32nd MAVMA CONGRESS

COVID-19 : RESHAPING THE FUTURE OF VETERINARY PROFESSION & INDUSTRY

15 - 16 July 2022 Dorsett Grand Subang

Proceeding Book

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Proceedings of 32nd Malaysian Veterinary Medical Association (MAVMA) Congress 2022

Published by:

Malaysian Veterinary Medical Association (MAVMA) (PPM - 011 - 14 - 23011989)
10-1, Jalan Sierra 10/2, Bandar 16 Sierra, 47120 Puchong, Selangor, Malaysia

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Proceedings of 32nd Malaysian Veterinary Medical Association (MAVMA) Congress 2022

Preface

Since our last congress in 2019, the world has seen the emergence of SARS-CoV-2 and the accompanying unfolding of the COVID-19 pandemic. After a two-year hiatus caused by the pandemic, this 32nd Malaysian Veterinary Medical Association (MAVMA) congress held from 15-16 July 2022 at Dorsett Regency Subang will be the first to be held under the new association's name after it was approved by the Registry of Societies (ROS) in January 2021. Given the focus on the post-COVID19 pandemic, the topics covered were zoonotic disease surveillance, COVID vaccine development and transboundary disease control given by our plenary speakers. In addition, 32nd MAVMA Congress 2022 shared the perspectives and breakthroughs within the veterinary community. The theme "Covid-19: Reshaping the Future of the Veterinary Profession and Industry" served and provide valuable current information to propel us to the next level of veterinary medicine and services in this COVID-19 pandemic situation.

Our fellow committee members were working hard to put together an impactful and relevant scientific programme, with specially crafted knowledge exchange sessions and networking opportunities with fellow peers in the industry. There was a significant representation of multiple agencies and industries, local and international participants presenting wide array of abstract topics. Therefore, the annual MAVMA Congress is an excellent platform to exchange ideas, share information regarding ideas and application of veterinary-related tools and other allied sciences, and a great occasion for all members to meet and greet, make connections, and network. With the information obtained from the 32nd MAVMA Congress 2022, it is hoped that we could reshape the future of the veterinary profession and industry towards adaptability and resilience.

Dr. Helen Mitin
Chairman
32nd MAVMA Congress 2022

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Keynote Paper

COVID-19: Reshaping the Future of Veterinary Profession and Industry

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ABSTRACT

Zoonotic diseases constitute 75% of all emerging infectious diseases, of which more than 70% originate from wild species. We have heard about the emergence of viruses such as Ebola (1976), H5N1 (1996), Nipah (1998), SARS (2003), influenza virus- H1N1 pandemic (2009), MERS (2012), H7N9 (2013) and Covid-19 pandemic (2019). The Covid-19 pandemic has put our human healthcare services to the test, and its impact on veterinary services and animal health cannot be ignored. The pandemic has impacted the Malaysian animal industry by disrupting veterinary services such as extension, animal health services, laboratory testing, and the veterinary education and teaching. The pandemic has also caused a reduction in consumer demand due to lockdown restrictions and reduced purchasing power when people lose jobs and income. An increase in animal feed costs, reduced access to equipment due to a global supply shortage, and shortage of foreign workers causing price increase are some of the most recent challenges the Malaysian livestock industry faces. Given the severe impacts of the pandemic on our veterinary profession and industry, it is critical that the 'lessons learned' from the pandemic for our workforce to adapt and transform our approaches in facing the future. Here are three ways Covid-19 is reshaping the future of the veterinary profession and industry.

The relationships with pets and owners have evolved. During the pandemic, there is delayed or no contact with veterinarians. In addition, when the pandemic struck, animals, especially pets, became unnecessary victims due to poor understanding of the Covid-19 virus and financial crisis worldwide. On the other hand, studies have also shown that pet owners claimed the bond with their pets had grown when the pandemic struck. The human-animal bond increase was significantly higher during the pandemic for those who worked from home. Several surveys also showed that pet owners are rising, opening opportunities and challenges for veterinary clinics and pet care businesses.

Digital transformation and technologies may shape the future of veterinary services. The pandemic has driven pet owners to email, texting, and even video call veterinarians. For farm animals, the Department of Veterinary Services (DVS) Malaysia responded by introducing a new system http://eternak.dvs.gov.my during the lockdown restriction. This surge in interest and demand for online veterinary services will accelerate the use of the Internet of Things (IoT) which will change the veterinary service landscape. The Covid-19 crisis has also allowed the emergence of the use of mobile technologies for animal health monitoring, disease surveillance, reporting and information sharing; big data and data analytics; and promising technologies such telemedicine and blockchain applications. In addition, embracing the use of IoT in the animal industry is of paramount importance as labour shortages affect farm production and the veterinary business.

Veterinary knowledge and skills are gaining unprecedented importance in terms of understanding and managing changes in the relationships between animal, environment and human, and in terms of contributing to global health. The Covid-19 pandemic is a wake-up call for leaders to adopt One Health approach. The pandemic triggered close consultation and information sharing between animal and human health experts. On the global front, the Pirbright Institute, UK which is dedicated to preventing and controlling zoonotic diseases, assisted in developing the Oxford University and AstraZeneca Covid-19 vaccine. In Malaysia, veterinarians and researchers from Universiti Putra Malaysia are among the first in the country that embark on working on the development of inactivated Covid-19 vaccine for humans. As we understand the epidemiology of the Covid- 19 virus in animals, there is no need to vaccinate pet animals from a public health standpoint. However, for other animals, given the susceptibility of mink and some captive mammals, there is merit in vaccinating them. Society in general demands that leadership across several levels of the profession expand and diversify efforts aimed at greater public service while preserving societal benefits stemming from companion animals. The pandemics most deeply rooted effects could lie in its potential threat to global food security, which can be better preserved if more veterinarians embrace the importance of One Health approach.

As the borders open up, the veterinary service landscape will experience some uncertainty in the post-Covid-19 pandemic with the challenges of vaccine roll-out and emerging virus variants and spillover effects into other risks. Covid-19 is not the last pandemic in our lifetime since infectious diseases that jump from animals to humans are on the rise. Surveillance combined with scientific studies to better understand zoonotic animal viruses and spillover will enable us to stay a step ahead of the next epidemic. The pandemic has accelerated changes in various sectors, giving us the opportunity and obligation for change. Embracing these changes will reshape the future of the veterinary profession and industry.

Plenary Paper

Rabies: Zero by 2030

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ABSTRACT

Rabies a dreadful disease known to mankind for 4000 years ago. Rabies found in all parts of the world except Antarctica, causing about 60,000 deaths yearly and mostly affected are those below 15 years of age. Lyssavirus causing rabies which is a neurotropic virus affecting the central nervous system leading to the inflammation of the brain which causes death of those infected as there is no available treatment. This virus usually transmitted via two cycles known as the terrestrial and canine cycles where the definite hosts being the bats and dogs. All mammals are susceptible to rabies and humans usually are the end host of which they get infected after being exposed to rabid animal by biting, licking to open wound and mucosal area. At entry point, the virus replicates in the muscles, then attaches and travels ascending via the nerves towards the brain. Once in the brain, the virus replicates further causing inflammation known as encephalomyelitis. Incubation period is about 3 weeks to 3 months sometimes can be much earlier or more than a year or longer. Initial symptoms are non-specific with fever and flu-like symptoms. The patient often complaints pain or paraesthesia at the bite site at prodromal stage. As the condition progress, the patient may start to experience change in behaviour, altered mental state, hydrophobia, aerophobia and eventually death within 7-10 days after prodromal stage. There are two forms of the human rabies. About 2 out of 3 patients exhibit furious rabies with signs of hyperactivity, excited behaviour, hydrophobia and sometimes aerophobia. After a few days, death occurs due to cardio-respiratory arrest. Paralytic rabies accounts for about 1/3 of the total number of human cases. The muscles gradually become paralyzed, starting at the site of the bite or scratch. Coma slowly develops and eventually death occurs. This form of rabies runs a less dramatic and usually longer course than the furious form. The control and eradication of rabies requires controlling it at its animal source due to the public health importance of this disease.

Vaccines Development and Vaccination for COVID-19 and Future Pandemic Preparedness

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ABSTRACT

On 11 March 2020, World Health Organization (WHO) has declared COVID-19 or SARS-CoV-2 virus infection to be a pandemic and it becomes one of the worst pandemics in history. It has caused profound impact on human health, societies, and economies in every corner of the world. A global challenge that cut across every discipline and border. A significant setback for the sustainable development goals (SDGs) in all three dimensions; economic, social, and environmental worldwide especially by increased poverty rates and unemployment. The battle against pandemic diseases is a continual process; winning does not mean stamping out every-last disease, but rather getting out ahead of the next one. The country should focus more to the proactive efforts and preparedness to ensuring we are resilience against pandemic diseases. Vaccination is the most effective method of preventing pandemic diseases in addition to effective biosecurity and biosafety. Equitable access to safe and effective vaccines is critical to ending the COVID-19 pandemic. It is hugely encouraging to see many vaccines proving and going into development. It is not vaccines that will stop the pandemic, it is vaccination. We must ensure fair and equitable access to vaccines, and ensure every country receives them and can roll them out to protect their people, starting with the most vulnerable. Bringing a new vaccine to the public involves many steps including vaccine development, clinical trials, authorization or approval, manufacturing, and distribution. While COVID-19 vaccines were developed rapidly, all steps have been taken to ensure their safety and efficacy. The knowledge that was gained through past research on coronavirus vaccines such as those that cause severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) helped speed up the initial development of the current COVID-19 vaccines. The vaccines shall go through three phases of clinical trials to make sure they are safe and effective. The authority continues to monitor their safety and alert the public about health problems that are reported after vaccination. Currently, the most common vaccine technologies used against COVID-19 includes the mRNA, viral vector, and inactivated methods. Malaysia has no choice but to be more prepared to face and respond to current and new challenges and waves of impact if another pandemic inevitably takes place. The existing policy and law, ecosystem and governance, environmental factors, capacity and capability development, biosafety and biosecurity management and research, development and innovation need critical review to address these issues. It is timely that Malaysia should produce its own human vaccine for national security and concurrently driving the bio-economy of the country. The country has strong ecosystem in vaccine development. We have many scientists and experts from the universities, research institutes and industries, and excellent government commitment and support on research, development, commercialisation, and innovation (RDCI). The collaboration among these parties, facilities and global partnerships needs to be strengthened to achieve these goals. The launching of National Vaccine Development Roadmap (NVDR) and establishment of Malaysia Genomic and Vaccine Institute (MGVI) further enhance on the capability and capacity of Malaysia to be a human vaccine producing country. The on-going research on the development of COVID-19 vaccines such as inactivated, recombinant and mRNA vaccines will ensure meeting of these goals. Effective proactive strategies and policy responses to prevent future pandemic is a critical element to be addressed in a pandemic preparedness plan.

Wildlife DNA Surveillance in Malaysia

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ABSTRACT

The Department of Wildlife and National Parks (PERHILITAN) Peninsular Malaysia is one of the governmental agencies that is responsible in the sustainable management of the national biodiversity resources, especially concerning with habitat and terrestrial wildlife conservation. The Department recognized the threats arising from emerging diseases and public health emergencies especially wildlife zoonoses, and realising the importance of this matters, PERHILITAN begun to develop the capacity with regards to activities related to wildlife zoonoses. By 2011, a programme to oversee the implementation of the surveillance and monitoring of wildlife diseases were established known as the Wildlife Disease Surveillance Programme (WDSP) (PERHILITAN, 2011). As a field coordinator for program, it is an honor to the author to share his experience and thought along conducting this program since 2015.

Transboundary Animal Disease Control from Thailand Perspective

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ABSTRACT

Transboundary animal disease control in Thailand are focusing on controlling diseases in livestock as well as promoting trade of livestock and livestock products to the international market. The Department of Livestock Development's (DLDs) yearly project work plan and implementation mechanisms have been established to better respond to the current challenges, maintain effective collaboration and coordination, as well as enhance prevention and control strategies to further strengthen the Southeast Asia or Mekong subregional capacities. The collaboration with surrounded countries and the development of feasible regional cooperation are the key success of our Region's Transboundary animal disease control.

Symposium Paper

Insight of African Swine Fever Situation: What Have We Learned and Planned to Combat ASF in Thailand

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ABSTRACT

The first outbreak of African Swine Fever (ASF) in Asia was reported in China in 2018. The ongoing epidemic started from China then spread to other Asian countries such as Laos, Myanmar, Cambodia, North Korea, South Korea, Philippines, Timor-Leste, Mongolia, Hong Kong, and Indonesia. ASF is considered as the most important disease affecting swine production not only in Asia, but globally. ASF is a very serious threat to the farm due to the inavailability of medicine or vaccine. The only prevention against ASF is to improve farm biosecurity. On the daily basic, pig farmers are facing multiple challenges on biosecurity risks. In order to be able to reduce the risk of ASF virus and new virus introduction and increase disease resilience, management and pig flow become more crucial. We need to understand and aware the biosecurity risks they face. After the first report of ASF in Thailand since Q1-2022, these are what we learned about ASF and farm biosecurity. 1) Animals: ASF virus spreads via direct contact, live animal can carry the virus. 2) Transport: vehicles that have carried infected pigs can be risk to other farms as ASF is highly resistant in environment. 3) People: how farm staff behaves contribute to the risk of farms 4) Management: daily routines on the farm are critical in the prevention of ASF entering the herd. 5) Feeding: ASF virus can remain infectious in kitchen scraps, catering leftover food and contaminated pork. 6) Location: infected swine and wild boar can pose serious risk that need to be understood. Furthermore, rapid detection of the virus faster is also very important. We can investigate the problem in the farm and plan for depopulation and repopulation. The usage of oral fluid, environmental floor swab, blood sample from the tail are new ways to collect sample with less contact to the pigs and the results correlate to the timeline of infection with ASF virus of which virus can be detected from oral fluid at 6 days post-infection (DPI), from blood at 9-10 DPI and at 10-12 DPI from fecal sample. This will lead to understanding the disease dynamic and plan the management to control the disease in the farm.

FAVA Strategy to Tackle Antimicrobial Resistance (AMR) 2021-2025

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ABSTRACT

AMR is a global issue which transcends across human, animal and environment and require a concerted effort from everyone to mitigate it. Failing to act will result in losses to human lives (estimated around 10 million in 2050) and will impact the Gross Domestic Product (GDP) to the tune of at least USD1 trillion annually by the year 2030. Asia and Oceania being a big continent with large populations will be the most affected. Hence there is an urgent need to address and take the necessary actions to reduce the impact. In this regard, the Federation of Asian Veterinary Associations (FAVA) has been working in collaboration with the Food and Agriculture Organisation (FAO) Regional Office for Asia and Pacific to develop a strategy to tackle antimicrobial resistance (AMR). The FAVA Strategy to tackle AMR 2021-2025 was developed to focus on efforts in empowering veterinarians in Asia towards fulfilling their roles on the Global Action Plan on Antimicrobial Resistance (GAP-AMR). The strategic objectives outlined aim to: (1) Increase awareness and understanding of AMR among veterinarians, veterinary students, and veterinary associations; (2) Strengthen surveillance of antimicrobial sales and use in animals and research on new antimicrobials and alternatives to antimicrobials to protect animal health; (3) Advocate good practices in infection prevention and control; (4) Promote the responsible and prudent use of antimicrobials; and (5) Strengthen governance mechanisms and sustainability of efforts to regulate the use of antimicrobials in animals through the national veterinary associations. The strategy serves as a tool to guide, encourage, and support public and private veterinarians in taking proactive roles to contribute to AMR mitigation.

Vaccination of Companion Animals in the Malaysian Context

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ABSTRACT

Vaccination is the cornerstone of preventive healthcare in veterinary medicine. Vaccines are proven to be safe and effective to protect companion animals against the infectious diseases. Guidelines for the vaccination of dogs and cats have been published by international organizations, notably by World Small Animal Veterinary Association (WSAVA) and American Animal Hospital Association (AAHA). South Korea and Singapore also developed their own vaccination guidelines as a reference to the local veterinary communities. In the Malaysian context, vaccination of pets ought to prioritize the protection against zoonotic diseases such as rabies and leptospirosis. Vaccinating dogs is the most cost-effective strategy to prevent rabies in people. Increasing the awareness of infectious diseases and preventive healthcare is critical as the medicalization rate of pets in Malaysia is low compared with the developed nations. Vaccination visit is a great opportunity for vets to educate pet owners on the responsible pet ownership and animal welfare. Vaccination is an individualized veterinary medical procedure. Factors such as the endemic status of the diseases, lifestyle of the animals (outdoor access and multi-pet household), breed and age of the animal, type of vaccines etc. must be considered before vaccination. For example, in the event of high infection pressure, puppies and kittens can be vaccinated from 6 weeks of age using RECOMBITEK® (canine vaccines) and PUREVAX® (feline vaccines) respectively to protect them against early infection. Vaccination, however, does not guarantee immunization. Successful immunization can be affected by maternally-derived antibody, vaccine storage and handling, brand of vaccine among others. Veterinarians can take advantage of the recent innovations in pet vaccines to provide a better preventive care for their patients. Examples of these innovations are the half volume feline vaccine that is more cat friendly, the non-adjuvanted tetravalent leptospirosis vaccine that offers 15 months of protection against renal pathology and shedding of leptospires in dogs, and the oral vaccine that protects the dogs against canine infectious tracheobronchitis. There is no one-size-fits-all approach to vaccination. Vaccination should be considered case by case, depending on the risk of exposure, disease epidemiology, and local context.

Oral Presentation

OP01

A Preliminary Study on Antibiotic-Resistant Genes Associated With the *Salmonella enterica* Serovar Typhimurium in Chicken

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ABSTRACT

Antibiotic resistance is a global threat involving human and animal health. In this study preliminary data regarding the association of resistance genes with the phenotype antibiotic resistance profile of Salmonella Typhimurium was obtained. A total of 35 samples of Salmonella Typhimurium strains were isolated from chicken were tested with five antibiotics (ampicillin, chloramphenicol, streptomycin, sulfonamides, and tetracycline) using the disc diffusion method according to Clinical Standard Laboratory Institute (CSLI). Polymerase chain reaction (PCR) was then performed on all of the isolates to detect the presence of associated resistant genes (blaTEM, floR, strA, sulA, and tetA). Phenotype study of Salmonella Typhimurium isolates showed 8/35 (22.85%) penta-resistant, 18/35 (51.43%) resistance to at least two types of antibiotics and 9/35 (25.71%) were susceptible to all antibiotics testing. For the genotyping study, the PCR result revealed that 26/35 (74.3%) presence of blaTEM gene, 13/35 (37.1%) with floR gene, 22/35 (62.9%) of strA gene, 24/35 (68.6%) of tetA gene and 1/35 (2.9%) of sulA gene. All the penta-resistant samples were present with four resistant genes. This data shows that the presence of antibiotic resistance genes was one of the factors that contribute to antibiotic resistance.

Keywords: antibiotic-resistant, *Salmonella* Typhimurium, gene resistant

OP02

The Prevalence of Salmonellosis in Horses Residing in Equine Stables Establishments of Malaysia

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ABSTRACT

Salmonellosis is an enteric infection with classical signs of anorexia, fever, and diarrhea. There are multiple sources of infection in equines which begin with the fecal-oral transmission. Asymptomatic horses are capable of shedding *Salmonella* spp., a risk to other resident animals, and contaminating the environment. The reported prevalence of salmonellosis in healthy horses in tropical countries varies from 6.5 to 14.3%. This study aims to determine the prevalence of salmonellosis in horses residing in equine stables establishments. A total of 73 horses were randomly selected from eight (8) stables in Malaysia. Fecal samples were obtained from the rectum daily for three days. The environment surrounding the horses was sampled using a moistened gauze swab. All samples were subject to pre-enrichment in Buffered Peptone Water, and selective enrichment in Rappaport-Vassiliadis broth. Xylose-Lysine-Deoxycholate (XLD) and Brilliant Green agar (BGA) were used to isolate presumptive *Salmonella* colonies, confirmed by biochemical tests. *Salmonella* spp. was isolated in the feces of two horses from two stables (2.7%) who had normal vital signs and normal fecal consistency, demonstrating carrier status of *Salmonella* while being asymptomatic. One horse was found to be shedding on Day 1 and Day 3 of sampling, while the other was shedding on Day 2 only. This demonstrates intermittent shedding which highlights the importance of consecutive sampling to accurately ascertain a horse's status. Shedding of *Salmonella* in feces may pose a risk to other horses, especially the young and immunocompromised, as well as a zoonotic risk to staff and visitors at the stables. It is important to reduce stress factors in these asymptomatic shedders to prevent the development of clinical signs and colic.

Keywords: *Salmonella* spp., equine, asymptomatic carrier, prevalence

OP03

Mycotoxins Survey in Poultry Feed Raw Materials in Malaysia (2021)

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ABSTRACT

Mycotoxins are naturally occurring harmful substances produced by certain mold or fungi which commonly grow on animal feedstuff depending on the weather conditions and storage practices. Feed refusal, reduced growth performance, compromised fertility, immunosuppression, damage to internal organs and reduced eggshells quality are some of the serious effects of mycotoxins. In 2021, 794 mycotoxins rapid tests (Aflatoxins, Ochratoxin, Fumonisins, T2/HT2 toxins, Deoxynivalenol (DON) and Zearalenone) were conducted by using Raptor® Integrated Analysis Platform on 153 of corn and soybean meal raw material samples. These raw material samples were analyzed for their mycotoxins levels (in ppb) and risk equivalent quantity (REQ) in broilers, layers and breeders. The samples were taken from various locations in Malaysia. From the 97 corn samples, results revealed that the average concentration of mycotoxins above the limit of quantitation (LOQ) were Aflatoxin 18.1 ppb, DON 600 ppb, Fumonisins 1313 ppb, Ochratoxin 3.3 ppb, T2/HT2 51.3 ppb and Zearaleone 198.8 ppb. The REQ analysis revealed 86.6%% of corn samples posed a lower risk, 6.2% of the samples posed a moderate risk and 7.2% of the samples posed a higher risk of mycotoxins to the broilers. For the layers and breeders, 57.7% of the corn samples had lower risk, 29.9% had moderate risk and 12.4% had a higher risk of mycotoxins. DON and T2/HT2 toxins were two major mycotoxins causing the problems in the broilers, layers and breeders. From the 56 soybean meal samples, results showed that the average concentration of mycotoxins above the limit of quantitation (LOQ) were Aflatoxins 5.8 ppb, DON 414 ppb, Fumonisins 413 ppb and Zearalenone 118 ppb. The REQ analysis revealed that 100% of the samples posed a lower risk of mycotoxins to the broiler. For the layers and breeders, 83.3% of the samples had a lower risk and 16.7% had a moderate risk of mycotoxins. DON was the main mycotoxin in soybean meal. Mycotoxins can dangerously affect poultry mortality at all growth stages and cause a significant reduction in poultry production. This survey found that corn samples had a higher level of mycotoxins compared to soybean meal and 42.3% of the corn samples had moderate to a higher risk to layers and breeders.

Keywords: mycotoxins, poultry, rapid test, risk equivalent quantity (REQ)

OP04

Interactions Between Fusogenic, Cationic, and Fuso_cationic Liposomes With Bacterial Cells of *Corynebacterium pseudotuberculosis*

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ABSTRACT

Bacterial resistance to antibacterials is a global phenomenon that causes many antibiotics to be less or ineffective for the treatment of several infectious diseases. *Corynebacterium pseudotuberculosis* (*C. pseudotuberculosis*) is the causative agent of caseous lymphadenitis (CLA) which is a chronic and contagious bacterial disease of ruminants, especially in goats and is highly refractory to many antibiotics. The application of nanoparticles was introduced as a novel approach to circumvent the bacterial resistance against antibacterial agents. Liposomes as promising nanoparticles can interact with bacterial cells through several mechanisms such as absorption, endocytosis, fusion, and lipid transfer. As a result, a high local concentration of antibiotics is achievable in the cell membrane or within the bacterial cells via encapsulation of antibiotics into the liposomes. However, liposome infusion is described as the most significant way of interaction with bacterial cells. Therefore, the main purpose of the current study was to evaluate the interaction of fusogenic, cationic, and fuso_cationic liposomes with *C. pseudotuberculosis*. The liposome formulations were prepared by the extrusion method. High-resolution transmission electron (HRTEM) was applied to evaluate the possible interaction of liposomal formulation with the bacterial cell membrane. Liposomal suspensions were mixed with an overnight culture of *C. pseudotuberculosis* at 37°C for 1 hour and then, the samples were evaluated by HRTEM. The results illustrated that fusogenic liposomes interact and fuse with the bacterial cell membrane. The presence of unique lipid1,2-dioleoylphophatidylethanolamine (DOPE) in the composition of fusogenic liposomes causes interaction and fusion with the bacterial membrane. DOPE improves the lipophilicity of the lipid vesicle layer and consequently facilitates the interaction process by lowering the interaction energy between the liposomal formulation and cell membrane Furthermore, fusogenic liposome contains cholesteryl hemisuccinate (CHEMS) which further promotes the interaction forces between the lipid vesicle and bacterial membrane. Considering the obtained results, encapsulation of antibiotics into fusogenic liposomes can be proposed as a potentially successful approach to enhance their activity against *C. pseudotuberculosis*.

Keywords: fusogenic, cationic, and fuso_cationic liposomes, bacterial resistance, *C. pseudotuberculosis*

OP05

Evaluation of Knowledge, Attitude and Practices Towards COVID-19 Among Pet Owners in Malaysia

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ABSTRACT

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) is a virus that emerged in late 2019 in Wuhan, China causing Covid-19 which has caused a global pandemic. Although the disease is primarily observed in humans, there are multiple reports of Covid-19 in animals including cats, dogs, minks and lions. There were multiple reports globally on Covid-19 infection in pets that were infected from Covid-19 positive owners. News on pet owners abandoning their cats or dogs has also emerged, possibly due to inaccurate information or news about Covid-19 infection in pets and misinterpretation of this information by the public. Given that Covid-19 would be treated as endemic in many countries including Malaysia, there is a need to determine the gap in awareness of this disease, especially among pet owners. Therefore, the objective of this study was to determine the level of knowledge, attitudes and practices (KAP) among pet owners on Covid-19 transmission from humans to pets. This study was conducted as a cross-sectional questionnaire-based study. The online questionnaire comprised of 50 items, of which ten were on pet owner's information, five were on pet's information, 35 were on questions related to KAP on Covid-19 and pets. The questionnaire was answered by 472 participants from March 2021 until August 2021. Statistical analyses were performed by using a statistical package for social sciences (SPSS) version 25.0. Based on the results, there was the presence of a gap in knowledge particularly on questions related to Covid-19 in animals. However, in general, there were good attitudes and practices toward general pet care and responsible pet ownership among the respondents. Not surprisingly, there were 3% of respondents surrendered their pets during the pandemic. Therefore, information dissemination that pets are not involved in Covid-19 spread to humans needs to be conducted through public awareness programs. In conclusion, it is hoped that this study shed more insights into the Covid-19 awareness in animals and the information could be used towards risk mitigation, improving disease awareness and developing communication strategies.

Keywords: SARS-CoV-2, Covid-19, pet, Malaysia, knowledge, attitude and practices

OP06

Estimating the Costs of Rearing Dairy Young Stock on Non-commercial and Commercial Farm Using Stochastic Model That Includes Uncertainty in Mortality

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ABSTRACT

Young stock rearing is needed to replace culled dairy cows and maintain optimal herd size. It is considered a substantial investment by a dairy farmer due to the non-productive rearing period in the first 2 to 3 years. Due to incomplete farm records, it is also difficult to calculate the rearing costs of young stock, especially in non-commercial dairy farm settings. Moreover, rearing costs are correlated with biological process (e.g.: growth rate) and uncertainty (e.g.: mortality) throughout the rearing period. This study aims to estimate the costs of rearing dairy young stock from birth to the first calving age, including uncertainty in young stock mortality. This study was conducted in Keningau, Sabah, Malaysia, in which the farms selected were classified into two categories: a farm with less than 50 dairy cows as non-commercial farm, while a dairy farm with more than 50 dairy cows was categorised as a commercial farm. A stochastic bioeconomic model was developed at animal level to calculate the cost of young stock rearing. The model's input data such as body weight, mortality rate, and prices, were obtained from field survey of farmers, existing literature, and expert opinions. The output results from the survey, literature and expert opinion were used to validate the model's output. Our result showed the average total costs of rearing dairy young stock from birth to the first calving age for non-commercial and commercial farms were RM7,775 and RM7,588, respectively, with an average mortality cost of RM3.08 (0.04%) and RM2.21 (0.03%), respectively. The first calving age of dairy young stock were 32.1 months (442.87 kg) and 24 months (585 kg) in non-commercial and commercial farms, respectively. In sensitivity analysis, the total cost of rearing was the most sensitive to the change in price of forage followed by price of concentrate. When the price of forage increased to RM0.02, the rearing costs for non-commercial and commercial farms also increased by RM419 and RM390, respectively. In conclusion, non-commercial dairy farmers should pay more attention to the price of feed due to its significant implication to the total cost of rearing. This study provides new insights and valuable guidelines for tropical dairy farming and the economics of rearing dairy young stock to enable practitioners, dairy farmers, and government officials to improve the profitability and sustainability of dairy farms.

Keywords: dairy young stock, economics, tropics, stochastic model

OP07

Veterinary Medical Problems Among Pet Rabbits From an Exotic Animal Practice in Kuala Lumpur: A 8-Year Study

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ABSTRACT

Rabbits are herbivores and are loved by adults and children due to their gentleness. A few common rabbit breeds in Malaysia are Holland Hop, Netherland Dwarf, and Mini Rex. Rabbits require intensive care and management. However, rabbits seldom exhibit major clinical symptoms leading to difficulties in diagnosis. This study aims to obtain data on the common medical disorders reported among pet rabbits in Malaysia. Findings then help in mitigating the preventive measures and management of pet rabbits. A total of 538 rabbits were presented to the Exotic Animal Veterinary clinic for various medical health issues from 1st January 2013 to 31st December 2020. All data were tabulated in Microsoft Excel according to the body systems, namely digestive (28.62%), musculoskeletal (23.23%), integumentary (18.77%), ocular (6.88%), respiratory (6.51%), central nervous (5.95%), urogenital (5.39%), auditory (4.46%), and cardiovascular system (0.19%). The digestive system has the highest prevalence of medical disorders in rabbits, followed by musculoskeletal, integumentary, ophthalmologic, auditory, respiratory, and central nervous systems. Some examples of medical disorders reported in rabbits include mange (n=72), followed by anorexia (n=54), abscess and wound (n=53), enteritis (n=31), upper respiratory infection (n=27), alopecia (n=24), and canker (n=20). Results also showed a correlation between gender and medical problems, where male rabbits were more prone to have medical issues than female rabbits (X2, P=0.000). To conclude, the medical health issue's underlying causes are often related to dietary changes and improper environmental management. Therefore, further continuing education among pet owners on the proper nutrition, husbandry, and management of pet rabbits is required.

Keywords: rabbit, body system, gender, disease, management

OP08

Cage-Free Revolution

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ABSTRACT

One of the most salient animal welfare issues globally is the confinement of animals in intensive agricultural systems. Battery cages, small and wire enclosures usually keeping five to seven egg-laying hens in a space less than the area of a letter-sized sheet of paper per hen, are being reconsidered given the growing body of scientific evidence. Laying hens have complex behavioural needs as they require a perch for roosting, loose litter for dustbathing and foraging, and a protected nesting area for egg-laying. While barren, battery cages have been prohibited in the European Union since 2012, there is a growing social movement to ban cages of all types for farm animals. The "End the Cage-Age" initiative gathered over 1.3 million signatures from EU citizens in 2020. The European Commission has promised new legislation that would prohibit the use of even "furnished" cages in the egg industry, requiring the transition to completely cage-free systems. These can be indoor barns, and aviary systems or may provide outdoor access (free-range). The cage-free movement has grown far beyond Europe, with dozens of multi-national corporations and hundreds more national and regional brands pledging to rid cages in their egg supply chains. Legislation in the United States and Bhutan, Codes of Practice in New Zealand and Canada, and legal challenges in India are adding to the international cage-free momentum. The cage-free movement is beginning to reach Asia, including in Indonesia, Thailand, Vietnam and Malaysia, where several egg producers are adding or expanding their cage-free egg production. In Malaysia, egg producers are beginning to organize a cage-free egg producers' association, through which they will speak with a unified voice. Moreover, to support the need for technical advice and assistance, Humane Society International has commissioned a management guide for cage-free egg production, which is freely available. As veterinarians working in animal agriculture, we may be increasingly called upon to ensure the health and productivity of cage-free hens. The movement is coming to Malaysia, and now is the time to begin learning, and planning for, this new egg production era.

Keywords: poultry, hens, cage-free, layer and animal welfare

OP09

Molecular Detection of Bovine Viral Diarrhoea Virus (BVDV) In Selected Farms in Selangor

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ABSTRACT

Bovine viral diarrhoea virus (BVDV) is a single-stranded plus sense RNA virus of the Pestivirus genus under the Flaviviridae family. Bovine viral diarrhoea (BVD) disease is manifested by diarrhoea, immunosuppression that exacerbates other respiratory diseases, orchitis, poor quality semen, chronic emaciation, mucosal disease, foetal abortion, congenital anomalies, and weak calf. Moreover, foetal infection in the first trimester can lead to a persistently infected (PI) animal that is immunotolerant and sheds the virus for life. Bovine viral diarrhoea virus (BVDV) seroprevalence in cattle was reported in Malaysia, but no BVDV antigen detection and isolation was conducted. This study aimed to determine the prevalence of BVDV antigen in cattle in the selected farms and to detect, isolate and identify BVDV antigen molecularly. Blood samples were obtained from cattle on the selected farms in Selangor. Plasma from the cattle was subjected to antigen detection by reverse transcriptase-polymerase chain reaction (RT-PCR). RT-PCR targets the conserved 5'UTR region of BVDV and can amplify only one positive sample (1/256). Subsequent amplification of hypervariable E2 region of BVDV followed by sequence analysis revealed that it was subgenotype BVDV1a, identified as UPM/MAL/BVDV/D17. Hence, this study revealed that the BVDV antigen was present in Malaysia. Since BVDV exists in many subgenotypes, and many countries are reported to have more than one subgenotype, Malaysia must control the entry of more BVDV subgenotypes. It is also important to screen larger sample sizes from all the states to better understand the prevalence of BDV subgenotypes in Malaysia. Moreover, BVDV screening should be imposed on all imported livestock susceptible to BVDV to prevent external infection from infecting local animals.

Keywords: bovine viral diarrhoea virus (BVDV), bovine viral diarrhoea (BVD), 5'UTR region of BVDV, E2 region of BVDV

OP10

Small Holders Ruminant Industry in Malaysia: Challenges and Remedies

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ABSTRACT

Animal health, nutrition, production, and immunity are several challenges impact the future of the large and small ruminant industry in Malaysia. In addition, the farmer's knowledge, feed supplements use, farm biosecurity, medication, products quality, product safety, the emergence and re-emergence of infectious diseases (e.g.: foot and mouth disease, lumpy skin disease, brucellosis, hemorrhagic septicaemia, pasteurellosis), parasites infestations (e.g.: blood parasite, internal and external parasite), eradication, control of infected animals or elimination, and zoonotic pathogens are other consistent challenges encountered by farmers in the ruminant sector. This report highlights the necessity of a vaccination program plan by public-private partnership under surveillance of registered veterinarian to encounter the previous issues and to enhance ruminants' industry, health, and products. Moreover, using feed supplements that contain vitamins and minerals continuously will improve the health and production of ruminants. The medication regimes, biosecurity, feeding, and water sources minimise the incidence of infestation. Another major challenge is the random use of antibiotics by farmers that cause increase of bacterial resistance which leads to the inability to control diseases. Therefore, the use of therapeutic alternatives, such as herbal products, reduces the use of antibiotics and thus facilitates the process of controlling and eliminating diseases. In conclusion, introducing good nutrition for ruminants, proper medication, stringent vaccination program, pyrophytic and therapeutic herbal medication, following healthcare practices on the farms will improve the innate animal immunity to prevent and control disease.

Keywords: ruminant health, nutrition, production, farm biosecurity, immunity

OP11

Basic Principles of Shelter Medicine Practiced in Malaysian Shelter

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ABSTRACT

An animal shelter is a housing facility for animals rescued, surrendered by owners, or awaiting adoption or reclamation by owners. Animals in shelters are usually from a source population with mostly unknown vaccination history, high infectious disease risk and high population turnover. This presentation will highlight the three fundamental shelter medicine principles: vigorous vaccination protocols, early aged neutering, and permanent marking of neutered animals. According to WSAVA Guidelines for Vaccination for Dogs and Cats (2016), the recommendations for puppies and kittens entering a shelter are that core vaccination may be started as early as 4-6 weeks of age, and revaccination should be given every two weeks until the animal reaches 20 weeks of age, if it remains in the shelter until that time. Revaccinated (booster) at the age of six months or one year old can also be given. Two doses of core vaccines 2-4 weeks apart for adult animals entering the shelter are generally recommended. Early age neutering (prepubertal gonadectomy) is a procedure in which puppies and kittens are neutered as early as seven weeks. It is mainly done to combat animal overpopulation. The anaesthetic and surgical procedures are safe, and recovery is faster than in adult animals. Neutered animals can be permanently marked by several methods: microchipping, ear notching or ear tipping, and tattooing. The pros and cons of each procedure will be discussed in the presentation. These fundamental principles are important not only for vets practicing in shelters but can be applied by the private practitioner when dealing with rescuers and multiple-pet households.

Keywords: shelter medicine, vaccination protocols, early aged neutering, prepubertal gonadectomy, abdomen tattooing

OP12

Cat Care Management: Challenges in Malaysian Veterinary Practices

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ABSTRACT

Although research has shown links between appropriate husbandry in post-operative environments and positive clinical outcomes in cats, we know from direct experience that many veterinary practices worldwide still do not meet basic cat care. Understanding why the appropriate care is not always given is important. The objectives were to identify what Malaysian veterinarians were placing in the post-operative cat cage; to ask their reasons for providing or not providing environmental resources and to gain a deeper understanding on why they made their choices. The mixed-methods study used two phases. Phase 1: a survey developed in the Bristol Online Survey (BOS) tool consisted of 14-questions which were divided into three sections 1) Demographic details 2) Attitudes to cat welfare 3) Basic management (e.g.: environmental resources used in cat cages) and barriers to providing good care for cats in practices (e.g.: time). The survey was distributed to 150 small animal veterinarians in Malaysia and was available for eight weeks. Responses were analysed for descriptive statistics in R studio. Phase 2 interviews were undertaken with 20 Malaysian veterinarians (selected from the survey sample) to explain the results in more depth. An iterative thematic analysis was conducted to extract the main barriers experienced by participants. 49 veterinarians completed the survey. Most respondents were senior veterinarians (53.1%, n=26), and 95.9% (n=47) were aware of Standard Operating Procedures (SOPs) within their clinical practice. All respondents acknowledged the importance of freedom from pain and discomfort in cats. Most respondents were aware of the basic provisions that cats need post-surgery (57.1%, n=28). Cost (47%, n=23) was the biggest restriction to good care provision. Interview findings showed that participants recognised that comfortable post-surgery environments help recovery, but barriers were highlighted, including practice management skills (e.g.: difficulty in managing a shortage of staff) and a lack of understanding of cat pain. This suggested that participants had the knowledge required to provide good cat care but experienced difficulties putting this into practice. Therefore, just providing education on cat care might be inadequate to change participants' behaviour, whereas a structured intervention including a theoretical basis of human behaviour change could be more effective.

Keywords: cat, animal welfare, barrier, veterinarian, veterinary practice

OP13

The Effective Control of LPAI H9N2 in Malaysia

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ABSTRACT

Globally, low pathogenic avian influenza H9N2 (LPAI H9N2) poses a grave threat to the poultry industry. Since its first detection in 1966, understanding on its prevalence has remained limited due to its non-notifiable status. In Malaysia, the H9N2-Y280 Malaysian isolate was first reported in 2015 and has posed a significant threat to the local poultry industry, especially laying-type birds. If affected, laying birds would experience production losses, mortality, and reduced hatchability. Severity of disease is largely dependent on other complicating diseases such as infectious bronchitis (IB), *Mycoplasma gallisepticum* (MG), and Newcastle disease (ND). Additionally, no country that has detected the virus has been successful in eradicating it. Without meaningful strategies to prevent, control, or treat, LPAI H9N2 devastated affected flocks. Considering that this widespread disease would be virtually impossible to eradicate, and pose a continuous threat to national food security, a public-private strategy was devised using autogenous vaccine technology. Through expertise of the Department of Veterinary Services Malaysia, Veterinary Research Institute and Ceva Animal Health, a suitable virus master seed of H9N2-Y280 Malaysia Isolate (VRI/2148/2020/MY) was successfully identified, isolated, and produced into a killed autogenous vaccine for local use. Since the year 2020, this vaccine had been largely applied to layer and breeder type birds using the recommended program of two doses administered during the rearing stage. The findings of the disease surveillance and vaccine monitoring carried out between 2020 and 2021 in Malaysia proved definitively that the vaccine is safe and efficacious in controlling LPAI H9N2 in Malaysia, exhibiting no reported adverse reactions, and no reported cases of LPAI H9N2 since in vaccinated flocks. Despite its positive results, poultry producers are still anticipating a simpler vaccination program using innovative vaccines approaches in face of the current market challenges of labour constraints and increasing intensity of rearing.

Keywords: LPAI H9N2, laying-type birds, public-private strategy, autogenous vaccine, innovative vaccine

OP14

Malaysia Veterinary Surgeons - The Crossroad

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ABSTRACT

In veterinary surgery, it is important to conduct surgeries on animals in a sterile environment and manner, using sterilized surgical instruments and equipment. Applications of aseptic techniques in veterinary surgeries are obligatory with the increase standard of animal healthcare and welfare in Malaysia. A small survey was conducted among some of the veterinarians in Malaysia to grasp the common surgical practices at their respective practices. Based on that survey, there are less than 20% of the surgeons in Malaysia wear surgical gown for ovariohysterectomy procedure, and 60% of the surveyed veterinarians sterilized their surgical instruments and equipment using an autoclave machine. It is suggested that for the current and updated veterinary surgeons to adapt sterile surgical techniques and maintaining aseptic surgical procedures in veterinary patients in par with human surgical standards. By doing so, the field of veterinary surgery will be able to offer higher standards of veterinary care and prevent the potential for surgical site infections post operatively.

Keywords: veterinary surgery, sterility, surgeon ethics

OP15

Hematuria Detection: A Tool for the Early Detection and Monitoring of Feline Lower Urinary Tract Disease

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ABSTRACT

Feline lower urinary tract disease (FLUTD) is a condition that is relatively very common in cats. This condition has a very high recurrence rate where up to 50% of cats within the first year of diagnosis. Out of the many presenting signs of FLUTD, hematuria is seen in almost 90% of them. Considering hematuria is a significant indicator of FLUTD, the question of "Why not it be used as an important parameter to continuously monitor patients with current and history of FLUTD" comes up. Detecting hematuria in cats requires a urinalysis where urine samples for this can be obtained via several methods such as cystocentesis, urethral catheterisation, manual expression of the urinary bladder and "free catch" or urine collected from urine being natural voided by cats. However, although some of these methods have their own added advantage, they inherit a list of disadvantages. For example, it is not practical for routine/regular urine sample collection. In addition, it also requires a veterinarian/trained professional for the samples to be obtained, thus needing the patient to be brought to a veterinary clinic/hospital for sample withdrawal. Most importantly, it could induce significant stress and discomfort for these patients. Thus, identifying a method to detect hematuria in cats without obtaining samples in these tedious ways would be of great help. Royal Canin introduces Hematuria Detect, a home monitoring tool used to detect blood in cats' urine at the convenience of the pet and pet owner's home. This is a litter granule that only needs to be distributed onto the cats' existing litter material, where upon contact with urine that contains blood, it changes colour from white to blue. The tool can detect microscopic amounts of blood up to as low as 100 red blood cells / µL of urine containing blood. Hematuria Detect acts as a "red flag" indicator where pet owners would be triggered to seek professional help at the very early stage of the plausible FLUTD occurring or recurring in the patient.

Keywords: feline urinary tract disease (FLUTD), recurring, hematuria, urinalysis and continuous monitoring

OP16

Supporting Gilt Development With Hormones in an Environment With African Swine Fever

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ABSTRACT

In an environment with African swine fever (ASF), it is difficult to source disease-free replacement breeding females, also known as gilts. As a result, many producers may resort to using commercial fattening females as replacement animals to restart their swine herds. Compared to normal gilts, fattening females are observed to have poorer reproductive performance. Commonly observed issues are delayed puberty or prolonged anestrus. Poor reproductive performance in farms is associated with increased feed costs and other variable expenses associated with needing to carry additional non-productive breeding stock. To improve the estrus rate of fattening females, technical help such as hormones may be indicated. Follicle stimulating hormone (FSH) and luteinizing hormone (LH) act in concert to regulate the final stages of follicular development leading to ovulation. Since PMSG has biological properties similar to those of FSH, and HCG has properties similar to LH, it is physiologically appropriate to use these in combination to stimulate follicular growth in prepuberal gilts. This study was conducted in two farms in China. 206 over 160 day's age fattening females were randomly selected from 2 farms, 101 from farm A, 105 from farm B. The average boar exposure start age of the 2 group was 170d and 165d. All the females were treated with a 28 - day gilt development protocol which combined boar exposure, acute stress and hormone treatment. The result showed that proper gilt development protocol and the application of PMSG/HCG combinations can assist producers with getting good gilt heat rates, even in the situation of using fattening females as replacements. Some additional case studies of hormone use in ASF environments will also be included.

Keywords: African swine fever, hormones, reproduction, gilt

OP17

LOAD, COAST & Canadian Consensus on Canine Osteoarthritis (OA) Treatment: A Brief Update on Proactive OA Care

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ABSTRACT

Canine osteoarthritis (OA) is an inflammatory disease that affects the whole joint organ, causing articular cartilage loss and dysfunction. The resultant changes will eventually damage all components inside the joint, including a thicker joint capsule with inflammatory synovium and lower viscosity of the synovial fluid, cartilage and subchondral bone injury, and the formation of osteophyte. OA is estimated to impact around 20% of the adult dog population. It is a common disease that is usually managed in primary care practice. The etiology of OA is multifaceted, with both local mechanical and systemic and metabolic variables playing a role. The chronic and progressive nature of the illness makes management tough for doctors. It is because recognizing signs of OA-related pain can be challenging because they are always subtle and varied. Due to a lack of understanding, the owner may assume that the early changes in behavior are normal. Furthermore, therapy recommendations in the literature can be inconsistent and ambiguous, and clinical approaches frequently differ across veterinarians. Individual case response, which includes both patient and client variability, adds to the difficulty of formulating treatment plan options. Thus, there is a need for a rational complete staging tool for canine osteoarthritis (OA) that incorporates both pet owners in their home evaluation and integrating examination at the vet clinic. The development of Liverpool Osteoarthritis in Dogs (LOAD) as a clinical measurement instrument where owners could assess their dogs' mobility in 13 areas, combining the Canine OsteoArthritis Staging Tool (COAST) which was created by a collaboration of worldwide experts involved in small animal orthopaedics, anaesthesiology, and pain management tackles this issue directly in our method to evaluate canine OA. COAST promotes the creation of treatment guidelines by providing a uniform way to stage canine OA. As a result, a group of Canadian OA specialists, including board-certified surgeons, anesthesiologists, sports medicine and rehabilitation practitioners, pharmacologists, and general practitioners, has created consensus guidelines on OA treatment. The guideline is meant to help clinicians by providing clear, clinically relevant information about treatment options based on COAST-defined OA phases.

Keywords: canine osteoarthritis, COAST, LOAD, OA staging, canine OA consensus treatment guidelines, proactive OA care

OP18

Molecular Detection and Histopathological Evaluation of *Leptospira* spp. in Bovine Kidneys in Kota Bharu, Kelantan

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ABSTRACT

Leptospirosis is a bacterial disease which can affect both humans and animals. The disease is always associated with kidney problem that characterized by tubulo-interstitial nephritis, and tubular dysfunction regardless in humans or animals. The aims of this study were to detect the presence of *Leptospira* spp. in the bovine kidney samples and to evaluate histopathological changes related to the disease. A total of 50 bovine kidney samples were collected from four wet markets across the Kota Bharu area and the samples were tested using polymerase chain reaction (PCR) assay and analysed histopathologically. Overall, six (12%) samples were found positive with the detection of 16S rRNA gene, while one (2%) sample showed positive with the detection of LipL32 gene. The infected bovine kidneys were showed relevant histopathological lesions of bovine leptospirosis which consisting of interstitial nephritis, glomerular atrophy and tubular necrosis. In conclusion, this study demonstrated the presence of pathogenic *Leptospira* spp. in bovine kidneys sold in wet markets in Kota Bharu, Kelantan which caused a series of histopathological changes and may pose zoonotic potential to the public.

Keywords: *Leptospira* spp., kidney, bovine, zoonotic

Rapid Oral Presentation

RP01

Radiographic and Cast Impression Measurements of Skin Expansion Using Anisotropic Tissue Expander in Horses

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ABSTRACT

The tissue expansion technique is one of the most important innovations in skin reconstructive surgery in human and veterinary medicine. In this study, an anisotropic self-inflating hydrogel tissue expander was evaluated in horses' skin. Tissue expanders were implanted subcutaneously at three different anatomical locations; frontal, right shoulder, and right forelimb (dorsomedial region of the cannon). The expansion of the tissue expanders and the skin were measured and recorded at different time points for 28 days using radiographic and cast impression measurements. Radiographically, the diameter and height of the tissue expander were significantly affected by the assessment week ($P < 0.05$), especially during the first week after implantation. The radiographic findings were further corroborated by the findings of the cast impression method, which showed that the surface area of the implantation regions was increased by about 50.90 % at the frontal site, 32.23% at the shoulder site, and 110.64% at the forelimb site by the end of expansion period. The cast impression method also showed that the volume of expansion increased in all horses (n=3), about 288.74 % at the frontal site, 336.13% at the shoulder site, and 421.29% at the forelimb site, respectively, within four weeks. The radiographic and cast impression method offered quantitative measurement of the expansion rate of the tissue expander subcutaneously. We believe this study will help the equine veterinarian understand the expansion rate of the hydrogel tissue expander in the horse's skin. The tissue expansion technique is an excellent option when pursuing equine skin reconstructive surgery.

Keywords: skin expansion, anisotropic, radiographic, cast impression, horse

RP02

Diagnosis of Anthrax in Veterinary Research Institute, Malaysia

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ABSTRACT

Anthrax is an acute bacterial disease which primarily infects herbivores. *Bacillus anthracis*, spore forming Gram-positive bacteria is the main aetiological agent of the infection. The transmission to animals is either through ingesting spores or bitten by infected flies. In Malaysia, the first reported case of suspected anthrax infection in animals involved imported Siamese cattle in 1948, and most of the suspected anthrax received after that involved human cases mostly in consequences to the biological weapon attack incidence in America since the year 2001. This paper reports suspected anthrax cases diagnosed in VRI from cattle received by Veterinary Research Institute (VRI), Ipoh. Two cattle were found dead at the farm located in Selangor, presented with bleeding at body orifices. Preliminary morphological examination of blood samples revealed Gram positive and bacillus shape bacterium which is highly suspected of *B. anthracis*. Subsequently, bacterial isolation on nostril fluid, heparinised blood and soil samples collected from the site were conducted in VRI following biosafety level III procedures. Gram positive bacillus bacteria were isolated from soil (2 out of 5) and blood (1 out of 11) samples, while no bacterial growth was observed in nostril fluid samples. Based on colony morphology and conventional identification methods, all the isolates were identified as *Bacillus mycoides*. Further detection of *B. anthracis* virulence-associated genes, plasmid virulence (*pXO1*) and capsule (*pXO2*) were performed using polymerase chain reaction according to the OIE manual terrestrial standard, and results were found negative. Based on this finding, even though all the tested samples were found negative it is important to strengthen diagnostic capabilities for alarming disease control preparedness.

Keywords: anthrax, *Bacillus anthracis*, cattle

RP03

Molecular Identification of Unculturable Gut Bacteria From Goat Feces

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ABSTRACT

Gut microbiota (GM) plays an important role in animal health, nutrition, immunity, gene and metabolic regulations of its host is widely acknowledged in many studies. The gastrointestinal microbiome generally can be identified by using culture-dependent techniques and culture-independent techniques. However, culture-dependent techniques are insufficient as most of the gastrointestinal microbiota are unculturable on media. The purpose of the study was to identify the gut bacteria of healthy goats via a culture-independent approach by using rectal swab. A total of 15 goats from Universiti Malaysia Kelantan (UMK) Bachok Campus, Faculty of Veterinary Medicine Goat Farm were used. The animals were fed with pasture (cut and carry) and commercial pallet feed with ad-libitum water supply. Fecal samples were collected aseptically by using sterile cotton swabs containing amies transport medium with and without charcoal. Molecular detection was done by PCR amplification of the 16S rRNA segment with specific primers targeting Actinobacteria, Firmicutes, Bacteroides, and Proteobacteria species. Out of 30 samples for each phylum detection, isolates from samples were found to be positive for Firmicutes phylum (30 isolates, 100%), Bacteriodes (26 isolates, 86.6%) and Actinobacteria (23 isolates, 76.7%) , while negative for Proteobacteria phylum (30 isolates, 100%). These preliminary findings revealed that the Firmicutes phylum was the most abundant bacterial species in the goat's gut, while the Proteobacteria phylum was not present. The findings suggest that the fecal microbial community has a higher potential for determining the majority of taxa in the goat's gut and could moderately mirror the microbial structure in the intestine at the microbial population level with phylum specificity. However, more research is required because using feces as a proxy to study associations for microbial structure at individual microorganism levels may not be sufficiently descriptive.

Keywords: 16S rRNA, culture-independent approach, fecal, goat, gut microbiota

RP04

Aptamer As Detection Probe in Enzyme Linked Apta-Sorbent Assay (ELASA) for Detection of Recombinant Foot-and-Mouth Disease Virus Capsid Protein

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ABSTRACT

Foot-and-mouth disease (FMD) remains one of the most prominent pathogens of livestock as it shows high economic impact even after years of it being identified. FMD is highly transmissible across all cloven-hoofed animals and causes a high morbidity rate. Current detection methods using reverse-transcriptase polymerase chain reaction (RT-PCR) and immuno-based assay are tedious and not applicable across FMD virus serotypes. Rapid and specific testing across all serotypes is a necessity to detect FMD in cattle to prevent and control outbreaks in Malaysia. To overcome these drawbacks, a rapid diagnostic approach using aptamer-based testing has been developed through this study. A set of DNA aptamers has been designed to specifically bind to VP2 of FMD virus capsid protein. VP2 has shown to be a highly conserved area with 80% to 90% similarity across serotypes, hence the aptamers designed are able to detect across serotypes. The aptamers are tested against VP2 capsid protein that was constructed based on the VP2 sequence of serotype A, O and Asia 1. Recombinant VP2 capsid protein was constructed, expressed and purified to be used in enzyme-linked aptamer sorbent assay (ELASA) to test the ability of the aptamer to bind to the protein. This indirect ELASA showed a high sensitivity for the detection of the FMD virus. At optimised conditions, top three aptamers are able to detect as low as 10ng/ml with aptamer concentrations as low as 0.5 µM. These results suggest that the assay is a promising method that could be used for FMD virus detection in analysis laboratories.

Keywords: aptamer, foot and mouth disease virus (FMD), ELASA

RP05

Simple Cloud-Based Google Worksheet as Initiatives to Develop Agropreneurs Toward Digital Technology in Livestock Production

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ABSTRACT

Farm data is the key to efficient and sustainable production for any livestock enterprise. One of the major weaknesses in local livestock production is the lack of proper data recording and assessment. Most livestock farms do not practice data recording and even those who do collect data manually, hardly use it for assessing overall farm productivity. This can be partially associated with the labour required for data entry and skills for analyses. The utilization of digital technology in livestock management has increased exponentially over the recent years. Most of these are expensive proprietary systems from developed countries, which are quite expensive and difficult to adopt locally. Nevertheless, there are free tools available, such as Google Worksheets, that can be innovated for farm data recording. A simple cloud-based Google worksheet for goat/sheep, beef cattle, dairy cattle, and rabbit production farm data recording system was custom developed based on local farm requirements. The system developed can be assessed using a smart mobile phone therefore no need for any additional equipment acquisition. Under a training program by the Department of Veterinary Services State Selangor (DVSSEL), a total of 60 livestock farmers were trained on the development and use of this system. The training was conducted both online and through workshops in 5 batches (Year 2020-2022). The system's basic data includes data such as animal ID, breed, body weight, health management, breeding records, and sales records custom-designed to farm capability. The system also does an automatic data analysis and generates a farm productivity dashboard. Following a series of training, farmers were able to grasp the concept of digital farm data recording and the benefits of automated analytics via automated performance dashboards. In fact, these agro entrepreneurs were even able to develop their own custom Google worksheets for use on their farm, demonstrating the success of deploying simple farm digital tools. With the success of this simple cloud-based farm recording system, DVSSEL plan to deploy more locally developed farm digital tools such as an RFID-based identification system, apps with a data management system, and feed formulation systems as an integrated approach in the near future.

Keywords: cloud-based Google, livestock farm, digital tools, management system, DVSSEL

RP06

Surgical Treatment and Outcome in Two Dogs With Caval Syndrome

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ABSTRACT

Canine heartworm *(Dirofilaria immitis)* is a vector-borne filarial nematode which resides in the pulmonary arteries. In caval syndrome, the heartworms migrate retrograde to the right ventricles, right atrium, and vena cava due to altered right heart haemodynamic and/or heavy worm burden. Subsequently, the heartworms partially or completely occlude the closure of tricuspid valves, causing right-sided heart failure. Dogs with caval syndrome presents poor prognosis and high mortality due to systemic hemodynamic impairment and multiple organ damage. By contrast, surgery represents a feasible life-saving approach to remove the heartworms and hence obstruction. The presentation discusses surgical treatment and outcomes in two dogs in Malaysia. The first case is 5-year-old mongrel bitch presented with severe ascites and tachypnoea. Radiography, abdominocentesis and fluid analysis, haematology, serum biochemistry, heartworm antigen test, electrocardiography, and echocardiography demonstrated right-sided congestive heart failure due to caval syndrome, atrial tachycardia, and pulmonary hypertension. After a few days of stabilization, jugular catheterization was carried out under general anaesthesia to remove seven heartworms. The dog also received heartworm treatment in accordance to the guidelines by American Heartworm Society (AHS), and other cardiac medications to control the right-sided heart failure at the present.The second case is a 6-year-old male miniature Schnauzer presented with dyspnoea and coughing. Complete diagnostic work-ups showed pulmonary hypertension due to caval syndrome. The dog underwent surgery in which three heartworms were removed and medical treatment in accordance to the guidelines by AHS. Subsequently, it also received two injections of mesenchymal adipose-derived stem cells as regenerative medicine. Gradually, the sildenafil medication was discontinued. At the present, it is free of clinical signs. In conclusion, surgery should be offered as a life-saving treatment for dogs with caval syndrome in Malaysia's veterinary practice, despite the presence of some limiting factors.

Keywords: caval syndrome, canine heartworm, heartworm extraction, pulmonary hypertension, right-sided heart failure

RP07

Molecular Survey on Rural Dogs as Potential Sources for Canine Distemper Virus in Johor, Malaysia

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ABSTRACT

Canine distemper virus (CDV), a virus belonging to the family *Paramyxoviridae*, genus *Morbillivirus*, is a pathogen infecting carnivores with high morbidity and eventually causing mortality to the host. A recent case of a dead Malayan Tiger reported positive with CDV in Dungun, Terengganu and a sighting of a dead tiger in Mersing, Johor suggested a possible emergence of the virus in Peninsular Malaysia, hence the need for a prevalence study to identify the source origin of the virus in this region. CDV is commonly reported in dogs, and it is imperative to determine their role as potential reservoirs for the virus, which would cause a spillover infection to the surrounding wildlife, specifically the Malayan Tiger. This study used pooled conjunctival and nasal swab samples from 14 free-roaming plantation guard dogs within 30 km of the area bordering the forest reserve in Mersing, Johor. A molecular approach using reverse-transcriptase polymerase chain reaction (RT-PCR) targeting the H gene of CDV was performed to identify the presence of the virus. The result showed that all 14 dogs were tested negative for CDV, indicating these dogs were probably not the reservoir of CDV and could not transmit the virus to wildlife. However, further investigation utilising serological assay is warranted to exclude these dogs as the potential source of CDV transmission to the wildlife. Moving forward, the continuation of this prevalence study in the area of tiger sightings and/or CDV-positive tiger cases is suggested to determine the risk of transmission of the virus from wild and domesticated dogs to the Malayan Tigers. Hence, preventive measures can be taken to control disease transmission, thus assisting conservatory strategies of Malayan tigers in Malaysia.

Keywords: canine distemper virus, dogs, molecular, RT-PCR, Malayan tiger

Poster Presentation

PP01

A Pandemic Extraintestinal Pathogenic *E. coli* (ExPEC) ST410 and other Concurrently Carbapenem and Colistin Resistant and Extended Spectrum Beta-lactamase Producing *Escherichia coli* Isolated from Chicken in Kelantan, Malaysia

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ABSTRACT

The rising antimicrobial resistance (AMR) in human and animal health and agriculture has become a persistent and concerning global challenge in recent years. Several contributing factors have been identified for the emergence and spread of AMR including imprudent use of antibiotics in human and animal health and the use of antibiotic growth promoters in livestock production. This study was conducted to investigate extended-spectrum beta-lactamase-producing *E. coli* (ESBL-EC), and colistin and carbapenem resistance (CRE-EC) from live broiler chicken and chicken meat in Kelantan, Malaysia. Among the *E. coli* isolates, 37.5% (27/72) were positive for at least one of the resistance genes and one isolate was positive for *mcr-1*, *blaTEM-52*, *blaNDM*, and *blaOXA-48* whereas 4.17% (3/72) and 2.78% (2/72) were positive for *mcr-1*, *blaTEM-52* and *blaOXA-48*, and *mcr-1*, *blaTEM-52* and *blaIMP*. Multilocus sequence typing (MLST) results revealed the presence of widespread *E. coli* strains belonging to the sequence types ST410 and ST155 and other extra-intestinal *E. coli* (ExPEC) strains. Phylogroup A made up the majority 51.85% (14/27) followed by phylogroup B1 22.22% (6/27). The findings imply the potential threats of these multidrug-resistant *E. coli* and other pathogens that may spread from and through livestock to humans and pose more challenges in treating infections caused by these pathogens. Nevertheless, further comprehensive studies are required to determine the actual prevalence, antimicrobial resistance, virulence, predisposing factors, and other epidemiological variables that may help in having a better understanding and risk assessments of ESBL-EC, CRE-EC and colistin-resistant *E. coli* from chicken and other food animals in the study area and at the national level.

Keywords: ExPEC, ESBL, CRE, antimicrobial resistance, food animals, public health, food safety

PP02

Surveillance of SARS-CoV-2 in Multispecies Animals in Malaysia from 2020 - 2021

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ABSTRACT

COVID-19 has become a pandemic globally, including Malaysia, affecting the human population. The aetiological agent SARS-CoV-2 is from the family *Coronaviridae*. However, the incidence of SARS-CoV-2 in Malaysia in animals is still unknown. The first case of SARS-CoV-2 was reported in Wuhan, China, and it was reported to have originated from the exotic animals used for human consumption at the Huanan seafood market. In addition, a positive case of SAR-CoV-2 was reported in tigers and lions at New York's Bronx Zoo in April 2020. In 2021, a positive case of SARS-CoV-2 was also reported in farmed mink in the Netherlands. Hence, it is necessary to develop baseline data to aid in taking precautionary measures or possibly in future planning for the surveillance of animals. This study aimed to determine the occurrence and distribution of SARS-CoV-2 in the multispecies animals. The studies involved various samples, including 18 lungs, 12 nasal swabs and 109 blood in EDTA tubes from various animal species, including deer, goat, cattle, bird, fish, rabbit, frog, gaur, leopard cat, bear, buffalo, goose, guinea pig, monkey, ostrich, pangolin, parrot, peacock, squirrel, tapir, tiger and white tight surili. All samples were collected between June 2020 to June 2021 and were tested using real-time PCR according to standard protocols. The result indicated that none of the tested samples was positive for SARS-CoV-2. Through observation, most of the animals tested did not show any clinical symptoms of SARS-CoV-2. In conclusion, all the samples tested were negative against SARS-CoV-2 by real-time PCR. There is a need to establish surveillance systems at the continental and global scales. This is evident in the last few decades due to animal disease epidemics caused by the transboundary spread of infectious agents and to substantiate the rationale of preventive measures in assuring trading partners regarding SARS-CoV-2 in the animal.

Keywords: COVID-19, SARS-CoV-2, *Coronaviridae*, multispecies, Malaysia

PP03

A Preliminary Survey on Haemorrhagic Septicaemia Vaccine, and Satisfaction Among Farmers in Malaysia

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ABSTRACT

Malaysia has a population of cattle and buffaloes at 659,317 heads and 100,242 heads in 2020 which contributed to RM 1,595 million to our country. Haemorrhagic septicaemia (HS) is a disease caused by *Pasteurella multocida* serotypes B: 2, and causes fatal septicaemia with high mortality in cattle and buffaloes. Vaccination of animals is the most common and easy practice against haemorrhagic septicaemia (HS). A preliminary random online survey was conducted among 25 farmers of different sex, ages, and race from Terengganu, Negeri Sembilan, Kelantan, Selangor, Perak, Johor, Melaka, Sarawak, and Kedah regarding their knowledge, the importance of HS vaccination in animals and satisfaction on VRI vaccines. Of 25 farmers who responded, our results showed that 80% (n=20) have heard about Haemorrhagic Septicaemia (HS) disease before, 100% (n=25) agree on the importance of HS vaccination, and 84% agree that HS could cause death in livestock, 8% unsure while 16% don't. They generally had good knowledge and awareness of vaccines, none were found vaccine-hesitant. Unfortunately, only 10 out of 25 (40%) respondents have used HS vaccines produced by VRI. Among the farmers that had used the VRI vaccine, 100% were satisfied with the vaccine efficacy including the side effects if any and 90% agree that it is easy to use the HS vaccine. Factors that influence farmer's satisfaction with HS vaccine are easy to keep and use, have no side effects, vaccine information is clear on the packaging, and stock availability. There were no significant differences in vaccine knowledge and awareness in those from different education levels. This study revealed usage of HS vaccines produced by VRI is still low among farmers in Malaysia. Further work should be conducted to investigate the predisposing factors which influence farmer's preferences, to increase the number of respondents that have used the VRI vaccine, conduct statistical analysis as well as create awareness about HS vaccines produced by VRI.

Keywords: haemorrhagic septicaemia (HS), vaccine, vaccination

PP04

Evaluation of Serum Amyloid A and Interleukin-6 as Potential Therapeutic Biomarkers of Mannheimiosis in Goats

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ABSTRACT

Mannheimiosis is a common respiratory disease in goats, mainly when the animals are immunocompromised. Till now, the study on the therapeutic biomarkers of mannheimiosis in goats is scarce. The study aimed to evaluate the expression of serum amyloid A (SAA) and interleukin-6 (IL-6) levels in experimentally induced mannheimiosis in goats that received antimicrobials and anti-inflammatory drugs. Twenty male goats were divided into five groups (n=4). All groups except group 1 (negative control) were inoculated intranasally with *Mannheimia haemolytica* (10^7 CFU/ml). Goats in group 2 were identified as the positive control. Goats in groups 3 and 4 were treated with an antimicrobial (Oxytetracycline, SID) on days 6 and 9 of post-infection and an anti-inflammatory drug (Flunixin meglumine, BID) for 5 days of post-infection, respectively. Meanwhile, goats in group 5 received both treatments. Blood samples were collected via jugular vein at 24 hours, days 5, 9, and 11 of post-bacteria inoculation for the analysis. Post-treatment results revealed a significant reduction ($p<0.05$) of SAA levels in the treatment groups (groups 3, 4, 5) on days 9 and 11 post-treatment compared to the positive control (group 2). The IL-6 levels post-treatment revealed a significant ($p<0.05$) decrease in groups 3 and 5 on day 9. On day 11, the levels of IL-6 were lower in groups 4 and 5 compared to groups 2 and 3. These findings demonstrated that serum Amyloid A (SAA) and interleukin-6 (IL-6) could be utilized as potential therapeutic biomarkers of mannheimiosis in goats.

Keywords: acute-phase proteins, cytokines, biomarkers, treatments, mannheimiosis

PP05

Reovirus Infections Cases Diagnosed in Veterinary Research Institute Malaysia From Year 2015 to 2021

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ABSTRACT

Avian reovirus (ARV) infections among avian species have caused significant clinical disease and economic losses. Most of the ARV-infected birds suffered from severe arthritis, tenosynovitis, pericarditis and depressed growth or runting-stunting syndrome (RSS). This study reports on ARV cases diagnosed in the Avian Virology Section, Veterinary Research Institute (VRI) from the year 2015 to 2021. A total of 13 positive ARV cases were recorded from total of 233 cases diagnosed in VRI. Results showed that 2017 has the highest positive cases (n=4), followed by 2015 (n=3), 2019 (n=2) with 2016, 2018, 2020 and 2021 recorded as a single case. Of the total positive cases, 6 cases were referred cases sent by the regional laboratories to VRI for confirmation. Based on the information provided in the case sheet and history, the usage of vaccine is in place. Sequence analysis performed on the selected ARV cases showed that the positive ARV was vary compared to the vaccine strain. Therefore, further studies on the prevalence of ARV need to be conducted to understand the disease status in Malaysia, whereby the vaccine effectiveness against field ARV strains can be evaluated and justified.

Keywords: avian reovirus (AVR), prevalence, economic losses, vaccine

PP06

Blackhead Disease in Turkey: A Case Report

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ABSTRACT

Blackhead disease was reported in many countries affecting poultry industries. The causal agent was identified as *Histomonas meleagridis*, a parasitic protozoan that infects a wide range of birds including turkey. Blackhead disease causes high mortality in turkeys, sometimes approaching 100% of a flock. This paper describes a case report of blackhead disease infection in a small farm in Perak. The farm has a total population of 20 turkeys which age about 1 month old. Fifteen out of twenty birds showed symptoms such as diarrhoea, emaciated, reduced appetite and mortalities. As a result, a carcass was submitted for post-mortem examination as well as for additional diagnostic testing for virology, parasitology, bacteriology and histopathology. Suitable samples were collected for further diagnostic testing. Fresh liver was sent to the parasitology laboratory for parasite detection and identification. Organs such as liver, lung, kidney, heart and spleen were sent to virology and bacteriology laboratories for leukosis, mycosis and tuberculosis detections. For histopathological testing, liver sample was fixed in 10% formalin and histological tissue was stained with haematoxylin and eosin (HE). During post mortem investigations, multifocal nailhead pattern was observed on the liver in which each measuring roughly 2-3 cm in diameter. The lungs were congested and a pasty vent was observed. During parasite identification, an impression smear was positive for *Histomonas* sp, whereas virology testing was negative for leukosis virus and bacteriological testing was negative for tuberculosis and mycosis. Aside from that, multifocal hepatic necrosis with numerous trophozoites, and infiltration of inflammatory cells with numerous multinucleated giant cells were observed from the liver sample. Thus, this case was concluded as histomoniasis based on the history, lesion findings and laboratory results.

Keywords: liver, histomoniasis, turkey

PP07

Pathological Characteristics of Classical Swine Fever and African Swine Fever in Domestic Pigs in Northern Vietnam

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ABSTRACT

Classical swine fever (CSF) is an endemic disease in southeastern Asia and one of Vietnam's most important swine diseases. This study was conducted to characterise the pathology of natural infection of CSF in northern Vietnam in 2018 and their genetic prevalence. A total of ten representative pigs were collected from four provinces during five outbreaks and examined pathologically. The gross and histopathological findings showed the disease was expressed as the acute or the subacute to the chronic form of CSF, depending on the age of the animals. The most consistently observed lesions associated with infection by the CSF virus (CSFV) included lymphoid depletion in tonsils, lymph nodes and spleen; histiocytic hyperplasia in the spleen; cerebral haemorrhage; perivascular cuffing in the brain; renal erythrodiapedesis; urothelial vacuolation and degeneration; and interstitial pneumonia. The immunohistochemical findings showed a ubiquitous CSFV antigen in the monocytes/macrophages and the epithelial and endothelial cells in various organs. CSFV neurotropism was also found in the small neurons of the cerebrum and the ganglia of the myenteric/submucosal plexus. Analysis of the full-length envelope protein (E2) genome sequence showed that all strains were genetically clustered into subgenotype 2.5, sharing a nucleotide identity of 94.0-100.00%. Based on the results of this study, the strain was categorised as a moderately virulent CSFV. African swine fever (ASF), a disease newly emerged in Vietnam in early 2019, is currently considered endemic and poses a continuing severe threat to the swine industry. A histopathological study of clinical samples collected during the May to July 2019 outbreak of ASF was performed to determine the characteristic lesions. We analyzed samples from eight ASFV-infected farms. Histopathological results revealed the characteristic lesions of the acute to the subacute clinical form of ASF. Immunohistochemical results showed ASFV viral antigen distribution in mononuclear cells/macrophages in various organs, hepatocytes, and renal tubular epithelium. Molecular analysis of partial capsid protein 72 genes revealed genotype II ASFV strain.

Keywords: African swine fever (ASF), genotype II, classical swine fever (CSF), natural infection, pathology

PP08

Parasites of the Edible-nest Swiftlet, *Aerodramus* sp. in Perak, Malaysia

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ABSTRACT

A study was carried out to investigate the presence of internal and external parasites of the edible-nest swiftlet, *Aerodramus* sp. in urban and agricultural land in Perak, Malaysia. The urban locations represent the samples taken from town and city areas and the agricultural land represent samples collected from areas located outside towns or in the plantations. A total of 94 swiftlets were examined from both urban and agriculture land. Seventy-eight birds were collected from ranching premises and 16 wild-caught birds from Perak comprising adults and juveniles of both sexes were examined for ecto-parasites, endo-parasites and haemo-parasites. Ninety edible-birdnest (EBN) were also examined for ecto-parasites. Blood samples were collected from a total of 64 birds; 16 blood films were made and 48 blood samples were spotted onto FTA® paper and tested using polymerase chain reaction (PCR) method. From the 48 birds, 22 birds were from the urban area and 26 birds were from agricultural land areas. PCR results showed 46 out of 48 blood samples (95.84%) were positive for blood parasites. All positive PCR products were sent for DNA sequencing and confirmation. A total of 46 blood samples were positive for *Haemoproteus columbae* (95.84%) and one sample was positive for *Plasmodium* sp. (2.09%). Fifty-seven fresh faeces were collected from the bird and examined for intestinal protozoa, coccidia oocysts, ova and larvae using direct faecal smears revealed absence of intestinal protozoa, coccidia oocysts, ova or larvae. There were three species of cestodes recovered from the bird samples. They were *Pseudochoanotaenia* sp., *Pseudangularia* sp. and *Neoliga* sp. The nematode was identified as belonging to the Order Spirurida. Two species of trematodes were identified from the samples namely *Prosthogonimus* sp. and *Plagiorchis* sp. Ecto-parasites were also collected for identification. A total of 11 mite species found on the birds were Cheyletiellidae, cf. *Laminalloptes* sp. (Type 1), cf. *Laminalloptes* sp. (Type 2), cf. *Dubininia* sp., *Ornithonyssus bursa*, cf. *Pterodectes amarochalinus*, cf. Acaridae, cf. *Cheyletus* sp., cf. Rhinonyssidae (*Ptilonyssus* sp.), cf. Laelapidae and *Cheyletus* sp. The nests contained the same types of mites except for cf. Acaridae, cf. Rhinonyssidae (*Ptilonyssus* sp.) and *Cheyletus* sp. All lice found on the birds and in the nest were identified as the genus Dennyus. Neither ticks nor fleas were recovered from the birds or the EBN. The study revealed no significant relationship between the locations (urban and agricultural land) and occurrence rate of parasitic infestation in edible-nest swiftlet, *Aerodramus* sp. in Perak ($P>0.05$).

Keywords: edible-nest swiftlet, *Aerodramus* sp., ecto-parasites, endo-parasites, blood parasites

PP09

Distribution of Avian Infectious Bronchitis (IB) Diagnosed in the Northern Region of Malaysia From Year 2017 to 2021

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ABSTRACT

Data over five years were analyzed for infectious bronchitis virus (IBV) isolated from poultry samples from the northern region of Malaysia and submitted to the Makmal Veterinar Zon Utara at Bukit Tengah, Malaysia (MVZU) for diagnosis. IBV belongs to the *Coronaviridae* family and is also a member of the genus *Gammacoronavirus* which is a poultry pathogenic coronavirus that can cause avian infectious bronchitis (IB) disease worldwide. A total of 60 suspected IB cases were tested by the Virology Section, MVZU between the years 2017 to 2021. IB virus has been tested by reverse transcriptase-polymerase chain reaction (RT-PCR) technique using universal oligonucleotides UTR1 & UTR2 corresponding to sequences within the 3' untranslated region (UTR) of the genome and nested polymerase chain reaction (PCR) technique by using oligonucleotides UTR3 & UTR4 which was internal to oligonucleotides UTR1 & UTR2. About 21 cases (34.99%) from a total of 60 suspected IB in poultry samples were positive for IBV. Among the bird species, chickens are more likely infected with IBV, whereas both broiler chickens and indigenous chickens are highly susceptible to this disease. Although for the past two years there was no detection of IBV, yet awareness of the existing IBV among different bird species from overall cases indicates the importance of strict management procedures, proper management programmes, and immunization of chickens in Malaysia.

Keywords: infectious bronchitis virus (IBV), birds, chicken, poultry, biosecurity

PP10

Evaluation of Treatment Protocols for Hoof Horn Lesions and Their Impact on Recovery Rates, Lying Down and Feeding Behaviour in Moderately Lame Dairy Cows

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ABSTRACT

Lameness resulting from hoof horn disruptive lesions (HHDL) remains a welfare concern in dairy cows. This study aimed to evaluate various treatment protocols for HHDL and their impact on recovery rates, feeding and lying behaviours in first parity cows. The study entailed a randomised clinical trial involving five groups of moderately lame cows (n = 81): Group A (therapeutic trim + administration of ketoprofen + hoof block), Group B (therapeutic trim + hoof block), Group C (therapeutic trim + ketoprofen), Group D (therapeutic trim only), and Group E (non-lame cows receiving only maintenance trim). The enrolled cows were observed weekly until day 28 after treatment. Group A had the highest recovery rate (75%; 15/20, $P < 0.05$) compared to Group D (40%; 6/15). Groups A and E spent lesser time lying down ($P < 0.05$) compared to other treatments. Time spent at the feed bunk was highest in Group E ($P < 0.05$) and lowest ($P < 0.05$) in Groups C and D. Hence, treatment protocols for hoof horn lesions affected both the lameness recovery rate and short-term behaviours in moderately lame cows. These results suggest that combined therapy involving therapeutic trim, hoof block application, and administration of ketoprofen was more effective for the management of moderately lame cows affected with HHDL. The treatment protocols also influenced feeding and lying behaviours before recovery.

Keywords: lameness, hoof horn lesions, feeding, lying down, animal welfare

PP11

Aflatoxin Awareness Among Dairy Goat Farmers in Johor

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ABSTRACT

Aflatoxins are produced primarily by fungi, *Aspergillus flavus* and *Aspergillus parasiticus*. Studies on aflatoxins in Malaysia are mostly considered contaminants to human food, but there is scarce information on feeds. Moreover, no study has been conducted to evaluate the awareness of aflatoxins among farmers, especially among ruminant farmers. The survey on aflatoxins awareness among dairy goat farmers in Johor was carried out to obtain data and create awareness among the farmers through the questionnaire method. This study was conducted in collaboration with the District Veterinary Office of Kluang, Batu Pahat, Pontian, Kulai and Johor Baharu. A survey on aflatoxins awareness among dairy goat farmers in Johor was conducted by prepared a questionnaire containing 20 different questions. Eighteen questionnaires were collected and a total of five districts were covered to collect the data. Among the five districts, seven questionnaires were collected from Kluang, six from Batu Pahat, one from Pontian, two from Kulai and two from Johor Baharu. There are no specific criteria in the selection of dairy goat farms studied, as all dairy farms registered under the District Veterinary Office are the respondents of this study. All collected data were imported into Microsoft Excel 2010 (Microsoft, Redmond, WA, USA) and analysed using IBM SPSS Statistics V21.0. In this aflatoxins survey, it has been observed that only 39% of farmers are aware of aflatoxins, therefore it is a need to make the remaining 61% of farmers aware of aflatoxins and problems caused due to consumption of aflatoxins by livestock. This study gives only a brief overview of the knowledge of farmers in the state of Johor about aflatoxins. Further studies with sample analysis are necessary to obtain a clearer picture of the presence of aflatoxin contamination in feed and milk samples. In addition, by providing awareness to the community, especially farmers, about the harmful effects of fungal and aflatoxin contamination, it is hoped to be able to prevent food contamination in the food chain.

Keywords: aflatoxin, awareness, ruminants, farmers

PP12

Avibacterium paragallinarum Diagnosis in VRI From 2012 to 2021

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ABSTRACT

Infectious coryza and mycoplasmosis commonly infect avian and both diseases are highly similar clinical signs. These include nasal discharge, facial swelling, lacrimation, anorexia, and diarrhea. Decreased feed and water consumption retards growth in young stock and reduces egg production in laying flocks. Yearly, VRI receives an unpredictable number of samples for infectious coryza diagnosis with significant clinical signs. Furthermore, there is limited data on infectious coryza reported in Malaysia. These data will present the total cases of infectious coryza received in VRI from the year 2012 till 2021 with positive cases based on conventional isolation and identification as well as haemagglutination agglutination (HA) testing. The total number of cases received from 2012 to 2021 was 362 cases. The highest number of cases found was in the year 2016, with 140 cases. Based on the isolation method, one positive case was reported in the year 2012 and one case in 2016 involving clinical samples. On the other hand, two positive cases were found in the year 2015 using HA testing. Based on this finding, the occurrence of infectious coryza mediated by *Avibacterium paragallinarum* is thus present in Malaysia. Since the clinical signs are similar to *Mycoplasma* infection, it is recommended to screen for both diseases to identify the source of infection in the poultry farm thus the best treatment can be applied.

Keywords: *Avibacterium paragallinarum*, diagnostic data, avian

PP13

Filariasis in Cattle: A Case Report

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ABSTRACT

Filariasis is a vector-borne parasitic disease of domestic animals caused by the filaroid nematodes. The most economically important filariod nematodes in cattle are *Setaria digitata*, *Setaria labiatopapillosa*, *Setaria marshalli*, *Onchocerca gibsoni*, *Onchocerca gutturosa*, *Onchocerca armillata*, *Onchocerca lienalis*, *Onchocerca ochengi*, *Parafilaria bovicola and Stephanofilaria* spp. This paper describes a case of filariasis in a cattle farm located in Terengganu. The total population of cattle were 700, managed under an extensive system and fed with pellet. The cattle were vaccinated against foot and mouth disease (FMD) and lumpy skin disease (LSD); and drenched with anthelmintic. The cattle exhibited symptoms of pale mucous membrane, body condition score (BCS) of 1.5/5 and having subcutaneous nodular lesions around 5 cm in diameter on dorsal parts of the body (i.e. around neck, shoulders and sides of the body). Three cattle were transferred from a farm in Terengganu to Ipoh, Perak on 30th March 2022. Blood samples were collected on the same day of arrival and tested with complete blood count (CBC), thin and thick blood smear, and buffy coat method to detect blood parasites. CBC results revealed 1 out 3 samples had low PCV level which was 22.2%. The microscopic examination of buffy coat method revealed high burden of microfilaria which indicates a positive case of filariasis. However, no microfilaria were detected from the blood smears. Ivermectin was given subcutaneously with a dose rate of 200 µg/kg weekly for three weeks. The prognosis of this case was good as the cattle was responsive to the treatment and no microfilaria was found a week after the ivermectin treatment. Based on the clinical signs, microscopic examination of buffy coat and successful treatment of ivermectin, this case was diagnosed as filariasis.

Keywords: filariasis, anaemia, nodular lesion, microfilaria, microscopic examination (ME), buffy coat method, ivermectin

PP14

Determination of Milk Quality by Detecting Total Dissolved Solids in Fresh Cow's Milk From the Year 2019-2020

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ABSTRACT

Total dissolved solid (TDS) is one of the established methods in determining the solid content in milk to ensure the quality of fresh milk. Low TDS content may impair the quality of the milk. Therefore, the objective of this study was to examine the quality of milk produced by dairy farmers from four Milk Collection Centre (MCC) in Perak based on the milk's TDS content. A total of 4215 fresh cow's milk samples was collected at MCC and processed at Veterinary Research Institute (VRI) for grading assessment (Grade A, B and C). Analysis of this study reveals that 44.6% of raw milks that received from four MCCs are graded as Grade A, followed by 36.7% as Grade B, and 18.6% as grade C. PPIT Sg. Siput has the highest percentage of total samples with Grade A (69.2%) whereas PPIT Tapah has the highest percentage of total samples with Grade B (48.4%) followed by PPIT Parit (47.1%). PPIT Tapah has the highest percentage of total samples with Grade C (30.4%) followed by PPIT Taiping (25.9%). This study indicated that the milk produced by dairy farmers in Perak was quite a good quality and yet there is still a need for improvements in providing a constantly high quality of milk. For instance, dairy farmers produced Grade C milk need continuous training and monitoring to improve the quality of milk. In conclusion, all dairy farmers need to be educated on the importance of producing good quality milk as it could give better incentives.

Keywords: total dissolved solid, grading assessment, dairy fresh milk, milk quality, Perak

PP15

Histomorphological Differences of Rumen Mucosae of Swamp Buffaloes Raised Under Semi-intensive and Extensive System Production System

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ABSTRACT

Feed intake and production systems may influence the morphology of the digestive system in ruminants. We hypothesized that swamp buffalo raised under different production systems would develop different micro-morphology rumen mucosa. An observational study investigated the micro-morphology of swamp buffalo's rumen mucosa raised under semi-intensive (SI) and extensive system (EX) production systems. Mature males swamp buffalo with the age of 24 months old were raised under SI and EX systems. The buffalo's ventral and dorsal regions of the rumen mucosae were obtained from each group. They were evaluated macroscopically for papillae length and width, surface area, density, and squamous epithelium (SSE), muscle, and keratin thickness. From the observation, the SSE layer on the dorsal region of the EX group's rumen was thicker than the SI group (P,â§0.05). However, within the EX and semi-intensive groups, the SSE of the dorsal region of the rumen was thicker than the ventral region (P,â§0.05) in the EX group. In contrast, the ventral region of the rumen was thicker than the dorsal region in the SI group. The thickness of the keratin layer in the EX-group was more significant than in the SI-group (P,â§0.05) only in the dorsal region. This study supports the hypothesis that the micro-morphology of rumen mucosae was different in swamp buffaloes that were raised under SI and EX systems.

Keywords: production system, rumen mucosae, swamp buffaloes

PP16

Review on Epidemiology, Milk Composition Changes, and Antimicrobial Susceptibility of Bubaline Mastitis in Asia

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ABSTRACT

Mastitis is one of the diseases in dairy buffaloes that causes economic losses worldwide due to the reduction in milk yield, the increase in the spread of mastitis, and the high cost of treatment. Although antibiotics are the mainstay treatment for this disease, their overuse has led to the emergence and increased occurrence of antimicrobial resistance (AMR) in animals and humans. Hence, this study aims to review and assess available literature on the epidemiology, milk composition changes, and antimicrobial susceptibility of causative agents of bubaline mastitis in Asia. The prevalence of subclinical mastitis in dairy buffaloes was higher than clinical mastitis in dairy buffaloes, especially in India and Pakistan. The majority of cases of mastitis in Asian countries were detected by using California mastitis test (CMT), surf field mastitis test (SFMT), somatic cell count (SCC) and bacteria culture. The risk factors of bubaline mastitis in Asia were mainly farm management, including improper milking handling and host factors such as stage of lactation, age and position of quarters. Mastitis in buffaloes caused alteration in milk composition, such as increasing lactose levels, somatic cell count, and the presence of bacteria in the milk. However, variation in protein level, fat level, and solid non-fat level were also affected by other factors such as stage of lactation, breed, and age. The most prevalent isolated bacteria in bubaline mastitis milk samples were coagulase-negative *Staphylococcus* spp. (CNS), *Staphylococcus aureus*, *Streptococcus* spp. including *Streptococcus agalactiae* and *Streptococcus uberis*, and *Escherichia coli*. Most of the bacteria showed high resistance towards penicillin, amoxicillin, ampicillin, and streptomycin except for cefoxitin (Gram-positive bacteria), and ceftriaxone (Gram-negative bacteria). The antimicrobial susceptibility of causative agents in Asia varies depending on the usage of common antibiotics to treat bubaline mastitis in each country. This review will help to understand bubaline mastitis better, although studies are limited in many Asian countries.

Keywords: bubaline mastitis, epidemiology, milk composition, antimicrobial resistance (AMR), Asia

PP17

E-Ternak: An Online System for Veterinary Movement Control in Livestock Industry During COVID 19 Pandemic

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ABSTRACT

The Malaysian government led by Tan Sri Muhyiddin Yasin had announce the implementation the Movement Control Order (MCO) on 18th March 2020 due to the novel coronavirus (COVID-19) pandemic that has spread and killed thousands of people. This restriction was implemented to prevent the spread of the virus in this country. At the same time, the government needs to make sure that the food chain supply is available and delivered to people all over the country. To do that, some methods of approval and monitoring of the essential service provider are required. Besides the standard operating procedures, a clear workflow for this service needs to be provided to register and obtain approval prior to operation, which typically begins with manual forms. This paper will cover the transition from manual forms to an online automation system. The system is integrated with DVS epermit2 system that contains details such as premises, owners, and animal registration to ease the verification. This system has been used to replace the manual forms until the end of MCO restrictions.

Keywords: movement control order, online application, QR code technology, Covid-19

PP18

Malaysian Free Roaming Dogs: Do We Really Know How to React to Them

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ABSTRACT

Free-roaming dogs (FRDs) is defined as a family of dogs that stays in one community together and are not confined to a yard or house. Dogs, in general, have a strong sense of identifying how we react towards them as they are capable of sensing if we are fearful, calm or friendly towards them. The current Malaysian FRDs project completed concurrently in Penang and Perak in 2019 and 2021 indicated that many respondents had misconceived how to react to dogs' reactions in different scenarios. In this survey, respondents were requested to answer four questions involving different movements of dogs, which included running, chasing, jumping and barking. The Penang FRDs project results revealed that 64% (n=101) of respondents were unsure of how to react if they had encountered a dog in the streets running. Findings also showed that respondents were unlettered about how to react if dogs were chasing (71.8%, n=111), jumping (65.6%, n=133) or barking (66.3%, n=85) at them in various types of scenarios. Meanwhile, when compared to the Perak FRDs project, results revealed similar results to the former project, in which 63.6% (n=231) of respondents were also illiterate about how to react when encountering a dog running in the streets. Respondents also did not know how to react if dogs were chasing (71.6%, n= 229), jumping (67.5%, n= 231) or barking (56.6%, n= 228) at them. This response in humans is termed a fight-or-flight response that usually transpires when confronted with a phenomenon that is either mentally or physically alarming. This fight-or-flight response is triggered by the release of catecholamine hormone that prepares our body to either stay or deal with a threat or escape to safety. Nevertheless, dogs will only exhibit signs of fear and bite if they feel in danger and intimidated. Therefore, it can be concluded that education is crucial in recognizing dogs' body movements. Knowing and practising how to react to dogs are also important as they will normally exhibit their emotions or reactions by their body movements.

Keywords: free-roaming dogs (FRDs), Perak, Penang, unlettered, reactions

PP19

The Effectiveness of the Online System, MyAnimalWelfare in Managing Animal Welfare Complaints in Malaysia

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ABSTRACT

MyAnimalWelfare is an online system for managing the licensing, complaints, regulatory and promotional activities related to the Animal Welfare Act 2015 (AWA 2015). This system has developed partly to address problems associated with managing animal welfare complaints and increase efficiencies in handling them. After its use on 1st March 2021, a review of this system was performed to examine the system's effectiveness in receiving and managing animal welfare complaints compared to the conventional methods. Data were collected from the MyAnimalWelfare system and the manual records from the Animal Welfare Section, DVS. Details of the complaints were categorised into three parameters; (i) years and (ii) months of complaints, and (iii) states where the complaints occur. The type of complaints was divided into three categories; (i) cases not related to the AWA 2015, (ii) welfare cases, and (iii) cruelty cases. In 2021, about 88% (N=1100) of animal welfare complaints were received through the MyAnimalWelfare system, while the rest were from other channels. There was an increase in the number of complaints received from 2017 until 2021. However, the most significant increase was obtained in 2021 (n=1249) compared to 2020 (n=766). In 2021, Selangor recorded the highest complaints received, with 38.2% (N= 477). In comparison, states with fewer complaints were Labuan and Terengganu (0.5%, N= 6). The most significant complaints were involving dogs mostly related to their welfare and abandonment. The increase in the number of complaints can be due to the increased awareness of animal welfare among Malaysians due to ongoing campaigns conducted by DVS and other NGOs and the convenience of the complaint submission system through the MyAnimalWelfare system. Findings from this study can be used to identify and assess critical problems and suggest recommendations that could improve the system efficiency in managing animal welfare complaints in Malaysia. In addition, findings help to strategise the awareness campaign in states with a low number of complaints. To conclude, more awareness programmes should be conducted on-farm animals' welfare since Malaysians are more aware of the welfare of domestic animals, particularly dogs and cats.

Keywords: MyAnimalWelfare system, animal welfare, complaints, effectiveness

PP20

Standard Marking to Identify Neutered Animals in Malaysia

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ABSTRACT

Neutering is being performed frequently in Malaysia, and occasionally a neutered animal may be presented for neutering again. Most of the healed surgical scars tend to be hard to identify, which causes the vet to misidentify the animal as unneutered. This can compromise their health by being under general anaesthesia, and neutering is an invasive procedure. The surgeon usually spends more time trying to find the reproductive organs which have been already removed, causing internal trauma and prolonged anaesthetic exposure. Strays or local breeds are at higher risk of repeatedly being presented for surgery because they tend to have an unknown medical history. Neutered animals can be permanently marked in several ways to avoid the second surgery. This includes ear notching or tipping, microchipping, or tattooing. A microchip is costly and relies on a database to confirm the animal's medical history. Ear notching or tipping is useful for feral animals and identification from afar. However, it may be very similar to injuries from fighting. A tattoo, on the other hand, is easily distinguishable from any other natural injury. Ear notching is also found to be not aesthetically pleasing to people, whereas a tattoo is more discrete and more acceptable, especially for current or future pet owners. An abdominal tattoo parallel to the incision site is recommended. This is performed regularly in certain countries such as the US or Canada. This poster will detail the procedure to perform this tattoo, how it heals the animal and the acceptability amongst pet owners. Finally, we encourage all Malaysian veterinarians to tattoo all neutered cats and dogs and make tattooing a national standard to mark neutered cats and dogs.

Keywords: shelter medicine, abdominal marking, abdominal tattoo

PP21

Open Pyometra as a Sequel of Botched Neutering Procedure in a 7-Year-Old Spayed Domestic Shorthair Cat.

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ABSTRACT

A 7-year-old Domestic Short Hair spayed female cat was presented with the complaints of purulent vaginal discharge and recurrence of estrus. The cat was spayed at 1 year age and was kept indoor in a one cat household. Physical examination was unremarkable except for purulent vaginal discharge. Radiographs revealed increased radiopacity of two tubular structures caudal to the urinary bladder. Ultrasonography of the mid-abdominal area found a rounded hyperechoic ovary surrounded by hypoechoic follicles caudal to the kidney on both left and right abdominal region. The cat had leukocytosis from complete blood count with otherwise normal serum biochemistry results. Exploratory laparotomy was done to identify the possible remnant of previous attempt of ovariohysterectomy. The outcome of the procedure found out that the cat had intact female reproductive organs except a section of the right uterine horn. The right ovary and the uterine horn stump attached to it was embedded in omental tissue as a sign of healing as well as the uterine horn stump to the rest of the reproductive organs. Ovariohysterectomy was carried out and the stumps were separated from the omental tissues. The cat recovered uneventfully after the surgery. This case was an example of botched neutering performed in the veterinary industry and has to be identified early to prevent such an event from happening to other animals.

Keywords: pyometra, botched ovariohysterectomy, exploratory laparotomy

PP22

Descemetocele in a 2-Year-Old Domestic Shorthair Cat

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ABSTRACT

Descemetocele describes a deep corneal ulcer in which the overlying epithelium and stroma are no longer present so that only the descemet's membrane prevents globe rupture. A 2-year-old Domestic Shorthair cat was presented to UMK Veterinary Clinic with a complaint of a mass protruding out from the cornea of the right eye. Physical examination was unremarkable except for the descemetocele estimated at 2 mm in diameter with translucent appearance. The center of the right eye lesion was not stained with fluorescent dye forming a halo shape indicating the definitive diagnosis of descemetocele. The condition was treated with a third eyelid flap and recovered uneventfully. Suture was removed after 14 days post-operation with increase in corneal opacity, but negative for fluorescent dye test indicating healed corneal ulcers.

Keywords: corneal ulcer, descemetocele, third eyelid flap

PP23

Bilateral Eyelid Coloboma Repair in 1-Year-Old Domestic Shorthair Tom Cat : A Case Report

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ABSTRACT

Eyelid coloboma or eyelid agenesis is a congenital developmental anomaly resulting in full or partial thickness defect of the eyelid. The 1-year-old Domestic Shorthair tom cat was presented with chronic bilateral epiphora, blepharospasm and keratoconjunctivitis sicca. The cat had a history of a bilateral reconstruction of the upper eyelids using Roberts and Bistner flap techniques at 4-month-old at a different clinic but the condition worsened with time. The cat was then presented to the UMK Veterinary Clinic for a second opinion. The eyelid colobomas were then reconstructed using modification to Whitaker's technique of lip commissure to eyelid transposition in 2 surgical sitting for left upper eyelid and another sitting for right upper eyelid in the spent of 1 month. The modification was needed to align the lip commissure to close a longer defect as a result from failed reconstruction done previously. The complications noticed from all the procedures were, salivation on left side of the mouth due to shortening of lip commissure and occasionally epiphora of the right eye. The desired effect from the procedures were that the cat had better corneal protection, return of palpebral reflex and improvement of tear production. Due to the positive outcome from the techniques, it can be utilized to reconstruct a longer upper eyelid defect with lesser complication in cats.

Keywords: coloboma, lip commissure to lid transposition technique, longer eyelid agenesis defect

PP24

A Rare Case of Vaginal Rupture and Septic Peritonitis Following Copulation in a Mongrel Bitch

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ABSTRACT

A 10 years old mongrel bitch was admitted our veterinary clinic due to weakness, inappetence and recumbent following copulation with an adult Dalmatian three days prior. The dog was non - ambulatory, tachycardic, tachypnoeic, hyperthermic, and depressed, however still responsive. There were signs of ascites and pain upon palpation of the caudal abdomen close to the inguinal region. Radiographic findings showed presence of rounded mass with soft tissue opacity at the caudal abdomen, cranial to the urinary bladder. There was also loss of abdominal serosal details, indicating ascites and peritonitis. The laboratory findings showed moderate non- regenerative anaemia, leukocytosis, hyperphosphatemia, hyperbilirubinaemia and increased blood urea nitrogen (BUN) and liver enzyme activities. Stabilization of the dog was initiated for a day before surgery with administration of antibiotic, antipyretic and fluid therapy. Upon exploratory laparotomy, exudative abdominal effusion together with peritonitis were observed. Vaginal rupture had been identified at the left mediodorsal region upon insertion of Foley catheter through vaginal opening. Ovariohysterectomy and suturing of serosal layer of ruptured vagina were performed along with thorough abdominal lavage using warm sterile normal saline. The course of antibiotic therapy was continued afterwards. Approximately 16 hours after surgery, the dog experienced cluster seizures. A bolus of diazepam was administered intravenously to stop the seizure. The dog later deteriorated, becoming hypothermic, bradycardic, icteric, with poor capillary perfusion. On the third day post-surgery, the dog died. The probable cause of vaginal rupture in this dog was due to trauma inflicted during the mating course which further led to septic peritonitis.

Keywords: vaginal rupture, copulation, septic peritonitis

PP25

Bilateral Third Eyelid Gland Prolapse in 4-Month-Old English Bulldog: A Case Report

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ABSTRACT

Third eyelid gland or nictitating membrane supply preocular tear film and help to distribute tears uniformly across cornea as well as sweep away debris. Prolapse of the gland or cherry eye appears as a reddened mass at the medial canthus of the eye. This case report describes a four-month-old male English bulldog that was presented to UMK Veterinary Clinic with the complaint of chronic, swollen, reddened, and rounded mass protruding out from bilateral medial canthus. Physical examination and further diagnostic findings revealed the dog had chronic bilateral third eyelid gland prolapse. Mucosal pocket technique was used to reduce both prolapsed glands during the same operative session. The dog recovered uneventfully and sutures were removed after 14 days post operatively. There was no recurrence after 7 months follow-up visit. The surgical procedure was successful with no complication in this case.

Keywords: third eyelid gland prolapse, cherry eye, mucosal pocket technique

PP26

Gastric Dilatation and Volvulus (GDV) in a Labrador

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ABSTRACT

Gastric dilatation-volvulus (GDV) is a highly dreadful and acute disease that affects dogs, involving severe distension of the stomach with food or gas and gastric malpositioning. The disease appears to have a breed predisposition, especially in the large, deep-chested dogs such as Great Danes, Saint Bernards, Weimaraners, and Doberman Pinschers. The exact cause is still not clearly understood, however, various risk factors have been identified such as dietary regime and animal's temperament. The dietary behaviour and regime include food size, activity after feeding, frequency and speed of eating. A stressful temperament and events that agitated the dogs may also predispose dogs to GDV. This is a case report of the sudden death of 11-year-old male, Labrador and presented with abdominal pain, tachycardia, non-productive retching, pale gum, labour breathing and hypersalivation prior to death. Post mortem examination revealed evidence of GDV. The stomach was twisted and distended with gastric contents and gas. Gastric mucosa revealed blackish discolouration with severe necrotic area. Serosa of the stomach showed severe engorgement of blood vessels and the contents were watery in nature. Moreover, the spleen was severely congested and evidence a "V" shaped spleen (splenic torsion) was observed as the spleen was twisted with the stomach. There was also evidence of a hiatal hernia as the proximal part of the stomach protruding into the thoracic cavity. Other organs such as liver, lung and kidney were severely congested. The sample was taken for further diagnosis by the Mammalian Bacteriology Unit, VRI. The only small colonies of *Enterobacter* sp., *Staphylococcus epidermidis* and *Enterococcus* sp. were isolated from all organs. In conclusion, this case was finally diagnosed as GDV based on pathological findings.

Keywords: gastric dilatation-volvulus (GDV), Labrador, torsion, congestion

PP27

Right Distal Tibia Salter-Harris Type I Fracture With Post-cross Pinning Complication in a 9-Month-Old Domestic Shorthair Cat

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ABSTRACT

A 9-month-old Domestic Shorthair Cat was presented to the veterinary clinic with partial weight-bearing lameness on the right hindlimb and presence of an open wound at medial distal tibia region with evidence of suture breakdown, yellowish discharge and bone exposure were observed. This was a result of post operative bone pinning. Upon palpation on the right distal tibia region, soft tissue swelling and crepitus were felt. Based on the examination and radiographic findings revealed a right distal tibia Salter-Harris type I fracture with post-cross pinning complications, including Kirschner wires (K-wires) migration and bone fragment misalignment. Prior to second surgical intervention, the open wound on the right medial distal tibia region was managed by wound lavage twice daily with diluted iodine solution and dressed with silver sulfadiazine cream. Surgical intervention was carried out by open reduction followed by transarticular normograde intramedullary pinning using a 2.0 mm K-wires. Dressing bandage was applied to deliver medication to the surgical site and also temporarily immobilized the limb to enhance stability of bone fragments. Post operatively, antibiotic and analgesic drugs were administered. The limb is corrected with transarticular intramedulary pin to to allow the stabilization and re alignment of the bone fragments, which permit the bone healing process to take place. In conclusion, the method use to fix the bone in consideration of post-operative client compliance is an important factor for successful the bone healing and to ensure the return of the limb function.

Keywords: tibia, Salter-Harris type I, cross pinning, complications, trans-articular pinning

PP28

Knowledge, Attitude, and Practice Towards Canine Cardiac Disease Among Dog Owner's In Malaysia

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ABSTRACT

Canine cardiac disease is a widespread disease occurring worldwide. This study was conducted to determine dog owners' knowledge, attitude, and practice toward canine heart diseases in Malaysia. A self-administered online-based questionnaire was distributed to dog owners, and data was collected from a total of 156 respondents. The questionnaire inquired about the owner's ability to identify the clinical signs, risk factors, types of canine cardiac disease, and the dog owner's attitude and practice towards canine cardiac disease. Data were entered and analysed using the Statistical Package for Social Sciences (SPSS) version 28. Numerical was presented in the form of standard deviations and means. Categorical data were presented in the form of percentages. The total knowledge, attitude and practice score was then computed. Overall, dog owners in Malaysia have good knowledge, a moderate attitude and a good practice toward canine heart disease. These findings could aid veterinarians in conducting a more thorough and detailed consult and client education to improve the knowledge, attitude, and practice of dog owners in Malaysia toward canine cardiac disease.

Keywords: canine, cardiac disease, knowledge, attitude, practice

PP29

Nitrite and Nitrate Contents in Edible Bird's Nest From Malaysia

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ABSTRACT

Edible bird's nest (EBN) is produced from the regurgitated saliva of two (2) species of swiftlets, namely the *Aerodramus fuciphagus* and *Aerodramus maximus*. Nitrite and nitrate are inorganic compounds that are water soluble and commonly found in EBN. It occurs naturally in the environment, including the atmosphere, water and soil, but could also occurs by contamination due to the fermentation process of bird droppings. According to Malaysian Standard MS 2334:2011, raw clean EBN, should not contain more than 30 ppm of nitrite after undergoing cleaning processes. However, no standard limit was set for nitrate content in EBN. Nitrates are relatively inert and harmless, while nitrites may become nitrosamines, which are potentially harmful to humans. In this study, 731 EBN samples were received by the National Veterinary Public Health Laboratory, Selangor from bird nest processing plants from 2018 to 2021 for nitrite (NO_2-) and nitrate (NO_3-) testing. The analysis was done using ion chromatography system based on method by Malaysian Standard MS 2509:2015. The samples were categorized into three types, namely raw unclean EBN (n=285), raw clean EBN (n=424) and EBN products (n=22). The mean ± standard deviation of nitrite content for raw unclean EBN was 19.21 ± 22.63 mg/kg, 6.13 ± 7.58 mg/kg for raw clean EBN and 0.12 ± 0.20 mg/kg for EBN products. Whereas, the mean ± standard deviation of nitrate content in raw unclean EBN, raw clean EBN and EBN products were 48.48 ± 47.03 mg/kg, 21.13 ± 30.37 mg/kg and 0.92 ± 1.05 mg/kg respectively. Results showed that nitrite and nitrate contents in raw unclean EBN were significantly ($p<0.05$) higher than in raw clean EBN and EBN products. However, there was no statistically significant difference ($p>0.05$) between raw clean EBN and EBN products. Meanwhile, nitrate content was found significantly ($p<0.05$) higher than nitrite content among all groups. More than 90% (92%, n=418) of raw clean EBN samples showed nitrite value below 30 ppm. In conclusion, the cleaning step in EBN processing is very critical, as it will reduce nitrite content significantly. Therefore, the nitrite content in clean EBN strictly needs to be monitored to ensure the quality and safety of EBN for the public.

Keywords: nitrite, nitrate, edible bird's nest (EBN)

PP30

Microbiological Contamination in Edible Bird Nest From Swiftlet Premises in Central Region of Peninsular Malaysia

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ABSTRACT

Edible bird's nest (EBN) is a well-known and precious delicacy in Chinese cuisine around the world. The high demand for EBNs in the global market has forced the local regulatory bodies to monitor swiftlet farming activities, including the EBN cleaning process to ensure that EBNs entering the market comply with the established food safety standards. This study aimed to determine the status of microbiological contamination in unprocessed (raw unclean and raw clean) and processed (product) EBN from swiftlets bird's nest premises in the central region of Peninsular Malaysia. A total of 560 samples from 38 swiftlets bird's nest premises in Selangor, Melaka, and Negeri Sembilan were tested for National Food Safety Monitoring Program 2021 from Mac until December 2021. The samples were categorized as raw unclean EBN (n=225), raw clean EBN (n=295), and products EBN (n=40). The microbiological testing was carried out according to ISO standards at National Veterinary Public Health Laboratory. The results were assessed as being satisfactory or unsatisfactory using assessment criteria in SIRIM/DVS 3:2015 (raw unclean EBN) and MS 2334:2011 (raw clean EBN). This study found that 87.7% of samples were assessed as satisfactory microbiological criteria of TPC, E.coli & coliform counts. The microbial counts of TPC, *E. coli* & coliform were <10 - 99000 cfu/g, <10 - 90 cfu/g and <10 - 460 cfu/g, respectively. The highest microbiological contamination was found due to yeast and mold where 37.3% of samples as having unsatisfactory levels. The microbial counts of yeast and mold were <100 - 9700 cfu/g. *Staphylococcus. Aureus* (*S. aureus*) was found unsatisfactory levels in 5% of samples with microbial counts <10 - 9900 cfu/g. *Salmonella* spp. was detected in 2 samples and L. monocytogenes were not detected in all samples. The microbial counts, (cfu/g) for TPC, *E. coli*, coliform, *S. aureus*, and yeast and mold were significantly different between locations (Selangor, Melaka, and Negeri Sembilan) and categories of the sample (raw unclean, raw clean, and product) at $p<0.05$. Overall, the results indicate that there was a significant occurrence of microbiological contamination in EBN from the Central Region of Peninsular Malaysia. Thus these swiftlet premises may need to improve good hygiene practices in their premises.

Keywords: microbiological, contamination, EBN, central region, Peninsular Malaysia

PP31

Development and Validation of UPLC-MS/MS Method for the Detection of Colistin in Poultry Feed

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ABSTRACT

Colistin is the last-resort antibiotic given for treatment of multidrugs-resistant gram-negative bacterial infections and classified as critically important human medicine by the World Health Organisation (WHO). Usage of colistin in animal feed raise a global concern of antimicrobial resistance occurrence, resulted the banning of colistin in animal feed through Malaysian Feed Act 2009 regulations since 2019 and the need to develop a detection method for colistin. In this study, an in-house method for the detection and confirmation of colistin in animal feed using ultra-performance liquid chromatography tandem quadrupole mass spectrometer (UPLC-MS/MS) was developed and validated. Poultry feed samples were subjected to solid phase extraction (SPE) to reduce matrices interference and the resulting extracts were analyze using UPLC-MS/MS due to its ability to detect and confirm the presence of targeted analyte even in low concentration. Colistin A was determined by precursor ion of 390.9 m/z with major fragmentation of 101.2 m/z and 384.9 m/z, while colistin B was detected at 386 m/z with major fragments of 101 m/z and 380 m/z. Limit of quantification (LOQ) was capped at 50 µg/kg, which is sufficient for monitoring purposes. Method specificity was determined by spiking 10 blank samples with 500 µg/kg of colistin A and colistin B, with mean recovery of 97.51% and 95.39% respectively. The developed method was applied to 30 random poultry feed samples and a sample was found to contain 89.75 µg/kg colistin A and 127.38 µg/kg colistin B. The presence of colistin in poultry feed used locally indicates the importance of implementing regular monitoring program on animal feed to detect the presence of banned substance.

Keywords: colistin, poultry feed, SPE, UPLC-MS/MS, LOQ

PP32

Compliance Status of Environmental Regulation in Pig Farming

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ABSTRACT

Swine wastewater or effluent is known to contain high concentrations of solids, organic matter and nutrients. However, knowledge on the swine wastewater characteristics from the final discharge point of pig farming is lacking. Therefore, in this study, swine wastewater quality of different pig farms was investigated. This study was carried out to investigate the swine wastewater or effluent assess compliance with Environment Quality Act, 1974. The evaluation of wastewater quality was done by monitoring pig farming activities as well as collecting wastewater samples in Kuala Langat that was managed by the Department of Veterinary Services, Selangor. There are about 128 pig farms located in Kuala Langat, Selangor. Wastewater samples of one liter were collected into polyethylene (PE) bottle at the outflow point of each final pond between 9.00am until 1.00pm. Samples collected were transported inside an icebox for laboratory analysis. The characteristics of physical and chemical parameters were determined, including dissolved oxygen (DO), biochemical oxygen demand (BOD5) and chemical oxygen demand (COD) based on standard methods, American Public Health Association (APHA) procedures. Result showed that dissolved oxygen values ranged from 0.2 mg/L to 18.8 mg/L (5.17 ± 4.10), whereas BOD5 ranged from 7.5 mg/L to 258.8 mg/L (92.35 ± 59.93) and COD values were between 67.1 mg/L to 1516.7 mg/L (606.11 ± 395.59). These values were higher than the Department of Environment, Malaysia permissible limit of 50 mg/L for BOD5 and 200 mg/L for COD on the discharge of wastewater regulations. From the results of this study, 72% of pig farms exceeded permissible limit of BOD5 while 90% of Pig farms exceeded permissible limit of COD. In conclusion, it was found that swine wastewater final discharge from farms mostly contain high levels of organic pollutants thus not in compliance of environment regulation. Based on these findings, the swine wastewater should be monitored from time to time in order to prevent environmental pollution and reduce health hazards caused by pig farming wastewater contamination.

Keywords: wastewater quality, pig farming, permissible limit, organic pollutants

PP33

Retrospective Study of Q-Fever in Ruminants From The Year 2017 to 2021 in Veterinary Research Institute (VRI), Ipoh

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ABSTRACT

Query Fever (Q-Fever) is a disease caused by *Coxiella burnetii*. This bacterium is a gram-negative coccobacillus, obligate intracellular bacteria which infects a large variety of hosts. Coxiellosis is considered the cause of abortion and reproductive disorders in domestic animals. This disease occurs worldwide; however, the prevalence reported in Malaysia is low. This cross-sectional study was carried out using samples received in the Veterinary Research Institute (VRI) between the years 2017 to 2021. The total data sample (n=310) involving cases (n=150) for five years consists of various samples from mixed-gender cattle, goats and sheep of all ages. All samples were tested using a Polymerase Chain Reaction (PCR) using the published primers recommended by the World Organisation of Animal Health (OIE). Based on the results, no positive Q-fever diseases were detected from the years 2017 to 2021. Histories of abortions were reported in 17 out of 105 cases (16.19%), while only one (1%) was reported with a reproductive disorder, endometritis and the rest were classified as no specific finding. It is known that the variability of shedding *C. burnetii* by animals plays a crucial part in sampling to be conducted. The reliable tools of PCR may give false-negative results as it might have different shedding routes and potentially intermittent shedding. In conclusion, the serological test needs to be conducted to evaluate the prevalence rate and provide the status of the infection rate in herds. In addition, proper sampling is required to reduce the possibility of contamination.

Keywords: Q-fever, *C. burnetii*, abortion, prevalence, serological test

PP34

Retrospective Study of Strangles in Horses From the Year 2017 to 2021 in Veterinary Research Institute

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ABSTRACT

Strangles is an infectious, contagious disease of equine species (horses, mules and donkeys) characterized by abscessation of the lymphoid tissue of the upper respiratory tract caused by *Streptococcus equi subsp. equi* (*S. equi*). In 2010, during a nationwide screening of horses following an isolation *S. equi* from a horse, 3 samples submitted to the Veterinary Research Institute (VRI) were positive for *S. equi* by using the culture method and polymerase chain reaction (PCR) method. A cross-sectional study was carried out for 1414 nasal swabs samples that were received by VRI from the year 2017 to 2021. Samples were cultured onto 5% blood agar plates and incubated at 37°C under 5-10% CO2 for 48 hours according to standard protocol. Out of a total of 1414 swabs, there was no positive case reported. Strangles is one of the notifiable disease (Penyakit Wajib Lapor) listed under the Department of Veterinary Services (DVS) Malaysia because it is highly contagious. Since most of the horses are imported from other countries, there might be chances for the transmission of the disease. Therefore, it is suggested that strangles become one of the diseases under national surveillance programs to monitor the occurrence of the disease in Malaysia.

Keywords: strangles, *Streptococcus equi*, horse

PP35

Identification of *Eimeria* spp. in Chickens in Perak Using Sporulation Technique

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ABSTRACT

Poultry coccidiosis is a disease caused by organism in genus Eimeria that belongs to the phylum apicomplexa. Coccidiosis is an economically important disease in poultry production and causes high morbidity and mortality. Seven known species of *Eimeria* infecting chickens are *Eimeria acervulina*, *Eimeria brunetti*, *Eimeria maxima*, *Eimeria mitis*, *Eimeria necatrix*, *Eimeria praecox* and *Eimeria tenella.* Sampling was conducted in six farms in Perak, four farms in Larut, Matang dan Selama District and two farms in Kinta District. Fresh faecal droppings were collected from the chicken litter and three samples were taken from different areas of each farm for a total of 18 samples. All samples were processed in parasitology section, Veterinary Research Institute, Ipoh. The sporulation technique was performed by mashing the faecal samples, filtering then mixing it with 2.5 % potassium dichromate solution and the final mixture was poured into a Petri dish. Observation of oocyst morphology was conducted on the mixture every 24 hours for seven days. Oocyst morphology, size and shape were captured using a compound microscope under 1000 X magnification for species identification. Results show that three out of six farms or 50.00% had at least 1 sample positive for coccidia oocyst which were Farm A, Farm C and Farm D. Six out of 18 or 33.33% of the samples collected were positive for coccidia oocyst. In Farm A, Farm C and Farm D, the percentage of positive samples were 33.33%, 66.67% and 100.00% respectively. Three species of *Eimeria* spp. were detected from the samples in this study; *E. acervulina* detected in three farms, *E. maxima* was detected in two farms and *E. mitis* was detected in two farms. Coccidiosis is a disease of major concern in poultry farming because it can decrease the growth of chickens and affect the output production of the farm. Therefore farmers should minimize disease transmission by implementing proper farm biosecurity practices such as good farm personnel hygiene and reducing the exposure of farm animals to wild birds.

Keywords: *Eimeria* spp., chickens, sporulation

PP36

ELISA Seroprofiles of Infectious Bronchitis (IB) in Malaysia

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ABSTRACT

In this study, ID Screen® Infectious Bronchitis (IB) Indirect ELISA was used to examine the sera from chickens (broiler breeder and commercial layer) which were vaccinated with different vaccination programs. The serology results were collected since 2020 until April 2022. Relevant results were selected for baseline calculations based on common vaccination programs practiced in Malaysia. For pullet at week 6 to 10, the range was around 6000-12000 with an inactivated vaccine and a few live vaccines given. At week 11-20, with two inactivated vaccines and a few live vaccines, the range was usually at 12000-15000. At week 20 onwards, the titer usually maintains at 12000-15000 or lower, but maximize at 16000, beyond which might indicate a challenge. To conclude, IB ELISA titers are generally high but within the normal range as stated, due to the kit's detection range which could capture high amount of IB antibodies in flocks hyper-immunized with both live and inactivated vaccines.

Keywords: infectious bronchitis (IB), IDvet ELISA titers, layer, breeder

PP37

Molecular Detection and Characterization of Canine Distemper Virus (CDV) in Tigers in Malaysia

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ABSTRACT

Canine distemper virus (CDV) is an infectious agent that can cause canine distemper (CD), a lethal disease commonly found in domestic dogs and cats. In August 2015 till December 2021, 13.5% (n=7) of 52 samples were found positive CDV from dogs in Sabah (n=1), Sarawak (n=5) and Pulau Pinang (n=1) states in Malaysia. Recently, the host range of CDV has expanded to include wild animals such as tigers and lions. From 2016 to 2021 there have been reports of wild Malayan tigers entering the town and roaming around the streets in a few states in Malaysia. The animals seemed confused, behaved strangely prior to death. Various types of samples were submitted to Veterinary Research Institute, Ipoh for diagnostic purposes. Hence, the present study aimed to detect and determine the actual cause of neurologic disease in these tigers. Molecular detection was carried out using reverse transcription-polymerase chain reaction (RT-PCR) based on the nucleoprotein (N) gene of CDV. Out of 69 samples tested from tigers, 43.47% (n=30) were successfully amplified a 335 bp amplicon representing of samples from Selangor (n=6), Perak (n=21), Terengganu (n=2), and Johor (n=1) states. Three samples were further sequenced and reveal 99.4 % homology with CDV/dog/HCM/33/140816 strain from Vietnam. Phylogenetic analysis of the partial N gene indicates that this virus was clustered under CDV Asia 1. These findings showed that local tigers are susceptible to CDV infection and the virus is circulating in the wild animals. The infected domestic dog particularly living in close proximity to forest fringes could be the source of CDV in wild tigers. Since there is no treatment available for this disease, it is suggested that vaccination of dogs with canine distemper virus (CDV) vaccine should be strengthened as it is the only effective disease control strategy to prevent it from spreading among Malayan tigers and other animals.

Keywords: canine distemper virus, polymerase chain reaction, tiger, phylogenetic

PP38

Comparative Analysis of Various Clinical Samples for Detection of Lumpy Skin Disease (LSD) Virus Using Taqman Real-Time PCR and Conventional PCR

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ABSTRACT

Lumpy skin disease (LSD) virus is a contagious virus that affects cattle and significantly impacts animal health with the potential for severe economic losses. The diagnosis of LSDV requires a fast, accurate, and feasible method in different biological samples. This study aimed to compare a variety of clinical samples for detection of lumpy skin disease virus (LSDV) by conventional PCR and TaqMan real-time PCR. The primer or probe used is based on recommendation by the OIE Terrestrial Manual 2018. We studied the detection of LSDV in 170 clinical samples of cattle with clinical signs and highly suspected LSD. Among these 170 clinical samples, 78.23% (n=133) presented positive results by TaqMan real-time PCR and 47.06% (n=80) were detected as positive by conventional PCR. The present data indicate that skin, scab, meat, and lymph nodes were better samples for TaqMan real-time PCR with 100% positive results. In contrast, whole blood in EDTA, nasal swab, and saliva swab samples were also able to give results in more than 50% positive results. For conventional PCR, the best samples for LSDV detection were skin (100%), scab (87.88%), and meat (71.42%). In line with these findings, we would like to recommend skin, scab, and meat as a more appropriate sample for diagnosis of LSD by both conventional PCR and TaqMan real-time PCR.

Keywords: lumpy skin disease virus (LSDV), TaqMan real-time PCR, conventional PCR

PP39

Molecular Analysis on African Swine Fever Virus From Various Occurrence in Malaysia Reveals Consistent Genotypic Identity

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ABSTRACT

African swine fever (ASF) is a recognized threat to the swine production globally, with major consequences on economy and food security, as it can lead up to a hundred percent mortality rate in infected pigs. The disease is caused by ASF virus (ASFV) and has been spreading in South East Asia since 2019. In Malaysia, the first ASF case was diagnosed in Sabah in early 2021. However, only in December 2021 was the virus detected in Peninsular Malaysia; first in wild boars and subsequently in commercial pigs. To identify the virus origin, ASFV DNA was extracted from six (6) samples from Perak, Pahang, Melaka and Negeri Sembilan and were analyzed by MVZT to determine the virus genotype and serogroup. Five loci from the virus genome were PCR-amplified and subjected to sequencing. These are *p72*-encoding gene (partial B646L), *p54*-encoding gene (E183L), central hypervariable region (CVR) of the *J9L*-encoding gene (B602L), tandem repeat sequences (TRS) within the intergenic region (IGR) between I73R and I329L and *CD2v*-encoding gene (EP402R). Three phylogenetic trees were inferred using maximum likelihood method and Tamura-3-parameter model based on the *p72-*, *p54- and CD2v*-encoding genes sequence and group the isolates in genotype II and serogroup 8 together with isolates from Vietnam, China, Europe and Eurasia. To increase the genotyping resolution, amino acid tetramers within the CVR was assessed and identified 10 TRS repeats - BNDBNDBNAA, narrowing the sequences as one variant known as Georgia type variant (GII-CVR1) or CVR subgroup XXXII. These repeats displayed a hundred percent identity with isolates from China, Belgium, Georgia, Vietnam and also the isolate responsible for the outbreak in Sabah. All six isolates also belonged together as IGR II variant with 10bp nucleotide TRS insertion, commonly detected in isolates from Asia and Eastern Europe, compared to isolate Georgia 2007/1, which is one of the vaccine candidate strains belonging to Genotype II. Overall, no novel variant is yet to be found in isolates from both East and Peninsular Malaysia. Data should continuously be gathered on the genotypic characteristics of ASF virus to track any possible divergence and provide the molecular epidemiology of the virus to assist in disease control.

Keywords: African swine fever virus (ASFV), swine, Malaysia, phylogenetic analysis

PP40

Screening of Viral-Host Protein Interactions Between Japanese Encephalitis Virus and Human Brain Proteins.

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ABSTRACT

Japanese encephalitis is a viral brain infection caused by the neurotropic, positive-sense RNA virus, the Japanese encephalitis virus (JEV). The virus is transmitted primarily by *Culex tritaeniorhynchus* mosquitoes, which are present abundantly in Malaysia. Pigs and migratory birds act as amplifying hosts that are an essential risk factor in transmitting JEV to humans. While pigs may show mild clinical symptoms, JEV infection in humans and horses can cause severe encephalitis. The network of interaction between host protein and viral protein during JEV infection in the host cell remained elusive. Among the viral proteins, NS5 proteins constitute the major enzymatic components of the viral replication complex and are essential to the flavivirus life cycle. The importance of NS5 in viral replication and host immune response modulation makes it an ideal target for developing broad-acting antiviral inhibitors to treat diseases caused by flaviviruses. Hence, the objective of the present study was to identify the human brain proteins (host) interacting with the JEV NS5 protein (virus) of the Muar strain. The yeast two-hybrid (Y2H) assay was used to screen the binding partners of JEV NS5 protein from the human brain cDNA library. The positive viral-host protein-protein interactions were validated by PCR assay and gene sequencing. This study has detected twenty-one human brain proteins as a strong binding partners of JEV NS5. Literature analysis revealed that the identified host proteins are associated with vital cellular activities such as RNA binding, transcription regulation, vesicular transport and innate immune response regulation. This screening identified that human FBXO45 and ITM2B proteins are crucial host binding proteins interacting with JEVNS5 protein during JEV infection. The FBXO45 is a component of ubiquitin ligase complexes, while ITM2B functions as a protease inhibitor. In order to improve the understanding of these proteins' function in JEV infection, advanced investigations need to be carried out, which may serve as the foundation for novel therapeutic and prevention strategies against JEV infection.

Keywords: Japanese encephalitis, JEV NS5 protein, yeast two-hybrid assay, viral-host protein interaction

PP41

A Retrospective Study: Newcastle Disease (ND) Cases in Regional Veterinary Laboratory, Bukit Tengah From 2016-2021

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ABSTRACT

Newcastle Disease (ND) is a panzootic disease that causes a devastating effect on poultry production. To monitor the disease cases number, scrutinized data analysis needs to be studied to get the preliminary delineation and patterns of ND cases in North Zone, Malaysia. At the regional laboratory, several types of laboratory works were conducted and all of the tested samples on ND were recorded into the Sistem Maklumat Makmal (SIMMAK). To reflect the data of ND cases received by the Virology Section, North Zone Regional Veterinary Laboratory Bukit Tengah (MVZU), a retrospective study was carried out on the records of ND in poultry from 2016-2021 aimed to understand the patterns of ND cases. All data were sorted out from the system and analysed. Out of 2289 samples tested for ND, only 2% revealed positive results. Surveillance and diagnostic works have contributed for 3.8% of the positive ND cases. Although the patterns of sample received by MVZU were inconsistent by year, the trend showed a great decrease in the number of positive cases from 2016 to 2021. It is suggested that ND cases in the north zone are under control with respect to the data, where there is no sudden increase in the number of samples received. This study reflects the importance of continuous ND surveillance and diagnostic reports. A further prevalence and molecular study of ND cases in Malaysia will be conducted to understand the actual trend and origin of the strain using phylogenetic methods.

Keywords: Newcastle disease, retrospective, trends, poultry, veterinary

PP42

Diagnosis and Prevalence of Bovine Tuberculosis in Dairy Cattle in Kinta and Batang Padang, Perak

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ABSTRACT

Bovine tuberculosis (BTB) is one of the important ruminant diseases and is characterized as a chronic, highly contagious respiratory disease with zoonotic implications. There are several types of diagnostic methods for detection of BTB in cattle such as ELISA, tuberculin skin test that consists of Caudal Fold Test (CFT) and Comparative Cervical test (CCT), PCR and histology-based techniques. The aim of the study are to evaluate the correlation of screening test (Bovigam ELISA kit-Bovigam) and confirmatory test (CCT) in the diagnosis of BTB in dairy cattle, and to determine the prevalence rate of BTB in dairy cattle in Kinta and Batang Padang, Perak. A cross-sectional study was conducted in eight farms (n=80) and four farms (n=40) from Kinta and Batang Padang, respectively. Blood was collected in a heparin tube from each cattle and proceeded with testing on Bovigam. Then, CCT was performed on all animals. Bovigam had a sensitivity of 78.9% and specificity of 91.3% compared to CCT. Bovigam demonstrated a positive and moderate correlation (r=0.51) compared to CCT. The overall prevalence of BTB is 23.8%. There is no significant difference in BTB prevalence between Kinta (22.5%) and Batang Padang (25%), even though Batang Padang showed a higher prevalence rate. Herd prevalence ranges between 0% and 70%. The sensitivity and specificity of Bovigam made it suitable for use as a screening test for BTB in dairy cattle. The finding agrees with most studies reported previously. Bovigam had advantages as a screening test as it requires a shorter time to obtain the result, and the personnel need to go to the farm only once compared to CFT. The prevalence rate of BTB in this study is higher than in other studies reported in Malaysia. In conclusion, Bovigam is an acceptable method to be used as a screening test for BTB in dairy cattle with good correlation, sensitivity and specificity. The prevalence of BTB is 23.8% among dairy cattle in Kinta and Batang Padang. The study is ongoing and larger sample sizes are expected to reveal the true prevalence of BTB in Perak.

Keywords: bovine tuberculosis, tuberculin skin test, Bovigam, ELISA test, dairy cattle

PP43

Comparison on the Performance of Newcastle Disease Virus Vaccine in Specific Pathogen Free (SPF) Chickens by Different Routes of Administration

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ABSTRACT

Newcastle disease (ND) has been defined by the World Organisation for Animal Health (OIE) as infection of poultry with virulent strains of Newcastle disease virus (NDV). The performance of Newcastle disease virus vaccine 1174/08 strain (NDVAC 1174/08) developed at Veterinary Research Institute (VRI), Ipoh was evaluated in specific pathogen free (SPF) chickens. The objective of this study is to compare the performance of NDVAC 1174/08 in different routes of administration. A total of 25 SPF chickens obtained from VRI were divided into three groups according to the administration route assigned, which were oral (10), intranasal (10) and control (5) group. Each chicken in every group except control was vaccinated once with NDVAC 1174/08 at a dose of $10^{6.5}$ per chicken. The control group received phosphate buffer saline (PBS) orally. Blood samples were collected at 7, 14, 21, 28 and 35 days post-vaccination (dpv). Serum samples were subjected to ND antibody titration by haemagglutination inhibition (HI) test. The result of the vaccine efficacy by oral route revealed mean HI titer $\log_2$ 4 with the mean HI titer 5.22 starting to increase at 14 dpv. However, the intranasal route showed a mean HI titer $\log_2 \geqslant 4$ with a mean of 4.8 starting at 21 dpv. No ND antibody was detected in the control group. Compared between the 2 routes, the intranasal route showed a lower mean HI titer compared to oral route. It may be due to mucosal immunity. In conclusion, this preliminary study showed that the NDV vaccine administered via oral route was able to give a good antibody response compared to the intranasal route. However, this study needs further research on the efficacy of the vaccine on different regimes of vaccination.

Keywords: Newcastle disease virus vaccine, oral route, intranasal, haemagglutination inhibition (HI) test

PP44

Foot-and-Mouth Disease Diagnostic: Comparison of Two Non-structural Protein (NSP) ELISA Kit

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ABSTRACT

Foot-and-mouth disease (FMD) is cloven-hoofed animals' most contagious disease, causing great production losses. Detection of the antibody against NSP of foot-and-mouth disease virus (FMDV) is used to determine infection with any FMDV serotypes. The NSP ELISA is a DIVA test that differentiate infected and vaccinated animals. Two commercial NSP ELISA kits were compared. A total of 221 sera of cattle, goat and sheep with known FMD status were tested. Sera was inactivated prior testing and tested in duplicate. The test procedure was performed following the kit's instructions. The significant difference between the two kits was the incubation period of the samples. Sera tested using Kit A was incubated between 16 to 20 hours while Kit B was only two hours, followed by washing. The performance of the kits was compared based on the sensitivity and specificity. Kit A and B showed the same sensitivity, which is 100% whereas, the specificity of Kit B (100%) was higher than Kit A (81.96%). Kit A showed 45.16% false positive compared to Kit B, which showed zero percent. The overall agreement between Kit A and Kit B was 74.66%, indicating a good concordance. Kit B is preferred due to its higher sensitivity and specificity with the additional advantage of shorter incubation time.

Keywords: non-structural protein, foot-and-mouth disease virus, DIVA

PP45

Knowledge, Attitude, and Practice of Veterinary Practitioners Towards Radiation Safety in Malaysia

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ABSTRACT

Radiographic examination is one of the most common diagnostic workups in veterinary medicine. This study was conducted to determine veterinary practitioners' knowledge, attitude, and practice (KAP) towards radiation safety in Malaysia. A self-administered online-based questionnaire was distributed to veterinary practitioners, including radiographers, veterinary assistants, and veterinary technicians. The questionnaire was designed to collect information about veterinary practitioners to determine the importance of radiation safety and thus can assess their knowledge, attitude, and practice towards radiation safety. Data were entered and analysed using the Statistical Package for Social Sciences (SPSS) Version 28. Numerical was presented in the form of standard deviation and means. Categorical data were presented as frequency and percentages. The total knowledge, attitude, and practice score were then computed. In total, 105 respondents participated in the study. Overall, respondents showed moderate knowledge, good levels of attitude, and good practice towards radiation safety. These findings could help veterinarians to improve the aspects that are lacking in the knowledge, attitude, and practice toward radiation safety in veterinary medicine in Malaysia.

Keywords: radiation safety, veterinary practitioners, knowledge, attitude and practice (KAP)

PP46

Wildlife Veterinary Dentistry: Toward Promoting Better Wildlife Healthcare and Welfare in Malaysia

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ABSTRACT

In recent years, wildlife institutions in developed countries have placed more emphasis on dental diseases in the captive and free-ranging wildlife under their care. A few common dental diseases have been reported in captive wildlife: periodontal disease, tooth wear, lumpy jaw and tooth fractures. Unattended dental diseases could impair wildlife's welfare and health; therefore, appropriate dental diagnostic workup and treatment are required. However, veterinary dentistry (e.g. dental charting, dental radiographs, dental treatment, and prevention) in captive wildlife is not a routine program scheduled for wildlife. Few limiting factors has been identified; the need for veterinary dentistry training, inexperience in handling dental problems, and absence of appropriate veterinary dental equipment. As a result, most dental treatments (e.g. dental scaling, extraction, restorative work, and root canal therapy) are conducted by visiting veterinary dentistry specialists or human dentists. Several measures should be put in action to improve captive wildlifes' dental health and welfare. For instance, (i) establishment of routine dental health check-ups and (ii) provision of dentistry training programs for veterinarians in Malaysia. In addition, knowledge and awareness of the importance of husbandry and nutrition changes are also essential to promote better healthcare in captive wildlife.

Keywords: veterinary dentistry, healthcare, wildlife

PP47

Serological Evidence of *Brucella suis* Infection from Wild Pigs in Negeri Sembilan

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ABSTRACT

Brucellosis is an infectious disease that can affect humans and animals caused by the bacterium *Brucella* spp. *Brucella suis* causes swine brucellosis, a zoonosis that affects pigs. The presence of brucellosis in large ruminants and pigs in Malaysia was confirmed by the isolation of *Brucella abortus* in 1950 and *B. suis* in 1963, respectively. In September 2020, four wild pigs were caught by Department of Veterinary Services, Negeri Sembilan, the blood samples were sent to the Makmal Veterinar Zon Tengah (MVZT), for *B. suis* serological screening. Upon screening by RBPT and ELISA, all four sera were positive for *B. suis* antibodies. This mark the risk of introduction of *B. suis* to the human population if the wild pigs are consumed as protein source. It is very important for clinicians and physicians attending patients exposed to the specific risks such as wild boar hunting or involved in meal preparation, with these kinds of predicament to ascertain whether they might have contracted *B. suis* infection through ingestion or handling of blood or body parts of the wild boars or pigs carcass.

Keywords: serology, *B. suis*, wild pigs, Negeri Sembilan

PP48

Gastrointestinal Parasites in Elephants: A Systematic Review

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ABSTRACT

Gastrointestinal parasites (GIPs) in elephants have been reported in several studies over the last decades. Nonetheless, comprehensive data on clinicopathology of elephant GIPs, parasite burden threshold value and the effectiveness of conventional anthelmintic drugs are still lacking. Herein, we have systematically reviewed the available knowledge on elephant GIPs identified among different parts of the world and subjected to their prevalence, epidemiology, pathology, diagnosis, treatment and control. Two electronic databases were searched for publications that met inclusion criteria. A total of 19 English articles sourcing from journal and published between 2011 - 2021 were included. The main GIPs reported in elephants were Cyathostomidae (at least 14 species), Ancylostomidae, *Haemonchus contortus*, *Trichostrongylus colubriformis*, *Oesophagostomum columbianum*, *O.aceleatum*, Ascarids, Trichurids, Strongyloides, Anophlocephalidae, flukes and Coccidia across different parts of the world including Malaysia, Indonesia, Thailand, Myanmar, Sri Lanka, India, Kenya, Nigeria and South Africa. Most elephants show no clinical signs until balance between parasite and host is disturbed. The common diagnostic method for GIPs are traditional direct smear, faecal floatation, sedimentation and McMaster egg counting technique, through the morphological identification. However, some articles described the use of molecular detection to characterize common GIPs of elephants. Benzimidazoles and macrocyclic lactones group of anthelmintic are the most conventional GIPs treatment and control for captive and semi-captive elephants, however there is limited data on the threshold value of faecal egg count as baseline for treatment decision. Over the last decades, various studies regarding elephant GIPs have been conducted, however, more focused and systematic research are required to enhance our knowledge in multiple aspects of elephant parasitology to find effective solutions and improve elephant health.

Keywords: gastrointestinal parasites, endoparasites, elephants, Asian elephants, African elephant

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