. Peripheral blood mononuclear cells were isolated, and the lymphocyte proliferation assay was performed by culture with the presence of *H. contortus* crude antigen, at 37 °C with 5% CO_2 for 72 h in RPMI with 10% FBS. Antigen-specific $CD4^+$ and $CD8^+$ T lymphocyte proliferation were determined by flow cytometric analysis. Following the first vaccine, the $CD4^+$ and $CD8^+$ T cell response of the test group gradually increased, peaked around day 21 and declined. Following the second vaccine on day 35, the $CD4^+$ and $CD8^+$ T cell responses rapidly increased. After the challenge on day 49, the response reached the climax on day 56 which is three-fold higher than the first peak. Throughout the trial period, no *H. contortus* eggs were detected (Eggs per gram/EPG=0) either in the test or control groups. The pooled t-test results indicated that $CD4^+$ and $CD8^+$ T cell responses were not statistically significant ($p>0.05$) on day 0 whereas from day 7 to day 70 the $CD4^+$ and $CD8^+$ T cell responses were statistically significant ($P<0.05$) in the test group compared to the control group. The results suggest that there is a significant $CD4^+$ and $CD8^+$ T cell responses elicited by the vaccine against the *H. contortus* infection in Saanen goats under local field conditions.

Keywords: Flow cytometry, Haemonchus contortus, Cell-mediated immunity, Goats

Phylogenetic Analysis of Infectious Laryngotracheitis Virus Detected in Selected Commercial Poultry Layer Flocks

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Infectious laryngotracheitis virus (ILTV) is the causative agent of infectious laryngotracheitis (ILT), a highly contagious respiratory disease in chicken, causing significant economic losses to the commercial poultry industry. ILTV is the common name for *Gallid alphaherpesvirus 1*, a linear double stranded DNA virus of the family Herpesviridae. Clinical signs of ILT includes conjunctivitis, sinusitis, dyspnoea, coughing with expectoration of blood-stained mucus, ocular and nasal discharges. The objective of the current study was molecular characterization of ILTV detected in selected commercial layer flocks manifesting respiratory signs. Respiratory distress, ocular and nasal discharges and mortality was observed in four different aged flocks in a single commercial layer farm in the North Western province, that had not been vaccinated against ILTV. Presence of yellow caseous clots, haemorrhagic tracheitis with blood clots and blood-stained mucus along the length of the trachea were observed at the necropsy. Total DNA was extracted from one tracheal sample from each flock and conventional PCR was performed to amplify a 588 bp fragment of the p32 gene of the ILTV and PCR products were analysed in a 1% agarose gel. Two of the PCR products were purified and directly sequenced. Nucleotide sequences of forward and reverse strands were aligned and manually edited using MEGA-X and the resulting consensus sequences were evaluated for sequence homology using BLASTn to compare the sequences in Genbank. Nucleotide sequences from this study and seven reference and/or published strains were aligned using CLUSTALW algorithm in MEGA-X. Phylogenetic analysis was performed using the maximum likelihood method with Tamura nei model in MEGA-X. All four samples were positive for the anticipated 588 bp band in PCR. Two sequenced samples were 99.83% similar to each other in the pairwise comparison. In the BLASTn analysis both samples showed highest sequence homology of 99.66% and 99.49% to two Australian field ILTV isolates MF156849 and JX646898 respectively. In the phylogenetic tree both samples clustered with an Australian field ILTV isolate, strain CSW-1/V1-99. Currently, vaccination against ILTV is not widely practiced in Sri Lanka. Therefore, identifying the virus strain currently circulating in the country will be useful in developing a vaccination strategy against ILTV.

Keywords: ILTV, PCR, Phylogenetic analysis

Assessment of the Relative Utility of Different Components of Urinalysis Including Dipstick, Urine Sediment (Wet Mount and Stained Dry Mounts), and Microbiological Culture in Diagnosing Canine Urinary Tract Infections

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Urinary tract infection (UTI) is a frequently reported disease in dogs. Bacteria is the most common infectious agent that causes UTIs. As many dogs with bacterial UTIs are either asymptomatic or show non-specific clinical signs, laboratory aids are often required for accurate diagnosis. A complete urinalysis includes an array of laboratory tests including visual and chemical analyses, sediment analysis, and microbiological culture. Nevertheless, performing a complete urinalysis in a clinical setup is affected by many factors including the availability of facilities, the client's financial status, and test selection by the clinician. The present study was carried out to evaluate which laboratory test/s are most useful to diagnose bacterial UTIs accurately, effectively, and economically. To fulfil this objective, complete urinalyses were performed for urine samples of dogs presented to Veterinary Teaching Hospital, University of Peradeniya with suspected UTI within 3 weeks period and of them, 25 dogs with confirmed bacterial UTI were selected. Then the test/s in the complete urinalysis of these 25 dogs that were most useful to confirm a diagnosis of bacterial UTI economically and accurately were assessed. Of the methods used to detect bacteria, wet mount examination was superior to other methods (21/25, 84%) while stained dry mount examination facilitated further classification of bacteria. Further, wet mount examination was helpful to determine the host response to UTI (pyuria, 21/25, 84%). Microbiological cultures were positive only for 15 samples. Additionally, it was identified that performing urinalysis sequentially i.e., starting with the least complex and most economical tests and proceeding towards the most complex and least economical tests facilitates accurate diagnostic decision-making of UTI in an economical manner. Moreover, the present findings suggest that simple and relatively economical laboratory tests such as wet mount examination, and Leishman-stained/ Gram-stained dry mount examination are extremely useful laboratory tests in assisting the selection of appropriate laboratory tests to arrive at a confirmatory diagnosis. Further, these findings suggest urine sediment analysis including wet mount and dry mount examinations facilitates the classification of causative bacteria of UTIs to a considerable extent (such as Gram-positive cocci, Gram negative rods) and therefore assists the selection of antibiotics for dogs with negative microbiological cultures.

Keywords: Dipstick, UTI, Urine sediment

An Outbreak of Caprine Listeriosis in Jaffna District: The Epidemiological, Clinical and Pathological Investigation.

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Listeriosis is a fatal infectious disease of ruminants including goats, sheep and cattle caused by *Listeria monocytogenes*. The disease is manifested as encephalitic, septicaemic or reproductive forms. Small ruminants are more likely to contract encephalitic listeriosis. Though it poses a significant public health risk, the prevalence of caprine listeriosis in Sri Lanka has not been documented well. This report describes the clinical aspects, diagnosis, treatment, outcome and control measures utilized during a recent listeriosis outbreak reported from ten veterinary ranges in the Jaffna District in 2021. A total of 937 cases from 262 farms were reported within 3 months (August-October). Common clinical signs in affected goats during the outbreak were pyrexia, nasal discharge and nervous signs (circling, head-tilt, lateral protrusion of tongue with salivation, convulsions, ataxia, incoordination and facial paralysis). The affected farms were visited and samples from live (nasal swabs, blood, milk) and dead (brain, spinal cord, heart, liver, lungs, spleen, kidney and intestine) animals were collected for investigations. Laboratory findings (culture, Gram staining, biochemical tests, histopathological and necropsy findings) confirmed the samples were positive for *Listeria monocytogenes*. The affected animals were treated with antibiotics (tetracyclines/ enrofloxacin/ trimethoprim-sulfamethoxazole / amoxycillin) depending on the availability and according to antibiotic susceptibility testing. Anti-inflammatory agents (ketoprofen) and supportive therapy was also used as appropriate. Encephalitic form was predominantly observed with morbidity and prevalence rates of 1.54 and 39.7% respectively. The overall case fatality, mortality and recovery rates were 77.8, 1.2 and 22.2%, respectively. The mortality rate was higher in goats above 1 year compared to goats below 1 year ($p<0.05$). The highest number of cases were reported in 1-3 years age group compared to other age groups (<1 year and >3 years). The sex and breed of the goats had no statistically significant association with case fatality, mortality and recovery rates. Abortion, torticollis, persistent ataxia and kerato-conjunctivitis were the complications commonly encountered by surviving animals. The cause of this outbreak could be the recent increase in silage usage in dairy sector. Preventive measures were immediately implemented to control the outbreak and to prevent the spread the disease outside Jaffna District. Public awareness programs were also carried out to highlight the zoonotic risk of this disease.

Keywords: Caprine Listeriosis, Epidemiology

Emergence, Distribution and Effects of Lumpy Skin Disease in Cattle in Ampara District of Sri Lanka from 2020 to 2021.

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Lumpy skin disease (LSD) is a notifiable disease of cattle and buffalo caused by lumpy skin disease virus (LSDV) belonging to the *Capripoxvirus* genus of the family *Poxviridae*. Cattle and buffalo are the natural hosts. All age groups of animals are susceptible to disease, but young animals are severely infected. The LSDV is mechanically transmitted by numerous hematophagous arthropods. Clinical signs include high fever, occurrence of multiple nodular skin lesions on head, neck, udder, scrotum, vulva and perineum, and enlargement of superficial lymph nodes. The condition was first reported from Addalachchenai and Mahaoya in Ampara district in October 2020. The disease spread rapidly throughout the district from October 2020 to March 2021. Since LSD has not been reported in Sri Lanka before 2020, the current study was undertaken to investigate and confirm the occurrence of LSD among the cattle in Ampara district and to understand the disease distribution and its impact on milk production. Samples from skin nodules were collected and dispatched to the Veterinary Research Institute. Samples fixed in 10% neutral buffered formalin were subjected to histopathological examination which revealed non-suppurative dermatitis sometimes associated with necrosis and presence of intracytoplasmic eosinophilic inclusion bodies within keratinocytes indicating LSD. Conventional PCR was performed on 5 samples for confirmation. Total DNA was extracted using Qiagen DNeasy blood and tissue kit according to manufacturer's protocol. The coding region of viral attachment protein gene of LSDV was detected following the conventional PCR methods described by OIE. In the present outbreak, 1655 animals out of total 175052 cattle population in the Ampara district (from 13 veterinary ranges) were reported to be suffering from the clinical disease. The disease prevalence, morbidity and mortality rates were 1%, 2% and 0.01% in the susceptible cattle population. A milk yield reduction of 31.1% was reported during the disease outbreak and 15.8% milk yield reduction was observed soon after the outbreak when compared to the total milk production before the outbreak in the district. A significance difference ($p<0.05$) was observed between the total milk production during and before the disease outbreak in Damana, Dehiaththakandiya, Laguhala, Mahaoya, Potuvil, Thirukkovil and Uhana veterinary ranges.

Keywords: Lumpy Skin Disease, Vector borne, Economic loss

Preliminary Evaluation of Humoral Immune Response Following Anti-Rabies Vaccination in Captive Asian Elephants in Sri Lanka

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In Asia, there have been several cases of rabies reported in Asian elephants (*Elephas maximus*) over the years. Sri Lanka, being a rabies-endemic country anti-rabies vaccination for elephants maintained in captivity plays a role in preventing infection in elephants and provides protection to humans that encounter the elephants. The objective of this preliminary evaluation is to assess the humoral immune response against rabies in captive elephants kept in Pinnawala elephant orphanage. The immune response following anti-rabies vaccination in elephants have not been evaluated in the country previously. Four male and nine female elephants aged more than 7 years were included in the screening process. Elephants have been vaccinated intra-muscularly with 1ml of commercially available inactivated rabies vaccine (Rabisin®). Blood samples were taken before the booster vaccination (in 2018) and on days 14, 32, 68, and 105 post-vaccination. Serum samples were tested using BioPro® rabies ELISA antibody kits (O.K. SERVIS BioPro, s.r.o., Czech Republic), for the presence or absence of anti-rabies antibodies. Based on the ELISA results, all elephants have shown antibody levels equal to or greater than 0.5 IU/ml in all sample collection dates starting from day0. Prior to the vaccination in 2018, five elephants have been vaccinated in 2014, 2015, and 2016. Three were vaccinated in 2015 and 2016. Two were vaccinated in 2016 and 2014, and two were vaccinated in 2016. Only one elephant has given the previous vaccination in 2014. Despite the differences in the vaccination schedules, all the elephants have shown protective levels of antibody titres (0.5 IU/ml) prior to and after the last booster vaccination done in 2018. Even though the number of animals evaluated is not statistically significant, it shows that a regular 1ml dose of anti-rabies vaccination can confer the required amount of immunity in elephants. The point to consider is that the ELISA test used here gives only a semi-quantitative result of the presence or absence of a protective level of antibodies. Therefore, it would have given a better understanding of the levels of immunity, if we test the samples to quantify the antibody titre levels.

Keywords: Asian elephants, Anti-rabies vaccination, BioPro® ELISA

Evaluation of Yield and Nutritional Composition of Red Napier (*Pennisetum purpureum* cross) at Two Harvesting Intervals during Yala Season

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Red Napier hybrid (*Pennisetum purpureum* cross): (RN) is a recently introduced hybrid fodder grass variety to Sri Lanka, but its performance under local conditions is not well-understood. Therefore, the objective of the current study was to evaluate the yield and the nutrient composition of RN grown in the 2022 Yala season. The experiment evaluated the performance of yield and nutritive values of RN harvested at two harvesting intervals (6 and 8weeks after planting) in the research farm facility of the Veterinary Research Institute. Plots (2 × 3 m in size) were arranged using a randomized complete block design and each treatment replicated two times. A basal organic fertilizer (cow dung) was applied to each pit (2kg/pit) at the establishment of the crop and after each harvest. Plants within a 1 m^2 section in each plot were cut (5 cm above ground level) and a representative sub sample of about 1 kg was taken to measure dry matter (DM), crude protein (CP), ash, acid detergent fiber (ADF), neutral detergent fiber (NDF), *in-vitro* organic matter digestibility (IVOMD), *in-vitro* metabolizable energy (IVME), water soluble carbohydrate (WSCHO), oxalate and nitrate contents. Data were analyzed using MINITAB (18^{th} Version) as a one way Anova to compare mean differences between two harvesting intervals. The DM yield at 8^{th} week harvest (7.84 mt/ha) was greater (P=0.00) than the 6^{th} week harvest (2.74 mt/ha). The CP and Ash contents reduced (P=0.00) from 6^{th} to 8^{th} week; (13.68% and 18.99% to 7.84% and 15.45% respectively). In contrast, CF, ADF, NDF increased (P=0.00) with maturity but lignin content did not differ (P=0.42) between harvesting intervals. IVOMD, IVME and WSCHO contents were similar (P>0.05) between two harvesting intervals which ranged from 56.86%-56.99%, 8.27MJ/Kg DM - 8.39MJ/Kg DM and 25.46% - 25.56% respectively. Nitrate content declined (P=0.00) from 0.39% to 0.14% whistle oxalate content did not differ (P=0.51) between harvesting intervals and they were within the safe limits for livestock consumption. Based on the yield and nutritional composition, RN harvested at 8^{th} week of maturity during Yala season of the year can be recommended for dairy cow feeding in Sri Lanka.

Keywords: Harvesting interval, Nutritional composition, Red Napier

Prevalence of Hock Lesions and their Association with Some Potential Risk Factors in an Upcountry Dairy Farm in Sri Lanka

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Hock lesions are a considerable animal welfare issue in intensively managed dairy cows worldwide. However, in Sri Lanka, related reports are scarce, potentially due to farm management negligence, lack of knowledge, and limited veterinary attention. The present study aimed to determine the prevalence of hock lesions and their association with several potential risk factors in an upcountry dairy farm in Sri Lanka. Two hundred and twenty (n = 220) dairy cows were enrolled in the study using the stratified random sampling procedure considering the level of production [i.e., high (≥ 25 L/d), moderate (15-24 L/d), and low (<15 L/d)] as the stratum. The risk factors evaluated were body condition score (BCS: 2, 2.5, and 3), cleanliness score (back, flank, tail, lower hind leg, and udder: clean, <50% dirty, >50% dirty), and production level of cows. Hock lesions were assessed when the cows were present at the milking parlour, adhering to a standard protocol. Data on the risk factors were collected on the same day when the hock lesions were assessed. The cows were considered prevalent for hock lesions when lesions were visible on at least one hock. A multivariable binary logistic regression model was used to determine the strength of the association between hock lesions and risk factors. The farm prevalence of hock lesions was 77.7%. There was a significant association between BCS and hock lesions (P =0.046). The odds of hock lesions were 0.5times lesser in cows with BCS 3 than in cows with BCS 2 and 2.5. However, the cleanliness score (P = 0.128) and the level of production (P = 0.259) were not associated with the hock lesions of cows. The present study suggests that improving the BCS reduces the prevalence of hock lesions in intensively managed dairy cows. The high prevalence of hock lesions emphasizes the urgent need to revisit the welfare factors of the studied upcountry dairy farm. Further studies with multiple farms and a larger sample size will provide a better overview of the prevalence of hock lesions in upcountry dairies in Sri Lanka.

Keywords: Body condition score, Hock lesions, Upcountry dairy cows

Response to GnRH Administration on AI in Saanen Goats at Upcountry Farms in Sri Lanka

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Gonadotropin-Releasing Hormone (GnRH) plays a key role in reproduction of farm animals. Artificial Insemination (AI) in a goat is not popular due to the low success rate in many countries. The serum concentration of GnRH and its variations would have an impact on ovarian activities and fertilization in livestock animals. Administration of GnRH at the time of AI is a well-established and scientifically proven technique for higher pregnancy rate in cows. The objective of the study was to determine the effect of GnRH administration at the time of AI on the pregnancy rate in Saanen goats managed in upcountry farms. This experiment was carried out using intensively managed, healthy, 2-4 months post kidding (body condition score; 2.5-3) Does. All Does were scanned trans-rectally to rule out pregnancy and uterine pathologies before starting the trial (2-3 parity, n = 48) using a portable ultrasound scanner (7.5 MHz, linear probe). Estrous of all Does were synchronized with the application of Controlled Intra-vaginal Drug Releasing (CIDR) devices which were left in the vagina for 21 days. Pregnant Mare Serum Gonadotropin (PMSG, 400 IU) was administered intramuscularly (IM) to all the Does at the time of CIDR removal. All Does were inseminated with deep frozen semen (Saanen) between 48- 56 hours after CIDR removal. Randomly selected half of the synchronized Does (n = 24, TEST GP) were injected with GnRH (100 µg, IM) on AI while the other half was injected with 1 ml of distilled water and served as the control group (CONT GP, n = 24). Pregnancy testing was performed by trans-rectal ultrasonography at 90 days post insemination. The overall pregnancy rate in the TEST GP (79.16%) was significantly higher ($P<0.05$) than in the CONT GP (51.42%). The study revealed that the injection of GnRH at the time of AI could significantly improve the pregnancy rate in Saanen goats managed under the above environmental condition. The kidding rate and the number of kids born in CONT and TEST groups would be determined at the end of the study and a higher kidding crop is anticipated in the TEST group.

Keywords: Artificial Insemination, GnRH, Goat breeding,

Acknowledgement: University Research Grant- URG/2019/33/V

In Vitro Evaluation of the Antimicrobial Activity of _Lacticaseibacillus rhamnosus_ against Selected Bacterial Pathogens of Veterinary Importance

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Lactobacilli have a great potential to produce antimicrobial compounds that control the growth of bacterial pathogens. *Lacticaseibacillus rhamnosus* is a widely used probiotic species known to possess antimicrobial properties in addition to a broad range of other health benefits. The objective of this study was to evaluate the antimicrobial activity of an *L.rhamnosus* strain isolated from a commercially available biogenic product (SYNERGY-Nozomi Poultry, Mizuho Synergy Pvt. Ltd.) using disc diffusion method. The identity of *L.rhamnosus* was confirmed phenotypically as well as by genetically via 16S rRNA sequencing. Antibacterial activity of *L.rhamnosus* cell free supernatant (CFS) towards six Gram-negative and three Gram-positive pathogenic bacteria species of veterinary importance was studied to understand the potential use of this strain for disease control in livestock, poultry and aquaculture. *L.rhamnosus* was cultured in De Man Rogosa and Sharpe (MRS) broth and incubated for 24 h at 37°C, and CFS was obtained by centrifugation at 12 000 *g* for 20 minutes and subsequent sterilization by filtration using 0·20-μm porous membrane. Mueller Hinton agar plates were inoculated with overnight cultures of indicator pathogens [three strains from each of the species *Aeromonas hydrophila, Vibrio* spp, *Pseudomonas* spp, *Citrobacter freundii, Salmonella* spp., *Bacillus* spp, *Listeria* spp. *Escherichia coli* including ATCC 25922 and *Staphylococcus aureus* including ATCC 25923] in the stationary phase (10^8 CFU ml^{-1}).Wells (6 mm diameter) were cut into agar plates and 100 µl of CFS was placed into each well. Plates were incubated for 24 h at 37°C. The diameters of the zones of inhibition were recorded. Antibacterial activity against each strain was tested in triplicate. These measurements were subjected to ANOVA and mean separation was done using LSD test. A negative control (distilled water) and a positive control (Ciprofloxacin antibiotic disc, Oxoid) were included in all assays. All the tested species were inhibited by *L.rhamnosus* to varying degrees and the differences were significant ($P<0.05$). The widest inhibition zone was observed against *Aeromonas* spp. followed by *Pseudomonas* spp., *E.coli*, *Citrobacter* spp., *Bacillus* spp., *Vibrio* spp., *Salmonella* spp., *Listeria* spp. and *Staphylococcus* spp. The inhibition zones of Gram-negative bacteria were significantly wider than that of Gram-positives ($P<0.05$). Due to the increasing demand for alternatives for antibiotics in farm animals, use of *L.rhamnosus* can be studied further as a potential candidate for pathogen control and adjunct treatment to cure bacterial infections.

Keywords: Antimicrobial activity, Lacticaseibacillus rhamnosus, Probiotics

Proximate Composition of Different Varieties of Foxtail Millet (*Setaria italica* (L) Beauv.) and Evaluation of Gamma-Aminobutyric Acid Production by Fermentation

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Foxtail millet (Thana haal) is one of the ancient cultivated millets and is neglected presently in Sri Lanka. It is a dual-purpose plant grown for its grain, which is used for human consumption, animal feeding, and fodder. Foxtail millet's high protein content, favorable amino acid profile, considerable energy density, and apparent absence of major antinutritional factors are interesting features to be utilized in human and animal feed. Gamma-aminobutyric acid (GABA), a major inhibitory neurotransmitter is known for its beneficial effects in stress management, reducing blood pressure, the significance in controlling heart disease and diabetes, and inhibiting cancer cell proliferation. The enhancement of food grains with respect to GABA content is possible through the process of controlled fermentation. The present study aimed to compare the nutrition parameters of four different foxtail millet varieties Yellow-435, Yellow-915, Orange-02, and Black-013-03 obtained from the Agriculture Research Stations in Sri Lanka and to evaluate the levels of GABA during fermentation. The proximate analysis was done to compare the nutritional quality and GABA levels were quantified by the modified Kitaoka and Nakano spectrophotometric methods. The study confirmed that the foxtail millet is a rich source of protein and fat with values of 11.51 - 12.95% and 2.55 – 3.8 % respectively. Ash content was in the range of 2.87- 5.31% and the moisture content ranged from 8.30 - 10.23 %. GABA levels present in the foxtail millet were 0.34, 0.49, 0.36, and 1.2 mg/g in Yellow-435, Yellow-915, Orange-02, and Black-013-03 respectively. Therefore, the highest GABA level was obtained from the 'Black' variant. During fermentation, GABA yield in the 'Orange' variant significantly increased with fermentation time and 1.6 mg/g was produced after 48 hours. GABA concentration significantly decreased in the 'Black' variant. There was no significant difference in the GABA levels of variants Yellow - 435 and Yellow – 915 during fermentation. The microbial strain present in the 'Orange' variant was isolated and identified as GABA-producing lactic acid bacteria by biochemical tests and morphology. Appropriate policy interventions to promote foxtail millet cultivation can ensure food, nutrition, fodder, and livelihood security.

Keywords: Fermentation, Foxtail millet, GABA,

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Isolation and Preliminary Characterisation of Aerobic Yeast from Dry Zone Cattle in Sri Lanka as a Potential Feed Additive

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Yeast in the rumen microbiome enhances fiber fermentation. Therefore, it is used as an additive in ruminant feeding. Ruminant feeding under Sri Lankan conditions contains more fibrous feed and their digestibility is low. The objectives of the current study were to identify beneficial aerobic yeast strains from rumen fluid of local cattle from the dry zone and to study the *in-vitro* fermentation characteristics of selected yeast strains to be developed further as an additive. Rumen fluids of three stud bulls were obtained from the abattoir and cultured on yeast extract peptone dextrose agar (YEPD) plates containing (0.1%) chloramphenicol for 48 h at room temperature (27ºC) and 37°C under aerobic conditions. Colony morphology and the Gram stain were used to identify the ruminal yeast. Isolated colonies were purified and their effect on fiber fermentation was compared by *in-vitro* gas fermentation technique using fodder sorghum (*Sorghum bicolor*) as the substrate. Treatments (substrate + Yeast strain), control (only substrate/non-inoculated culture) and blank (non-inoculated culture) were included in this experiment. Gas production (24 h) was measured and organic matter digestibility (OMD) and metabolizable energy content (ME) of the substrate were calculated. Data on fiber fermentation characteristics of different yeast isolates were analyzed using MINITAB (16th Version) and one-way ANOVA. Three yeast isolates were recovered [two (T1, T2) at 27ºC and one (T3) at 37ºC] corresponding to each animal respectively. All strains had a budding yeast appearance and were well adapted to grow on YEPD broth and YEPD agar at room temperature (27°C). Compared to the control, fibrous substrate inoculated with all three strains (T1, T2 and T3) had higher($p=0.01$) OMD (44.3%, 54.0%, 58.0% and 54.7% respectively) and ME (6.0. 8.0, 8.7 and 8.2 MJ/Kg/DM respectively). Since three yeast strains identified in the current study have shown to increase OMD and ME of the fibrous substrate, it can be concluded that they have the potential of being used as an additive in ruminant feeding. Further studies should be conducted to identify most potential yeast strain/s, their preservation as a commercial product, suitable dosage and replication of positive effects in-vivo.

Keywords: Fiber, Dryzone cattle, Yeast

Nutritive Contents of Guinea-A and CO-3 (Hybrid Napier) Grasses against their Heights, Cultivated in Kandy District, Sri Lanka

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When considering cattle nutrition, fodder grass plays a major role in their ration. The grass is the primary natural source of a number of vitamins and minerals. However, forage grown in tropical regions is generally lower in protein and high in fiber and lignin. Therefore, much concern is needed about the quality of the tropical forage as the dry matter content alone will not fully represent its quality. Guinea [Ecotype-A] (GA) is the most abundant fodder grass and Hybrid Napier var. CO-3 (CO-3) is one of the highest-yielding perennial tropical fodder grasses in Sri Lanka. Hence, those two types were selected. The objective of this study is to investigate the variation of nutritional values of Guinea-A and CO-3 against their heights cultivated in the Peradeniya area. Grasslands were selected from the same location to ensure similar geological and environmental conditions. The experiment was conducted in a randomized complete block design with three replicates. Three plots, each with 5'× 5' were demarcated in each grassland. The vegetative part of grasses from 6 inches above the ground to the corresponding heights (12" to 78" in 6 inches intervals) was used to collect samples. A total of 72 samples for both varieties were analyzed via Near-Infrared Reflectance Spectroscopy (NIRS) (calibrated for 10 grass types including both fodder grass types) to obtain average percentage values of Acid Detergent Fiber (ADF), Neutral Detergent Fiber (NDF), Crude Protein (CP), Ash and Crude Fat (CF). Statistical analysis was performed using Minitab® 15.1.0.0. According to the results, the average percentage values for the respective range of heights for CO-3 were: ADF% 35.2-46.4, NDF% 62.0-78.5, CP% 9.1-17.8, Ash% 8.5-11.2, CF% 1.5-2.7, whereas for GA; ADF% 40.0-57.4, NDF% 69.3-88, CP% 5.9-11.9, Ash% 5.3-9.3, CF% 0.7-2.2. These results can be used to develop a farmer-friendly guide for the selection of suitable heights of the grasses for different production stages of their cattle herd.

Keywords: ADF, CO-3, Guinea grass, Hybrid Napier. NDF, NIRS

Detection of Colistin-Resistant *E. coli* in Chicken Cecal Samples Processed at Three Large-scale Processing Plants in Sri Lanka

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Colistin resistance of *Escherichia coli (E. coli)* of human origin is a serious concern throughout the world. Resistance to colistin is a great public health risk as it is the last treatment of choice available for the multi-drug resistant Gram-negative bacteria. The studies on the prevalence of colistin resistance in animal *E. coli* isolates are very limited. The objective of this study was to determine the prevalence of colistin resistance among commensal *E. coli* in broiler chickens. The study was performed to identify the frequency of Colistin-resistant *E. coli* in cecal samples of broiler chickens. Previously identified and confirmed *E. coli* isolates from three large-scale poultry processing plants in Sri Lanka were used. Phenotypic colistin resistance was determined by the agar dilution method. Antimicrobial agents used were assessed by using standard units. In accordance with the published literature, the colistin concentration range used was from 0.125µg/ml to 64µg/ml. According to the EUCAST guidelines, 2 µg/ml was considered as the MIC breakpoint for colistin. MIC >2 µg/ml and MIC < 2 µg/ml were considered resistant and susceptible to colistin respectively. Of the 181 isolates evaluated for colistin resistance, 105 isolates (58.01%) were phenotypically resistant to colistin. Of the colistin-resistant *E. coli* isolates, 68 isolates (37.56%) showed resistance at high colistin concentrations (>64 µg/ml). Overall, our study reveals the high frequency of colistin resistance among commensal *E. coli* isolated from broiler chickens. High MICs were shown high risks of resistance to colistin in the food chain from live animals to humans. Molecular detection of *mcr* genes is required for further conclusion. The reasons for the higher frequency of colistin resistance need to be investigated further.

Keywords: Colistin, E. coli, Poultry

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Case Study to Ascertain Knowledge, Attitude and Practices (KAP) of Livestock Farmers Related to Goat Contagious Pustular Dermatitis (CPD) in Goats at Mawanella Veterinary Range, Sri Lanka

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Zoonotic diseases have a greater impact on public health, livestock production as well as on the economy all over the world. More than 60% of currently known infectious diseases and up to 75% of emerging infectious agents are of zoonotic origin. CPD is also a zoonotic disease, specially spreading among goats, resulting in health hazards to human beings. Due to the emerging goat population in Mawanella veterinary range, there is a risk of increasing CPD cases in goats annually. At the initial stage of CPD infection, erythematous spots are visible in affected sites and then they develop into papules, vesicles and pustules with uncreative exudate. At the final stage, dry scabs without scar formation can be observed. These pathological lesions can be found most frequently in the gums, lip mucosa, tongue, skin of the face and nose in the goat. Knowledge, Attitude and Practices (KAP) are considered as independent variables and CPD is considered as the dependent variable. The main objective of the study was to assess the farmers' KAP level and provide effective solutions to prevent spreading of CPD among the goat and their handlers. A pretested questionnaire was forwarded to the 250 farmers. Due to the Covid 19 pandemic and the ongoing fuel issue, only 225 questioners were collected. After considering the goat raring statistics based on Grama Niladhari divisions, the cluster-based sampling method was utilized to gather information. With the help of SSPS software, the data was analyzed. Based on the co-relation coefficient value, the results reviled that there is a negative relationship between the independent and dependent variables. According to the results, it was noted that most of the goat handlers are male and hence, there is a high risk to affect with CPD. All ages of goats can be affected with this zoonotic disease. Therefore, not only male goat handlers, their family members like spouse, children and relations can be affected when feeding and petting the animals. Therefore, using modern technology, CPD awareness creation programme is to be conducted by focusing the target group. Specially, "A health and safety guideline to prevent CPD disease" to be introduced ensuring the goat and their handlers' health and safety. Once the guideline is implemented, a continuous monitoring and evaluation need to be done with the assistance of public health officers.

Keywords: Attitudes, Contagious Pustular, Dermatitis, Knowledge, Practices, Zoonotic diseases

Prevalence and the Predominant Phenotypes of Multi Drug Resistant *Escherichia coli* in Livestock, Wild Animals and Associated Environment in Kosgama, Sri Lanka

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Multidrug resistance (MDR) is the ability of bacteria to resist at least one antimicrobial in three or more antimicrobial classes. MDR is a public health threat. The objective of this study was to understand the prevalence and phenotypes of MDR *Escherichia coli* (*E. coli*) among livestock, wildlife and environment in an ecosystem with a high density of organized livestock farms, Kosgama. One square km area at Kosgama (Mawalgama) was mapped using GPS for the study. A total of 222 samples were collected including fecal samples from 79 livestock (58 = poultry, 21 = cattle/ goat/ pig) and 68 wild animals with 75 environmental samples (44 = soil, 31=water). *E. coli* was isolated using standard methods and 77% (61/79) of livestock, 62% (42/68) of wild animals, 79% (35/44) of soil and 68% (21/31) of water samples were positive for *E. coli.* Maximum of two *E. coli* from each sample to a total of 297 were tested for AMR (Antimicrobial Resistance) using disk diffusion method following CLSI guidelines. Of the *E. coli* tested for AMR, 20.8% (62/ 297) was MDR which contained 31% (35/ 114), 6% (5/ 82), 13.6 % (9/ 66), and 37% (13 / 35) from livestock, wild animals, soil and water respectively. The MDR prevalence in chicken and livestock were 38% (34/90) and 4% (1/24) respectively. The predominant MDR (45%, 28/62) phenotype was resistant to tetracycline, ampicillin and nalidixic acid. Among the MDRs, 84% were resistant to tetracycline while 77%, 71%, 68% and 60% resistance were observed against ampicillin, nalidixic acid, trimethoprim-sulfamethoxazole and streptomycin respectively. Around 26% of MDRs were resistant to more than five antimicrobials. Five wild animal MDRs were from a leaf monkey, a mongoose, a cuckoo and a mynah bird. The results highlight the widespread dissemination of MDR *E. coli* in major components of the ecosystem. Wild animals act as indicators of environmental contamination. High prevalence of MDRs from chicken poses a risk to human health as it can be transferred to humans via the food chain. Future studies should be focused on quantifying the risks to humans as MDR bacteria of food animals are transmittable to humans.

Keywords: E. coli, Environment, Livestock, MDR, Wildlife,

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Antimicrobial usage and Antimicrobial Resistance Profiles of Fecal *Escherichia coli* in Chicken Layer Farms in Selected Veterinary Divisions of North Western Province, Sri Lanka

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Irrational use of antimicrobials to mask the poor management system and biosecurity in poultry is a common practice that has resulted in the development of antimicrobial resistance (AMR). Commensals like *Escherichia coli* (*E. coli*) can easily acquire AMR and transfer it to pathogenic bacteria leading to non-curable diseases. The present study was conducted to identify antimicrobial usage patterns and the AMR distribution in the chicken layer industry in an area with high density of layer farms in the country. The study was conducted from November 2016 to January 2017. Fifty chicken layer farms situated in seven veterinary divisions in the North-Western province were visited and data on antimicrobial usage in each farm were collected using a questionnaire. Among those 50 farms, chicken feces were collected from 26 farms. Isolation of *E coli* was done using MacConkey and EMB agar. Indole, TSI, Urease, and Citrate tests were performed for confirmation. AMR profiles of *E. coli* were detected for 12 antimicrobials using the disk diffusion method following the procedures in CLSI. According to the questionnaire survey, only 76% (38/50) of farmers had knowledge about the purpose of antibiotics. Ninety-eight percent (49/50) of the farmers were using at least one type of antibiotic. The antibiotics most frequently used in layer poultry operations were: Enrofloxacin 79.6% (39/49), Amoxicillin 61.2% (30/49), Sulfamethoxazole-Trimethoprim 49% (24/49), Tetracycline 26.5% (13/49), Neomycin 22.4% (11/49), and Tylosin 4.1% (2/49). Out of 26 fecal samples, *E coli* could be isolated from 22 samples to study AMR profiles. All isolates were sensitive to Gentamycin and Amikacin. The resistance rates for Tetracycline, Nalidixic acid, Ampicillin, Sulfamethoxazole-Trimethoprim, ciprofloxacin, Streptomycin, Ceftazidime, and Imipenem were 81.8% (18/22), 54.5% (12/22), 45.5% (10/22), 40.9% (9/22), 31.8% (7/22), 13.6% (3/22). 9.1% (2/22) and 4.5% (1/22) respectively. The majority of isolated *E coli* were multidrug-resistant strains with resistance to >=3 classes of antimicrobials. Our study concludes that a high level of antimicrobial usage and resistance is present among small and medium-scale farmers. AMR profiles of *E coli* are important in postulating future empiric treatments, taking necessary actions and precautions to prevent the transmission of AMR bacteria via the food chain.

Keywords: AMR, Escherichia coli, Poultry layer farms

A Preliminary Study on Aflatoxin M1 Levels in Four Selected Cheese Products in Sri Lanka

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Aflatoxin M1 (AFM1) is known to have carcinogenic, mutagenic, teratogenic, and toxic effects on both animals and humans. AFM1 is a hydroxylated metabolite of aflatoxin B1 (AFB1) excreted in the milk. AFB1 enters the animal body through the consumption of AFB1 contaminated feed. The presence of AFM1 in milk products poses a potential health risk to consumers. This ongoing study is aimed at determining AFM1 levels in commercially available cheese products in Sri Lanka. The four selected cheese products (two hard and two soft cheese), representing three batches of each product (n=12), were collected from the local markets around Kandy using a convenient sampling method. These products represented three major brands. The aflatoxins (AFs) in the samples were extracted using a solution of methanol: water (80:20, v/v) followed by an immunoaffinity column clean-up. Finally, the eluate was analyzed using an ultrahigh-performance liquid chromatography fluorescence detection system to determine AF contamination in cheese products. The limit of detection and limit of quantification of the method for AFM1 were 0.02 ppb and 0.06 ppb, respectively. AFM1 was detected in nine out of the twelve samples (range: 0.10 ppb to 1.22 ppb). Out of nine positive samples, four had AFM1 levels (0.34 ppb, 0.58 ppb, 0.60 ppb, and 1.22 ppb) above the maximum limit allowed for cheese (0.25 ppb) according to the European Union regulations and one sample violated the Sri Lankan maximum limit (1 ppb). Further, traces of aflatoxin B1, B2, G1, and G2 were detected in some of the samples. The imported cheese brand included in the study did not have detectable levels of AFM1. Some of the cheese products available in the Sri Lankan market may pose health risks to consumers, especially children. Further, the regulatory authorities should implement a surveillance program to monitor aflatoxin M1 in commercially available cheese products in the Sri Lankan market.

Keywords: Aflatoxin M1, Cheese, High-Performance Liquid Chromatography

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Molecular Identification of Hepatic Trematode *Platynosomum* spp. from a Domestic Cat with Severe Cholangiohepatitis: First Case Report in Sri Lanka

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Platynosomum is a parasitic trematode belongs to digenean group, causing severe hepatic infection in cats. The presence of *Platynosomum* species in Sri Lanka has not been studied. Even though the *Platynosomum* spp. has a complicated life cycle, and Sri Lanka is home to both primary and secondary intermediate hosts, *Sibulina octana* and *Eulota simiaris* emphasizing the presence of natural maintenance of the life cycle. A case study of a domestic cat with severe hepatobiliary complications was presented with regular deworming history. Upon examination with ultrasonography, extensive enlargement of the common bile duct, thickening of gallbladder wall, liver enlargement, and anechoic debris in the gallbladder were detected. Ultrasound scanning guided, fine-needle aspiration of bile was performed, and the biliary extract revealed the presence of many parasitic eggs. The eggs were collected to study the morphology and molecular characterization. Nuclear ribosomal Internal Transcribed Spacer 2 (ITS2) and Cytochrome C Oxidase subunit 1 (COX1) primers were used and subjected to sanger sequencing and phylogenetic analysis. The history together with clinical signs and molecular study revealed that the cat was infected with the parasite *Platynosomum* spp. *Platynosomum* spp. reported in Sri Lanka formed a monophyletic clade with *Platynosomum illiciens* reported from Costa Rica, Central America, and Brazil. The cat was treated for parasitism with an increased dose of Praziquantel administered at 10 mg/Kg body weight daily for two weeks and the cat was found to be fully recovered in the subsequent follow up. This case study emphasizes the importance of well-designed future studies in Sri Lanka on the prevalence and distribution of *Platynosomum* and redefining the dose of deworming in cats. Further, the addition of feline Platynosomiasis in the differential diagnoses list for hepatic complications in cats is a necessity.

Keywords: Molecular identification, Hepatic trematode, Cholangiohepatitis

Phenobarbital Responsive Sialadenosis in Rottweiler Dog - A Case Report on Clinical Findings and Treatments.

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Sialadenosis is a bilateral, painless, non-inflammatory, uniform and non-neoplastic condition that is reported in both human and animal medicine. But this is a rare condition in animal medicine with only a handful of case reports published thus far. According to the different case reviews in veterinary literature, it can be classified under different forms that are associated with the enlargement of salivary gland with gastrointestinal diseases or without any other abnormality and phenobarbital responsive or non-responsive form. This communication is based on the case report of Phenobarbital responsive sialadenosis of a ten-month-old male Rottweiler. The case was presented with the main complaint of acute vomiting combining inappetence, gulping and weight loss. Imaging studies revealed gastrointestinal inflammation with mild ulceration with unclear etiology. The dog did not show any improvement for symptomatic treatments. Additionally, it developed bilateral enlargement of the submandibular salivary gland, which is hard in texture. Treatment with oral Phenobarbital brought rapid resolution in the of clinical signs. Until recently, the pathogenesis of sialadenosis and why it responds to Phenobarbital are not well understood. Because of the response to Phenobarbital treatments, sialadenosis may represent a form of limbic epilepsy or peripheral autonomic dysfunction.

Keywords: Epilepsy, Sialadenosis, Submandibular

Total Ear Canal Ablation with Lateral Bulla Osteotomy (TECA-LBO) in Advanced Ear Disease in Dogs

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TECA-LBO is indicated in irreversible inflammatory disease of the aural canal and middle ear. The objective of the surgery was to remove the diseased ear canal and middle ear tissue to provide effective drainage. Six dogs with protracted otitis externa which had been ineffective to medical treatment for more than three years were included. Three were Cocker Spaniels and others were crossbred dogs. Additional signs included, facial sinus tract, head tilt, dermatitis and otitis externa with or without proliferation of the canal. Gross examination, otoscopy and in some cases, radiography was performed. Dogs were administered Carprofen or Meloxicam three days prior to surgery. Following pre-medication with Morphine, Meditomidine combination, Cefuroxime was administered preoperatively. Anaesthesia was induced with Propofol and maintained with Isolfuorane. External canal was lavaged with 0.1% Chlorhexidine and saline. Dog was positioned on lateral recumbency. A T-shaped skin incision was placed over the vertical canal encircling the external ear canal opening. Using sharp and blunt dissection, the vertical canal was dissected from the overlying skin and surrounding soft tissue. The facial nerve was identified and protected by gentle retraction during dissection. Upon reaching the osseous external acoustic process the cartilaginous ear canal was transected. A bone curette was used to remove aural epithelium lining of the osseous external acoustic meatus. Rongeurs was used to enlarge the lateral wall of the tympanic bulla. Debris was removed from tympanic bulla by a combination of curette and gentle saline irrigation. An ear swab was taken for bacterial culture. The removed canal was sent for histopathology. The auricular muscles and skin were closed. Cefuroxime and Meloxicam was continued for 2 weeks orally post -operatively. All dogs were examined for signs of neurological abnormalities after recovery. One dog developed vestibular signs: head tilt and nystagmus which resolved within 48hrs. One dog had suture adhesions. In all the dog's histopathology showed severe inflammatory changes. Two dogs had positive bacterial cultures. In all the dogs, otits externa resolved, the head tilt improved along with the quality of life. When conservative therapy is not resolving the disease, TECA-LBO relieves the pain and suffering in dogs. Meticulous surgical technique reduces the risk of facial nerve injury.

Keywords: Ear Canal Ablation, Osteotomy

Using Joules Solution and Intravenous KCL to Control Critical Acute Conditions in Thirteen Cats with Refeeding Syndrome (RS)

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We are presenting a case series of 13 cats with electrolyte deficits caused by the refeeding syndrome. These cats were anorexic for more than one to a few weeks. History included missing for a few days to weeks or prolonged anorexia. Cause of anorexia varied from simple dental issues to complicated systemic illnesses. During treatments, the symptoms began as we started them on feeding (NG tube or forced). Severe acute anaemia, tachypnoea, dyspnoea, hypoglycaemia, or hyperglycaemia, change in mentation and developing neuronal deficits were observed within 12 hours to 1 week of refeeding. Identification and progression of the condition were done using consecutive blood smear analysis, FBC and Electrolyte analysis. Blood smears revealed sudden development of Heinz bodies and large amounts of RBC micro-fragments compared to the smear observed at presentation. The electrolyte panel revealed hypophosphatemia and hypokalaemia in all cats and hypomagnesaemia in 2/13 cats. An increase in total bilirubin, liver and kidney damage was observed in some cats. While treating the primary cause of anorexia, we have given oral joules solution (1 mmol phosphate/ml) at a dose of (0.5-2 mmol/kg/day P.O.) and intravenous KCL. The dosage was based on serum potassium levels of each cat (BSAVA). Feeding the cats was done strategically increasing the energy requirement over 3 days. Although the prognosis was promising, they needed intensive care with supportive treatments. There was a drastic difference in speed of recovery and survival rates from none up to 85%; undiagnosed cats with similar signs vs cats who got treatments for RS. It is important to monitor levels of electrolytes during treatments to prevent complications from over-administration of KCl and joules solution. RS was commonly seen due to client negligence or due to the inability to reach for medical attention for domestic cats in Colombo. Emphasizing the importance of identifying RS at an early stage and monitoring electrolyte levels while correcting them to avoid unnecessary death rates was the purpose of this study.

Keywords: Feline Medicine, Joules, KCL, Refeeding syndrome

Femoral Head Ostectomy in Dogs with Abnormal Gait

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Femoral head ostectomies (FHO) were performed on 50 dogs presented from 2018-2022 with abnormal gait and diagnosed with hip dysplasia (n = 37), osteoarthritis (n =11) or femoral head necrosis (n = 2) by using radiography. The patients were German shepherd (n = 17), Golden retriever (n = 23), American bull terrier (n = 6), Rhodesian Ridgeback (n = 2) and crossbred (n = 2) with a male to female ratio 33:17 and average age of 0.6-8 years. After patient evaluation, general anesthesia was induced using Xylazine 1 mg/Kg, followed by Ketamine 15 mg/Kg and both IM with repeated doses of their combination (0.3 mg/Kg Xylazine and 0.6mg/Kg Ketamine) were used in 40 dogs. Remaining surgeries (n = 10) were done with gas anesthesia (3-2% of isoflurane and 2-1L/min. of oxygen). After incising the skin along the biceps muscle proximal to greater trochanter and incising the subcutaneous tissues, the tensor fascia lata and superficial gluteal muscles were separated. In between the tensor fascia lata and biceps femoris, the middle gluteal muscle was reached. Partial tenotomy was performed on the deep gluteal to reach the acetabulofemoral joint capsule, and then the vastus lateralis were incised, the round ligament was severed, and the femoral head was located. Subsequently, the femoral head was severed from the neck and sharp edges were smoothened, joint capsule was sutured, tendon of deep gluteal muscle was reconstructed, vastus lateralis and deep gluteal muscle were reattached, middle, superficial gluteal and tensor fascia lata, sub cutaneous and skin were sutured in that order. The surgery lasted from 0.5 to 1 hr, and all patients recovered uneventfully. Buprenophine (0.01-0.02mg/kg, IV) followed by Ketoprofen (2mg/Kg, IM) were administered to all patients and they were hospitalized for a maximum of 5 days. During hospitalization, Meropenem (8mg/kg, IV) and Metronidazole (20mg/kg, IV) were administered with anti-inflammatory medication. Subsequently, the patients were discharged and prescribed Augmentin, Fexofenadin and Rimadyl orally twice daily. Moreover, it was advised to walk the patient daily for 1 week. All patients were evaluated weekly. Wound dehiscence was reported in one dog due to persistent licking. Exercise was gradually increased until complete recovery was achieved within 1 to 3 months. One German Shepherd male, reported to have periodical lameness after 3 months.

Keywords: Acetabulofemoral joint, Hip dysplasia, Tenotomy

Severe Calcinosis Circumscripta in Multiple Foot Pads in a five-Months-old Pomeranian Puppy Secondary to Renal Disease – A Case Report

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A 5-month-old Pomeranian puppy with lameness in all four limbs, polydipsia, polyuria, vomiting, and melena approximately for one month was presented to the Veterinary Teaching Hospital, University of Peradeniya. The metacarpal and metatarsal foot pads of all four limbs were swollen with chalky white, mottling. The differential diagnoses for foot pad lesions were fungal granuloma, calcinosis circumscripta, and neoplasia. The fine-needle aspirate obtained from a foot pad lesion was chalky white, gritty, and microscopically consistent with mineral deposits. Plain radiographs of the metacarpals revealed deposition of radio dense material in metacarpal foot pads with normal bones and joints. Based on the gross lesions, radiography, and fine needle aspiration findings, a tentative diagnosis of calcinosis circumscripta in foot pads was made. Haematology and serum chemistry revealed normocytic normochromic anaemia and azotemia. Ultrasonography of kidneys revealed small right and left kidneys with increased overall echogenicity and poor corticomedullary differentiation. The historical, clinical, radiographic, and ultrasonographic findings were suggestive of calcinosis cricumscripta in multiple foot pads with concurrent renal disease. The very young age of the dog was highly suggestive of renal dysplasia as the cause of concurrent renal disease. Despite the supportive and symptomatic treatments, the dog died five days after presentation. There are no previous reports of calcinosis circumscripta of foot pads with evidence of renal disease diagnosed in a dog less than one-year-old.

Keywords: Calcinosis circumscripta, Foot pads, Renal disease, Renal dysplasia

Electric Fences Erected Around Houses and Properties for Better Human Elephant Co-Existence

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We have administered a questionnaire via telephone interviews with 60 randomly selected individuals from Anuradhapura, Kurunagala, Polonnaruwa, Badulla, Matale and Hambantotha, with whom the first author had installed electric fence fences (EF)s around either their houses or property as means of responsibly mitigating the human elephant conflict (HEC). Lengths of such EF s installed varied between 400m to 3500m., were erected during 2009 to 2021 and had costed the respective respondents between 16,000 to 589,000 LKR, at that time. Before the EFs were installed, 33 respondents had faced conflicts with elephants on a daily basis while 24 respondents had conflicts with elephants, once a week. All the conflicts were property and cultivation damages out of which many were home garden cultivations and Chena cultivations. No conflict was reported after EFs were installed and the frequencies of daily observation of elephants got reduced only to 25 and weekly observation was reduced only to 18. A total of 50 of the respondents had observed elephants in herds while loners had also been observed by 50 of them within close proximity to their property before the EFs were erected. These frequencies however did not reduce significantly (45 and 49 respectively) after erecting the fences. Thus, it can be assumed that the fence did not seriously disturb the social structure or migratory patterns of elephants involved. All respondents indicated that the EFs are working up to date, and that they never had to face HEC after erecting the fence They were financially, socially and psychologically satisfied with EF s and therefore maintained them well. Since installation, up to date, 20 individuals have reported faults in the EFs all of which were remedied by the first author. Most (n=47) of the respondents indicated that the reason, for elephants to be in conflict with humans, is their search for tastier food. For settlers in areas with elephant conflicts, erecting EFs around their property and agricultural lands may be profitable, better effective, and cheaper for the state because initial investment and fence maintenance is done by them. It also appears as if, such fences do minimum disturbance to the social structure and feeding patterns of elephants involved.

Keywords: Electric fence, Human elephant conflict, Mitigation

A Suspected Case of Inclusion Body Disease in a Captive Russell's Viper

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Inclusion body disease is a fatal viral disease in snakes worldwide, particularly in the family Boidae and Pythonidae. This has been recognized since the mid-1970s in the world but has not been reported in Sri Lanka. This disease is suspected to be caused by an RNA virus which is classified under members of the newly formed genus Reptarena virus, in the family *Arenaviridae*. Clinical signs of the disease are found in the gastrointestinal, respiratory, central nervous, and integumentary systems and this disease leads to lymphoproliferative disorders and round cell tumours. Generally, snakes infected with the virus die within weeks to months after observing the clinical signs.However, some may survive for months, or the disease may remain as a subclinical infection. This report illustrates a specific case of inclusion body disease in a captive Russell's viper (*Daboia russelii*) in Sri Lanka. A 6-year-old, male Russell's viper had been found dead in a captive snake sanatorium. The major postmortem finding was the multifocal variable-sized haemorrhages in the lung parenchyma.Tissue samples were taken into 10% neutral buffered formalin for further histopathological investigations. The histology slides were prepared and stained with hematoxylin and eosin. Upon histopathological examination,non suppurative myocarditis, hepatocellular degeneration and necrosis, renal tubular degeneration and necrosis, and severe to moderate diffuse pulmonary haemorrhages were detected. The most striking finding was the presence of numerous variable-sized amorphous eosinophilic intracytoplasmic inclusion bodies in the hepatocytes and the renal tubular cells.The gold standard method of diagnosis of inclusion body disease is based on the presence of characteristic intra-cytoplasmic eosinophilic inclusion bodies in epidermal cells, oral mucosal epithelial cells, visceral epithelial cells, and neurons.These inclusion bodies are also termed inclusion body disease protein (IBDP). Therefore, the presence of inclusion bodies in these histological sections is highly suggestive of inclusion body disease in the viper, implying this is the first case report of inclusion body disease in Sri Lanka and in Russell's viper. This disease is a deadly disease and a serious threat to captive snakes. The primary route of transmission has not yet been identified and no effective treatment has been found. Therefore, thorough investigations of both captive and wild snakes are necessary for the prevention of the disease in Sri Lanka.

Keywords: Inclusion bodies, Hystopathology, Russell's viper

Minimal Invasive Laparoscopic-Guided Tubectomy with Ovarian Conservation in Sri Lankan *Macaca sinica*

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Laparoscopic surgery is a growing area of expertise in both human and animal diagnosis and treatment. It potentially can be used in many areas of work with minimal invasive alternative approach to conventional "open" surgery in veterinary medicine. Pain reduction, rapid return to normal function, reduced surgical site infection rate and reduced hospitalization time are significant advantages of laparoscopic surgery. Laparoscopic tubectomies were carried out at the veterinary teaching hospital, on trouble making red faced monkeys (*Macaca sinica*), captured in groups from a student's hostel in University of Peradeniya. This project was done as a model of sharing knowledge among medical and veterinary professionals with a main objective of describing a modern technique for laparoscopic-tubectomy, in red faced monkeys. All 15-monkeys captured by community cage trapping outside the students' hostel, had an average weight of 4.67kg ±1.3. Monkeys were anesthetized with Xylazine and Ketamine combination and all females were ultrasound scanned to rule out pregnancies. After inflation of abdomen with CO_2 (10mmHg), a 5mm safety trocar and cannula were inserted through a mid-ventrally surgically incised port into the abdominal cavity. The trocar thereafter was removed to insert the light source through the same cannula. With the guidance of the above light source as indicated in the monitor, 5mm two stab incisions were placed, one in the left and the other in right quadrant of the abdomen using trocar with cannula. Grasping forceps were inserted through the right paramedian port and a monopolar cautery forceps were introduced through the left paramedian port. With the clear visualization on the monitor, one fallopian tube was identified using the grasping forceps and traced to their termination at the fimbriae. The isthmus of the tube was elevated using the same forceps, and a bipolar vessel sealing device was used to seal the tube. The procedure was repeated to the remaining fallopian tube. Long-acting antibiotic and pain killer were administered post operatively. This surgery can be completed within 10-15 minutes through 3-entry points. A total of 15-females recovered uneventfully and were returned to the hostel premises. They were monitored for one week, subsequent to their release.

Keywords: Ovarian conservation, Laparoscopy, Tubectomy

Tracheal Fibroma in a Captive Zebra (*Equus quagga chapmani*) in Sri Lanka

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A two and half-year-old male Chapman's zebra was detected with severe acute dyspnea, choking, and restlessness. Despite the emergency treatment with inhalational oxygen and parenteral injection of hydrocortisone, the animal died within a short period of time with no response to treatment. Although there were three other zebras in the enclosure, none had manifested similar clinical signs or conditions. Post mortem examination of the animal revealed an abnormal tissue mass attached to the mucosal surface of the mid-trachea with discontinuation of the 'C' shaped hyaline cartilage. The mass was about 5cm in length and distributed along the lumen of the trachea, irregular in shape, and moderately firm in consistency. It was observed to be occluding more than 50% of the tracheal lumen. Examination of other organ systems revealed severe, extensive paint brush haemorrhages on the right ventricular wall and pinpoint haemorrhages on both left and right atrial walls of the heart. Tissue samples collected from the tracheal mass and the heart were fixed in 10% neutral buffered formalin for histopathology. Histopathological examination of the abnormal tissue from the trachea revealed a fibrous connective tissue mass adhered to the tracheal mucosa. It was mainly composed of bundles of collagen interspersed with some fibroblasts which were mostly inactive in nature. Multifocal vascular congestion, haemorrhage and mild lymphocytic infiltration were also evident with no mitoses. The inadequacy of inflammatory cells and the lack of proliferating capillaries in the mass supported ruling out the possibility of exuberant granulation tissue. Based on these findings, the abnormal tissue mass in the trachea was diagnosed as a fibroma, leading to occlusion of the airway passage in the animal. Fibromas are benign tumours which do not show any clinical sign or symptom by themselves unless they interfere with the regular functions of an organ or occlude the passage or lumen of a hollow organ. Among all types of fibromas, tracheal fibromas are considered extremely rare and according to the authors' knowledge, this is the first case reported in a captive animal in Sri Lanka.

Keywords: Zebra, Trachea, Fibroma

Quantitative Assessment of Biosecurity Level of Ornamental Fish Farms in Sri Lanka Using a Scoring System

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Biosecurity measures are important to prevent or reduce the risk of animals being infected with pathogenic organisms. Biosecurity risk assessment is the major challenge in decision making as the decisions based only on expert opinion may leave the process biased. The objective of this study is to quantitatively assess the on-farm biosecurity levels by developing a risk based weighed biosecurity scoring system for ornamental fish farms in Sri Lanka. To our knowledge no studies have been carried out to assess the current biosecurity levels in ornamental fish farms. Based on risk factors, relative information of disease transmission, priority of fish diseases and information taken from extensive literature survey, biosecurity measures were indexed. The system was developed according to the method used to implement Biocheck UGent biosecurity scoring system. The unique feature of this scoring system is that it provides relative importance of the different biosecurity aspects into account resulting in risk based weighed score. ProProfs quiz app was used to develop the biosecurity measurement quiz for ornamental fish farmers. Biosecurity scores were weighed according to the weights given by experts for each measure. The scoring process consisted of both external and internal biosecurity aspects of the farms through the assessment of 20 biosecurity measures. Biosecurity was quantified by converting the answers to 20 measures into a score ranging from 0 to 100. If the data is available expert weighed scores can be replaced by the national score of each measure. The quiz was sent 15 ornamental fish farmers selected from convenient sampling method as the pilot study. The biosecurity assessment was automatically received through the system after completion of the questionnaire at farm level. The pilot study (n=15) showed a huge variation in biosecurity levels in ornamental fish farms with biosecurity scores ranging from 43%-87%, which implies a lack of implementation of many biosecurity measures and room for improvement. By using this scoring system, internal and external biosecurity of fish farms and scope for farm specific hygiene improvement can be identified. At the same time, developed scoring systems will be helpful to assess the biosecurity of fish farms and to identify the gaps comparing with national standards.

Keywords: Biosecurity, Ornamental fish farms, Scoring system

Apocrine Adenoma in a Golden Hamster – A Case Report

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A 4-month-old, female, intact, golden hamster was referred to the Veterinary Teaching Hospital, University of Peradeniya, for investigation of a progressively enlarging mass approximately of 2 cm diameter in the ventral neck area. The mass was subcutaneous, freely movable, non-painful, and had a mixed firm to flocculent consistency. The hamster was previously seen by a regional veterinarian and treated with topical anti-inflammatories (0.5% Hydrocortisone ointment) without any success. On presentation, the hamster was bright, alert, and responsive and all the vital parameters were within the normal limits. A fine-needle aspirate was obtained from the mass for cytology under local anesthesia. The aspirate was highly cellular and contained variably sized clusters of cuboidal to polygonal cells in a mildly basophilic background with scattered individual cells, admixed with blood cells that were accountable for mild haemorrhage that occurred during sample collection. The cell clusters consist of two types of cells with apparently different staining characteristics. The first population of cells was found at the periphery of the cell clusters. These cells had indistinct cytoplasmic borders and a scanty to moderate amount of lightly basophilic cytoplasm. The nuclei were large, round to oval with coarsely clumped chromatin, and occasionally contained 1-2 prominent nucleoli. The nucleus to cytoplasmic ratio of the neoplastic cells was high. The condition was tentatively diagnosed as benign neoplasia and surgical excision was performed under general anesthesia. Histopathology revealed a well demarcated, partially encapsulated, neoplasm composed of polygonal cells arranged in variably sized, tubules lined by a double layer of columnar cells, surrounded by a loose fibrovascular stroma consistent with a diagnosis of an adenoma. Eosinophilic granular cytoplasm with frequent apical blebbing suggesting apocrine origin. There was minimum cellular and nuclear pleomorphism. The life span of a hamster is approximately 2-3 years and apocrine neoplasia at the age of 5 months is rarely reported. The surgery was successful, and no tumour recurrence was reported after four months from the surgery. Cytology of apocrine adenomas of hamsters is rarely described in literature and therefore the present report provides useful information regarding diagnosis of this tumour type.

Keywords: Hamster, Adenocarcinoma, Neoplasm

Success of Intra Uterine Antibiotic Treatment in Repeat Breeding Cows

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A repeat breeder is a cow with normal estrous cycles and estrous period, but fails to become pregnant in three or more successive inseminations performed in true estrous. Repeat breeding is one of the most common problems in small scale dairy farms resulting in heavy economic losses and premature culling of breeding animals. Potential causes of repeat breeding include nutritional deficiency, age of the dam, improper estrous detection, endocrine dysfunction and subclinical uterine infection. The study was planned to investigate the effectiveness of intrauterine antibiotics on the conception rate in repeat breeding European breed cows (Holstein Friesian and Jersey) as a less expensive method in small-scale dairy farms in the upcountry area. Twenty normal cyclic, postpartum cows with a Body Condition Score (BCS) of 2.5 to 3.0 who were not conceived with three consecutive AI were selected. These animals were treated with 1000mg Enrofloxacin (- 10 ml diluted in 10 ml of normal saline, once) through the intrauterine route and inseminated with good quality frozen semen by a single technician at least for three sequential post-treatment cycles. The pregnancy diagnosis was carried out 35 days post AI using ultrasound scanning in non-returning cows. The results showed 50% conception rate at first service and 20% and 5% conception rates respectively for second and third services, with a 75% of the total conception rate. The study showed that intra-uterine administration of antibiotics increases the overall breeding performance of repeat-breeding cows with clinically normal reproductive tracts and regular cycles which are suspected to be associated with subclinical uterine infections.

Keywords: Artificial Insemination, Cows, Pregnancy, Repeat Breeding, Uterine Antibiotic

Effect of Graded Levels of Dietary Sugarcane-Derived Polyphenol (Polygain) on Growth Performance of Broiler Chickens

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Polygain is a polyphenol-rich natural sugarcane extract and can protect living cells against oxidative damage that could negatively affect broiler performance. The objective of the study was to evaluate the effect of graded levels of dietary Polygain on the growth performance of broiler chickens under local conditions. A pilot study was conducted by housing a total of 9600-day-old broilers (Cobb 500) in litter floor pens and feeding graded levels of dietary Polygain (0, 0.1, 0.2 and 0.3%) from 0 to 35 days. Four replicated rooms (240 birds/room) were portioned into four pens (60 birds/pen), to which treatments were randomly assigned. Birds were fed commercial starter (crumbles; 0 to 18 d) and finisher (pellets; 18 to 35 d) diets according to Cobb 500 broiler performance objectives, and water was given *ad-libitum* throughout the study. Treatment diets were prepared by adding the respective levels of Polygain to the processed commercial diets (both starter and finisher) by hand mixing. Bird mortality was recorded daily, and bodyweight gain, feed intake, and mortality corrected feed to gain ratio were evaluated weekly (7, 14, 21, 28 and 35 d) by measuring body weight and feed intake on a pen basis. Data were analyzed using one-way ANOVA for randomized complete block design. Statistical significance was considered at $P \leq 0.05$. The dietary level of Polygain did not significantly affect the broiler performance parameters each week and overall trial period and did not negatively affect Cobb 500 performance targets. Polygain levels of 0, 0.1, 0.2 and 0.3% respectively resulted in 2.268, 2.261, 2.242 and 2.227 kg body weight gain ($P = 0.437$), and 3.429, 3.417, 3.348 and 3.350 kg feed intake ($P = 0.245$) for the total trial period. Feed to gain ratios ($P = 0.207$) for the total trial length were1.51, 1.51, 1.49 and 1.50 for the dietary Polygain levels of 0, 0.1, 0.2 and 0.3%, respectively. The absence of significant Polygain effects on broiler performance could be related to unequal dietary Polygain distribution, which should be addressed by incorporating Polygain at the custom feed processing when designing future experiments.

Keywords: Feed additive, Antioxidant, Broiler performance

Acknowledgement: The funding for the project was given by PJM Bioactives (Pvt) Ltd and the University of Peradeniya.

Formulation and Analysis of the Composition of a Locally Produced Mineral Supplement for Dogs

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Pet owners use commercially available mineral mixtures for dogs to fulfill their requirements for their different life stages. Some of the issues of those mineral mixtures are associated with bioavailability, palatability, texture and odor. Aim of this study is to formulate a locally produced mineral mixture which can supply adequately their mineral requirements for metabolism by enhancing the bioavailability, palatability and a better texture. Various mineral mixtures, which contain macro and micro minerals are available in the market. Different dog breeds require variable amounts of macro and micro minerals. In this current study, formulation was performed using locally available ingredients that are rich in major and trace minerals and adhering to the guidelines indicated in the nutrient requirement tables published in Merck Veterinary Manual. Mixing of minerals was performed according to the international standards. Minerals less than 1% (w/w %) premixed using blender for 3 times for 40 seconds. Flavors were added and mixed for 3 times for 40 seconds. Minerals higher than 1% (w/w %) were directly added to mixture and mixed for 3 times for one-minute duration. Evaluation of mineral supplement was performed using Atomic Absorption Spectroscopy. Formulated values: Ca; 18% (w/w %), P; 14% (w/w %), Mg; 1% (w/w %), Cu; 20 mg/kg and Zn; 200mg/kg. Laboratory values Ca; 17.11% (w/w %), P; 12.48% (w/w %), Mg; 1.1% (w/w %), Cu;25.7 mg/kg and Zn; 203.8mg/kg. Also Potassium 0.6% (w/w %), Sodium 0.7% (w/w %), Iron 80mg/kg, Copper 8mg/kg, Manganese 0.01% (w/w %). Further, formulated values of mineral mixture and results obtained by laboratory analysis were comparable and the values are within the ranges of AFFCO standards. The palatability test was performed using two healthy dogs, an 8 month old Labrador male and an 8 months cross breed, male, both exhibited positive results. Packing materials were also designed for potential commercialization of this locally produced mineral supplement in future. In conclusion. palatability of the locally produced mixture was also successful. Therefore, this locally produced mineral supplement can be effectively used to fulfill the mineral requirements of dogs.

Keywords: Dogs, Mineral mixture, Palatability

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Design and Construction of a Low-Cost Electronic Weighing Scale for the Livestock Industry in Sri Lanka

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This study was conducted in a farm located at Uda-Peradeniya. The fundamental components of the electronic weighing scale system are load cells, a load cell junction box, a weighing indicator, and a suitable platform. Load cells are incorporated beneath the platform at each corner to read equally distributed weight with minimizing the error as much as possible. The load cell summing box or the load cell junction box connects numerous load cells and generates one signal which is then read by the terminal/indicator. In this study, four load cells are connected parallel to the load cell junction box. All the corresponding analogue signals which are generated from load cells are processed through the junction box. The resulting signal from the junction box is the average of the signals from all individual sensing load cells. The resulting signal is displayed and recorded in the weighing indicator. For the program development, Arduino UNO was used as a microcontroller which provides auto taring, data processing capabilities, and digital display of animal weight. After constructing the electronic weighing scale, the scale was calibrated using a known weight. If there was a discrepancy, the settings were modified following the manual, and the calibration was repeated until the right quantity in the indicator was visible. The accuracy of the weighing scale was tested using known water weight by adding the same amount of water. This scale is having around 99% accuracy of the actual value. This weighing scale can measure weight from 500g to 1,000 kg with an increment of 100g.Trials were conducted with 16 dry cows and 24 lactating cows to assess the correlation between weight tape and electronic scale measurements. According to the data, the two approaches had a strong relationship (r = 0.851, P 0.001). This scale can measure the live weight of livestock, particularly cattle, without disrupting their normal routine.

Keywords: Cattle, Livestock Industry, Weighing Scale

Effect of Monosodium Glutamate (MSG) on the Production of Gamma-Aminobutyric Acid (GABA) by Lactic Acid Bacteria

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GABA is a non-protein amino acid that is synthesized when glutamate is decarboxylated by the enzyme glutamate decarboxylase (GAD). GABA and GAD have been discovered in plants, animals, and microorganisms. GABA functions as an inhibitory neurotransmitter in the brain and also has hypotensive, diuretic, antidiabetic and antioxidant. GABA is a crucial active ingredient in food derived from microbial fermentation. Lactic Acid Bacteria (LAB) are the most researched group of microorganisms that produce GABA via fermentation. Because GABA is in high demand as a functional food component in recent years, scientists are searching for the optimal conditions for GABA production and novel GABA-producing LAB strains. In this study, isolated seven LAB strains (S 1-3-3, S 1-4-1, S 1-4-2, S 5-2-2, S 7-2-2, S 9-4-1, and S 12-3-3) from dairy products are used to assess the GABA producing capabilities in the presence of monosodium glutamate (MSG). GABA production was quantified by the modified spectrophotometric method described by Kitaoka and Nakano (1969). The test was carried out with two different MSG concentrations, 1% and 2%, in Man Ragosa and Sharpe (MRS) broth and with a control medium without MSG. Spots appeared for all seven strains at the level of GABA control during screening by thin-layer chromatography, confirming their ability to produce GABA. Without MSG supplementation, GABA production ranged from 133.89 mg/ml to 315.83 mg/ml in their culture supernatant. The addition of 1% MSG increased GABA production in six strains, while the addition of 2% MSG decreased GABA production in all seven strains. The strain S 9-4-1 was unable to tolerate MSG (1%) and produced 133mg/L in control, 110mg/L with 1% MSG, and 55mg/L with 2% MSG. In the presence of 1% MSG, lactobacillus S 7-2-2 produced the most GABA (474.09 mg/L).MSG can be inferred to have both a stimulating and a suppressive effect on the production of GABA. The genotypic identification of strains is in progress.

Keywords: GABA, Lactic Acid Bacteria, Monosodium Glutamate,

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Measures Assessing Pathological Changes in the Trachea are More Discriminatory and Reproducible than Measures of Air Sac Lesions Caused by Chronic Respiratory Disease in Poultry: A Systematic Review

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*Mycoplasma gallisepticum*is the primary cause of chronic respiratory disease (CRD) in poultry and vaccination is efficacious and routinely used in the field for its control. Trachea and air sacs are the main organs affected by infection with *M. gallisepticum*. The parameters used to assess the lesions in the trachea and air sacs should be reproducible and discriminatory between the infected and uninfected groups when the efficacies of vaccines against *M. gallisepticum* are experimentally evaluated. The aim of this study was to explore the most reproducible and discriminatory parameter used to evaluate tracheal and air sac lesions in poultry in previous studies by conducting a systematic review of the published journal articles describing evaluation of histological changes in the trachea and/or gross pathological changes in the air sacs after infection with *M. gallisepticum*. This study included 23 eligible articles but only 17/23 articles have included both positive-control and negative-control groups while 6/23 articles had only a positive-control group. Data were extracted from 30 different vaccination-infection trials that were included in those 17 articles and critically analysed. There was a significant difference in the measures of tracheal lesions between the negative-control and positive-control groups in 29/30 trials. In contrast, a significant difference in the measures of air sac lesions between the negative-control and positive-control groups was detected only in 17/30 trials. The proportion of trials that detected a significant difference in tracheal lesions between the two control groups differed significantly from the proportion of trials that detected a significant difference in air sac lesions between the two control groups. These findings highlighted that the parameters assessing tracheal lesions are more reproducible and discriminatory than those assessing air sac lesions after infection with *M. gallisepticum* in poultry reflecting the necessity for inclusion of parameters assessing tracheal lesions as the primary outcome variable in future studies evaluating the efficacy of vaccines against *M. gallisepticum*.

Keywords: Mycoplasma, Chronic Respiratory Disease

Molecular Evidence for the Presence of Inclusion Body Hepatitis Virus among Broiler Farms in Kurunagala District of Sri Lanka.

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Inclusion body hepatitis (IBH) is caused by fowl adenoviruses (FAdV) belonging to the genus *Aviadenovirus*of the Family *Adenoviridae*. Recent studies have found out that FAdV- D (serotypes 2, 3, 9, and 11) and FAdV- E (serotypes 6, 7, 8a, 8b) are responsible for IBH. It is an acute disease, mainly affecting 3-7 weeks old broiler chickens. Even though published information is limited on IBH prevalence in Sri Lanka, field veterinarians suspect that the disease is prevalent in certain areas of the country. This study used the PCR technique to demonstrate the presence of FAdV responsible for IBH cases in broiler chickens in Sri Lanka. Liver samples were obtained from four different broiler farms in the Kurunagala district. The affected birds manifested clinical signs suggestive of IBH which include lethargy, huddling, ruffled feathers, depression and inappetence. Postmortem examination of carcasses revealed hepatomegaly, pale yellowish liver with necrotic foci, and multifocal petechial haemorrhages on the liver surface. During the histopathological examination, diffuse, large, basophilic or eosinophilic, intranuclear or intracytoplasmic inclusion bodies were observed in the hepatocytes. Total DNA was extracted from the liver samples containing inclusion bodies by using QIAGEN DNA easy® mini kit. Conventional PCR targeting the hexon gene of the FAdV was performed using FAdV-Hexon A-CAARTTCAGRCAGACGGT and FAdV-Hexon B-TAGTAGTGMCGSGACATCAT primers. Anticipated amplicon size was 897 bp. PCR products were analyzed on a 1% agarose gel. All 04 tested liver samples and the positive control showed an anticipated band for the hexon gene at 897 bp level. Commercially available, inactivated IBH vaccine, used in broiler parent flocks was used as the positive control. Therefore, the findings of this study concluded that FAdV responsible for IBH is circulating in broiler farms in the Kurunagala district of Sri Lanka. Further identification of circulating FAdV strains is important for the implementation of vaccination strategies since IBH causes huge economic losses in the poultry industry.

Keywords: Polymerase Chain Reaction, Fowl adenoviruses, Molecular diagnosis

Preliminary Evidence for Possible Multi Drug Anthelmintic Resistance in the Semi - Intensively Managed Goat Herd at Government Goat Genetic Resource Development Center, Thumpankerney.

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Government goat genetic resource development centre in Thumpankerney in Eastern province produces a robust meat type goat breed derived from Jaffna Nupian, Jamunapari and Boer breeds. Persistent mortality and production losses related to helminthic infestations were continuously experienced by the farm despite the comprehensive deworming practices. The objective of this study was to perform a preliminary faecal egg count reduction test to evaluate the efficacy of anthelmintic compounds regularly used in the farm namely Albendazole, Oxfendazole-Oxyclosanide combination, Levamisole-oxyclosanide combination and Niclosamide. Altogether 30 goats aged more than six months were assigned into four treatment groups and one control group (n=6 per group). Selected animals were not dewormed during the last 60 days prior to the trial and received same feed and water. Treatment dosages of 1 ml/10 Kg bodyweight (BW) of 10% Albendazole solution, 1ml/5Kg BW of 2.265% Oxfendazole and 6.25% Oxyclosanide solution, 1ml/4Kg BW of 3% Levamisole and 6% Oxyclosanide solution, and 2.5g/10Kg BW of 30% Niclosamide powder were used in respective treatment groups. Faecal samples were collected 14 days after the treatment and examined for parasitic eggs. Parasitic eggs were morphologically identified and quantitatively analysed using McMaster counting technique. The quantitative data was normalised by using $\log_{10}$ transformation and the percentage reduction in faecal egg count was determined for each treatment group. Mean eggs per gram of faeces (EPG)among treatment groups Albendazole, Oxfendazole-oxyclosanide, Levamisole-oxfendazole, Niclosamide and control group were 1933, 2050, 1933,1417 and 3067 respectively. Faecal egg count reduction at 14 days post treatment (37%, 33%, 37%, 54% respectively) compared to the control was not significant ($P<0.05$) in any of the groups suggesting that resistance may have been developed against all groups of anthelmintic compounds currently tested. However, not testing the goats for initial EPG and before the treatment and grouping them based on their counts was a limitation of this study.

Keywords: EPG, Anthelmintic

Preliminary Coprological Survey of Gastrointestinal Parasites in Free Grazing Indigenous Cattle in Thumpankerney Veterinary Range during Dry Season

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Cattle farming is one of the major livelihood sectors of the local community in Thumpankerney veterinary range in Batticaloa district. A vast majority of the cattle in this region are reared under extensive management. This study was intended to determine the prevalence of gastrointestinal nematodes, cestodes and coccidian parasites by determining eggs per gram of faeces (EPG) and oocysts per gram of faeces (OPG) respectively, using salt floatation. The study was conducted during the dry season from late May to early August 2021. A total of 100 faecal samples were collected directly from the rectum, from four regions of the range to keep the sample distribution as uniform as possible with 25 samples from each region. In this study three types of nematode eggs, namely Strongyle, Strongyloid and Trichuris, were found along with cestodes eggs and coccidian oocysts. The types of parasitic stages found in this study were similar to those reported elsewhere in the country. Out of 100 samples, 93% were positive for at least one type of parasitic eggs or oocysts. Among nematodes, strongyles had the highest prevalence of 93% followed by Strongyloides (92%) and Trichuris (51%) respectively. Cestodes eggs were found in 56% of the samples, and 90% of the samples were positive for coccidian oocysts. A significant association was found between age and parasitic burden ($P < 0.05$), where young animals had higher parasitic burden. Sex and geographic location of the animals did not have any significant association with the parasitic burden ($P > 0.05$). This research was a preliminary step to study the epidemiology of gastrointestinal parasitism in cattle in Thumpankerney veterinary range and expected to be continued.

Keywords: Free grazing, Gastrointestinal parasitism, Indigenous cattle

Occurrence of Poultry Coccidiosis in Small Scale Farms Participating in a Pilot Chick Distribution Project Implemented in Mawanella Veterinary Range in 2021

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Coccidiosis is the most economically significant parasitic infection in the poultry industry as it is associated with high morbidity and mortality. A pilot project was implemented to distribute 5000 one month old chicks among 250 low-income category farmers in the Mawanella veterinary range in December 2021. The main objective of this study was to determine the occurrence of poultry coccidiosis among the chicks distributed to 250 low-income category farmers under this pilot project. The total number of birds kept by a single farmer varied from 10 to 250 and the age range was from 4 to 32 weeks. The farms were visited with the complaints of diarrhoea, decreased feed intake, decreased egg production, abnormal mortality associated with lameness, and low body weight, blood or mucus in droppings. Total numbers of 225 carcasses were examined for gross pathological changes and 65 fecal samples were also examined. Mucosal scrapings of small intestine and the caeca were examined microscopically to identify the oocysts. Salt flotation method was used to examine the oocyst in the fecal samples. Haemorrhages in intestines and ceaca were observed in the carcasses. The results showed that out of 250 farms, 189 farms were positive for coccidiosis (overall occurrence75.6%). The occurrence among chicks in age categories of 4-6 weeks, 7-9 weeks and greater than 9 weeks were 86.6%, 26.6% and 4% respectively. The occurrence of coccidiosis was higher in female birds than in the males. It was observed that famers do not have adequate knowledge of this diseases. Poor feeding systems, inadequate ventilation, environmental and managemental stress such as overstocking contributed to high occurrence of coccidiosis.

Keywords: Coccidiosis, Low-income farmers

Phylogenetic Characterisation of Incidentally Discovered *Syngamus trachea* from a Backyard Poultry Carcass: A Case Report

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An approximately three years old male backyard poultry carcass was presented for postmortem examination. The complaint was sudden death of the bird without any clinical signs and it was from a farmer that kept 3-4 birds under less ideal conditions. Lesions seen during necropsy included hyperemic trachea infested with red worms with a forked appearance, and congested lungs with hemorrhages. The parasite was microscopically identified as *Syngamus trachea.* Molecular studies have provided important insights into the evolutionary relationships of various nematode groups. Despite the fact that there have been few studies on the molecular characterization of poultry parasites in Sri Lanka, no molecular key regarding poultry parasites has been developed previously. Therefore, although this was an unintentional discovery, PCR and sequencing was performed to characterize this parasite. DNA was extorted using 'Wizard® Genomic DNA Purification Kit' (Promega USA) according to the manufacturer's instructions. Approximately 1500bp segment of 28s gene of the parasite was amplified using previously published primers. The purified PCR product was sequenced at the DNA sequencing facility at Faculty of Science, University of Peradeniya. The NCBI Basic Local Alignment Search Tool (BLAST) was used to compare the sequence to GenBank database. It was identified as *S.trachea* (91.65 % identity, 99% similarity and E value = 4e-167). To infer the evolutionary relationship of the parasite, phylogenetic analysis was performed by comparing 28S gene sequences of *S.trachea* available in the Genbank database. Total of 28 S. trachea sequences were obtained from the Genbank database. BioEdit (Version 7.0) and Mega X (Version 11) were used for the phylogenetic analysis using neighbor joining method with bootstrapping (1000 bootstrap replications).The phylogenetic tree contained six clusters, and the local specimen clustered together with *Syngumus trachea* species found in Australian Magpie.

Keywords: Backyard poultry, PCR, Phylogenetic analysis, Syngamus trachea

Assessment of Correlation between Platelet Count Determined by the Conventional Automated Haematological Analyzer and using Blood Smear

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Precise assessment of the severity of thrombocytopenia is extremely important in therapeutic decision-making. Automated haematological analyzers are frequently used to enumerate platelets while stained blood smears are only occasionally used to determine platelet counts in clinical set-ups. However, the accuracy of platelet counts determined by the impedance type automated analyzers may be affected by platelet clumping and the presence of mega platelets (MP). This study investigated the correlation between platelet counts of dogs determined using an automated impedance type haematological analyzer (Beckman Coulter D×400) and the platelet counts of the same dog estimated using stained blood smears. Additionally, it was examined whether the degree of thrombocytopenia is predictive of the presence of mega platelets or the degree of platelet clumping. Thirty-seven canine blood samples received by the Haematology Laboratory at Veterinary Teaching Hospital, University of Peradeniya with platelet counts < 200 x 10^3/L in the complete blood count (CBC) were selected for the study. Platelet counts and the presence of MPs were determined using blood smears prepared from venous blood in EDTA. Platelet clumping at the feathered edge of the blood smears was semi-quantitatively assessed. Spearman's rank-order correlation test was used for statistical analysis(SPSS Software). Only a poor correlation was identified between the platelet counts in CBC and the platelet counts estimated using stained blood smears. Only weak, non-significant correlations between the total platelet count and the presence of MPs or the degree of platelet clumping were identified that suggested the severity of the thrombocytopenia is not predictive of either platelet clumping or the presence of MPs. However, the platelet counts estimated by the stained blood smear showed a good correlation with the presence of MPs (rho =-0.64). Further, only a weak correlation was observed between the presence of MPs and mean platelet volume (MPV) or platelet distribution width (PDW), indicating that neither of them is a good indicator of the presence of MPsin peripheral blood. The findings of this study highlight the importance of blood smear examination concurrent with CBC in assessing thrombocytopenia and in dogs.

Keywords: Megaplatelets, Platelet clumping, Platelet count

Acknowledgement: Staff of the Veterinary Teaching Hospital for their assistance with the project

Atypical Closed-Pyometra Case of a Dog: Affecting only the Uterine Body

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A 5-year-old intact female Rottweiler weighing 25 kg was presented to the Veterinary Teaching Hospital, University of Peradeniya with complaints of hyporexia, an enlarged abdomen, and difficulty in defecating observed over a week. At the time of presentation, the patient was hyperthermic and its mucous membranes were pale pink. Lumbar pain and generalized lymphadenomegaly were observed upon palpation. The abdomen was severely distended with a doughy feeling on palpation. Abdominal ultrasonography revealed a large anechoic area cranio-ventral to the urinary bladder which was suspected to be the uterine body. However, the uterine horns were not prominent. The condition was tentatively diagnosed as closed cervix pyometra, and an ovariohysterectomy was performed. During the surgery, it was revealed that the uterine horns were only mildly enlarged while the purulent fluid was mostly accumulated in the uterine body. Approximately two litres of fluid were suctioned out of the uterine body using a mechanized electric sucker followed by an ovariohysterectomy. Ultimately, an abdominal lavage was performed with warm isotonic saline solution (200 mL/kg). Generally, in pyometra, both uterine horns contain purulent material. In this rare case, purulent material was present mostly within the uterine body and only a mild accumulation was noticed in uterine horns, suggesting narrowing of uterine horns. To the authors' knowledge, this is the first report of a large volume of purulent material accumulation noticed in the uterine body with mildly enlarged uterine horns. The main differentials for such conditions are uterine neoplasia and adenomyosis. The presence of excessive progesterone in blood as a result of long-acting progesterone in the luteal phase of the reproductive cycle influences the uterine glandular tissue to become cystic, edematous, thickened, and infiltrated by lymphocytes and plasma cells. Additionally, it reduces the myometrial contractility. This abnormal uterine environment allows bacterial colonization causing pyometra. This report documents an unusual accumulation of purulent material in the uterine body in a dog diagnosed with closed pyometra.

Keywords: Ovariohysterectomy, Pyometra, Uterine body, Ultrasonography,

Pyloromyotomy Using Fredet-Ramstedt Technique on a Dog with Canine Hypertrophic Pyloric Stenosis

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Pyloric stenosis causes gastric outflow obstruction and ends up with a delay in gastric emptying which eventually leads to chronic vomiting in dogs. It can be either congenital or acquired. This report describes the successful surgical correction of pyloric stenosis in a dog by Fredet-Ramstedt technique. A 10-month-old female Cocker Spaniel was referred to the Veterinary Teaching Hospital, University of Peradeniya for evaluation of the distended abdomen and chronic vomiting for one month. It had passed a scanty amount of hard brownish feces. Intermittently appetite loss was observed by the owners. The vomiting was not responded to any antiemetics. A fully distended stomach was noted in the survey radiograph which displaced the gas-filled intestines more caudo-dorsally and ultrasound showed a massive accumulation of stomach content within the enlarged stomach. Full blood count, serum creatinine, alanine transaminase, albumin, glucose, and total protein levels were checked, and values were within normal ranges. Exploratory laparotomy was performed suspecting pyloric stenosis following the diagnostic aids and clinical history. Investigation of pyloric outflow revealed thickened pylorus with a narrowed lumen. While, holding the pylorus between the index finger and thumb, a longitudinal incision was made through the serosa and muscularis mucosa in a hypovascular area of the ventral pylorus. Muscular hypertrophy was observed in the tunica muscularis layer of the pylorus and hypertrophied parts were debulked. The muscularis layer was completely incised to allow the mucosa to bulge into the incision site. A small biopsy from the pylorus was submitted for histopathology and it revealed a benign smooth muscle cell proliferation suggesting differential diagnoses including smooth muscle cell hamatoma or leiomyoma. The dog completely recovered, and vomiting was reported four months after the surgery. This report would be beneficial to veterinary practitioners to understand the background information regarding pyloric stenosis and move forward with surgical treatment to cure the patient from this fatal condition.

Keywords: Pyloromyotomy, Stenosis, Vomiting

Correlation between a Number of Polychromatophils in Leishman-Stained Canine Blood Smears and Haemotocrit, MCV, MCHC and RDW

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Anaemia is a condition caused by reduced RBC number or haemoglobin concentration. Anaemia is categorized as regenerative or non-regenerative according to the bone marrow's response to the reduction of RBCs. Differentiation of regenerative anaemia from non-regenerative anaemia is important in veterinary medicine as it helps to determine the cause of anaemia and treatments. The best indicator of regenerative anaemia is reticulocytosis. However, assessment of % reticulocyte count or absolute reticulocyte count is not cost-effective and therefore not routinely used. Immature RBCs identified in canine blood smears stained with Romanowsky-type stains such as Leishman stain are known as polychromatophils. Although the presence of an increased number of polychromatophils indicates regenerative anaemia, it is currently unknown whether the number of polychromatophils or % of polychromatophils is useful to identify regenerative anaemia similar to % and absolute reticulocyte counts. The RBC indices: mean corpuscular volume (MCV), mean corpuscular hemoglobin concentration (MCHC), and red cell distribution width (RDW), correlate with reticulocyte counts. The present study investigated whether the RBC indices correlate with the % polychromatophil count and absolute polychromatophil count similar to reticulocyte counts. For this purpose, % and absolute polychromatophil counts were assessed in 25 Leishman-stained, canine blood smears prepared using venous blood samples collected in EDTA. The polychromatophil % was determined by counting 1000 RBCs in100x magnification and the absolute polychromatophil count was determined by multiplying the % polychromatophil count by the total RBC count. Haematocrit and other RBC indices were obtained from the complete blood count reports. The correlation between the % polychromatophil count/absolute polychromatophil count was tested with the haematocrit and RBC indices to determine the correlation/s between them (Pearson's correlation). There were statistically significant, strong correlation between % polychromatophil count and MCV (r=0.584, p=.0002), MCHC (r=-0.305, p=0.001), and RDW (r=0.396, p=0.05) suggesting that the possibility of % polychromatophil count is a good indicator of regenerative anaemia. However, the correlations were weak when the absolute count of polychomatophils was used in place of % polychromatophil counts indicating the necessity of further studies with greater sample size. Small sample size and confounding factors including age, breed and concurrent diseases are the limitations of this study.

Keywords: Leishman stain, Polychromatophils, Reticulocytes

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project

Surgical Repair of Tibial Tuberosity Avulsion Fracture in Dogs Using two Kirschhner wire and Stay Suture

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Tibial tuberosity is the prominent bump located on the cranial, proximal tibia bellow the stifle joint. It serves as an attachment for the patella tendon. It takes approximately 3-8 months period to fuse tibial tuberosity apophysis and proximal tibial epiphysis. In avulsion fracture, a bone fragment detaches from the main part of the bone at the attachment site of tendon. Tibial Tuberosity avulsion fractures generally seen in younger dogs less than 8 months old. This fracture can occur due to trauma from falling from height, Road traffic accident and slipping on the floor. Repair can be done by conservative method and surgical intervention. If left untreated, the knee joint and consequently the limb function may be poor. Present report describes Tibial Tuberosity fracture correction using Two pins and Placed a nylon suture in three dog and their management. Fiona four months old American Bully female, Rocky five months old Rottweiler male and Rufy 5 months old Rottweiler male dogs were presented to Citypet Animal Hospital Athurugiriya with the complaint of pain and limping of hind limb. General clinical examination revealed present of swelling and pain on palpation. Tibial Tuberosity fracture was confirmed upon radiographic examination. Both knees were radiograph as avulsion of bone fragment may vary from small to dramatic. Two 1mm pins, 1/0 vicryl suture material were selected. Atrophine sulphate at 0.005 mg/kg body weight was administered subcutaneously prior to sedation with Xylazine HCl intramuscular injection. Induction of anesthesia was achieved using Ketamine intravenously. Animal was kept on Lateral recumbency. A skin incision was made from the craniolateral border of the patella ligament at the level of Tibial tuberosity. Subcutaneous tissue was incised along the same line and expose the tibial tuberosity. Tibial tuberosity fracture was reduced and stabilized with Two Kirschner wire and a tension band wire. After the surgery a soft padded bandage was applied to the leg. Patient was discharged after 2 days of treatment. Owner was advised that movement should be restricted for about 4 weeks. Surgical fixation was successful resulting in excellent function of the stifle joint.

Keywords:Fracture, Tibial Tuberosity

Success Rate of Artificial Insemination in Dogs: A Preliminary Study in Sri Lanka

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Artificial insemination (AI) is one of the popular techniques for assisted breeding in animals and humans. The objective of this study was to investigate the success rate of artificial insemination in dogs. The experiment was carried out in 2012/2013 at the Faculty of Veterinary Medicine and Animal Science, University of Peradeniya. The breeds of dogs used in this study were German Shepherds, Labrador Retrievers, Rottweilers, Cocker Spaniels, Dalmatians, Shih Tzu, Terriers, Belgian Malinois, Siberian Huskies and cross breeds. Semen was collected from 9 stud dogs while keeping the female dog at the vicinity using manual massaging technique. The volume, color, motility and concentration of semen were assessed. Average semen volumes of different breeds ranged from 3ml to 15.5ml. The sperm concentration ranged from 126×10^6/mL to 690×10^6/mL. All the samples showed more than 80% normal sperm percentage. Motility of the sperms ranged from 70% to 90% with more than 40%-90% forward progressive motility. Speed of the sperms was medium to fast in all samples. Nineteen bitches in heat were inseminated directly into the anterior vagina using non- surgical insemination procedure. Inseminations were done with fresh semen of same breed males using an AI pipette connected to a sterile syringe through a sterile rubber hub. A volume of 3 to 15 ml of semen was used for each insemination. For each bitch, two inseminations were performed 48 hours apart. Insemination timing was mainly determined by behavioral, and physiological signs of estrus with microscopic examination of vaginal smears. Pregnancy was confirmed at 30 days after insemination using ultrasound scanning. The success rate of AI in dogs was 47.36% (9/19) with 4.7 (±1.56) average litter size. Only one incidence of abortion was recorded. These preliminary results suggest that a high success rate of AI can be obtained when fresh semen is used. Lack of data on AI success rate with chilled or frozen semen to compare with fresh semen is a limitation of the study.

Keywords: Artificial insemination, Dogs, Success rate

Splenic Lymphoma in a Thoroughbred Horse:A Case Report

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An 8-year-old thoroughbred horse from an equestrian unit at Kandy was brought to the Farm Animal Teaching Hospital, University of Peradeniya with a history of deteriorating body condition and pica for one year. The feed intake and the fecal output of the horse were normal. Except for the low body condition, the general clinical examination was unremarkable. Fecal wet mounts were negative for parasitic eggs. Except for hyper proteinemia (7.57g/dl), hyperalbuminemia (5.35 g/dl) and marginally low ALT (9.8 UI), no other abnormalities were found in the hematological and biochemical profiles. The neoplastic condition was suspected due to the chronic reduction of body condition and the horse was hospitalized and supportive treatments were provided. However, the horse died on the following day of hospitalization. The necropsy revealed an abdominal mass (60×58×45cm), originating from the dorsal 2/3 of the spleen with multifocal, white-yellow, caseous lesions. Histopathology of the splenic mass revealed a pleomorphic population of lymphoid cells that extensively replaced the normal splenic parenchyma. The lymphoid cells included many large cells (2-4 times of an RBC) with round to convoluted nuclei admixed with a moderate number of small cells (1-2 times of an RBC) with a small rim of cytoplasm. The nuclei of large lymphoid cells had peripheralized chromatin and a single, prominent central nucleolus while a few of them had 3–4 nuclei. There were occasional bi-nucleated cells. Scattered among the neoplastic lymphoid cells, there were few necrotic cells with pyknotic nuclei and brightly eosinophilic cytoplasm. In addition, there was widespread, regional fibrosis. The histopathological characteristics were most consistent with a splenic lymphoma. Lymphomas represent only 0.2 - 3.0% of equine tumors while splenic lymphomas are rarely reported in horses. Clinical manifestation, laboratory results, illness progression, and histopathological findings of equine lymphoma vary greatly between horses. Early diagnosis would be beneficial as splenectomy is the recommended treatment method for splenic lymphomas.

Keywords: B cells, Horse, Neoplasm, T cells, Tumor

Cystadenofibroma of the *Rete Ovarii:* A Rare Tumour in a Bitch

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The *rete ovarii* is the counterpart of the male *rete testis* that develops from the primary sex cords of female animals. In adult female animals, the *rete ovarii* is found in the hilus of the ovary. Pathological conditions of the *rete ovarii* are rarely reported in dogs. This communication describes a cystadenofibroma of rete *ovarii* in a 2-year-old, intact, crossbred, 22kg bitch presented to the Veterinary Teaching Hospital, University of Peradeniya. The presenting complaints were hyporexia, constipation, purulent vaginal discharges and progressive abdominal distension for three weeks. In addition, there was no history of mating or whelping. Abdominal ultrasonography revealed a well demarcated, large anechoic structure, lined by a dense hyperechoic wall of which the interior lining was protruding into the lumen forming multiple invaginations. The uterine lumen was anechoic and mildly dilated. A tentative diagnosis of pyometra with concurrent uterine cyst/neoplasia was arrived at based on the clinical examination and imaging findings. An exploratory laparotomy revealed that the space of the right ovary is occupied by a large, 14 cm x 16 cm, smooth surfaced, spherical mass. The cyst lumen contained convoluted and blind-ended tubular structures suspended in yellowish viscous fluid. Histopathology of the cyst revealed an irregular, variably sized, tubular, and slit-like labyrinth of cystic spaces lined by an epithelium that contained alternating areas with cuboidal and ciliated columnar cells overlying a mature fibrovascular stroma infiltrated by inflammatory cells. The cyst lumen contained amorphous, granular, proteinaceous substances, and the lining epithelium often invaginated into the lumen forming papillary projections. The core of the papillae was composed of fibrovascular tissues admixed with smooth muscle cells. There was mild to moderate cellular and nuclear atypia in the epithelial cells, and mitotic figures were extremely rare. These findings suggested a cystadenofibroma of *rete ovarii*. The left ovary was normal and endometritis was present. Both the ovaries and the uterus were surgically removed by an ovariohysterectomy. To the authors' knowledge, this is the first report of canine cystadenofibroma in *rete ovarii* in Sri Lanka.

Keywords: Cystadenofibroma, Rete Ovarii, Rare tumour

Cutaneous Myxomas in Two Dogs:A Case Report

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Myxoma is a benign neoplasm originates from the fibroblasts in connective tissues that produces abundant myxomatous matrix rich in mucin and glycosaminoglycans. The exact etiology of myxoma is unknown but genetics, certain types of medication, and some environmental factors are suspected as predisposing factors by the previous reports. Both male and female dogs are similarly affected by myxomas while old dogs frequently develop myxoma than young dogs. The most common sites of myxomas include limbs and trunk. The present report describes two myxomas diagnosed in two crossbred dogs aged twelve and thirteen-years respectively, presented to the Veterinary Teaching Hospital, University of Peradeniya. The presenting complaint of both the dogs was gradually enlarging nodular, firm to flocculant, surface-ulcerated masses present on the skin over the neck area (8cm diameter) and left caudal thigh region (6cm diameter), respectively. Other than the mass lesions, both the dogs were clinically unremarkable, and all the vital parameters were within the normal limits. Full blood count of both patients revealed a stress leukogram. Fine needle aspirates (FNA) obtained from the masses revealed a population of spindle cells with mild to moderate cellular and nuclear pleomorphism that showed "windrowing" in the surrounding abundant amphophilic matrix poor with inflammatory cells. A tentative diagnosis of mesenchymal neoplasia was made, and both the lesions were surgically resected. Both the masses were histopathologically similar and consisted of a well demarcated, poorly encapsulated, moderately cellular mesenchymal neoplasm. The neoplastic spindle cells were arranged in streams and occasionally swirls around adnexa and vasculature and widely separated by abundant, loose, myxomatous matrix. Neoplastic cells had indistinct borders, a moderate amount of eosinophilic cytoplasm, and round to oval nuclei with finely stippled chromatin and indistinct nucleoli. Mitotic rate was than 1 per 10 high power fields. The tumours were diagnosed as cutaneous myxomas. No tumour recurrence was reported after 3 months in one dog while the other dog was lost to follow-up. Currently, there are no local reports available that provide the incidence of myxomas in dogs in Sri Lanka. While reporting an uncommon type of canine cutaneous tumour, the present report emphasises the importance of cytology and histopathology in diagnosing them.

Keywords: Cutaneous myxoma, Mesenchymal tumours, Dog, Windrowing, Surgical excision

Extra- Skeletal Osteosarcoma in the Bladder of a Dog:A Case Report

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Extraskeletal osteosarcomas, a rare entity of highly malignant neoplasm in dogs, originates in various soft tissues without the involvement of bones. The present case report describes an extraskeletal osteosarcoma identified in the urinary bladder of a 10-year-old, female, crossbred dog presented to the Veterinary Teaching Hospital, University of Peradeniya. At the presentation, the dog was recumbent but quiet, alert, responsive, and showed signs of severe abdominal pain. In addition, the dog was hyporexic, emaciated, constipated, and had a reduced frequency of urination for three months. A hard mass was palpated in the caudal abdomen and the subsequent plain lateral abdominal radiographs revealed a radiopaque mass in the corresponding location. Considering the history, clinical examination, and radiographic findings, a tentative diagnosis of urinary bladder neoplasia was made. An exploratory laparotomy revealed a severely thickened and gritty urinary bladder wall and an irregular,10 x 6cm, hard, grey-white mass that almost completely occupied the bladder lumen. There were multifocal, grey-white, ~0.5cm diameter, gritty areas on the serosa of the nearby large intestine and omentum which were suspected as foci of metastatic calcification. Considering the poor prognosis, the dog was humanely euthanized. The necropsy reveled widespread tumour metastasis including the lungs, pericardium, diaphragm, and kidneys. Histopathology of the bladder mass revealed sheets of round to spindle cells with basophilic cytoplasm and eccentric, hyperchromatic nuclei with coarsely clumped chromatin and 1-2, prominent nucleoli. The cellular and nuclear pleomorphism was high. Multifocally, there was hyalinized eosinophilic material (osteoid) produced by the neoplastic osteoblasts, arranged in thin strands between neoplastic cells or occasionally forming irregular islands or spicules. Scattered within the tumour, there were binucleated and multinucleated cells in abundance. The mitotic rate was 3 per 10 high-power fields. Within the neoplasm, there were multifocal areas of non-neoplastic cartilage formation, hemorrhage, edema, and necrosis. The histopathological findings were consistent with osteosarcoma and due to the lack of evidence that the neoplasm is originating from bone tissue, it was diagnosed as an extraskeletal osteosarcoma. According to the authors' knowledge, this is the first report of an extraskeletal osteosarcoma in the urinary bladder of a dog in Si Lanka.

Keywords: Bladder, Extra skeletal, Neoplasia, Osteosarcoma

Natural *Trypanasoma evansi* Infection in three Dogs Presented to the Veterinary Teaching Hospital

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Trypanosoma evansi, *(T. evansi*) transmitted by tabanid flies, is distributed in many countries and infects camel, horses and livestock, and occasionally dogs. Information on natural infections of *T. evansi* in dogs is limited. This report describes three canine trypanosomiasis cases presented from Peradeniya, Ukuwela and Gelioya to the Veterinary Teaching Hospital during August to September 2022. Common clinical signs of affected dogs were dyspnoea, anorexia, increased temperature (104ºF – 106ºF), corneal opacity, staggering gait and dizziness. Microscopic examination of Leishman-stained thin blood smears revealed slender form of *Trypanosoma* with long free flagellum, thin posterior extremity and subterminal small kinetoplast. All three dogs had severe parasitaemia (five to seven parasites per oil immersion field) and one dog was concurrently infected with *Babesia canis.* Haematological analysis revealed anaemia (Hct 22% ±2.32%; RBC count = 3.24 ±0.18) thrombocytopenia (149.33×10^3 $\pm2.32\times10^3$) and mild leucocytosis ($25.07\times10^3/\mu l$, $\pm 0.42\times10^3$). Two dogs died within 2-24 hours of presentation. The other dog was treated with diminazene aceturate (3.5mg/kg, deep IM, q 24) and died on the third day of post-treatment. Necropsies were not carried out. *T. evansi* infection in dogs has been previously reported in Sri Lanka in 2018. This infection is lethal for dogs, but some have recovered when treated with diminazine aceturate for five consecutive days. All three cases described in this article were reported during the rainy season that could be secondary to the abundance of fly vector in this period. *T. evansi* could be eradicated if appropriate controlled measures are implemented at a very early stage such as understanding the epidemiology of trypanosomiasis, identification of the vector, and educating the veterinarian on the treatment protocols. Once the disease become enzootic, it is difficult to eradicate.

Keywords: Canine trypanosomiasis, Diminazene aceturate, Trypanosoma evansi

Leptospirosis in four Owned Dogs: Diagnosis, Treatment and Disease Outcome

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Leptospirosis is a zoonotic disease of global importance. This clinical communication describes the diagnosis, treatment and management of four dogs with leptospirosis presented to the Veterinary Teaching Hospital, University of Peradeniya within a period of 4 months. The presenting complaints of all four dogs included anorexia, lethargy, and depression. Only two dog were properly vaccinated. Physical examination revealed abdominal and lumbar pain. The differential diagnoses were urinary tract infection, renal failure, hepatic failure and leptospirosis. Routine haematological and biochemical tests and urinalysis revealed uremia, thrombocytopenia, haematuria, and mild to moderate proteinuria in all four dogs. Leukocytosis, neutrophilia and anaemia were identified in Dog 1, 3 and 4 respectively. Based on the clinical and laboratory findings, a tentative diagnosis of leptospirosis was made which was later confirmed by serology (Microscopic Agglutination Test - MAT) and/or PCR. Serum samples of Dogs 1 and 2 were positive for MAT and serogroups were identified as Hardjo (1:800) and Canicola (1:400), respectively. Pathogenic leptospira DNA was detected in blood samples collected from dogs 3 and 4 using nested PCR targeting part of the flaB gene. The clinical picture and the confirmatory tests taken together were suggestive of that all four dogs were in the acute stage of leptospirosis. Initial therapy consisted of parenteral fluid to correct fluid and electrolyte imbalances. In addition, Dog 1 and Dog 4 were treated with Ciprofloxacin (10 mg/kg sid). Dog 2 was treated with Amoxy-clavulanic acid (20 mg/kg bid) and later with Doxycycline (10 mg/kg sid) after MAT results. Dog 3 was treated with Doxycycline (10 mg/kg sid). Further, the treatment plan included Furosemide (2 mg/kg bid), Acetylcysteine (10mg/kg bid), Omeprazole (1 mg/kg sid) and Lactulose syrup. Dog 2 responded well to the treatments. All haematological and biochemical parameters of Dog 2 became normal after two weeks and with continued treatments it regained appetite and became active. Dog 1 showed only a mild response to treatments and died one week after initiation of treatments. Dog 4 and Dog 3 died two and one day respectively after treatments. This report highlights the importance of including leptospirosis as a differential diagnosis for the dogs diagnosed with acute renal failure.

Keywords: Leptospirosis, Microscopic Agglutination Test, Polymerase Chain Reaction

Progressive Mortalities in Juvenile Barramundi/Asian Sea Bass (*Lates calcarifer*) after Stocking in Net Cages in Trincomalee Coastal Area

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The marine fin fish, Asian sea bass (*Lates calcarifer*)/barramundi is an important food fish cultured in the marine, fresh, and brackish waters. The occurrence of disease outbreaks among cage-cultured Asian sea bass is a challenge faced by large-scale farmers due to the associated production loss. This study was carried out to find out the causative agent/s for progressive mortalities in the juvenile Asian sea bass reared in sea cages on the east coast of Sri Lanka. Three months old barramundi juveniles of around 20g body weight with clinical signs such as loss of scales, fin rot, loss of mucus on the skin, opaque eyes, gill hemorrhages, and reduced feed intake, two weeks after stocking in the cages were collected from a farm located along the Trincomalee coast. The affected group had slow mortality (with a cumulative mortality of approx. 20% within 2-3 weeks) and the opaqueness in the eyes that resolved spontaneously. Twenty diseased fish showing clinical signs and 20 apparently healthy fish were transported and stored in separate glass aquaria at the Center for Aquatic Animal Disease Diagnosis and Research (CAADDR). External examination of affected fish showed marked superficial skin ulceration and gill hemorrhages. No external parasites were detected during the microscopical examination of skin scrapings and gill clips. Upon culturing kidney samples from moribund fish on blood agar (BA), Thiosulfate-citrate-bile salts- sucrose agar (TCBS), and Tryptic Soy Agar (TSA) with 3% NaCl, two different bacterial species were isolated that form yellow color colonies in TCBS and are Gram-negative curved rods. Both the isolates were identified as *Vibrio* spp. based on the phenotypic and biochemical characteristics. Histopathological examination of the kidney and liver of affected fish showed tubular damage, macrophage, and lymphocytic aggregation in the interstitium of the kidneys and steatohepatitis. There were no macroscopic or microscopic abnormalities in the brain and muscles. Both *Vibrio* spp. were sensitive to Oxytetracycline, Chloramphenicol, Enrofloxacin and Gentamycin based on the results of antimicrobial susceptibility testing by the disc diffusion method. *Vibrio* infection could be either a primary or secondary cause of the mortality observed in these barramundi juveniles. However, as sea bass is a food fish and is grown in large water bodies, the use of a vaccine would be the most appropriate method to prevent the infection.

Keywords: Vibrio infection, Asian Seabass (Barramundi), Sea Cages

Successful Treatment of Hole in the Head Disease in a Flowerhorn Cichlid *(Amphilophus citrinellus X Cichlasoma trimaculatum)* using Metronidazole :A Case Study

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Hexamita/Spironucleus is a flagellate protozoan parasite that is frequently found in the gastrointestinal tracts of tropical fish, particularly in freshwater Cichlids. Heavy infestations with *Hexamita* spp. are associated with necrosis and sloughing off of the intestinal epithelium causing inappetence, unthriftiness, emaciation, and death in aquarium-reared Cichlids such as angelfish, discus and oscars. This pathogen has also been implicated in 'Hole in the head' disease(HITH)/head and lateral line erosion which is characterized by lesions in the skin above sensory pores of the head and the trunk. Immuno suppression, poor water quality and overcrowding, predispose fish to this condition. Flowerhorn *(Amphilophus citrinellus x Cichlasoma trimaculatum*) is an exotic, genetically improved hybrid fish of the family *Cichlidae*. It is a popular ornamental pet fish among hobbyists in Sri Lanka. In February 2022, a 250g flowerhorn cichlid with depigmentation, pitting of the skin of the head (nuchal hump) and body on either side of the anal fin with white, amorphous masses accumulated at the eroded pits was presented to the Center for Aquatic Animal Disease Diagnosis and Research. The fish was anorexic and lethargic for more than one week. Microscopic examination of the wet mounts (X40) of skin scrapings, white discharge from skin lesions, and faeces revealed a large number of parasites morphologically suggestive of *Hexamita* spp. The history and clinical signs were also suggestive of HITH. After transferring the fish to a hospital tank under aeration, an initial dose of Metronidazole (50 mg/Kg body weight) was administered orally via a stomach tube, followed by Metronidazole prolonged immersion at a dose rate of 7 mg/l for 12 hours/day for three days. On the fourth day, Metronidazole 50 mg/Kg was administered orally followed by immersion at 5mg/l for 12 hours/day for four days. During the seven-day treatment, pitted areas were swabbed with $KMnO_4$ and one hour bath of salt (2g/L) was administered daily. Densities of parasites per field of view in wet mounts of skin scrapings and faeces were examined every other day until the parasite is cleared. The fish gradually showed signs of improvement with complete recovery and absence of skin lesions within two weeks of admission. The client was advised to clean the gravel and filter material to eliminate the pathogen from the environment. HITH in flowerhorn can successfully be treated with combined oral and immersion administration of Metrandazole along with environmental improvement.

Keywords: Flowerhorn, Hexamita, Metronidazole

A Case Study on using of *Phyllanthus reticulatus* (Kyla) for the Wound Treatment in two Orphan Wild Juvenile Elephants (*Elephas maximus maximus*) in Sri Lanka.

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We present the use of *Phyllanthus reticulatus* locally known as Kyla to treat severely infected, chronic, deep wounds in two wild juvenile elephants. Both elephants were presented with deep wounds on their forelimbs, which were filled with purulent material. Both wounds were deep up to the carpal bones and wide about 5 - 8 cm. Due to severe pain, both elephants were reluctant to bear the weight using their wounded limbs. The first elephant had a wound caused by a crocodile attack and the second elephant had a wound due to a metal snare. Currently, the use of metal snares is a major threat to all wild animals including elephants. The management of the wounds of both elephants was challenging. Daily cleaning and dressing of deeper areas of the wound could not be performed under physical restraint, due to excessive pain felt by the patients. Age, body conditions, and severity of infections were taken into consideration and a decision was made not to sedate them daily for wound cleaning and dressing. Instead, Kyla paste was used as a non-invasive wound cleaning and dressing method to remove purulent material from even the deeper areas of the wound without imposing excessive pain. The Kyla paste was made by grinding 500 grams of Kyla leaves with 200 ml of water. The paste was applied to the wounds and covered with gauze and Coban bandages overnight. The same process was repeated daily until the purulent material disappeared from the wound, and the wound was daily monitored to measure the rate of healing. With the Kyla treatment, we gave parenteral antibiotics to enhance the healing and prevent sepsis. Gradually inflammation reduced and the wounds appeared cleaner with granulation tissues. Further, the use of Kyla to treat severely infected wounds can reduce the long-term use of antibiotics. As Kyla is readily available locally in abundance, it is economically advantageous to treat such wounds of wild animals with Kyla.

Keywords: Wound treatments, Asian Elephants, Phyllanthus reticulatus

Retrospective Study on Long Bone Fracture Management in Goats in Kilinochchi District

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Fracture in long bones is one of the common orthopaedic conditions found in goats and other small ruminants. Understanding the type of fracture is crucial for a successful repair of the fracture in goats. A retrospective study was conducted on management of long bone fractures in goats reported to Karachchi Government Veterinary Surgeon's office in Kilinochchi district from January 2018 to December 2020. Long bone fractures in 40 goats were reviewed in this study. The fractures in goats were classified according to the location and the bones involved were divided into two groups. Group A included 20 goats with fractures in the femur and or in the humerus that were treated with the external fixation technique using splints. The goats in group B had fractures in the radius, ulna, tibia, fibula, metacarpal or metatarsal bones that were treated similarly to group A. Plaster of Paris, timber splints and gauze bandages were used for external fixation. No treatments were given prior to bone fixation and all the animals were treated within three days of observing the fracture for the first time. The movements of the goats in both groups were restricted for 6 weeks and the owners were asked to keep the splint for 21 days. Signs of lameness were absent in 25% of goats in group A and 90% of goats in group B respectively when the splint was removed after 45 days from the surgery. The goats in group B showed more anatomical reduction of fracture compared to the goats in group A. Overall, 75% of goats had closed fractures and all the animals with open fractures had sepsis. Post operative complications including splint sores, sepsis, and malunion were reported in both groups. In this study, external fixation technique for closed fractures in lower long bones (radius, ulna, tibia, fibula, metacarpal and metatarsal bones) showed good fracture reduction and alignment, early signs of healing and less post operative complications.

Keywords: Closed fractures, External fixation technique, Long bone fracture

A Retrospective Survey on Age, Breed, Previous Hormonal Therapy and Leukocyte Counts in Dogs Diagnosed with Pyometra Presented to the Veterinary Teaching Hospital, University of Peradeniya

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Pyometra is a hormonal mediated female reproductive disorder characterized by accumulation of pus in the uterus caused by secondary bacterial infections. It is commonly reported in middle-aged to older, sexually intact bitches. If left untreated, pyometra can lead to dehydration, toxemia, kidney failure, and death. The aim of this retrospective study was to determine the age, breed, previous hormonal therapy, leukocyte counts, blood urea nitrogen (BUN), and creatinine levels in dogs diagnosed with pyometra and who underwent surgical correction at the Veterinary Teaching Hospital (VTH), University of Peradeniya from 2021 to 2022. All necessary data of the dogs were retrieved from the past patient records available at the VTH. A total number of 32 (31%) surgically corrected pyometra cases were identified from the female dogs presented for urogenital surgeries during the specified period. Among these 32 dogs, there were 17 dogs with open-cervix pyometra, and 15 dogs with closed-cervix pyometra. The majority of dogs (59.4%) were crossbred dogs while the pure breeds reported included German shepherd, Rottweiler, Rhodesian ridgeback, Bullmastiff, Labrador retriever, and Dachshund. The dogs with pyometra were classified into three age groups as ≤ 4 years, 4 to 8 years, and ≥ 8 years and the highest percentage (60%) of dogs were 4 to 8 years old. Ten dogs (31.2%) were previously given hormonal therapy (medroxyprogesterone acetate) and 7 (70%) of them had closed cervix pyometra. Prerenal azotemia was observed in five dogs. Leukocytosis was observed in 15 (46.9%) cases while in nine of them a leukemoid response was reported. The average leukocyte count was $58.9\times10^3 \pm 25.7 \times10^3$.The success rate of surgical correction of pyometra was 90.6 %. The results emphasize the importance of raising awareness about pyometra among the dog owners.

Keywords: Dog, Pyometra, Urogenital surgery

Eye Worm Infestation Caused by *Thelazia spp.*. in a Buffalo Calf from Kataragama: A Case Report

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Nematodes of the genus *Thelazia* cause eye infection in several animal species of veterinary importance including dogs, cats, cattle, buffalo and horses who are definitive hosts of the parasite. Humans are considered as an aberrant host of *Thelazia spp*. *T.gulosa,* and *T.rhodesii* are the common species causing eye infection in cattle and buffalo that could turn into a herd problem. However, the extraocular worm infestation caused by *Thelazia spp.* is not a common condition in the dry zone of Sri Lanka. This report describes a *Thelazia* eye worm infestation identified in a buffalo calf from Kataragama area. A four-month-old, female, buffalo calf was presented with the complaint of anorexia after an episode of diarrhoea. In the general clinical examination, milky white, 1-2 cm long roundworms were found crawling around the conjunctival sacs of both eyes. A tentative diagnosis of eye infestation caused by *Thelazia spp.* was made based on the gross appearance of the worms and the anatomic allocation they were found on the host. Other than the *Thelazia* worm infestation, no signs of eye infection were observed. Worms obtained using cotton swabs were sent to the Veterinary Investigation Center, Monaragala and confirmed as *Thelazia spp.* by light microscopy. However, the species confirmation was not possible due to the lack of required laboratory facilities. The calf was treated with Ivermectin (0.2mg/kg, subcutaneous route). This buffalo calf was from a herd of five buffalos in which another two buffalos were found to be positive for eye worm infestation and treated accordingly. None of the owner's pets had eye worm infestation. A large garbage dump was found nearby the owner's premises which was suspected to be the breeding ground for *Musca spp;* the intermediate hosts of *Thelazia* worms. Thelaziasis in buffalos can be asymptomatic. Mild infection may cause excessive lacrimation and conjunctivitis, while severe infection causes keratitis, photophobia, sub conjunctival cysts, corneal opacity, and ocular ulceration leading to "pink eye" in cattle and buffaloes. It is important for Veterinarians to be aware of the zoonotic potential of *Thelazia spp.* although confirmed human cases are not reported in Sri Lanka.

Keywords: Eye worm infestation, Intermediate host, Thelazia, Buffaloes

Successful Caesarean Section of two Mixed Breed Horses

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Dystocia in horse is an emergency in which the lives of both mare and the foal are at risk. Caesarian sections are useful to manage dystocia in horses. However, incidence of dystocia in horses is uncommon so as the reports of equine caesarian sections. This report describes successful caesarean sections that were performed to manage dystocia in two mixed breed horses. The first case is a four-year-old, mixed-breed, first parity mare referred to the Large Animal Teaching Hospital, University of Peradeniya. The mare was referred after an unsuccessful attempt of assisted vaginal delivery and dystocia for one day. General clinical examination revealed bruxism, tachycardia, tachypnoea, and an emphysematous dead full-term foetus was identified during per vaginal examination. The mare was depressed with severe pain. A caesarian section was performed considering the status of the foetus and mare. Pre-emptive medication included intravenous (IV) fluid therapy, analgesics (Flunixine Meglumine; 2.2mg/kg, IV), tetanus toxoid (four 2 mL vials, deep intramuscular) and antibiotics (Ceftriaxone 20mg/kg, IV). The mare was sedated with Xylazine HCl (1mg/kg, IV) and after 10 minutes, general anaesthesia was induced with Midazolam (0.05mg/kg, IV) and Ketamine HCl (2 mg/kg, IV). To maintain general anaesthesia, anaesthetics used for sedation and induction were used in half dose rates every 20 minutes until completion of the surgery. The mare was positioned on dorsal recumbency, and surgery was performed following standard surgical procedures. Briefly, the gravid uterus was exteriorized and via a laparotomy an incision was made to retract the foal. The detached placenta was removed under strict aseptic conditions. The uterine incisions, muscles and skin/subcutaneous tissues were closed using inverted lambert(1-0Catgut), simple interrupted (USP 1-0 Catgut) and horizontal mattress (USP 1-0 Nylone)suture patterns respectively. Then the mare was kept under observation until complete recovery, following standard post-surgical management procedures. The second case of caesarian section also was performed for a mare presented with a dead foetus following similar surgical procedures described for the first case. The signalment of the second mare was similar to the first. Use of appropriate anesthetic protocol, standard surgical procedures, post-surgical management, and teamwork are the key determinants for the success of equine caesarian sections. According to the authors' knowledge this is the first report on equine caesarian section in Sri Lanka.

Keywords: Caesarean section, Dystocia, Horses, Sri Lanka

Opinion on Elephants among Veterinary and other Undergraduates and a Cohort in Public Affected Frequently by Human Elephant Conflict

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Elephants are declared as an endangered species. Therefore, considerations of new methods of elephant conservation are critically important. A questionnaire was developed to collect opinions on four categories of elephants in Sri Lanka (Wild elephants (n=4000-5000), privately owned (n=100), Pinnawela elephant orphanage (PEO) (n=90), Udawalawa elephant transit home (ETH) (n=100)) from Veterinary undergraduates (VU; n=306), other undergraduates from University of Peradeniya (OU; n=148) and individuals who encounter human-elephant conflict (HEC: n=100) regularly with the aim of comparing the attitude and knowledge on the different elephant categories among the groups. Results, statistically significant at $P < 0.05$ are mentioned. VU indicated numbers of all four categories to be either just sufficient or too few. OU stated too many in all categories except the privately owned elephants. HEC group indicated that there were too many wild elephants but not others.VU and OU trusted that sufficient food and water is available for wild elephants. Only the HEC group indicated that wild elephants do not have sufficient shelter. All respondents think elephants have long musth periods in all four categories. HEC group has positive attitudes toward elephants in PEO or ETH for having sufficient food, water, and veterinary care. Responses indicated electric fence is the mainstay to mitigate HEC but with the trenches. VU and OU indicated capture and translocation is a good option though the HEC group did not approve of it. Respondents did not know about the deterrent effects of certain citrus plants and most in all categories also believed that bees could repel elephants. All respondents indicated that Kandy and other Perahera must continue with the participation of elephants but with better welfare. No evidence of anger or hatred was expressed in any of the responses by the HEC group on any of the elephant categories. All respondents believe that captives must be maintained but with better welfare and health care, especially during musth. The responses by VU did not always reflect their subject knowledge and appeared to be not updated on certain subject areas. A detailed analysis depending on seniority among VU would reveal their opinion which can be used to improve teaching.

Keywords: Electric fence, Human-elephant conflict, Other repellents

Study on Ornamental Fish Farmer's Perception on Biosecurity Strategies

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Implementation of biosecurity management strategies for disease prevention and control is currently believed the most effective way to ensure the health and welfare of animals in a farm. However similar to other animal related farms, ornamental fish farms also often fail to implement recommended biosecurity strategies. Therefore, adoption remains below expectations. Factors affecting biosecurity adoption in a farm have been mostly studied by overlooking the influence of psychological factors in the analysis. The objective of this study is to examine the factors, which influence the ornamental fish farmer's intention to adopt biosecurity practices and to assess the attitude of farmers towards the recommended biosecurity practices. Theory of Planned behaviour Framework was used for psychological approach and 20 ornamental fish farmers in Gampaha District were selected as a preliminary study using snowball sampling method. Interviews with the farmers were carried out using a questionnaire. The results revealed that only attitude has been significantly and positively correlated with the biosecurity adoption intention. Subjective norms, perceived behavior control and socioeconomic characters do not pose any significant relationship with the biosecurity adoption intention. Respondents have stated that the motivation to take the decision on biosecurity adoption has been aroused due to economic benefits (n=75%), guidance on purchasing disease free animals (n=70%), biosecurity strategies customized for the farm (n=75%), risk assessment and risk management consideration of each practice (n=75%), regular data updating of disease outbreaks (n=95%)on biosecurity adoption. Reasons for attitude o not adopting biosecurity measures were accounted as problems in time-efficiency (n =50%), economic feasibility (n=65%), issues in coordination with government policies (n=75%). Farmer's decision on biosecurity adoption was mainly influenced by farmer's society whereas the government is the least influenced social referents. These results indicated that psychological issues must be addressed by initiatives designed to uptake the biosecurity strategies. Further guidance about the intricacies of loopholes in prevailing biosecurity practices may be required with an obvious role of veterinarian. There appears to be an opportunity for the policy makers to further understand the farmer's beliefs behind certain attitudes and target communication advice accordingly for the further enhancement of ornamental fish health and welfare.

Keywords; Biosecurity, Ornamental fish

Rabies in a Goat: A Case Report

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Rabies is a highly fatal viral disease that infects the central nervous system and is transmissible to all mammals including humans. It is caused by a neurotropic virus of the genus Lyssavirus in the family Rhabdoviridae. Both 'furious' and 'dumb' forms of rabies can be seen in animals, but there are few clinical reports on furious form in goats worldwide. Few studies have reported the cerebrospinal fluid findings in rabid livestock. This paper describes an incidence of a two-year-old, cross-breed doe (1st parity) from a semi-intensively managed up-country farm. In that particular small-scale family farm, six goats were in a shared facility. The affected animal was presented to the Farm Animal Teaching Hospital with the complaint of abnormal behaviour and that the goat was off feed and water for 2 days. When observing from a distance, violent attacks without provocation, excessive bleating, drooling, and tenesmus were observed. On inquiry, the owner reported the history a of suspected dog bite on the neck region one month ago and the wound had healed already. With the tentative diagnosis of rabies, the animal was kept in an isolated cage under close monitoring. The owner and her family members were educated on the risk and advised with written instructions to seek medical advice immediately. Also, the regional veterinary surgeon was informed of the post-exposure anti-rabies vaccination on other exposed animals and related public health issues. On the following day, the animal died and the head was submitted to the Rabies Diagnostic Unit in the Faculty of Veterinary Medicine and Animal Science. The case was diagnosed as positive for rabies by Seller's staining technique conducted on brain tissue followed by fluorescent antibody test for confirmation of the disease. Subsequently, relevant personnel were informed and the case was followed up to ensure the implementation of necessary preventive actions. This case highlights the unawareness of livestock farmers on susceptibility of livestock animals to rabies and the possibility of livestock animals contracting rabies. As a consequence of that, rabies cases in livestock remains under-reported in developing countries like Sri Lanka. Moreover, animal and public health approaches would be mandatory for veterinarians handling rabies cases.

Keywords: Goats, Public health, Rabies, Rhabdoviridae, Virus

Assessment of Export-Oriented Meat, Meat Products and Processing Establishments in Sri Lanka

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The food safety in meat and meat products are monitored collectively by the Ministry of Health, and Department of Animal Production and Health in Sri Lanka. Animal quarantine is enacted by the animal disease act and it is a vital law and regulation in international trade.

Exporting meat products is an emerging business where1,566.83 and 3,758.40 metric tons of meat and meat products had been exported in 2016 and 2019 respectively. Since exporting is encouraged by the government, the objective of this paper is to compile necessary information and make veterinarians and the stakeholders aware about the inspection flow of meat and meat products in the country.The assessment of meat establishment commences day after the submission of the official requisition and relevant documentation. The meat processing facility is inspected in accordance with the existing quality standards such as ISO 22000, HACCP and GMP. The presence of anti-mortem and post-mortem inspections, evaluation on biosecurity standards and possible risk analysis are carried out with special focus on hygienic status of raw material and water. The traceable evidence are inspected and examined in all steps of the production chain. The satisfied establishment is required to be registered in the DAPH. The samples are tested for pathogens (Total plate counts, Salmonella, Staphylococcus and *E. coli*) according to the SLS standards for the food and antimicrobial residues. Hygienic status of the staff is also evaluated through health certificates issued by the medical officer.The issuing of international veterinary health certificates (IVHC) for meat related products is a duty of the chief veterinarian in Sri Lanka. The Sri Lanka customs facilitates export with adhering to Harmonized System (HS) Codes and IATA regulations. A functional and regular monitoring programme in the processing establishments is highly encouraged to meet the requirement in the international meat market by minimizing biological and chemical hazards. When veterinarians and exporters are aware on the procedures, exportations can be carried out in a short period of time. This will encourage the exporters.

Keywords: Establishment, Exports, Meat,

The first Confirmed Cattle Rabies Case in Kataragama Veterinary Division Appeared to be Transmitted by a Fishing Cat (*Prionailurus viverrinus*) : A Case Report

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Rabies is an important but neglected zoonotic disease in Sri Lanka. It is an invariably fatal disease caused by Lyssa viruses leading to acute encephalomyelitis in mammals. The virus is transmitted through reservoir/vector animals in the urban and sylvatic infection cycles. The present case was a 1 ½ -year-old heifer who was presented with the complaint of anorexia and hyper-salivation for a day. The heifer was found to be difficult to restrain and showed signs of hypothermia, stiff mandibular joints, hyper-salivation, scanty faeces, and ruminal stasis. History revealed that the animal had eaten construction cement. The heifer was treated for an allergy but showed no improvement in the condition. The following day, the animal showed a unique bellowing with all other clinical signs. The effort to insert a stomach tube to rule out any oesophageal obstruction was in vain as the tube did not go beyond the pharynx. Upon detailed inquiry, the owner mentioned that the heifer was bitten by a fishing cat (*Prionailurus viverrinus*) near the right eyelid about one month ago and the wound was dressed by himself. Being on the differential diagnosis of rabies, the owner was advised to keep the animal isolated and hand over the head of the animal to the office of Medical Officer of Health (MOH) for rabies confirmation, in case of death. The following day the animal succumbed to the illness and the Medical Research Institute report confirmed the animal was positive for rabies. The farmer's family and the veterinarian were directed to post-exposure rabies prophylaxis. The Regional Director of Health Service, Monaragala confirmed that this was the first-ever confirmed cattle rabies case in the Kataragama Veterinary Division. This case highlights the necessity for livestock veterinarians to be vigilant and take maximum precautions when handling rabies suspected cases. Many of us neglect the possibility of farm animals, particularly those reared under intensive management systems getting contacted with rabies. It is also important to make the farmers aware of rabies, its reservoir/vector animals, and timely prophylaxis for their animals. Further, this case emphasizes the reservoir/vector role played by wildlife in transmitting rabies in our country.

Keywords: Cattle, Farmers, Rabies, Reservoir/Vector, Veterinary

Determination of Viable Lactic Acid Bacterial Count and Physicochemical Properties of Commercially Available Drinking Yogurt in Peradeniya City Area

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Yogurt is among the most common dairy products consumed around the world. Drinkable yogurt is a stirred yogurt with low viscosity, popular due to its convenience, portability, and nutritional benefits. Objective of this study was to determine the viable counts of lactic acid bacteria (LAB) and selected physiochemical properties of commercially available drinkable yogurt in Peradeniya. Random samples of forty-six drinkable yogurts from different brands were bought from local supermarkets. Then the viability of LAB was analyzed by determining the number of colony-forming units (CFU), measuring the corresponding pH and titrable acidity (TA) of each sample. CFU/g was determined by enumeration of bacteria on De Man, Rogosa and Sharpe agar using spread plate method and incubating at 37^0C for 24 to 48 hours according to the standard procedures. pH of the samples at the time of inoculation was detected using a pH meter and TA was evaluated using standard titration method. Lower limit for the viable LAB count is 1×10^6 CFU/g according to International Dairy Federation. Majority (84.7%) of the samples had CFU above 1×10^6 CFU/g. CFU of the remaining 15.3% of samples were within the range 1×10^4 CFU/g to 8×10^5 CFU/g. pH values of 95.7% of the samples at the time of culturing was within the normal range, which is between 4.01-4.66. Results for evaluation of TA, which was performed to determine the lactic acid content in yoghurt, indicated that 60.9% of the samples had values within the normal range for fermented dairy products (0.7-1.2%). Even though the pH, and the viable LAB count of 34.8% of samples were within the normal range, corresponding TA levels were outside the normal range. At the same time 10.9% of the samples had the pH and TA within range but failed to have the required amount of viable LAB count. Many factors interfere with the LAB content of yoghurt, such as level of inoculation, viability of starter culture, dissolved oxygen content of the product, breakdown of cold chain during storage and transport time. Further studies can determine the variation of viable LAB counts and physiochemical properties among different brands of yogurt in a wider study area.

Keywords: Drinkable yoghurt, Lactic acid bacteria, Titrable acidity

Veterinary Involvement in Border Management

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Veterinary involvement in border management is considered as a key pillar to prevent the introduction of any risk to human and animal health into a country originating from imports of live animals, animal products and animal by products. Involvement of veterinarians is necessary in complying with international trade regulations and the requirements of the importing country. Changes in the global trade market have led to a thriving potential in international trade in animal related products especially due to emerging and reemerging pathogens of public health concern. This study was carried out to analyze the exports and imports handled by the Sri Lankan veterinarians as Animal Quarantine Officers for past five years to observe their contribution to the international trade. Export and import figures of Animal Quarantine Office for last five years were gathered for the evaluation. Total number of 6639 export health certificates have been issued by the Animal Quarantine officers which included 3141 health certificates of ornamental fish, 2235 health certificates of meat & meat products, 988 health certificates of table eggs, and 45 of pet birds in 2021. Out of 8210 export health certificates issued,3042 are for ornamental fish ,3414 for meat, 1354 for table eggs and 2 for pet birds respectively in 2017. The data variation implies export health certificate of 3141 in 2021 and 3042 in 2017 remained unchanged for last five years, but salient reduction was observed for meat product exports ranging from 3414 certificates in 2017 to 2235 certificates in 2021. Emerging growth of pet bird exports also can be observed. Total imports of shipments (4269 in 2021 and 4461in 2017) also remained without drastic changes during last five years. These observations imply that even during the critical situations faced in the country in 2020 and 2021, the contribution of the continuous service of the veterinarians for the international trade facilitation remained unchanged. The policy of zero risk from imports and exports have been translated carefully to minimize the no or reduced trade in animals and animal products or to prevent dramatic trade inequalities. Veterinary border management in Sri Lanka can be further expanded to carry out with long term strategies to reach the said objectives. Veterinarians' involvement is essential in exploring the potential to promote animal, animal products and by products exports to several other countries by developing the local export establishments fulfilling the specified country requirements. Even the provided compliance to established procedures seem to be minimizing the animal and public health risks in imported animal, animal product and animal by products. The facilities for ongoing handling, sampling, dispatching and testing procedures carried out by the veterinarians should be improved considering the future threats of emerging disease risks.

Keywords: Border management, Animal quarantine

Trends of Export Pet Bird Industry in Sri Lanka

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Exporting live pet birds is an emerging business in international trade. Highest numbers of bird species are found in South America and the Indian region, and a high diversity of species is observed in Sri Lanka with over 400 species of birds. The demand for pet birds is found to be high in Europe, America and some Asian countries such as Malaysia, Indonesia, Japan and Singapore. Since Sri Lanka is free from most of the World Organization for Animal Health (WOAH) listed notifiable diseases, potential and possibility of exporting barriers are minimum. Three main acts are involved in exporting live pet birds in Sri Lanka that include Fauna and Flora Act, Animal disease act and Custom Ordinance. Only captive bred birds are allowed to be exported. The objectives of this study are to summarize information on exporting pet birds during the last ten years and to understand the trends in the industry. The data were extracted from Sri Lanka Customs and analyzed the trend of the industry during the period from 2013 to mid of 2022.The Macaws, love birds, Cockatiel, Budgerigar were the main pet birds exported. Parrot beak aseel were exported in high numbers in the recent past. Maldives, Pakistan and Singapore are the main destinations of exported pet birds from Sri Lanka. The total value of exports LKR 46,721, 1,095,500, 480,195, 8,907,18,526, 534,604, 1,022,722, 7,714,402, 15,693,534,32,573,588 from 2013 to mid of 2022, respectively. The number of export consignments has increased annually. The potential factors for the expansion of the pet bird market in the last two years has been identified as free of notifiable disease, tropical weather and knowledge of employees including breeding. A prolonged processing period, lack of infrastructure, lack of breeding facilities, lack of guidelines and financial support have been identified as possible drawbacks for the industry. Inter government discussion to open the new market, digitalization of international trade has been identified as major elements of the emerging business. Establishment and implementation of proper guidelines, disease surveillance, awareness of the business county have been identified as potential solutions to uplift the business to earn more foreign currency. More concentration on possible zoonotic diseases such as Salmonella, Chlamydiosis and parasitic diseases are also highlighted.

Keywords: Diseases, Exports, Pet birds

Status of Ornamental Zebrafish Varieties in Aquaria in Badulla, Sri Lanka

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Zebrafish (*Daniorerio*) are freshwater tropical cyprinid fish species which are originally from South Asia and popular by its name in ornamental fish industry due to their body with instantly recognizable stripped zebra pattern. It has numerous advantages to play an increasingly important role as a model organism. In Sri Lanka, Zebrafish embryo is popular as an alternative animal model for toxicity testing. However, the ornamental value of these species increased recently due to the availability of colored varieties also called as "Glo Fish". This preliminary study was performed to find out the availability of Zebrafish varieties and customer demand in aquaria at Badulla. Additionally, information on Zebrafish breeding, disease occurrence, and treatments performed were also gathered by questionnaire survey. We have investigated seven aquaria available in Badulla and five of them were selling Zebrafish. Among them two aquaria breed Zebrafish varieties. Based on the results of our questionnaire survey, Moonrise-pink color Zebrafish were available at all five aquariums, while Electric-green and Yellow color varieties were found in four aquaria. Black color Zebrafish were present in three aquaria and Cosmic-blue variety was available in two aquaria. Starfire-red, Sunburst-orange, Neon and Wild zebrafish were available in one aquarium each. The aquarium owners reported that, white spot disease (*Ichyophthirius multifilis*) was the commonest disease followed by, spinal curvature, worm infestation and fin rot. *Trichodina sp., Plasmodium sp., Gyrodactylus sp*. and intermediate stage of *Paramecium sp.* were identified by wet mount preparations at laboratory from the randomly collected live Zebrafish (n=15). Aquarium keepers use salt, "Acriflavine", "Triple mixture" and commercially available anti-fungal agents to treat diseases by experience. The highest customer demand for Zebrafish was 500 pairs per month in one aquarium and others reported between 150 – 300 pairs per month. Price of a pair of mature Zebrafish varied from Rs. 50.00 – 100.00. Although Zebrafish is commonly considered as a scientific animal model in the world, In Sri Lanka there is a high demand in ornamental fish industry due to their availability in colored varieties and ability to thrive tropical environmental conditions. However, proper disease diagnosis and treatment need to be addressed for the prevention of diseases.

Keywords: Fish diseases, Ornamental Fish, Zebrafish

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