



31<sup>st</sup>

# Veterinary Association Malaysia (VAM) Congress 2019

## FUTURE-PROOFING

THE VETERINARY PROFESSION

*E-Proceeding*

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## Welcome Message from the Director General of Veterinary Services Malaysia

It is a great pleasure for me to extend my warm welcome to all distinguished guests, speakers and participants to the 31st VAM Congress 2019, which is held from 19-20 October in Bangi Resort Hotel, Bangi, Selangor.

This year's congress is organised by the Veterinary Association Malaysia and co-organised by Department of Veterinary Services, Universiti Putra Malaysia and Universiti Malaysia Kelantan. I believe it is essential for the veterinary profession to share and discuss new findings related to animal and human health.

The theme, "Future Proofing of Veterinary Profession" has been chosen to highlight and emphasize on preparedness of veterinarians to anticipate the future of the veterinary profession in Malaysia. As the veterinary care and services are changed dramatically due to higher expectations from pet owners, increase the standard of care and services, growth of livestock industry and emerging infectious and zoonotic diseases, the need for future-proofing with innovation is immediately apparent.

With cutting-edge technologies, international and national collaboration and discovery of new scientific findings, we can upgrade and transform the veterinary profession for the enhancement of livestock industry, animal health and animal welfare.

In order to achieve this aspiration, all veterinarians in Malaysia including in the Department of Veterinary Services, public universities, research institutions and private practices are responsible with mindset shifts and work hand in hand for the benefits of veterinary profession and fraternity.

I hope that the aspiration of the congress towards the "Future Proofing of Veterinary Profession" will succeed and become the platform for all participants to gain and apply knowledge and brainstorm new ideas regardless of different backgrounds.

Last but not least, I would like to thank the organising committee for their efforts and commitment to making this congress a success.



**Dato' Dr Quaza Nizamuddin Hassan Nizam**  
Director General of Veterinary Services Malaysia



## Welcome Message from the President of Veterinary Association Malaysia

First and foremost, it is an honour for me to welcome all Veterinary Association Malaysia (VAM) members, participants, presenters, speakers, researchers and distinguished guests to the 31st VAM Congress with the theme “Future-Proofing the Veterinary Profession” which is held from 19-20 October 2019 at Bangi Resort Hotel, Bangi, Selangor Darul Ehsan.

Currently, VAM plays a significant role in providing and promoting awareness towards several issues such as zoonotics diseases, animal welfare and antimicrobial resistance. Although we have been tackling this agenda for the past several years, efforts to overcome these issues need constant attention in terms of research and policy. Other issues pertaining to the advancement of the veterinary profession such as Continuing Professional Development (CPD), Professional Ethics and Conduct can be further discussed and solved on this platform. For long term solution on the issues relating to the profession, commitment from all parties and stakeholders is needed. It is my sincere hope that beneficial collaborations among veterinarians, academicians, and industry players is achieved with all stakeholders on the same frequency to create a sustainable ecosystem between humans, animals and the environment. This agenda is also strongly promoted by the government for the benefit of our beloved country and world. I am confident that with the support from all, we can make progress and success.

The annual VAM Congress is indeed an excellent platform to exchange ideas, create networking, update knowledge and distribute information regarding animal health, management and production. I am aware that VAM is a great platform for us to discuss and bring meaningful evolution and changes in the way we practice and upgrade our knowledge. Hence, we also organize dialogues and seminars on animal welfare issues, Veterinary Product Registration with our members and affiliates where all veterinarians can benefit and express their opinions.

As the President of VAM, I would like to record my sincere gratitude to our organising committee and fellow members for the success of 31st VAM Congress 2019. My greatest appreciation also goes to our sponsors for their generous contribution and continuous support. Thank you to all who have contributed directly or indirectly to the success of this event. I also wish all the best to all plenary speakers and presenters for the indispensable knowledge shared to the profession.

Have a fabulous congress. Thank you.



**Dato' Dr. Norlizan Mohd Noor**

President of Veterinary Association Malaysia, 2018-2020

## Welcome Message from the Congress Chairman

It is a great pleasure to welcome everyone to the 31st Veterinary Association Malaysia Annual Congress.

This congress serves as the primary platform for the veterinary fraternity to ensure veterinary profession always highly relevant in the changing time. All veterinarians, the relevant policy makers, industry players and other stakeholders shall remain up-to-date with the current issues, latest technologies and current advancement. Members are demanded to keep up with current and future trends to bring about meaningful changes in the way we practice our profession and here is the theme “Future-Proofing the Veterinary Professions” is for all of us to embrace with strong commitment.

The organising committee highly appreciates all team members for their high commitment and pivotal role towards the success of this congress.

Let's congratulate our organising committee members, who have worked together as a team and made this event possible. I would like to express my deepest appreciation to each and everyone of you for your remarkable contribution.

Great thanks to the sponsors who have always been pillars of support in all of our endeavours in making this congress a success.

Once again on behalf of the organising committee and VAM exco-members, I wish you all an enlightening and a fruitful meeting and networking session.

Thank you and have a splendid congress.



**Professor Dato' Dr. Mohd. Azmi Lila**  
Congress Chairman  
31st Veterinary Association Malaysia Congress 2019

## Organising Committee

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Dato' Dr. Norlizan Bin Mohd Noor

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Zin



Dr. Wan Nor'Amirah  
Diana Hishamnuri



## Speakers



### Keynote Speaker

YBhg. Dato' Dr. Quaza Nizammuddin Hassan Nizam  
*Director General of the Department of Veterinary Services*

### Plenary Speaker 1

Dr. S.M. Johnson Chiang  
*President of World Veterinary Association*



### Plenary Speaker 2

Dr. Ainu Husna Binti MS Suhaimi  
*Deputy Director of Advanced and Reproductive Technologies Program,  
Livestock Science Research Centre, MARDI, Malaysia*

### Plenary Speaker 3

Mr. Vignesvaran  
*Polis Diraja Malaysia (Royal Malaysia Police) PDRM*



### Plenary Speaker 4

Mr. Takashi Ishibashi  
*Fornix Food Stuffs*

### Plenary Speaker 5

Dr. Marcelo Paniago  
*Director of Global Veterinary Services (Poultry)*



### Plenary Speaker 6

Dr. Ho Ai Chia  
*Sarawak State Health Department*

### Plenary Speaker 7

Madam Asnida bt Mat Daud  
*National Pharmaceutical Regulatory Agency (NPRA), MPRA, KKM*



## Plenary 1

**Dr. S.M. Johnson Chiang**

*President of World Veterinary Association*

### **Sustainability of Private Small Animal Clinics**

In the past few years, having pets has become a trend worldwide. Pet keeping, companion animal vet population, and pet care product distribution are growing rapidly all over the world. The pet amount worldwide in 2019 is 2.2 times as many as in 2012. The market of pet care worldwide is USD 96 billion in 2012 and will grow to USD 128 billion in 2022. Take US for example, the pet care market is USD 31.3 billion in 2010 and grew to USD 43.2 billion in 2018; the population of companion animal vet is 48,906 in 2013 and grew to 55,270 in 2018. More and more families prefer having pets than kids because of economic pressure or issues in education especially in Asia, like Taiwan. Instead of companion animals, the owners are taking their pets as members of the family. Having Pets are already inseparable to our life. The trend of pet industry In Taiwan, the retail of pet supplies is the biggest item in the market. Pet care, behaviour training, and funeral service are also noteworthy items. Besides, the market value of medical service is over \$20 billion NTD in 2018.

The distribution of the veterinary hospital is uneven because of the rural-urban demand is different. There are lots of reasons for the pet owners choosing veterinary hospitals, including reliable vets, iatrotechnics, service attitude, public transport, opening hours, price, and so on. According to the statistics, the price which is acceptable to the owners is based on trustworthy vets. 64% of the owners are willing to receive treatment after elucidation by the vets. 44% of the owners spend over \$2000 NTD a month on their pets. Time is another critical factor. About 70% of the owners are willing to spend only 30 minutes waiting for their turn. Also, only 30% of the owners are willing to spend over 30 minutes receiving treatment.

There are two types of veterinary hospitals, traditional and chain management. Some owners think that chain veterinary hospitals could provide better customer service, more trustworthy, better medical quality. However, some owners cannot tell the difference between the two types of veterinary hospitals. For management, the chain veterinary hospital is a better model. The chain management model has a better human resource, financial resource, employee training, professional clinic, account management, brand, constructive competition, and external audit.

Although the high potential of the pet industry, there are some difficulties and challenges, such as trade competition, lacking channels of consultation in case of emergency, incomplete medical equipment, poor communication to the owners, should be overcome. The development of the pet industry relies on the effort of vets, medicine and biotech developer, pet service industry, and even the government support. Having pets has become a trend worldwide; the pet industry will be popular soon in the future.

**Plenary 3**  
**Mr. Vignesvaran**

*Polis Diraja Malaysia (Royal Malaysia Police) PDRM*

**Common Findings in Crime Scene Investigation and  
Applications for Animal Related Incidents**

CSI RMP Malaysia involved in various investigations which include cruelty and death of animals. Investigation cases related with animals become more challenging and variety. Currently CSI RMP team collects those samples at crime scene and sent to Chemist Dept and Veterinary Dept for further analysis. With current working system, process and method has been accepted in court of law. In near future CSI RMP would work closely with Veterinary Dept and other relevant Authority to collect evidence at crime scene to help to determine the cause of crime against animals.

**Plenary 4**  
**Mr. Takashi Ishibashi**  
*Fornix Food Stuffs*

**World Egg Day- Natural astaxanthin of  
Panaferd ® P: applications for poultry farming**

**Keywords:** Paracoccus carotinifaciens, astaxanthin, coloring agent, functional feed ingredient

**BACKGROUND:**

Consumer expectations for more natural food that is free of synthetic additives are now more prevalent around the world. Common sources of natural astaxanthin are the green algae *Haematococcus pluvialis*, the red yeast *Phaffia rhodozyma* and the microbe *Paracoccus carotinifaciens* of Panaferd ® P. Astaxanthin has important applications in the functional nutritional food, cosmetics, functional feed ingredient of livestock, coloring agent of aquafarming and coloring agent of egg yolk. Panaferd ® P is used as feed the most in the world. Astaxanthin can significantly reduce singlet oxygen and lipid peroxide and it is use to prevent brain aging, lifestyle disease, eyestrain, ultraviolet-induced skin damage, heart failure, non-alcoholic steatohepatitis, diabetes of human. Astaxanthin may call a medical food.

**OBJECTIVE:**

We introduce the benefit of astaxanthin through production of astaxanthin egg.

**ABSTRACT:**

Natural pigments, paprika (capsanthin), marigold (lutein) and Panaferd ® P (astaxanthin) are widely used as increasing color of egg yolk in Japan. The usage ratio of natural pigment is more than 65% in coloring agent for hen. Recently astaxanthin has become popular and more people have become health conscious. The astaxanthin in feed transfers egg yolk depending on dosage of astaxanthin and feed intake. The ordinary use of astaxanthin is 5-6 ppm in feed. The color fan value is more than 13 and the content of astaxanthin in egg yolk is 0.6-0.7 mg/100g. However, the color fan value and astaxanthin content in egg yolk do not exactly reflect on astaxanthin content in feed. The relationship with astaxanthin content in egg yolk and astaxanthin content in feed is a logarithmic function. When the astaxanthin of 40 ppm is added in feed, astaxanthin content in egg yolk is only 1.3 mg/100g. The recommended intake of astaxanthin is 6-12 mg/day as supplement. The astaxanthin content in egg yolk is little compared to supplement. But absorbed number of carotenoids in egg yolk is several times more than supplement. There are two reasons. The lecithin in egg yolk increases intestinal absorptiveness of carotenoids. The carotenoids in egg yolk increases cis-body, the absorption rate of cis-body carotenoids into a blood is higher than trans-body carotenoids. The astaxanthin in a blood shows useful efficacy for human health. Especially, astaxanthin is paid attention to the effects of beautiful



skin and presbyopia in Japan. The primary component of Panaferd ® P is astaxanthin, but it also contains adonixanthin and adonirubin.

These carotenoids have unique characteristics. Adonixanthin and adonirubin possess a higher activity to scavenge singlet oxygen compared with astaxanthin. Adonixanthin is a carotenoid contained in crabs and salmon. It assumes an asymmetric structure in which a keto group is detached from astaxanthin. With a strong anti-inflammatory activity, it may potentially relieve atopic dermatitis. Moreover, it is known to suppress light-induced photoreceptor degeneration via Nrf2 activation. It has also been confirmed to transfer into a rat's brain. Adonirubin is a carotenoid contained in sea urchins and sea cucumbers. It assumes an asymmetric structure in which a hydroxy group is detached from astaxanthin. With a strong cholesterol-reducing activity, it may improve hyperlipidemia. It has also been confirmed to transfer into a rat's brain.

Panaferd ® P has unique carotenoids in addition to the astaxanthin. As adonixanthin and adonirubin transfer egg yolk, astaxanthin egg which is fed Panaferd ® P is expected to improve the health of consumer. We are expecting to extend astaxanthin egg in Malaysia.

## Plenary 5

**Dr. Marcelo Paniago**

Director of Global Veterinary Services (Poultry)

### **Vaccines Reduce the Usage of Antibiotics and Occurrence of Antimicrobial Resistant**

In veterinary medicine, antimicrobials play a crucial role in the maintenance of animal health, animal welfare and food-safety. Specifically, in the poultry industry, the use of antibiotics aims at improving meat production through increased feed conversion, growth rate promotion and disease prevention. However, the misuse of these drugs, associated with the emergence and spread of antimicrobial-resistant microorganisms, places everyone at great risk. Additionally, there is an increasing pressure from consumers to reduce the use of antibiotics food-production animals.

Unquestionably, controlling infectious diseases is a straightforward way to reduce the use of antibiotics in farm animals and consequently decreasing antimicrobial resistant. However, the vaccination itself possesses challenges to producers as, if it is not properly performed, it might not protect the flocks and, even worse, it could lead to undesirable post-vaccination reactions that culminate with the use of antibiotics to control secondary infections. Within this context, several factors such as vaccine strains, schedule, administration routes and equipment, and monitoring strategies must be considered to better control the disease and reduce the unwanted reactions.

Although prevention of diseases through vaccination is able to reduce the usage of antibiotics, a holistic approach is required all along production chain in order to reach this goal in a sustainable and long-lasting manner and they include parent stock health management, hatching eggs hygiene, incubation monitoring, day-old chicks sorting, transportation hygiene, proper brooding at farms and health management of broilers and layers.

Last but not least, the reduction of the use of antimicrobial drugs in food-producing animals is an unstoppable trend and producers will have, sooner or later, to adapt to this reality. Definitely, this is not an easy goal to achieve as it involves different factors and, as a consequence, the whole process can take years. The starting point, though, might be to avoid disease challenges in the farms through sound biosecurity procedures and, if applicable, vaccination.

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## Plenary 6

Dr. Ho Ai Chia

Sarawak State Health Department

### Rabies in Sarawak

Rabies is a zoonotic disease caused by Rabies virus from the Lyssavirus genus. The disease is nearly always fatal but can be prevented through adequate post-exposure prophylaxis. Since the first case of Rabies in Sarawak confirmed in July 2017, the outbreak has claimed nineteen (19) lives and leaving one child with severe neurological complications. Bite incidence remained high and positive rabies samples from animals continued to be detected. Elimination of Rabies requires integration of both human and animal health sectors, involving collaborative effort from multiple disciplines, shared data and coordinated rabies control efforts.

Much efforts have been put on achieving effective vaccination coverage of dogs, targeted removal, integrated Rabies surveillance, licensing and enforcement as well as health education for communities. Health department continued to strengthen animal bite surveillance, revise protocol on animal bite management, training of health personnel and ensuring accessibility of rabies vaccination to all at risk population.

Despite all efforts, availability of post-exposure prophylaxis and education given, the effectiveness and sustainability of rabies outbreak control depends greatly on community participations and commitment from all agencies.



# Scientific Papers

## Rapid Oral Presentation

## **ROLE OF VETERINARIANS IN THE ANIMAL WELFARE ACT 2015: TOWARDS SUCCESSFUL ANIMAL WELFARE ENFORCEMENT FOR MALAYSIA**

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### **ABSTRACT**

The Animal Welfare Act 2015 (Act 772) was enacted on 29 December 2015 and has been enforced since 1 July 2017. With the increasing awareness of public towards the responsibilities of pet and animal ownership, the Department of Veterinary Services is the custodian entrusted to ensure the safety of animals and veterinarians are sworn to deliver their expertise and profession conduct within the practise of the Veterinary Surgeon Act. This paper is delivered to provide awareness on the roles of a Veterinarian in the Act as owner or licensee or any person, who is a Registered Veterinary Surgeon (RVS) and government witness. The basic standard operating procedure indicated investigating cases related to the Act includes ownership of pets, premises occupied by the animal, the veterinarian's role in evaluating, conducting procedures and treatments, advising the owner and making deductions based on the five basic needs of the animal which needs to be fulfilled. The Veterinarian must be registered under the Malaysian Veterinary Council as a Registered Veterinary Surgeon (RVS) in order to carry out such activities and empowered to certify an animal in distress status and produce a medical report to be tendered as prosecution documents and witness. It is also vital for any such investigation to be conducted with the utmost professionalism, working in tandem with other agencies if necessary, such as the police personnel as well as other medical or management specialists to ensure justice prevails. Thus the role of veterinarians is multifaceted and in keeping with current times.

## **PENANG FREE ROAMING DOG STUDY: PUBLIC'S OUTLOOK OF TRAP-NEUTER-RELEASE (TNR) SCHEME VS. TRAP-EUTHANASIA (TE) SCHEME**

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### **ABSTRACT**

The presence of uncontrolled dogs with or without an owner is generally recognized to be a significant problem for both humans and animals. Trap Neuter and Release (TNR) is one of the Dog Population Managements (DPMs) adopted worldwide for reducing free roaming dog populations (FRDs). TNR scheme humanely trapped FRD, spayed/neutered and vaccinated, and then returned to where they are fed. Trap Euthanasia (TE) is another scheme in which FRDs are humanely trapped and euthanatized. The aim of this survey was to ascertain the publics' notion and outlook of TNR scheme which is being currently practiced and concurrently in comparison with the TE scheme in managing the FRDs in Penang. Our questionnaire survey had resulted 157 local Penang public respondents. Findings indicated that they were in favour and preferred humane methods of FRD population control such as the Trap and Take to a Shelter, Adoption scheme, Spaying/ Neutering scheme and TNR compared to TE. In spite of TNR being practiced currently, results indicated that 55% (n=146 respondents) had disapproved and 43% (n=157 respondents) did not believe in its effectiveness to control the FRD population. Besides that, Trap Euthanasia (TE) scheme showed that 70% (n= 145 respondents) disagreed with this scheme although their presence is unwanted and can be a vexation at times. Thirty-five percent (n=157 respondents) also found TE ineffective. In conclusion, the results showed public concern towards FRDs and encourage the authorities to seek out improved methods of population and FRD control which is humane and acceptable in society.

## **EDIBLE BIRD'S NEST SUPPLEMENTATION ON NEURON DENSITY AND COGNITIVE FUNCTION OF TRANSGENERATIONAL MICE**

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### **ABSTRACT**

Edible bird's nest (EBN) is well known as a natural food product rich in glycoproteins, such as sialic acid, carbohydrates and minerals. In mammals, the highest absorption of EBN occurs in the brain where it participates on synaptogenesis and neural transmission. While EBN supplementation has been associated to enhance cognitive functions in infants, the effects of multiple generations of EBN on cognitive functions are still remain unclear. Therefore, the present study aims to determine the effects of EBN supplementation cognitive functions of trans-generational mice. C57BL/6 breeder mice were fed with different sources of EBN. After 6 weeks of supplemented diet, animals were bred to produce first- and second-generation mice. At 6 weeks of age, animals from both generations were tested for cognitive function using Y-Maze task. The effects of EBN on neuron density from both generations were evaluated using haematoxylin and eosin procedure. Results showed that animals from both generations on EBN supplementation had significantly higher performance on the time spent and entries in the novel arm. In addition, there was significantly higher number of neurons in the hippocampus compared to control animals. This could indicate that the higher performance in Y-Maze and denser amounts of neurons in the hippocampus region due to the breeder mice synthesized the sialic acid from EBN, which crosses the placenta to contribute fetal neuron development in the third trimester. Thus, dietary supplementation of EBN resulted an increased cellular density in the hippocampal associated with an improving cognitive function in multiple generation mice.



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## A CASE REPORT OF FELINE CORONAVIRUS (FCOV) IN A DSH CAT

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### ABSTRACT

Feline Coronavirus (FCoV) belongs to the genus of Alphacoronavirus under family of Coronaviridae. There are two biotypes of FCoV known as Feline Enteric Coronavirus (FECV) and Feline Infectious Peritonitis Virus (FIPV). FECV can cause asymptomatic infection or mild diarrheal in cat while FIPV is characterise as a fatal viral disease in cat manifested as wet or dry form Feline Infectious Peritonitis (FIP). A clinically ill cat died with a distended abdomen. Gross lesion coupled with RT-PCR revealed that the cat was positive of Coronavirus which suggestive of the cause of death is due to FIP infection.

**Keywords:** Feline coronavirus (FCoV), Feline enteric coronavirus (FECV) , Feline infectious peritonitis (FIP), RT-PCR

## THE CURRENT STATUS OF PIG FARMING SYSTEMS IN MALAYSIA: ARE WE MOVING TOWARDS SUSTAINABLE PIG FARMING?

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### ABSTRACT

Pig farming is known as one of the major livestock industrial sectors in Malaysia due to the expansion of this non-ruminant sector to multimillion-ringgit enterprises. This study is an overview of the current pig farming industries in West Malaysia. A total of 8 states provided data on pig farms in 2018. It was estimated about 1,413 042 heads of total Standing Pig Population (SPP). Perak state indicated the highest SPP (540 816 heads), followed by Penang (317 897 heads) and Johor (266 480 heads). Meanwhile, from 508 of total farms recorded, 96.67% were commercial farms, 2.76% were smallholder farms and 1.57% were semi-commercial farming. From the total of 512 wastewater treatment systems that were recorded (7 types), the three most common types that were used in the pig farms were wastewater pond (276 units), followed by lagoon/oxidation pond (140 units) and continuous/enzyme aeration (69 units). Out of 591 farms recorded, the most common were opened-house system (393 units), followed by semi-intensive system (87 units) and the least common were the closed-house system (28 units). Additionally, out of 322 farms that were monitored, 302 farms recorded the Biological Oxygen Demand (BOD5) of below 50 ppm, while 20 farms exceeded 50 ppm (Standard B of Industrial Waste by Department of Environment). Sustainable pig farming systems are important to ensure that the by-products particularly wastewater released from the pig farms will not continue to create concerns to the environment as well as the well-being of the animals and humans.

## TREATMENT OF CMV CONGENITAL INFECTION IN RATS WITH CYCLOSPORINE A

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### ABSTRACT

CMV causes congenital infection and lead to brain disability. Treatment of congenital infection with approved drug mediates some toxicity and help to repair CNS injured. CyPA was known as important protein mediated CMV replication. This study aims to use CsA as an antiviral drug as also it has neuro-protective action.

Eight groups of pregnant female rats involved in this study. Two doses of CsA were administrated compared with standard drug GCV. After treatment organs/tissues were collected for histopathology study, qRT-PCR and ultrastructure study.

The result showed improved in histopathological lesions in both dam placenta and pup brain in treatment rat treated with low dose 5mg/kg/rat CsA compared with a high dose which showed more inflammation compared with infected animals. qRT\_PCR showed less expression of IE1 and IE2 in placenta dam and pup brain in treatment rat with 5mg/kg/rat CsA compared with 10mg/kg/rat. Ultrastructure data showed improved in placenta structure zone, and in the pup brain in the rat treated with 5mg/kg/rat but some toxicity associated with 10mg/kg/rat.

RCMV has the ability to show the typical lesion in both dam placenta and pup brain as approved by previous study. The low dose of CsA has antiviral drug activity while the high dose enhanced virus replication. RCMV model is great small animal models to future study of HCMV.

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## CLINICAL SIGNS, HAEMATOLOGY AND SERUM BIOCHEMISTRY CHANGES IN C. PSEUDOTUBERCULOSIS INFECTED BALB/c MICE TREATED WITH OXYTETRACYCLINE LOADED CALCIUM CARBONATE ARAGONITE NANOPARTICLES

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### ABSTRACT

Nano-antibiotic formulation represents a promising alternative drug delivery strategy for the treatment of caseous lymphadenitis. A chronic bacterial disease of small ruminants caused by *Corynebacterium pseudotuberculosis* (*C. pseudotuberculosis*). Current treatment modalities involve surgical excision, lancing and drainage of granulomatous lesions with administration of antibiotics. These do not solve the issue because most times lesions do reoccur. Calcium carbonate aragonite nanoparticle (CS-CaCO<sub>3</sub>NP) has been described as perfect candidate for drug delivery because of their sustained and selective release of antibiotics at acidic conditions. The study was aimed at determining the antibacterial effect of oxytetracycline loaded calcium carbonate aragonite nanoparticle (OTC-CS-CaCO<sub>3</sub>NP) on *C. pseudotuberculosis* infection in BALB/c mice. Thirty 5-6-weeks-old female BALB/c mice were used. The mice were randomly divided into 5 groups of 6 mice each with treatments thus: G1 (sterile distilled water), G2 (0.2 ml *C. pseudotuberculosis*), G3 (0.2 ml *C. pseudotuberculosis* and 10mg/kg OTC), G4 (0.2 ml *C. pseudotuberculosis* and 10mg/kg OTC-CS-CaCO<sub>3</sub>NP) and G5 (20mg/kg CS-CaCO<sub>3</sub>NP). The findings revealed the occurrence of depression, reduced movement, ruffled fur and weight-loss in BALB/c mice due to caseous lymphadenitis were significantly reduced by OTC-CS-CaCO<sub>3</sub>NP treatment. Haematological analysis showed a reduction in the mean red blood cell, haemoglobin and packed cell volume in G2 and G3 groups compared to OTC-CS-CaCO<sub>3</sub>NP treated group. Biochemical analysis revealed no significant changes between treatment groups. It is concluded that encapsulating oxytetracycline into CS-CaCO<sub>3</sub>NP improved its antibacterial activity against CLA in mice.

**Keywords:** nanoparticle, oxytetracycline, haematology, biochemistry

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## **RABIES VIRUS DETECTION BY NESTED REVERSE TRANSCRIPTION POLYMERASE CHAIN REACTION (nRT-PCR) IN BRAIN TISSUES**

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### **ABSTRACT**

Rabies is an acute fatal zoonotic encephalitis caused by Lyssavirus of family Rhabdoviridae. In July 2015, Malaysia lost its rabies free status due to canine rabies outbreaks that started from Perlis, later spread to Kedah and Pulau Pinang in Peninsular Malaysia. Rabies was subsequently detected in Sarawak at the Borneo island in July 2017. From July 2015 till Mac 2019, a total of 651 suspected rabies infected brain (579 fresh samples and 72 autolysed samples) were received for rabies diagnosis at the Veterinary Research Institute. The present study reported the diagnosis of rabies using nested reverse transcription polymerase chain reaction (nRT-PCR), when the fluorescent antibody test (FAT) results were doubtful or autolysed sample. From the 651 samples tested, 23.66% (n=154) of the samples were detected positive for rabies. Out of these positive samples, 34 samples are from autolysed brain that were not tested with FAT while 35 samples are from doubtful FAT results. The remaining 497 samples (76.34%) were diagnosed as negative. Although, FAT is regarded as the gold standard for rabies diagnosis, autolysed samples can affect the sensitivity of the FAT. Hence, nRT-PCR is a supplementary and alternative test to FAT for accurate testing of rabies especially in doubtful cases and autolysed samples.

**Keywords:** Rabies virus, nested RT-PCR, outbreak, Malaysia.



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## ESTABLISHMENT AND EVALUATION OF RAPID TISSUE CULTURE INFECTION TEST (RTCIT) DURING RABIES OUTBREAK IN MALAYSIA 2017-2018 COMPARED TO FLUORESCENCE ANTIBODY TEST (FAT)

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### ABSTRACT

A rapid tissue culture infection test (RTCIT) was established and compared to fluorescence antibody test (FAT) for rabies diagnosis from field cases submitted at Veterinary Research Institute, Ipoh during Rabies outbreak in Malaysia 2017 to 2018. The test was established in 4-wells chamber slide with confluence Murine Neuroblastoma (MNA) cells. The brain suspension of suspected rabies cases was inoculated and incubated at 37°C for 4 days. The cultures were then fixed using cold acetone and stained with fluorescein-labelled monoclonal antibodies conjugate and examined under fluorescence microscope. A total of 224 brain samples were analysed. The sensitivity and specificity of RTCIT and FAT were compared. This study showed that RTCIT appears to be reliable as confirmation test for FAT.

**Keywords:** Rabies diagnosis, rabies outbreak, rapid tissue culture infection test

## **SPECIES DIVERSITY OF CULEX SPP. MOSQUITOES IN KUALA GULA BIRD SANCTUARY, PERAK**

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### **ABSTRACT**

Mosquitoes-borne Flavivirus such as Japanese Encephalitis virus (JEV) and West Nile Virus (WNV) are the two significant neurotropic viruses. These emerging viruses are maintained in the sylvatic cycle between mosquitoes specifically *Culex* spp. and wild birds as the reservoir host. Clinical manifestation caused by JEV and WNV ranging from asymptomatic, febrile illness and encephalitis in which human and mammals served as dead-end hosts. Although wild bird is known as the reservoir for both viruses, the vector diversity in wild bird's habitat or landing areas is poorly known in Malaysia. Considering *Culex* mosquitoes has ornithophilic preference and known to carry JEV and WNV, a cross-sectional study was conducted to identify the species diversity of the *Culex* genus in Kuala Gula Bird Sanctuary, Perak. The mosquitoes were collected by using CDC Light Trap baited with carbon dioxide and stored at -80°C. Species of *Culex* mosquitoes were characterized based on morphological features which are the characteristics of proboscis, the dorsal view of vertex, abdomen, scutellum shape and wing scales under a stereomicroscope. The relative abundance was calculated in percentage and classified based on density (dominant, subdominant and satellite) for collected mosquito species. Six *Culex* species were identified which comprised of *Culex tritaeniorhynchus*, *Culex vishnui*, *Culex pseudovishnui* (dominant species), *Culex gelidus* (subdominant species), *Culex quinquefasciatus* and *Culex Lophoceraomyia* sp. (satellite species). This finding highlighted the potential transmission risk of mosquito-borne viruses. Therefore, designing comprehensive vector control and preventive measures programs are essential.

**Keywords:** Mosquitoes-borne Flavivirus, wild bird, diversity, *Culex*, species

## PREVALENCE OF PLATYNOSOMUM SP. IN STRAY CATS IN KUALA LUMPUR AND SELANGOR, MALAYSIA

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### ABSTRACT

*Platynosomum* sp. (*P. fastosum*, *P. illiciens*) is a hepatic trematode causing platynosomiasis or 'lizard poisoning' in cats through consumption or accidental ingestion of lizard which is the paratenic host of *Platynosomum* sp. The aim of this study is to determine the prevalence of *Platynosomum* sp. infection among stray cats in Kuala Lumpur and Selangor and their correlation with gender of animals. Liver and bile samples from 42 cats obtained from city council were collected via necropsy after euthanizing. Bile samples were examined under microscope for ova detection followed by liver necropsies to detect adult flukes. The adult flukes were collected, and their DNA was extracted using QIAGEN DNEasy Blood and Tissue kit. The extracted DNA were subjected for Polymerase Chain Reaction (PCR) and sequencing. The sequences were BLAST to GenBank for species identification. The results of this study show a prevalence of 21.43% (CI 0.12 – 0.37) cat liver fluke and showed no significant association with the gender of the cats ( $p > 0.05$ ) using Chi Square Test. The result of sequencing from adult flukes detected showed seven out of nine are *Platynosomum illiciens* (96.96% - 99.89%) and the other two were identified as *Platynosomum fastosum* (99.12% - 99.78%). In conclusion, the prevalence of *Platynosomum* sp. in shelter cats from Selangor and Kuala Lumpur is significant with no gender association and are molecular identified as *Platynosomum illiciens* and *Platynosomum fastosum* where both species were confirmed to be identical from previous work.

## THE EMERGENCE OF CHICKEN ASTROVIRUS IN MALAYSIA

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### ABSTRACT

Chicken astrovirus (CAstV) is the most recently identified virus of the family, Astroviridae, and like other family members, is a leading cause of enteritis and diarrhoea in the young birds. The recent detection of CAstV from enteric and kidney samples of chickens with un-even uniformity and decrease feed conversion ratio, submitted by commercial poultry farms in Malaysia calls for an in-depth study of the emerging virus. Positive tissue homogenates were propagated in 6-day-old SPF chickens embryonated eggs via the yolk route. At 7 days post-inoculation (dpi), chicken embryos suffered mortality with varying degrees of lesions such as congestion, haemorrhages and oedema of abdominal muscles. Dwarfing (stunting) was conspicuously observed in embryos that survived up to 10-dpi. Same mortality and lesions were observed in three consecutive passages. The presence of CAstV was detected by RT-PCR in all the passages, and the amplified product shared a similarity with the CAstV isolate (GA2011) in the RNA-dependent RNA polymerase gene. Therefore, there is the need to carry out an in-depth study consisting of full-length genome analysis and pathogenicity study of the Malaysian isolate of the CAstV for the development of an effective control measure against the virus.

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## MECHANICAL PROPERTIES OF EXPANDED SKIN OF HORSES UTILIZING SUBCUTANEOUS ANISOTROPIC TISSUE EXPANDERS

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### ABSTRACT

A skin wound in horses undergoes a normal healing process of inflammation and repair. When skin healing is impaired, an Internationale surgery is an option either for anatomical restoration or cosmetic. The implantation of self-inflating subcutaneous tissue expander is a technique by which additional cutaneous tissues are formed. The skin tissue expands by application of force to the skin which involves a combination of creep and biological stretch process, increasing the skin surface area. This study aims to evaluate the mechanical tensile strength of the expanded and control skin tissue of horses at different areas. For this experiment, 18 tissue expanders were surgically implanted subcutaneously in the target regions for 14 days. Then, the tissue expanders were explanted, and samples of expanded skin were harvested. Normal skin samples were collected from the opposite side for comparison. The mechanical characteristics of the skin tissue were determined under the uniaxial tensile test performed at a constant loading rate of 5mm/min until rupture. The results presented here showed that there are significant differences between the tensile strength of the expanded and normal skin tissue of the frontal sites (PV= 0.000), however, there is no significant differences in shoulder sites (PV= 0.080) and forelimb sites (PV= 0.559) on the elasticity of the skin. Based on this experiment, tissue expansion is a way of mechanically generating excess soft tissue adjacent to a defect. The significance of this technique enables replacement of lost tissue with similar tissue of matching colour, texture and other characteristics.



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## INTRANASAL VACCINATION WITH PESTE DES PETITS RUMINANTS VIRUS VACCINE IN GOATS USING NATURAL MUCOADHESIVE POLYMER AS VACCINE DELIVERY SYSTEM; HAEMATOLOGICAL AND HUMORAL IMMUNE RESPONSES

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### ABSTRACT

Peste des petits ruminants (PPR) caused by Peste des petits ruminants' virus (PPRV), is a highly contagious and economically were transboundary viral disease of small ruminants, mainly sheep and goats. This study evaluates the immunomodulatory potential of Irvingia gabonensis gum polymer extract as mucoadhesive vaccine delivery system against PPR in goats. Twenty-five (25) male West African dwarf goats (6-9 months) were divided into 5 groups (n=5). Attenuated 75/1 PPR lineage 1 strain, a homologous PPR vaccine was used for this study. Group 1 was vaccinated via the intranasal route using mucoadhesive polymer as vehicle; Group 2 was vaccinated intranasally with reconstituted vaccine only; Group 3 were haematology via subcutaneous injection while Groups 4 and 5 served as the non-vaccinated controls administered intranasal mucoadhesive polymer and water respectively. Haematology and H-based PPR blocking ELISA was done weekly for 4 weeks post-vaccination to evaluate the immune response. H-PPR ELISA detected antibodies against PPR by 7-day post-vaccination (dpv), reaching a peak by 21 dpv with mean percentage inhibition (PI) of 78.2%; 69.6% and 87% in Groups 1, 2 and 3, respectively. The unvaccinated control animals remained negative. The haematocrit, a red cell count and total leucocyte counts did not differ significantly between groups. However, low neutrophil to lymphocyte ratios (NLR) which differed significantly ( $P<0.05$ ) from the controls were observed by 14 dpv to 28 dpv in the vaccinated groups. The findings of this study suggest that use of mucoadhesive polymers in mucosal vaccine delivery have an immunomodulatory effect in intranasal PPRV vaccination.

**Keywords:** Peste des petits ruminants, mucoadhesive polymer, intranasal vaccine, West African dwarf goats

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## RABIES DIAGNOSTIC MANAGEMENT DURING OUTBREAK IN VETERINARY RESEARCH INSTITUTE (VRI)

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### ABSTRACT

Rabies is a fatal disease in humans and animals that needs immediate action and diagnosis in controlling the disease especially during outbreak. Veterinary Research Institute (VRI) played a big role in diagnosing rabies cases. Recent outbreak was during year 2017 until 2019 in Sarawak, Perak, Kedah and Perlis. This paper describes the management of rabies cases from registration until the release of results in VRI. During this period, a total of 1079 dog bite and surveillance cases from 4 states were received for rabies diagnosis using the international test methods of OIE. When the suspected rabies-infected head samples were received at the registration unit, postmortem was performed and the brain samples were tested with Fluorescent Antibody Test (FAT), a gold standard for diagnosing rabies. The positive FAT samples were further confirmed with Nested reversed transcription Polymerase Chain Reaction (nRT-PCR) and Rabies Tissue Culture Infection Test (RTCIT). Among the positive nRT-PCR and RTCIT cases, few were selected for DNA sequencing to determine the origin of virus. All rabies diagnosis results were first reported to Director General of Department of Veterinary Services (DVS) before releasing it to the sender and relevant DVS bodies for further immediate action. All bite and surveillance cases were diagnosed within the turnaround time (TAT), which is 2 to 7 days. In conclusion, a clear workflow for diagnosis of rabies in VRI is crucial to provide laboratory results within the TAT to assist in control measures during rabies outbreak.

**Keywords:** Rabies outbreak, diagnostic, management

## DETECTION OF FUNGI FROM CLAWS AND SALIVA OF COMMUNITY CATS IN SRI SERDANG, SELANGOR, MALAYSIA

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### ABSTRACT

Fungi are generally classified as either mould or yeast. Some have been recognised as classic pathogens, whereas others are recognised as environmental saprobes. Cat claws and saliva are frequently contaminated with fungi especially in those with access to outdoors and when they are grooming. The aim of this project is to identify the presence of fungi in cats' claws and saliva samples from 25 community cats in Sri Serdang, and to determine their prevalence. All samples were inoculated onto Sabouraud dextrose agar (SDA) supplemented with cycloheximide and chloramphenicol. The species of moulds were identified by macroscopic and microscopic examination, while the yeasts were identified using API 20 C AUX test kit. From both samples, a total of 20 different fungus were identified and all of them have been known to cause infection in humans. A few of them may require further identification to determine their species or strains. The prevalence of cats harbouring fungi in their claws and saliva are 48% and 60% respectively. Overall, the prevalence of cats in Sri Serdang that harbour at least one species of fungi in their claws or/and saliva is 80% (n=25). Thus, it can be concluded that a large proportion of community cats in Sri Serdang do harbor at least one type of fungi in their claws and/or saliva. Due to their potential for causing infection in humans, caution should be exercised to minimise the risk of infection especially in immunocompromised people.

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## THE QUALITY AND PRODUCTION OF MILK BY LOCAL FARMERS IN JOHOR IN YEAR 2016 TO 2018

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### ABSTRACT

This study aimed to determine the quality and trend of production of cow milk from local dairy farmers in Johor. Data were obtained from 185 farmers in five Pusat Pengumpulan Industri Tenusu (PPIT), for the year 2016-2018. Five milk quality parameters gathered were solid non-fat (SNF), fat, total dissolve solid (TDS), total plate count (TPC), and methylene blue reduction test (MBRT), with the average of 8.81%, 3.82%, 12.78%,  $1.7 \times 10^6$  cfu/ml and five hours, respectively. There were slightly significant differences in the quality parameters in different years, except for MBRT. The TPC results for all PPITs in every year were exceeding the limit of  $1.0 \times 10^6$  cfu/ml. About 40% of the farmers were categories as small-scale farmers, 16% as semi-commercial, 33% as commercial, whereas no data for the remaining. Overall, there were no significant differences in the milk quality parameters between small-scale, semi-commercial and commercial farmers in every year. Total milk production was at average of 6.70 million liters, and half of it was contributed from PPIT JB. An average income for the farmers has been estimated at RM 3,785.29. The average income for the commercial farmers was significantly higher than semi-commercial and small-scale farmers, at RM 10,827, RM 3,059 and RM 1,765, respectively. About 80% of milk produced by the farmers was sent to PPITs. The rate of production was quite low, at an average of 9.27 L/cattle/day.

## A SURVEY OF SALMONELLA SPP. CARRIAGE ON FOOTPADS AND RECTUM OF STRAY AND OWNED CATS

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### ABSTRACT

Incidence of Salmonellosis is common worldwide. However, Salmonellosis in companion animals commonly manifests as latent infection with raw feed diet as a main potential risk factor. This study aimed to determine the occurrence of *Salmonella* spp. on footpads and rectum of stray and owned cats and to determine the relationship between positive isolation and the lifestyle of the cats. Rectal and footpads (digital, metacarpal and metatarsal) swabs were obtained from apparently healthy 30 stray and 30 owned cats by convenience sampling. Xylose Lysine Deoxycholate (XLD) agar and Brilliant Green Agar (BGA) were used to isolate presumptive *Salmonella* colonies, followed by biochemical tests and polyvalent *Salmonella* antisera. Eight *Salmonella* isolates were obtained from 7 cats (11.6%), with 4 of these being pet cats. Three of these cats were managed fully indoor and only 1 was a semi-roamer. Majority of the isolates retrieved were from the rear footpads (n=5), followed by rectum (n=2) and only one was from the forelimb footpads. One stray cat harboured *Salmonella* in its rectum and on the left hindlimb footpads. Results indicate the role of cats as potential *Salmonella* spp. carrier with potential zoonotic risk. Further characterisation of all *Salmonella* spp. isolated is underway to assess the public health risks posed.



## **SEROLOGICAL AND MOLECULAR DETECTION OF LEPTOSPIRAL INFECTION IN DOGS DIAGNOSED WITH KIDNEY AND/OR LIVER DISEASE**

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### **ABSTRACT**

Leptospirosis is caused by spirochete bacteria of the genus *Leptospira*, that can cause a wide range of symptoms in both humans and dogs. In Malaysia, there is still paucity of information regarding leptospiral infection in dogs and their role in transmission of this zoonotic disease. This study investigated the occurrences of leptospiral infection in dogs diagnosed with kidney and/or liver disease. A total of 117 dogs with kidney and/or liver disease were recruited. Blood and urine samples were collected from the dogs via venipuncture and spontaneous micturition, respectively. The detection of leptospiral infection were performed using microscopic agglutination test (MAT) and polymerase chain reaction (PCR). Leptospiral infection could be identified exclusively by MAT in 25 dogs (21.4%), exclusively by PCR in 31 dogs (26.5%), and by both tests in 16 dogs, totaling 72 dogs (61.5% ; 95%CI: 52.7–70.4). The leptospiral serovars detected in MAT were bataviae (n=13), icterohaemorrhagiae (n=12), malaysia (n=4), ballum (n=3), australis (n=3), pomona (n=2), autumnalis (n=2), canicola (n=1) and celledoni (n=1). The PCR positive samples were further identified with DNA sequencing and were confirmed *L. interrogans* (n=43), *L. borgpetersenii* (n=2) and *L. kirschneri* (n=2). The simultaneous use of MAT and PCR was able to increase the diagnosis of leptospirosis in clinically suspected cases. Despite the increasing incidence of new serovars affecting dogs being reported in different countries, these results suggested that serovars bataviae and icterohaemorrhagiae could be major causative agents of leptospiral infection in dogs diagnosed with kidney and/or liver disease.

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## EVALUATION OF IN VITRO ANTHELMINTHIC ACTIVITY OF INDIAN ACALYPHA ROOT EXTRACT AGAINST L3 STAGE STRONGYLE LARVAE IN SHEEP

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### ABSTRACT

Gastrointestinal nematode (GIN) infection has been identified as the second most important cause of small ruminant morbidity and mortality in Malaysia. To control GIN infection, commercial anthelmintic drugs (AHD) are used. However, continuous unscrupulous usage of AHD has inevitably resulted in rampant anthelmintic resistance across numerous small ruminant farms in Malaysia. Hence, ethnoveterinary medicine is being actively explored to find an alternative to commercial AHD. This study aims to evaluate the anthelmintic activity of *Acalypha indica*, a common tropical weed, against L3 stage strongyle larvae in sheep. A total of 300 L3 larvae were assigned to 5 experimental groups (40, 50 and 60 mg/ml Indian *Acalypha* Root Methanolic Extract (IARME), ivermectin and distilled water) with a replicate each. The average percentage of L3 larvae mortality were recorded at 0, 10, and 30 minutes, 1, 2, 3, 4 and 24 hours and analysed. Results showed that 60 mg/ml IARME displayed the highest average percentage of L3 mortality against time, whereby 100% mortality was achieved in 3 hours with a mere 15.7% lower mean L3 mortality than the positive control, ivermectin. All concentrations of IARME were statistically significant ( $p < 0.05$ ) when compared to the control groups and exhibited increasing anthelmintic activity in a dose dependent manner. In conclusion, this study displayed that *Acalypha indica* roots possess anthelmintic properties and has the potential to be used as an alternative medicine to control GIN in sheep.

**Keywords:** *Acalypha indica*, anthelmintic resistance, gastrointestinal nematode, methanolic extract, sheep

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## COMPUTED TOMOGRAPHY STUDY OF IMPLANTATION CORRIDORS FOR CANINE VERTEBRAL SCREW AND ROD FIXATION SYSTEM IN DOGS

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### ABSTRACT

Canine vertebral screw and rod fixation system (CVSRFs) is a new device tailored for canine spine that offers a great alternative to commercially available implants in treating an unstable vertebral fracture. This study was performed to determine the optimal implantation corridor of CVSRFs in medium size dogs (15-20kg) and to assess its safety. Six adult dogs underwent a dorsal approach to the spine and the CVSRFs device was placed on the left (rod– 40mm; 2 screws–16mm length(S1)) and right (rod– 45mm; 2 screws– 20mm length(S2)) at pedicle of L1 and L2 vertebral bodies. Computed tomography was performed from T11 to L4 with and without contrast and screw insertion angle and the distance between screw tip and aorta (dAo2) and caudal vena cava (dCVC2) were measured. The mean insertion angles of S1 was 55° (SD: 9°) and S2 was 55° (SD: 4°). The mean dAo2 of S1 were 6.40mm (SD: 1.72mm) and for S2 were 6.40mm (SD: 2.16mm). Whereas the mean dCVC2 for S1 and S2 were 19.11mm (SD: 3.75mm) and 20.96mm (SD: 4.45mm) respectively. CVSRFs was successfully implanted in medium sized dogs without compromising the spinal cord and blood vessels using both 16mm and 20mm screw size on L1 and L2. However, from this study, it is noted that the 20mm screw appeared somewhat too long in length because it interfered with the implantation corridor on the opposite site of the vertebrae. This study confirmed that CVSRFs can be safely inserted on the L1 and L2 pedicles in canine.

## MICROBIOLOGICAL CONTAMINATION OF BEEF MEAT FROM SELECTED RUMINANT ABATOIRS IN MALAYSIA

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### ABSTRACT

Beef meat is a highly nutritious source of animal protein that is ideal for the growth of most microorganisms. Microbiological contamination of meat can lead to spoilage and food borne infection, resulting in health and economic losses. The aim of this study is to assess the microbiological contamination of beef meat from ruminant abattoirs in Malaysia. A total of 68 beef meat samples were collected during February to November 2018 from six ruminant abattoirs in three states of Malaysia (Selangor, Negeri Sembilan and Melaka). All the samples were subjected to aerobic plate count (APC), coliform and E.coli count as well as Salmonella detection. The results revealed that the average value for aerobic plate count for the total of 68 samples was  $3.81 \times 10^5$  CFU/g. Coliform was detected from 52.9% of total samples with the average reading of  $1.55 \times 10^2$  CFU/g while E. coli was isolated from 23.5% of total samples with an average reading of  $5.3 \times 10^1$  CFU/g. A total of 4 samples (5.9%) were tested positive for the presence of Salmonella spp. Moreover, 1.5% of samples exceeded the permissible limit for APC (106), 3% for coliform count (103), 4.4% for E.coli count (102) and 5.9% for Salmonella. This study showed the microbiological contamination of locally produced beef in Malaysian abattoirs. More efforts from the related authorities are still needed to ensure the safety and quality of locally produced beef.

**Keywords:** Beef meat, ruminant abattoirs, aerobic plate count (APC), coliform, E.coli, Salmonella spp.

14<sup>th</sup> Proceedings of the Seminar on Veterinary Sciences, 19 – 20 October 2019**SUSPECTED EQUINE HERPES VIRUS (EHV) TYPE-1 IN  
HORSES: CASE REPORT****<sup>1</sup>\*Nurul Hafizah F., <sup>1</sup>Faizah H. M. S., <sup>2</sup>Zul Edham W., <sup>2</sup>Mas Ayu Suraya  
A.R. & <sup>3</sup>Maria J.**\*Corresponding author: [fizafaisal88@gmail.com](mailto:fizafaisal88@gmail.com)**ABSTRACT**

Equine Herpes Virus 1 (EHV-1) is the major cause of respiratory, paralytic neurological, abortion, and perinatal foal death among horse populations worldwide. EHV-1 can be differentiated with EHV-4 as it causes sporadic abortion cases but not large outbreaks. This paper describes a case of high mortality in a horse farm located in Johor from July 2017 until March 2018. The total population of horses were 50, semi-intensively managed, fed with guinea grass and horse pellet. The horses were not vaccinated against EHV but the deworming status was up to date for the past 5 years. Horses exhibited respiratory, neurological and abortion clinical signs. All 22 horses that died showed symptoms of hindlimb paresis, paralysis followed by a temperature spike and mucopurulent discharge from eyes and nostrils. Two abortion and stillbirths were also observed. Twenty-four random serum samples were collected 3 weeks apart and tested with serum neutralization test (SNT) for antibodies level specific to EHV. Nasopharyngeal swab samples were tested using polymerase chain reaction (PCR) for the EHV detection. SNT results revealed 24 horses had antibody titer of more than 1: 4 dilution which indicates that these animals were positive for EHV, suggestive of potential recent infection. However, no EHV-1 were detected from the nasopharyngeal swabs through PCR. Post mortem and disease investigation revealed insignificant findings associated with EHV-1. However, based on the history of high mortality, clinical signs and further supported with the increase of antibody titer against EHV by SNT, this case was diagnosed as suspected EHV-1 infection.



## CASE REPORT: SUSPECTED BRACHIARIA DECUMBENS TOXICITY IN SHEEP

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### ABSTRACT

Signal grass (*Brachiaria decumbens*) is a highly productive tropical and subtropical grass widely cultivated for forage. Unfortunately, it is toxic to sheep and goats causing severe hepatic and renal damage, and death. This paper focuses on cases reported on a farm located at Perak where toxicity of *B. decumbens* were suspected among the herd of sheep. Generally, this farm was managed semi intensively where sheep and goats were allowed to graze in the paddock every day. Based on the records, the vaccination and deworming status of the herd is up to date. However, the caretaker reported a sudden increased in death of Dorper and Barbados-Black Belly sheep noted from September 2018 to January 2019. Further investigation revealed some areas in the paddocks were overgrown with *B. decumbens* grass. Affected animals showed clinical signs of thin body condition, moderate to severe alopecia and mild ulcerative dermatitis of the skin. Full diagnostic investigation inclusive of external observation, postmortem, hematology, serum biochemistry, parasite screening, bacterial and virus isolation was conducted. Majority of the serum biochemistry results of the affected sheep shown elevated liver enzymes concentration, particularly aspartate aminotransferase (AST) and gamma-glutamyl transferase (GGT) and this finding is in accordance with other similar clinical outbreak reported. Based on compatible clinical signs, gross pathology and serum biochemistry changes, diagnosis of suspected *B. decumbens* toxicity is made.

**Keywords:** *Brachiaria decumbens*, signal grass, toxicity, alopecia, ulcerative dermatitis, aspartate aminotransferase, gamma-glutamyl transferase

## PRELIMINARY STUDY OF CARCASS CHARACTERISTICS OF MALIN SHEEP UNDER SEMI-INTENSIVE PRODUCTION SYSTEM

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### ABSTRACT

The aim of this pilot study was to evaluate the carcass characteristics of indigenous Malin sheep reared under semi-intensive production system. Eight Malin rams at 2 to 3.5 years of age and 36.00 kg to 53.00 kg live body weight (average body weight, 45.75kg) were slaughtered according to halal standard procedures. The left half carcass was jointed into eight wholesale joints and dissected into muscles, bone and fat. Meat to bone ratio and dressing percentage were calculated and compared to the Percent Boneless Closely Trimmed Retail Cut (% BCTRC) which was based on USDA lamb evaluation standard. The heaviest part of the Malin carcass was leg with 2.19 kg weight and the lightest part was loin with 0.79 kg weight which was 20.32% and 7.11% of whole weight respectively. The weight and percentage of other parts were chump (1.08 kg, 9.97%), breast (1.24 kg, 11.15%), midrib (1.11 kg, 9.96%), main rib (0.89 kg, 8.18%), shoulder (1.82 kg, 16.61%) and neck (1.19 kg, 10.94%). Meat to bone ratio for Malin carcass was 1.93. Dressing percentage of Malin hot carcass was higher than % BTCRC estimation which was 47.73% and 42.51% respectively. The result was as expected because % BTCRC calculation took into consideration of the hot carcass weight and ribeye area but minus the body wall and fat thickness. Based on the result of dressing percentage, it also showed that Malin carcass yield was slightly higher than Dorper sheep (46.79%) but lower than Barbados Blackbelly sheep (49.00%).

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## **EVALUATION OF DETECTION METHODS AND PREVALENCE OF BOVINE TUBERCULOSIS (bTB) IN DAIRY CATTLE IN SELANGOR**

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### **ABSTRACT**

Aim of this study is to evaluate the detection methods of bTB on sensitivity, specificity, simple costing and logistics involved in testing and to determine the prevalence of bTB in dairy cattle in Selangor. A cross-sectional study was conducted at 10 dairy cattle herds; a total of 196 animals were randomly selected. Whole blood (heparinized) was collected for testing using Gamma-interferon ( $\gamma$ -IFN) Bovigam® ELISA test kit (Bovigam). Tuberculin skin test (consist of Caudal fold test (CFT) and Cervical comparative test (CCT)) was performed on an individual animal. CFT and Bovigam is a screening and CCT is a confirmation test. Based on the findings, sensitivity and specificity for CFT were 90% and 82.4%, while Bovigam had 70.83% and 93.38%. Additional to that, Bovigam has a higher tendency to produce false-negative results compared to CFT and vice versa to false-positive. Type 1 Method (Bovigam-CCT) had a 45% higher cost compared to Type 2 Method (CFT-CCT). Evaluation of implementation time showed that Type 2 Method had 21% longer duration compared to Type 1 Method. Type 3 Method (CCT only) is the cheapest and time effective compared to others. Prevalence of bTB in this study recorded at 12.24% (Type 3 Method). As a conclusion, Bovigam has higher sensitivity compared to CFT. CCT only is the most cost and time effective and it is recommended to use CCT only as of the diagnosis of bTB in cattle in Malaysia. The prevalence rate of bTB is considered high in the dairy cattle herd in Selangor.

## EVALUATION OF THE DURATION AND MAGNITUDE OF ANTIBODY TITRES POST-LEPTOSPIRA VACCINATION REGIME IN PUPPIES AND ADULT DOGS

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### ABSTRACT

The zoonotic impact of leptospirosis calls for control and preventive measures to mitigate the risk of infection. Vaccination is an important preventive measure for many known diseases including leptospirosis. However, the level of protection from commercial vaccines among dogs in Malaysia with its diverse tropical environments and arrays of circulating serovars is debatable. Vaccination masked the true presence, especially among subclinical dogs. There is limited local documentation of antibody titre production from vaccination in dogs. This research evaluated the duration and magnitude of antibody titres post-*Leptospira* vaccination in puppies (n=14; 6-8 weeks) and adult dogs (n=14; 1-5 years old) recruited from private owners. Health status of the dogs was determined before recruitment. Dogs were vaccinated with a commercial quadrivalent vaccine (*Icterohaemorrhagiae*, *Canicola*, *Grippotyphosa* and *Pomona*) in accordance to WSAVA guidelines. Blood was sampled for one year at intervals of 2, 4, 6, 8, 10, 12 weeks followed by 6, 9, 12 months post-vaccination. Serum was analysed using the microscopic agglutination test against vaccine serovars. The antibody titre of 1:50-1:200 (puppies) and 1:50-1:400 (adults) were recorded. The antibody titres of serovar *Icterohaemorrhagiae* was the highest with the longest duration followed by *Canicola*, *Grippotyphosa* and *Pomona*. The antibody titres were detectable? 3 months (puppies) and? 6 months (adults). The presence of these circulating antibodies complicates the diagnosis of leptospirosis through the occurrence of false positives. This information will aid in disease management by utilising serological testing both in diagnosis and surveillance. Findings will assist in improving disease control and prevention.

## EFFECTS OF STOCKING DENSITY ASSOCIATED WITH PARASITIC INFECTION IN BALB/C MICE

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### ABSTRACT

Parasites may be found in the skin and intestine of the laboratory mice (*Mus musculus*) which influence certain experimental results, especially during high worm burden. In Malaysia, there is a lack of study on the parasitic levels of laboratory mice. Therefore, this study allows the assessment of parasite infection of mice based on stocking density that can serve as a guideline for proper management to be implemented. Fifty-four (54) male BALB/C mice were randomly chosen from an animal facility located in Klang Valley and placed in groups of 3, 6 and 9 mice to reflect different stocking densities. Examination of helminths, ectoparasites and blood parasites were done by using different conventional techniques. Samples were taken weekly for 5 weeks. Identification of the parasites was made based on observation and classification of their distinct characteristics under a compound microscope. Results revealed that the mice were infected with pinworms; *Aspicularis tetraptera* and *Syphacia obvelata* with the absence of ectoparasites and blood parasites. Direct faecal smear and faecal floatation were unable to detect the parasites from first week. Weekly sampling showed there is the reduction of *S. obvelata* infection over time by using the perianal tape test but an increase in *A. tetraptera* infection with faecal floatation method. Gastrointestinal examination mentioned as the 'gold standard' revealed the group with the highest stocking density had the most positive for worms. Overall, the results varied according to the parasitological method used and stocking density may play a role in the level of parasitic infection.



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## PROTEOME PROFILE COMPARISON OF SYNOVIAL FLUID BETWEEN CHEMICALLY INDUCED RABBIT MODEL AND SURGICALLY INDUCED RABBIT MODEL IN MIMICKING EARLY OSTEOARTHRITIS

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### ABSTRACT

Osteoarthritis (OA) is an organ disease caused by the disruption of balance between synthesis and degradation of cartilage. Animal models are used to further understand the disease as they can show many pathologic features that describe the human disease. Animal models are classified into induced and spontaneous. Induced models are further subdivided into surgical and chemical models. Based on the hypothesis that the concentration of proteins and protein fragments in synovial fluid are distinctive for the various stages in OA progression, changes in proteome profiles of synovial fluid could give us valuable input in the differences of mechanism and pathophysiology of different methods of induction. This study aimed to compare the proteome profiles of two induction methods of OA to compare disease progression at different time points. 30 New Zealand white rabbits were divided into surgically induced group (n=15) and chemically induced group (n=15) and further divided into three time points which were week 4, week 8 and week 12 group. At the end of each time group, the rabbits were euthanized, and the synovial fluid subjected to proteomics analysis via two-dimensional gel electrophoresis (2DGE) and MALDI TOF/TOF. Eight proteins were identified for surgically induced group and three proteins were identified for chemically induced group. Overall, for surgically induced group, the proteome profile indicated OA started immediately after induction and progressed till week 12 and as for chemically induced group, the OA development was slower than surgically induced model.

## NEWCASTLE DISEASE VIRUS GENOTYPE VII AND VIII CAUSE REDUCTION IN AVIAN INTRAEPITHELIAL LYMPHOCYTES

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### ABSTRACT

Newcastle disease (ND) is a devastating viral disease ravaging the poultry industry. It is caused by Newcastle disease virus (NDV). Different genotypes of NDV virulent strain have been circulating in different parts of the world. Although genotype VII is the predominantly circulating NDV genotype in Asia including Malaysia, genotype VIII however had been isolated in the region since 1960s. Studies have been carried out to understand the interaction between NDV and different lymphocytes in visceral organs. However, there are few data on the interactions between the virus and intestinal mucosal surface despite the fact that the virus has been shown to replicate at the mucosal surfaces, thus resulting in the virus shedding. Understanding the probable immunopathology of NDV especially of the intestinal epithelium will provide valuable information on virus shedding. In this study, the effect of NDV genotype VII and VIII in chicken intraepithelial lymphocytes was evaluated and compared. Different lymphocyte markers were used and analysed using flow cytometry. The results showed that except at 12 hours post genotype VIII NDV infection, CD45+ cells decreased at all other time points. Similarly, CD25+ cells were depleted in both genotype VII and genotype III. CD4+/CD8- cells were also depleted with the highest reduction at 60 hours post genotype VII inoculation. No CD4+/CD8+ cells were detected in both control and NDV challenged chickens. However, there was increase in CD4-/CD8- cells except at 12 hours post inoculation of genotype VII. This study showed that velogenic Newcastle disease virus of different genotypes causes depletion of some avian intestinal lymphocytes.

## **DETECTION OF RECENTLY ISOLATED INFECTIOUS BURSAL DISEASE VIRUS IN COMMERCIAL POULTRY FARMS IN MALAYSIA**

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### **ABSTRACT**

Infectious bursal disease virus (IBDV) remains an important viral pathogen that causes huge economic losses to the poultry industry worldwide. IBDV has a high genetic mutation rate that may result in antigenic variations leading to emerging of neutralizing antibody escape mutants. In Malaysia, information about the genetic characteristics of recently isolated IBDV is yet to be explored. In this study, the genetic characteristics of recently isolated Malaysian IBDV from commercial poultry farms were investigated. Five recently isolated IBDV from different commercial poultry farms in Malaysia were propagated in specific pathogen-free chicken eggs (SPF). The isolates were detected using reverse transcription-polymerase chain reaction (RT-PCR) targeting hypervariable region (hv) of VP2 gene. The amplicons were sequenced. Alignment of the deduced amino acid sequences shows the presence of virulent markers which indicated the presence of very virulent viruses. In addition, hvVP2 revealed the presence of substitutions that represent antigenic variant strain. Amino acids (aa) sequences of hvVP2 (aa 210-350) confirmed the identity of the IBDV isolates. A further study is required to sequence the complete genome of the viruses.

## **AMELIORATING EFFECT OF EDIBLE BIRD'S NEST (EBN) ON OVARIAN FUNCTION OF CYCLING FEMALE RATS SUBJECTED TO CADMIUM TOXICITY**

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### **ABSTRACT**

Cadmium (Cd) is frequently linked with reproductive function disorders in several species from rodents to mammals. It has shown to target ovarian functions and inhibit the biosynthesis of reproductive hormones. Edible bird's nest (EBN), a natural product from the saliva of Swiftlets, has been used to alleviate a number of ailments for centuries. The present study aimed to examine ameliorative effects of EBN on CdCl<sub>2</sub> induced toxicity in ovaries of rats. A total of 30 Female Sprague Dawley rats were divided into 5 equal groups (6/group). Group 1 (C), received distilled water; group 2 (T<sub>0</sub>), which was administered with CdCl<sub>2</sub> (5 mg/ kg body weight (BW)); and groups 3 (T<sub>1</sub>), 4 (T<sub>2</sub>) and 5 (T<sub>3</sub>), which were given CdCl<sub>2</sub> (5 mg/kg BW) plus graded concentrations of 60, 90 and 120 mg/kg BW of EBN, respectively. Both EBN and CdCl<sub>2</sub> were administered orally once daily for 4 weeks. At the end of the treatment, rats were sacrificed, and ovaries were dissected out and processed for histopathological studies. Histopathology of the ovaries revealed a significantly increased number of surviving follicles in all EBN-treated groups in a dose-dependent manner, as well as decreased degenerative changes compared with groups exposed to Cd alone. These results suggest that EBN exerts protective effects against cadmium toxicity possibly attributable to its antioxidant action.

**Keyword:** Edible Birds Nest, cadmium toxicity, cycling female rats, uterus, ovary

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## COMPARISON ON GROWTH PERFORMANCE AND TESTICULAR TRAITS IN PERI-PUBERTAL KEDAH-KELANTAN PUREBRED AND CROSSBRED BULLS

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### ABSTRACT

This study was conducted to determine the growth performance and testicular parameters of the peripubertal growing bulls. A total of 10 bulls consisting Kedah-Kelantan (6) and crossbred (4) were used in accordance with the guidance of University Institutional Animal Care and Use Committee. Body weight and testicular parameters were measured monthly from April 2019 to September 2019. Body weight were taken by digital weighing balance. Testicular parameters were measured by metallic scrotal measuring tape. Growth performance were determined through growth rate and average daily gain, respectively. Growth rate and average daily gain were significantly higher ( $p < 0.01$ ) in Kedah-Kelantan compared with their crossbred bulls. Scrotal circumference was  $21.00 \pm 0.73$  cm and  $16.25 \pm 0.25$  cm for Kedah-Kelantan and crossbred bulls, respectively with highly significant difference ( $p < 0.001$ ). The study also shown that significant difference ( $p < 0.01$ ) were found in testicular length and testicular weight between KK purebred and crossbred growing bulls. The results of the present study clearly indicate that Kedah-Kelantan purebred growing bulls are superior in terms of growth rate, average daily gain and scrotal circumference. So, it can be concluded from the current study results that scrotal circumference might be a good indicator to assess the suitable bulls for commercial semen production to enhance the Kedah-Kelantan production in Malaysia.

**Key words:** Body weight, scrotal and testicular biometry, peri-puberty, Kedah-Kelantan bull.



## Effect of Raw EBN (Edible Birds Nest) on embryo implantation using a female rat model exposed to Lead Acetate (PbA) toxicity

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### ABSTRACT

Edible bird's nest (EBN), a natural product from the saliva of Swiftlets, is traditionally considered as powerful medicine. The main objective of this study is to investigate the ameliorating role of in vivo supplement of different doses of Raw EBN against Lead Acetate (PbA) (10 mg/kg b.w., Oral route(PO)/Gavage) toxicity effect on reproduction using a rat model. A total of 48 adult female sprague-dawley rats, divided into 30 (6x5) groups, were used for the experiment. The groups include 2 control groups, and 6 treatment groups; PbA only (10 mg/kg body wt., PO); PbA + REBN (10 mg/kg b.w., PO + 120, 90 and 60mg/kg). Raw EBN supplementation were given along with Lead Acetate (PbA) for 60 days, respectively. Rats were sacrificed and uterus excised to determine implantation and pregnancy rates on day 8 postcoitum. Endometrial histomorphological changes and expressions of pinopods (cellular markers of implantation) were evaluated using H&E stain and scanning electron microscope (SEM), respectively. The study revealed decreased number of pinopods with positive control group (PbA only), and low doses of Raw EBN while histopathological changes which included vasoconstrictions, necrosis and fibrosis with PbA only, however best treatment result were observed under doses for 120 mg/kg REBN.

**Keyword:** Edible Birds Nest, Sprague female rats, Lead toxicity.

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## UNDERSTANDING MALAYSIAN SWINE FARMERS' DECISION MAKING PROCESSES ON DISEASE CONTROL

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### ABSTRACT

The catastrophic novel Nipah virus outbreak in Malaysia caused a devastating blow to the billion-dollar swine industry. The outbreak led to the culling of a million pigs and several hundred cases of human encephalitis and deaths. Livestock farmers' decision-making in the management of zoonotic and non-zoonotic disease threats plays an important role in ensuring farm viability and financial sustainability. This study aims to understand the mental model of farmers in implementing disease prevention and control practices during the Nipah outbreak and today. Using a qualitative approach, in-depth, semi-structured interviews with 12 swine farmers were carried out. Interviews were recorded and transcribed for analysis. Data were analysed inductively and analysed by means of thematic analysis. Results showed 26 dimensions to pig farmers' mental model of implementing disease prevention and control practices. In general, most farmers are driven by the perceived risk of disease, perceived economic factors and past experiences. Decisions to upgrade farm or adopt the pig farming area are influenced by perceived economic factors, perceived barriers and perceived future. This better understanding of farmers' decision-making processes will help guide veterinarians, public health professionals and policy makers in designing and prioritizing public health and disease prevention interventions in the ever-evolving disease landscape.

## SUB-CHRONIC TOXICITY EFFECTS OF CLINACANTHUS NUTANS ETHANOLIC LEAF EXTRACT ON THE HISTOLOGY OF LIVER AND KIDNEY OF ICR-MICE

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### ABSTRACT

This study investigated the effects of sub-chronic oral administration of *C. nutans* ethanolic leaf extract (CELE) on the histology of liver and kidney of ICR mice. A total 50 8-week old female mice were divided into five groups of 10 mice each, comprising of groups A (control), B (125 mg/kg), C (250 mg/kg), D (500 mg/kg) and E (1000 mg/kg). The extract was administered orally daily for 90 days. The mice were monitored and sacrificed at day 91. Liver and kidneys were collected for histopathological evaluation. The study revealed significant ( $p < 0.05$ ) changes in the hepatic and renal lesion score between the groups. There was mild and moderate hepatic degeneration, hepatic zonal necrosis, characterised by eosinophilic cytoplasm and pyknosis of the hepatocytes in groups D and E respectively compared to A. There was also significant ( $p < 0.05$ ) mild and moderate hepatic cellular infiltrations in groups D and E respectively. Besides, there were significant ( $p < 0.05$ ) mild to moderate renal tubular degeneration, tubular eosinophilic cytoplasm and tubular protein casts in group E compared to A. Similar renal tubular lesions were also observed in groups C and D. It was concluded that repeated doses of CELE for 90 days induced mild and moderate hepatic zonal necrosis at 500 and 1000 mg/kg respectively as well as mild hepatitis at 1000 mg/kg. Similarly, administration of the extract induced very mild, mild and moderate renal lesions at 250, 500 and 1000 mg/kg respectively in female ICR mice.

**Keywords:** Clinacanthus nutans, ICR-Mice, sub-chronic toxicity, haematology, histopathology

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## DETECTION OF MYCOBACTERIUM TUBERCULOSIS COMPLEX IN WILD BOAR POPULATIONS IN SELECTED AREAS IN SELANGOR

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### ABSTRACT

Tuberculosis (TB) is a zoonotic disease that have serious economic impact on livestock industry, a major public health concern and conservation issues in wildlife. Wild boar in other regions known as a true reservoir for Mycobacterium tuberculosis complex (MTBC) causing TB in other animals. To date, there were no study done on wildlife TB in Malaysia. Therefore, this study was aimed to determine the occurrence of MTBC in wild boar populations in selected area in Selangor. Serum and selected tissue samples were collected from 30 wild boar carcasses. Selected organs were examined grossly for tuberculosis-like lesion (TBLL), antibody was analyzed using an in-house bovine purified protein derivatives (bPPD) ELISA while Ziehl-Neelsen (Z-N) staining and molecular polymerase chain reaction (PCR) were used for antigen detection. Results of the cross-sectional study showed that all samples (n=30) were negative by Z-N staining, commercial ELISA test, and PCR of pooled tissue samples. Proportion of samples with TBLL from gross pathology was 30% (9/30). Proportion of seropositive by in-house bPPD ELISA was 16.7% (5/30). PCR detected DNA of MTBC in 9 out of 12 (75%) wild boar lymphoid organs. The positive samples were sent for DNA sequencing for further verification and the result yielded Mycobacterium tuberculosis variant bovis strain 1. In conclusion, this study reports the preliminary occurrence of MTBC in wild boar populations in Selangor.

**Keywords:** Mycobacterium tuberculosis complex, tuberculosis, detection, wild boar, wildlife, Selangor

## FOOT-AND-MOUTH DISEASE VIRUS-SPECIFIC SEROLOGICAL IMMUNE RESPONSES OF CATTLE IN PENINSULAR MALAYSIA FOLLOWING VACCINATION

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### ABSTRACT

Currently, some countries in Asia and African regions are still endemic for Foot-and-mouth Disease (FMD) despite the use of prophylactic and responsive vaccination. A field experiment was carried out in a dairy cattle farm in Peninsular Malaysia to assess the post-vaccination antibody responses after primary and booster vaccination in calves and cows. Serum samples were collected from young calves at different ages, with different levels of maternally derived antibody after primary and booster vaccination. Cow serum samples were only collected after booster vaccination. No NSP positive detected from all 48 cows and 51 calves at all sampling points. All cows showed neutralisation antibody titre against the vaccine strains higher than the suggested protective cut-off for both serotypes A ( $2.84 \log_{10} \pm 0.27 \log_{10}$ ) and serotype O ( $2.54 \log_{10} \pm 0.49 \log_{10}$ ). Moreover, >90% of cows showed neutralisation antibody titre against the field strains of serotype A (A/MAY/2/2011) and serotype O (O/MAY/10/2016) above the suggestive protective cut-off. The calves showed that maternally derived antibody titre is higher in younger calves and reduces with age. Maternally derived antibody also interfered negatively with primary neutralisation titre but does not affect neutralisation antibody titre after booster vaccination. These findings indicate that the vaccine tested was suitable for use against the serotype A field virus tested, despite the fact that r1-values generated from neutralisation titres in all groups (either after primary, booster or multiple booster vaccination) had a high degree of variability.



## EMERGENCE OF STAPHYLOCOCCUS ARGENTEUS AS BOVINE MASTITIS PATHOGEN IN MALAYSIA

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### ABSTRACT

*Staphylococcus argenteus* is an emerging specie and genetically divergent lineage of *Staphylococcus aureus*. Based on routine diagnostic bacteriological procedures, *S. argenteus* cannot be distinguished from *S. aureus*. The PCR identification of the *nuc* gene, which is the standard confirmatory marker for the *S. aureus*, may also be positive for *S. argenteus*. However, it has also been observed that traditional multi-locus sequence and typing (MLST) primers used for typing *S. aureus* cannot amplify some multi-locus sequence typing genes in *S. argenteus*. This novel specie is of public health importance due its ability to infect both humans and domestic animals including dairy cattle. The objective of this study was to understand and discriminate *S. argenteus* from *S. aureus* isolates implicated in bovine subclinical mastitis in Malaysia. A total of forty (40) *S. aureus* isolates that were confirmed by conventional techniques, analytical profile index (API), and nuclease gene (*nuc*) PCR detection were subjected for multi-locus sequence and typing (MLST). It appears that 25% (n=10/40) of the isolates were confirmed to be *S. aureus* and 75% (n=30/40) were confirmed to be *S. argenteus*. This study shows that multi-locus sequence and typing could correctly discriminate this species of *S. argenteus* from *S. aureus* and can help in the understanding of this novel bacterial species. However, there need for recognition and further study on *S. argenteus* by bovine medicine and veterinary public health as important etiologic agent of bovine mastitis and possible cause of human infections from milk.

**Keywords:** *Staphylococcus argenteus*, Mastitis, Milk.

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## GENOTYPIC DISTRIBUTION OF SUPEROXIDE DISMUTASE 1 GENE MUTATION (SOD1:C.118G>A) IN DOGS

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### ABSTRACT

Sod1 gene mutation (Sod1:C.118G>A) has been recognized as the major risk factor for a canine neurodegenerative disease; a condition referred as degenerative myelopathy (DM). The occurrence of DM appears to be global however its status in Malaysia is currently unknown due to limited access to genetic screening test and advanced diagnostic facilities. The aim of this study is to determine the genotypic distribution of Sod1: c.118G>A mutation in a large-scale population of dogs in Malaysia. One-hundred fifty blood samples were screened for 118G>A Sod1 mutation through restriction fragment length polymorphism (RFLP) technique, characterized by three different genotypes; wild type (G/G), homozygous (A/A), or heterozygous (G/A) mutations. Across 29 dog breeds, 88.7% (n=133) are identified as wild type (G/G), 8.67% (n=13) are heterozygous (G/A), and 2.67% harbor (n=4) homozygous mutation (A/A). Labrador retriever represented about 29% (n=44) of the total population with none of dogs harbor heterozygous or homozygous mutation. Heterozygous population was dominated by German Shepherd dogs (20%; n=6) and Pembroke Welsh Corgis (20%; n=6) followed by one French Bulldog. Forty percent of Pembroke Welsh Corgi range between 10 months - 5 years old are homozygotes. However, no dogs are found showing clinical signs typical to DM although long term follow up for homozygotes individuals are necessary. This study has shown that prevalence of the Sod1 mutation is currently low which may reflect the rarity of DM in Malaysia. However, the relationship of heterozygotes and DM is remain unclear and may require to be explored in the future.

## TOXOCARA SPP. INFECTION IN CHEETAH

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### ABSTRACT

2 faecal samples from 1 male and 1 female *Acinonyx jubatus* cheetah aged 10 years old from the same confinement were presented to Kuantan Regional Veterinary Laboratory on August 2019 for disease investigation by the zoo personnel in Kuantan with the clinical signs of inappetance, inactive, have slight cough and flu, droopy saliva and also muscle tremors. The clinical signs had been first observed 3 days prior to sample submission and treatment had been given which is sulfadiazine/trimetophrim and oxytetracycline. The differential diagnoses were canine distemper, toxoplasmosis, toxocariosis, corona virus infection and also intestinal parasite infestation. Faecal floatation test had been conducted from the faecal samples received to identify presence of any worm eggs. The faecal samples were sent to Parasitology Section for testing and laboratory result showed positive *Toxocara* spp. eggs through MVK/PARA 03 Floatation method. High burden of *Toxocara* spp. eggs were found from both samples. Based on the laboratory result and finding, it can be concluded that the cheetah had *Toxocara* spp. infection. Suitable and prompt treatment should be given to prevent severe illness that might lead to mortality. Another sample such as blood samples or nasal swabs should be sent to the laboratory for virus isolation to rule out any viral disease suspected.

**Keywords:** cheetah, faecal samples, *Toxocara* spp. Eggs

## **PREVALENCE, RISK FACTORS AND ANTIMICROBIAL RESISTANCE PATTERNS OF *Escherichia coli* ISOLATED FROM POULTRY FARMS IN EAST COAST OF PENINSULAR MALAYSIA**

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### **ABSTRACT**

Antimicrobial resistance remains an alarming issue with public-health concern worldwide. We conducted a cross sectional study to determine the potential farm-level risk factors associated with antibiotic resistance in *Escherichia coli* strains simultaneously isolated from poultry farms and the environment in three states in the country, namely Kelantan, Terengganu and Pahang. A total of 357 (n=357) samples (cloacal swabs = 259; faecal= 84; Sewage = 5, Tape water= 9) were randomly collected where data on farm management, biosecurity and disease history were collected using structured questionnaire. Odds ratio (OR) was used to determine the prevalence of antibiotic resistance of *Escherichia coli* strains in the selected farms. P-values less than 0.05 were considered statistically significant. Of these, 230 (64.4%) were confirmed positive for *E.coli*, using conventional culture, including 171 (74.3%) in cloacal swab, 58 (25.2%) in faecal, 1 (0.4%) in tape water and sewage system, 0 (0%). Multivariate analyses revealed significant risk factors and biosecurity deficiencies associated with the prevalence of antibiotic resistance of *Escherichia coli* strains. Moreover, the data indicated a high prevalence of resistance to common veterinary antibiotics with special reference to tetracycline (91.7%), sulfamethoxazole trimethoprim (86%), sulfamethoxazole (79.8%), nalidixic acid (65.5), doxycycline (55.5%) and chloramphenicol (55.5%), but no resistance to amoxicillin, ampicillin, gentamicin, ciprofloxacin and cefoxitin. A close association between different risk factors and the high prevalence of antibiotic-resistant *E. coli* strains in the current study suggests a concern over rising misuse of veterinary antibiotics that warrants a future threat of emergence of multidrug-resistant pathogen isolates.

## **BLUNT TRAUMATIC INJURY IN A GREEN SEA TURTLE (CHELONIA MYDAS)**

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### **ABSTRACT**

Mortality from being struck by a motorized watercraft is considerable for many aquatic vertebrates around the world, including sea turtles. In September 2019, an injured adult male green turtle was found stranded at Pulau Kapas, Terengganu by the local villagers. Unfortunately, the turtle died 2 days after it was found. The carcass was then presented for necropsy at Klinik Veterinar Universiti Malaysia Kelantan (KVUMK). General carcass examination adapted for sea turtles was conducted and morphometric data were taken. Necropsy revealed open comminuted (fragmented) carapace fracture at the 3rd, 4th of bilateral and central scutes, and complete fracture of 8th thoracic vertebrae with protrusion of coelomic membrane along with the colon. When the plastron was removed, lung and colonic perforation, moderate pulmonary congestion, pulmonary oedema, bronchial melanosis, necrotizing colitis, hepatic and cardiac congestion were observed. The bronchus mucosa showed multifocal black areas. Pure growth of *Klebsiella pneumonia* was isolated from the nasal, cloacal and carapace fracture sites whereas pure growth of *Escherichia coli* was cultured from the lung and *Staphylococcus aureus* from the trachea. Histopathology of the lungs and trachea revealed mild congestion and infiltration of heterophils. The heart developed subacute necro-haemorrhagic myocarditis and myocardial infarction. Several hepatocytes showed hepatic vacuolation (hepatic lipidosis) and there was evidence of hemosiderosis. This is a case of multisystemic vital system failure due to blunt traumatic injury of the carapace. The perforated organs led to hypovolemic shock and entry of pathogens causing circulatory failure. Death was also contributed by respiratory and cardiac failures.



## LIPOSARCOMA AND TRICHOFOOLLICULOMA IN A 9 YEARS OLD ROTTWEILER

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### ABSTRACT

Liposarcoma is a rare malignant tumor of adipocytes. Most of the canine patient presented with liposarcoma are at the mean age of 9.7 years old with the overall incidence of 0.2-0.5% among all canine neoplasms. A 9-year-old male Rottweiler was presented to the University of Malaysia Kelantan Veterinary Clinic (KVUMK) with a cutaneous pedunculated mass at the interdigital space of the left forelimb. Upon palpation, the mass was warmed and reveal a focal area of ulceration. The mass was surgically removed by lumpectomy and examined. Histopathologically, there was evidenced of numerous pleomorphic round, oval to polygonal shape cells of various sizes. Single fat vacuole of various sizes with peripheral flat, round to oval nucleus were observed. They were also many blood vessel interspersed in the foci of neoplastic adipocytes. There were also presence of hair follicles containing single to a few lobules surrounded by fibrous connective tissue adjacent to sebaceous glands. The lobules were of various sizes containing a few or numerous pinkish keratin fragments. The hair follicles containing the lobules appeared elongated and branched.

**Keywords:** rottweiler, pedunculated mass, liposarcoma, trichofolliculoma, benign tumor, malignant tumor

## EARLY POST-MORTEM INTERVAL ESTIMATION IN RAT MODELS USING THERMOGRAPHY

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### ABSTRACT

Determination of post-mortem interval (PMI) is essential in forensic sciences and is still understudied veterinary discipline due to the wide range of animal species and sizes. This study was conducted to determine the rate of heat dissipation from different body parts of Sprague-Dawley rat models using thermography. Observations from thermography were correlated with histopathology. Thermal images were retrieved from 300 to 400-gram male and female rat carcasses during the 32 hours post-mortem period and analysed for the heat dissipation of different body parts by visual, thermal changes. Histopathology of the brain, heart, kidney, liver, and spleen samples were examined for autolytic changes. This study revealed that post-mortem interval estimation in rats using algor mortis pattern is only suitable for an estimate of up to 6 hours post-mortem interval. Beyond that, histological changes would be more appropriate. The study showed that the pattern of algor mortis in rats exhibit logistic temperature regression in whole body, forelimb, hindlimb and pelvic area. Through thermal images, heat loss was fastest in the tail, followed by the head, pelvis, limbs, thorax, and abdomen of the carcass. Findings from this study can be researched on a larger scale to model larger sized animals and humans.

# Scientific Papers

## Oral Presentation

## HUSBANDRY AND VETERINARY MEDICAL CARE OF INFANT LEAF MONKEYS IN PENINSULAR MALAYSIA

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### ABSTRACT

Leaf monkeys are the Old World Monkeys of the Colobinae family. The leaf monkeys in peninsular Malaysia include dusky, silver and banded leaf monkeys. The orange colour of the infants misleads them as the Chinese 'golden monkey' as believed by the public. This attracts the public to keep them as companions. Their cuteness and cuddly character attract the public to raise them in captive. Raising them can cause medical problems to the infant primates. Primates are susceptible to acquire diseases from human and transmit the diseases to human. They need special attention from the owners which can affect their behaviour. As they grow, they tend to be violent and bite the owners. Leaf monkey babies are difficult to raise. They leaf eaters compared to other species of primates such as baboons and macaques. This is due to their specialized digestive system which consists of three sacs namely saccus gastricus, tubus gastricus and pars pylorica. Improper diet and husbandry could cause medical problems and die. Thus, this interviewer-administered survey was conducted to determine the frequency of death, medical problems and feeding behaviour of the captive leaf monkey infants. Twenty (20) respondents answered the survey. Based on the survey, most of the captive leaf monkey infants died due to various medical problems such as aspiration pneumonia, upper respiratory infection, bloat and food poisoning. This is the first study to postulate the protocol of keeping leaf monkeys in captivity.

**Keywords:** leaf monkeys, husbandry, diet, captivity

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## PENANG FREE ROAMING DOGS STUDY: STATUS, AWARENESS AND KNOWLEDGE OF RABIES AMONG CORRESPONDENTS

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### ABSTRACT

Free roaming dogs (FRDs) are defined as unconfined dogs and are not prevented from roaming. In Malaysia, the status quo of FRDs and its management is still inconclusive. This study was initiated after the 2015 Rabies outbreak in Penang aiming to establish the level of Rabies awareness and knowledge among correspondents, concomitantly the status quo of FRDs along with its managements. Hence, a set of basic Rabies questions were included in our questionnaire to establish this notion which resulted in 157 local Penang respondents. Our survey reported that 40% agreed that Rabies is a problem in Malaysia and 70% of respondents believed that children are at high risk of contracting it. From this figure, 69% were not knowledgeable about Rabies and its zoonotic implications. As for awareness and knowledge of getting medical help, 72% were unfamiliar with the treatment options available in which 56% were illiterate of the next step after a dog bite. For prevention, 66% agreed in animal vaccination and 84% in disease education. Seventy-four percent disagreed that Rabies can be prevented by euthanasia. In conclusion, the awareness and understanding level of Rabies are deficient among the public. The awareness level of participants regarding compulsory medical measures after an immediate dog bite exposure was also inadequate. Therefore, the Government, Non-Government Organization (NGO) and public should join forces to resolve this matter together to educate the public about the dangers and prevention of this preventable disease starting from a very young age.



## POTENTIAL BIOMARKERS OF PAIN SENSITIZATION IN HORSES WITH CHRONIC BACK PAIN

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### ABSTRACT

The genesis and maintenance of chronic pain have largely been attributed to microglia and astrocytes activation. Studies have identified ionized calcium-binding adaptor molecule 1 (Iba-1) and glial fibrillary acidic protein (GFAP) as a marker of microglia and astrocytes activation respectively. Therefore, in this study, we evaluate the potential of serum Iba-1 and GFAP as biomarkers of pain sensitization for diagnosis of equine chronic back pain. Serum was collected from 40 athletic horses comprising of 10 horses per each group: back pain (BP), back pain current with lameness (BPL), lameness alone (LN) and healthy control (HC) groups. The sera were screened for activated microglia and astrocytes using Iba-1 and GFAP immunoassay techniques. Results showed serum Iba-1 and GFAP varies considerably among all the groups, however, the increase in Iba-1 concentration was higher in horses with BP than in BPL, LN and HC horses. Likewise, the serum GFAP was significantly higher in the BP horses. The discriminatory capacity of serum Iba-1 and GFAP was higher for differentiating chronic pain in the BP horses when compared to BPL and LN horses. The diagnostic performance of Iba-1 (AUC = 0.72) in BP horses was moderately accurate whereas in BPL and LN horses it was poor and absent respectively. Similarly, the performance of serum GFAP ( $0.7 > \text{AUC} > 0.79$ ) was moderately accurate in BP and BPL but poor in LN horses. In conclusion, Iba-1 and GFAP have potential as markers of pain sensitization precipitated by activated microglia and astrocytes in equine chronic back pain.

**Keywords:** Equine back pain, GFAP, Iba-1, Serum

## PREVALENCE AND SUBTYPE CHARACTERIZATION OF BLASTOCYSTIS SP. FROM POULTRY, CAPRINE AND FISHES IN PENANG, MALAYSIA

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### ABSTRACT

Blastocystis is one of the most common parasites inhabiting in small intestine of human and animals. In addition, there is growing interest in Blastocystis as potential enteric pathogen, and the possible role of domestic animals as the reservoir for human infection. The purpose of this study was to determine the prevalence of Blastocystis infection in poultry, fishes and caprine in Penang, Malaysia. A total of 337 faecal samples/intestinal contents were collected from two different region of Penang, Seberang Perai and Penang Island which consists of 50 faecal samples of caprine; 29 faecal samples from meat goat and 21 faecal samples from dairy goats, 96 intestinal contents of commercially barn-reared chickens, 84 intestinal contents of quails and 123 intestinal contents of freshwater fishes. Faecal samples or intestinal contents from each animal were subjected to in-vitro cultivation method using Jones medium supplemented with 10% horse serum. The respective prevalence of Blastocystis infection in dairy and meat goats were 47.6% (10/21) and 31.0% (9/29) whereas in chickens 26% (25/96) followed by quails with 23.8% (20/84). However, none of the freshwater fishes were infected with this protozoan parasite. Using the DNA barcoding method, three isolates were identified as ST6 (allele 122) which is the first report on the subtype of Blastocystis sp. from quails in Malaysia.

## **EFFECTS OF DIFFERENT LAIRAGE DURATION AFTER SHORT TRANSPORTATION ON THE CARCASS CHARACTERISTICS AND MEAT QUALITY OF GOATS**

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### **ABSTRACT**

The pre-slaughter procedure often involves transportation intended to relocate animals from the farm to the market or slaughterhouse. Transportation and other factors may affect the quality of the meat produced. Animals are put in lairage to allow them to recover before slaughter. However, some research has reported the negative effect of lairage. Recommendations on suitable lairage duration are essential to maintain the animals' welfare and to preserve the quality of meat produced. Therefore, this research was conducted to study the effect of three lairage duration after two and six-hour transportation on the meat quality of goats. In general, a total of eighteen goats were used in this study. The goats were divided into six groups, which based on transport (TS) and lairage (L) duration. The groups are TS2L3, TS2L6, TS2L12, TS6L3, TS6L6 and TS6L12. Samples of longissimus lumborum muscle from each animal were obtained within 15 minutes after slaughter, on day one, day three and day seven postmortem. The meat was analysed for water holding capacity (WHC), pH, colour and tenderness. Transportation stress was shown to affect the meat quality parameters significantly, whereas lairage time mitigated the impact of transportation. It can be seen that meats produced from the TS6 goats have higher pH, darker coloured, lower drip loss and higher cooking loss percentage than meat produced from the TS2 goats. It was concluded that three-hour lairage was sufficient for the TS2 animals, while more than six hours lairage was needed for the TS6 goats to recover.

## **EFFECT OF DIETARY INCLUSION OF PERSICARIA ODORATA ON HAEMATOLOGY AND SERUM BIOCHEMICAL PARAMETERS IN BROILER CHICKENS**

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### **ABSTRACT**

Phytobiotics are extensively investigated to replace antibiotic growth promoters, because of their non-residual effects. This study was designed to evaluate the haematological and serum biochemical parameters of broiler chickens supplemented with different dose inclusion of *Persicaria odorata* (Po). A total of one hundred and twenty day-old broiler chickens (Cobb-500) were randomly allocated into 4 treatments, with three replicates of 10 birds each. The chicks were fed experimental diets C (control; basal diet with no supplementation); Po2 (basal diet + Po 2g/kg); Po4 (basal diet + Po 4g/kg) and Po8 (basal diet + Po 8g/kg). At day 42, two chickens from each replicate of the treatment group were randomly selected to take blood samples for haematology and serum biochemical analysis. The results of the present study revealed that the inclusion of *P.odorata* significantly improved ( $p<0.05$ ) haemoglobin (Hb), red blood cell (RBC), Packed cell volume (PCV) and white blood cell (WBC) count relative to broilers fed on the control diet. Dietary supplementation of *P.odorata* resulted in higher ( $p<0.05$ ) total protein, albumin, and globulin, while lower ( $p<0.05$ ) glucose, cholesterol and triglyceride concentration compared to the control group. The serum level of AST, ALT and urea was significantly lower ( $p<0.05$ ) in supplemented groups. In conclusion, the results demonstrated that supplementation of *P.odorata* possibly have no adverse effects on hematopoietic system, liver and kidney functions even at 8g/kg dose. This study has provided evident that *P. odorata* can be safely used as poultry feed additive. Keywords: broiler chicken, feed additive, haematology, *Persicaria odorata*, serum biochemistry

## **BLOOD CARDIAC TROPONIN I AS A PROGNOSTIC BIOMARKER FOR HEART DISEASES IN CATS**

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### **ABSTRACT**

Cardiac troponin I (cTnI) is routinely used as a diagnostic biomarker for myocardial damage in humans. However, the utility of blood cTnI as a cardiac biomarker in cats with heart disease has not been adequately investigated. The objectives of this study were to determine serum and plasma cTnI concentrations in cats with and without cardiac disease and to ascertain whether serum cTnI could be used to determine progression of heart disease in these animals. The study was conducted at the University Veterinary Hospital, Universiti Putra Malaysia. The cats were categorised as healthy, asymptomatic or symptomatic cardiomyopathic based on signalmen, and physical examination, radiographic, echocardiographic, haematological, and serum biochemical findings. cTnI concentrations were determined in 109 archived cat serum and plasma samples using the one-step sandwich enzyme immunoassay. Nine cats diagnosed with heart disease also provided a series of post-treatment blood samples collected over a period of 2 months. The range of plasma and serum cTnI concentrations for symptomatic (0.00 to 32.78 ng/mL) and asymptomatic (0.00 to 0.61 ng/mL) were significantly ( $p > 0.05$ ) higher than that of healthy cats at 0.00 to 0.05 ng/mL. The serum cTnI concentrations decreased with time during the post-treatment period. In conclusion, the study showed that serum and plasma cTnI are sensitive prognostic biomarkers for cardiac diseases in cats.



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## CHROMOSOMAL ABERRATION A POSSIBLE CAUSE OF REDUCED FERTILITY DUE TO INBREEDING IN A DEER FARM IN MALAYSIA

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### ABSTRACT

**Background:** The association between chromosomal aberrations and reduced fertility and/or infertility has been documented in both domestic and wild animals. They can occur as numerical errors or structural rearrangements usually with or without causing phenotypic abnormalities on carrier animals. In other cases, they may directly affect meiosis, gametogenesis, and the viability of conceptus. In a lot of instances, balanced structural rearrangements can be transmitted to offspring, affecting fertility in subsequent generations.

**Objective:** This work aimed to characterize the genome of three breeds of deer (*Rusatimorensis*, *R. unicolor* and *Axis axis*,) raised in a deer farm in Malaysia through karyotyping to study their chromosome morphology and number, and to detect chromosomal aberrations if they exist.

**Methodology:** Blood samples were collected from six animals through venipuncture, from the jugular vein. Peripheral blood mononuclear cells were isolated by gradient method using Ficoll. They were cultured for 72 hours and arrested at metaphase. The cells were plumped and fixed and stored before further treatment. Slides were made from the fixed cells and aged for 5 days. They were then treated with 0.025% trypsin and finally stained with 5% Giemsa, air dried and viewed under microscope at both X40 and X100. The pictures were captured and processed and SmartTypes software v3.3.1 (Digital Scientific UK Ltd) was used to karyotype the chromosomes.

**Results:** Of the sixty animals characterized, fifteen were found to have chromosomal aberrations, while forty-five were normal. *Rusatimorensis*, *R. unicolor* and *Axis axis* had normal karyotypes of  $2n = 60$ ,  $62$  and  $66$  respectively. The animals with abnormal chromosomes were; *Rusatimorensis* 6 (3 males, 3 females), *R. unicolor* 5 (2 males, 3

females) and Axis axis 4(2 males, 2 females). This cumulatively accounts for 25% of the total animals investigated.

Conclusion and recommendation: Chromosomal aberrations exist on the farm at the rate of 25% and may not be unconnected with the observed reduced fertility on the farm. The animals with chromosomal aberrations should be culled to arrest the propagation of their chromosomal abnormality

# Scientific Papers

e-Poster

## ASTROCYTOSIS AND MICROGLIOSIS IN HORSES WITH CHRONIC BACK PAIN

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### ABSTRACT

Glia cells are important supporting cells of the central nervous system (CNS) involved in the maintenance of neuronal circuit and microenvironment homeostasis, and injury to CNS can induce their activation particularly microglia and astrocytes, through the change in their morphology and functional characteristics. Recently, the development of chronic musculoskeletal pain was associated with microgliosis and astrocytosis. However, the possibility of microglia and astrocytes activation in pain sensitization in horses with back pain has not been elucidated. In the study, we demonstrated activation of microglia and astrocytes in the spinal dorsal horn of horses with chronic back pain (CBP) using ionized calcium-binding adaptor molecule 1 (Iba-1) and Glial Fibrillary Acidic Protein (GFAP) immunostaining technique respectively. Interestingly, Iba-1 and GFAP stained spinal dorsal horn revealed increased expression of activated microglia and astrocytes in CBP horses. Astrocytes total count was higher in relative to microglia count. With relation to the degree of back pain, the ratio of activated microglia to astrocytes was lower (0.54) in the horse with severe back pain compare to moderate back pain. The activated astrocytes have larger cell bodies with large radiating processes with some clustering together with each other. Activated microglia, however, is characterized by four phenotypes: elongated, spherical, amoeboid and hypertrophied. The elongated phenotype has the highest (32.6 – 47.3) percentage distribution in all the CBP cases. In conclusion, microgliosis and astrocytosis possibly have a role in the development and maintenance of CBP in athletic horses.

**Keywords:** astrocytes, back pain, horses, microglia, Immunoperoxidase

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## BACTERIOLOGICAL QUALITY OF RAW COW'S MILK FROM MILK COLLECTION CENTRES IN PERAK FOR YEAR 2017-2018

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### ABSTRACT

Bacteriological quality is a crucial element for quality checking of locally produced milk which is collected at the milk collecting centres (MCC) as it determines the safety level of the milk and also the price of the milk under the Price Incentive Program (PIP). This paper reports the bacteriological quality of raw cow's milk samples received by Veterinary Research Institute, Ipoh (VRI) from year 2017-2018 from 4 milk collection centres in Perak: Sg. Siput, Tapah, Taiping and Parit. A TPC less than 106 cfu/ml is the standard set by the Department of Veterinary Services Malaysia (DVS) for the dairy farmer's milk PIP. A total of 4,902 milk samples were received within the 2 years period (2017-2018) comprising 2,165 samples from Sg. Siput, 1,560 from Tapah, 1,058 from Parit and 119 from Taiping. An overall of 27.8% of the milk samples collected in Perak MCC were heavily contaminated with the TPC of 106 cfu/ml and above. Analysis according to MCC showed that 43.0% of milk samples from Sg. Siput MCC had TPC of 106 cfu/ml and above, followed by Taiping (25.2%), Tapah (18.3%) and Parit (11.1%). In conclusion, the bacteriological quality result indicates that there is a need to improve the quality of raw milk delivered by farmers to MCC in Perak as it poses great significance on the milk consumer's health and the economic development of dairy sector.

**Keywords:** Total Plate Count (TPC), Milk Collection Centre (MCC), Price Incentive Program (PIP), raw cow's milk



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## METASTRONGYLUS SPP. INFECTION IN WILD BOAR (SUS SCROFA) IN MALAYSIA

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### ABSTRACT

Metastrongylus spp. is lungworms which infect domestic and feral pigs as definitive hosts. In Malaysia, the incidence of Metastrongylus spp. infection is still under reported. The Pathology Section of Veterinary Research Institute (VRI), Ipoh had received five histopathological slides for detection of Sarcocystis in wild boar from Makmal Veterinar Kawasan Bukit Tengah (MVKBT). Microscopically, all the five slides were negative for Sarcocystis. However, intraluminal adult Metastrongylus spp. nematodes were incidentally observed in lung interstitium based on the morphological characteristics together with bronchitis, alveolitis and interstitial pneumonia from three out of five slides examined. Histological slides examination also revealed bronchi and bronchiole surrounded with moderate to numerous eosinophils and lymphocyte. In general, wild boar could get infected with Metastrongylus spp. larvae through ingestion of parasitized earthworms and showed histological signs as mentioned. In conclusion, continuous study is required to determine the prevalence and incidence of Metastrongylus spp. in wild boar for prevention and actions to avoid spillover to domestic pigs.

**Keywords:** Metastrongylus spp., nematodes, pig, parasitic bronchitis, wild boar

## POTENCY STUDY OF LOCAL NEWCASTLE DISEASE VIRUS VACCINE IN SPECIFIC-PATHOGEN-FREE (SPF) AND VILLAGE CHICKENS

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### ABSTRACT

Newcastle disease (ND) is a major constraint to village poultry production in unvaccinated flocks. Disease control gets tricky with unrealistic conventional ND vaccination strategies in village chicken farming due to unsuitability of vaccine administration routes and demanding trained personnel in this production settings. This study was carried out to investigate the potency of live ND vaccine 1174 /08 in specific pathogen free (SPF) and village chickens. Twenty-day-old, eight SPF and nine village chickens were subjected for oral administration of vaccine. Ten vaccinated SPF and seven vaccinated village chickens were challenged with 106.5/per bird ND virus orally, when around 70% of the test group showed HI titer geometric mean (GM)  $\geq 4$ . The antibody response in SPF chickens were detected as early as 3-5 days post vaccination (DPV) compared to village chickens at 5-7 DPV. Apparently, the protective hemagglutination inhibition (HI) titer in village chickens were beyond the cut off value ( $\geq 4 \log_2$  i.e. GM  $\geq 4$ ) up to 35 DPV; while the SPF chickens exhibited protective HI titer up to 48 DPV. Basically, both vaccinated village and SPF chickens yield high HI titer (ranging GM 6-9) at day 15 post challenge. There was an inverse relationship between chicken mortality and mean HI titer. Chickens with higher HI titers had better survival rate (90% in SPF and 58% in village chicken) to the challenge experiment. In conclusion, ND vaccine 1174 /08 was able to yield serological responses and protection by oral route vaccination.

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## COLISTIN RESISTANT AND EXTENDED SPECTRUM BETA-LACTAMASE (ESBL) ENTEROBACTERIACEAE IN RAW CHICKEN MEAT AND LETTUCE (LACTUCA SATIVA) IN KOTA BHARU, KELANTAN

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### ABSTRACT

Emergence of multidrug resistant (MDR) bacteria including ESBL and colistin resistant Enterobacteriaceae has been posing threat to human health globally. This study was conducted to determine the prevalence and antimicrobial resistance of colistin resistant and ESBL Enterobacteriaceae in raw chicken meats and lettuce (*Lactuca sativa*) in Kota Bharu, Kelantan. A total of 100 food samples (50 raw chicken meats and 50 lettuces) samples were analyzed using routine bacteriology and molecular identification. Overall *E. coli* was detected in 10% (10/100) of which 16% (8/50) were from raw chicken meat sample and 4% (2/50) from lettuce samples. *Kilabsiella pneumonia* was detected in 12% (12/100) of the samples of which 6% (3/50) were from raw chicken meat sample and 18% (9/50) were from lettuce samples. Colistin resistance, *mcr-1* was detected in 70% (7/10) of *E. coli* (62.5% (5/8) from meat and 100% (2/2)) from lettuce. However, all *K. pneumoniae* isolates were negative for *mcr-1*. ESBL resistance gene detection revealed that 14.2% (1/9) of *K. pneumoniae* from lettuce were positive for *blaCTX* and 60% (6/10) *E. coli* (66.7% (4/6) from meat and 33.3% (2/6) from lettuce) sample were positive for *blaTEM*. Overall, 100% (8/8) of *E. coli* and 100% (3/3) and 77.9% (7/9) of *K. pneumoniae* isolates from raw chicken meat and lettuce showed MDR. In conclusion, the study shows the existence of MDR Colistin resistant and ESBL *E. coli* and *K. pneumoniae* in raw chicken meat and lettuce. These findings imply the public health risk that these resistant pathogens may pose.

## **COMMON CONTROL METHODS FOR WORMS IN SMALL RUMINANTS - WHAT YOU CAN DO TO REDUCE HELMINTHIASIS IN YOUR GOATS OR SHEEP!**

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### **ABSTRACT**

Helminthiasis is one of the most common gastrointestinal infections in small ruminants, which may cause morbidity and mortality which results in losses for the farmer. In Malaysia, the severe anthelmintic resistance issues that have occurred over the past two decades has necessitated the use of alternative methods for worm control. The DVS encourages use of non drug related options for helminth control especially haemonchosis. Due to the hot, wet climate in Malaysia, the strongyle worms and coccidiosis seems to be rampant and more than 80% of farms have these infections. There are various options for worm control such as rearing worm resistant breeds like Kambing Kacang, malin, Barbados black belly and their crosses. As infections are obtained by contaminated pastures, it is wise to embark on rotational grazing system with 3 to 4 days of grazing per paddock and to allow the pasture to rest for at least 30-40 days before grazing again. This will disrupt the life cycle of the strongyles and prevent infection. The diagnosis of helminth infections by using the FAMACHA method will also save time as farmer is able to pick up anemic animals which could be due to helminthiasis. This will allow early remedial treatment and save the animals from death. Biological control using nematophagous fungi is also used in some countries especially for horses and herbal remedies are used commonly in some Asian countries for example neem leaves in India and Malaysia.

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## RAPID DETECTION OF AVIAN INFLUENZA TYPE A VIRUS BY REAL TIME RT-PCR

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### ABSTRACT

The rapid diagnosis of Avian Influenza virus during a poultry outbreak is critical for a timely control program. Any delays in diagnosis to an outbreak allow the virus to spread, and thus making eradication increasingly difficult. At present, molecular tests such as conventional RT-PCR and real time RT-PCR assays are the most suitable test for rapid detection of Avian Influenza virus. However, as for conventional RT-PCR, it has been claimed as less sensitive and a little bit time consuming which is not really convenience in the case of urgency. Therefore, this study was attempted to demonstrate and compare the difference in terms of sensitivity and the time taken of standard protocol, rapid protocol of real time RT-PCR and conventional RT-PCR (matrix and nucleoprotein gene). Herein, the sensitivity of the assays was determined by using six 10-fold serial dilutions of Avian Influenza RNA virus. On top of that, this study also compares the specificity of primers to other avian viruses. Overall, the results demonstrate that the real time RT-PCR assays are 100 times more sensitive compared to conventional RT-PCR. The real time RT-PCR and conventional RT-PCR were shown to be 100% specific when tested against other avian viruses. The rapid protocols allowed the detection of Avian Influenza Type A in less than 53 minutes with sensitivity of at least 1 pg/μl RNA. The results of this study suggest that the rapid protocol real time RT-PCR assay has the potential to be used for the rapid detection of Avian Influenza Type A virus



## **HAEMORRHAGIC SEPTICAEMIA (HS) VACCINE: VRI ROLE IN LOCAL VETERINARY VACCINE PRODUCTION**

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### **ABSTRACT**

Haemorrhagic Septicaemia (HS) is caused by *Pasteurella multocida* serotypes B: 2, a Gram negative coccobacilli bacterium. It causes fatal septicaemia with high mortality in cattle and buffaloes. Major HS outbreaks in Peninsular Malaysia 1946 in Northern region states were recorded and had caused a major impact to cattle and buffalo industry. Thus, control strategy have been adopted by Department of Veterinary Services to prevent and control the spread of infections during disease outbreak. Veterinary Research Institute (VRI) has been appointed to develop HS vaccine and eventually become the pioneer in local HS vaccine production when the disease is controlled. A decline in HS outbreak numbers have been reported due to effective vaccination although seasonal outbreak does occur especially during the monsoon season. Two HS vaccines using the local isolates were developed in 1960s which are the alum and oil vaccines, for two different types of protection. They are continuously being produced till today for disease control requirement. To date VRI is the only HS vaccine producer in Malaysia and supplies at a minimum charge and free for DVS use. Currently, improved HS vaccine in terms of selection of vaccine seed, delivery method and efficacy studies in field are crucial for more effective control of HS in livestock in the future.

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## **VIRULENCE GENES PROFILE OF HAEMORRHAGIC SEPTICAEMIA (HS) CAUSING PASTEURELLA MULTOCIDA SEROGROUP B IN MALAYSIA**

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### **ABSTRACT**

Haemorrhagic septicaemia (HS) is a disease caused by *Pasteurella multocida* serogroup B in Asian region. The disease mainly affects cattle and buffaloes causing high mortality due to septicaemia. HS is a notifiable disease in Malaysia and VRI is the main local HS vaccine producer. However, there are still sporadic outbreak in East Coast of Peninsular Malaysia in year 2017. This study is conducted to characterize the virulence profile of ten HS causing *P. multocida* serogroup B isolates from outbreak cases. All ten isolates showed only one type of virulence genes profile, with no variation between vaccine seed and field isolates. The nine genes hgbA, ExBDtonB, ptfA, pfhA, sodA, sodC, nanB, oma87 and nanH were present in 100% (10/10) of the isolates. Remaining three genes, which were, ompH, hgbB, and toxA were not detected. Although virulence genes profile of Malaysia *P. multocida* serogroup B isolates differ from isolates from other geographical location, the commonly found virulence genes were present. This study found no virulence gene profile variation between vaccine seed in used and field isolates. Thus, the HS vaccine produced by VRI was relevant to provide protection to the animal herd because the virulence gene of the strain that circulated in Malaysia has not changed over the time. Some unsuccessful prevention of HS in our country may be due to other contributing factors on the ground, such as vaccination schedule or delivery failure. Study and characterization of current and new potential vaccine candidate with its delivery method is needed to evaluate the vaccine produced for disease prevention.

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## RETROSPECTIVE STUDY ON DISTRIBUTION OF SALMONELLA SEROVARS IDENTIFIED IN PIG SAMPLES IN VETERINARY RESEARCH INSTITUTE (VRI)

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### ABSTRACT

There are some Salmonella serovars that have been associated with foodborne outbreaks in human due to the consumption of contaminated pig products in many countries. This paper provides a baseline data on distribution of Salmonella serovars in pigs from year 1986 to 2017. A total of 1020 positive Salmonella isolated from pig and pork were identified to 79 different serovars. The most predominant serovar identified were S. Typhimurium (41%), followed by S. Cholerasuis var. Kunzendorf (23%), S. Rissen (11%), S. Typhisuis and S. Weltevreden (5%). Another 74 serovars consists of the less frequently identified serovars including S. Tsevie (4%), S. Stanley (3%), S. Agona (2%) and S. Saintpaul (1%). Based on this data, S. Typhimurium was consistently found throughout for 31 years. This non-host adaptive serovar was frequently identified from diseased pigs previously. However, recently it is frequently found in healthy pigs and pork meat as well. High numbers of positive isolation of host adaptive serovars such as S. Cholerasuis var. Kunzendorf and S. Typhisuis were reported in the year 1995 and 1996, but had rapidly decreased since the year 2000 and have never been isolated and identified until now. These two serovars have been noted to cause high mortality with prominent clinical signs among infected pigs. Emerging and shifting from host adaptive to non- host adaptive serovars among pigs have been observed from this data collection and analysis. Keeping track of these circulating Salmonella serovars is important to study the disease epidemiology affecting the pig industry.

**Keywords:** Salmonella, Typhimurium, S. Cholerasuis var. Kunzendorf, serovar, pig.

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## **UPDATE ON ADENOVIRUS DIAGNOSED IN VETERINARY RESEARCH INSTITUTE MALAYSIA FROM YEAR 2015 TO 2019.**

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### **ABSTRACT**

Adenoviruses (AV) are widespread throughout all avian species causing no or mild disease. Nonetheless, some AV are associated with specific clinical conditions. AV in chickens are the etiologic agents of two important diseases, inclusion body hepatitis (IBH) and hydropericardium syndrome (HP). This study report the positives cases of AV diagnosed in Avian Virology Section, Veterinary Research Institute from year 2015 to 2019. A total of, 27 positives AVs cases were recorded with breakdown of 9 cases in 2019, 7 cases in 2018, 9 cases in 2017 and 2 cases in 2016. There was no positives cases been diagnosed in 2015. Results showed Melaka has the highest positive (n = 11), followed by Perak and Johor (n = 4), Pulau Pinang (n = 3), Pahang, Negeri Sembilan and Selangor (n = 2) while Kedah recorded a single case. From 27 cases, Nine AVs from 2019 were selected and subjected to subtyping test. Based on sequence analysis, all the isolates were belong to AV subtype 8b that can cause IBH in the flocks. This indicate that the disease is spreading among the population at the farm level. Additionally, the current vaccine in used could be ineffective in preventing the spreading of AV subtype 8b. Therefore, further studies on the prevalence of AV need to be conducted to understand the disease status in Malaysia whereby the vaccine effectiveness againts field AV can be evaluated and justified.

**Keywords:** Adenovirus, Poultry, subtype 8b, Inclusion Body Hepatitis (IBH)

## PHYLOGENETIC ANALYSIS OF RABIES VIRUSES DETECTED IN MALAYSIA

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### ABSTRACT

Rabies is a major fatal zoonotic disease among dog population in some parts of Malaysia and the risk of human rabies is thought to be steadily high in this regions. This study was conducted to determine the recent dynamics of rabies virus (RABV) that was detected in Perak and Sarawak on 2017. A total of 17 RABVs nucleic acid was extracted and amplified by nested PCR. The N gene of the virus was sequenced and analyzed using phylogenetic analysis. Result showed that the partial N gene sequence with size 460bp analysis of all RABVs tested shared about 99% similarity with each other. Hence, BLAST analysis showed that the N gene of the viruses was at 98% similarities with Sulawesi and Kalimantan Rabies viruses. S. Following phylogenetic analysis, all positive RABVs detected in Malaysia were clustered under the lineage of RABVs from Indonesia, while the 2016 were clustered under lineage of the South East Asia (SEA). The differences of Rabies cases occurring in 2016 and 2017 showed that there are different lineages of viruses circulating among dogs population in Malaysia. The introduction of the Indonesia lineage in Peninsular Malaysia for the first time raises an alarm about the virus potential to become an epidemic problem if not controlled properly especially at the borders. Several approaches including vaccination, post antibody screening programs, rapid diagnostics capabilities, risk assessment and awareness education programs among citizen are needed to prevent this virus spread to all over the country.

**Keywords:** Rabies virus, phylogenetic analysis, N gene



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## SEX DETERMINATION OF MOSQUITOES IN KUALA GULA BIRD SANCTUARY, PERAK

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### ABSTRACT

Mosquitoes are classified as arthropod-borne viruses (arbovirus) which are the vectors of emerging and re-emerging viruses such as West Nile virus (WNV), Japanese Encephalitis virus (JEV), Chikungunya virus, Dengue virus, and Zika virus. These viruses are transmitted through the female mosquitoes' bite. Alternatively, the infected female mosquitoes can transfer the viral pathogen to the offspring via vertical transmission causing male mosquitoes to be the carriers while the female mosquitoes are infected. Thus, both male and female mosquitoes are evenly risked to the transmission of arboviral diseases. Hence, a qualitative study was conducted to determine the sex of mosquitoes in Kuala Gula Bird Sanctuary, Perak. The mosquitoes were captured by using CDC Light Trap baited with carbon dioxide and stored at -80°C. The sex of mosquitoes was determined by distinguishing the size of palp and the feature of the antenna. The relative abundance was calculated in percentage and categorized based on sex (male and female). A total of 14 male and 1391 female mosquitoes were identified which showed female mosquitoes are higher relative abundance as compared to the male mosquitoes causing the dead-end are at the high risk to be infected by the arboviruses. Therefore, vector controls are recommended in order to monitor the population of male and female mosquitoes as it acts as a significant factor in the presence of the arbovirus vector.

**Keywords:** arbovirus, mosquitoes, bird, sex

## AN ISOLATED CASE OF ASPERGILLOSIS IN A FLOCK OF DUCKS IN KOTA BHARU, KELANTAN.

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### ABSTRACT

This is a case of 3 months old, mixed sexes, flock of 900 Muscovy ducks of which were reported to have depression and dyspnoea one week prior to presentation to the Pejabat Perkhidmatan Veterinar Jajahan Kota Bharu, Kelantan. The mortality rate upon presentation was 4.4%. The ducks were fed with self-mixed feed containing sago, rice, commercial duck pellet, and coconut. The ducks were reared extensively with water supply for the farm coming from a nearby well. Upon field investigation, morbidity rate of depression and dyspnoea was estimated at 60%, with higher number of ducks exhibiting dyspnoea and eventually succumbing to death were on hotter days. The affected ducks were observed having depression, dyspnea, cyanotic bill and ruffled feathers. Postmortem revealed congested liver and generalised caseous nodules of multiple sizes and location. Samples were sent for bacterial and fungal cultures as well as histopathology. Fungal cultures revealed *Aspergillus fumigatus*, while bacterial cultures were unremarkable. Histopathology of the lungs revealed granulomas, with presence of hyphae and spores, while the liver revealed congestion, infiltration of polymorphonuclear cells and loss of hepatocyte architecture. Treatment started immediately with copper sulphate, erythromycin, and Stresspac ®. Added supplementation of Stresspac ® and dicalcium phosphate were administered over the next 14 days. Farmer was advised to regularly disinfect farm and monitor feed quality, as he admitted to giving retreated moldy fish by-product mixed in feed previously. The respiratory symptoms resolved post 14 days treatment.

## **MOLECULAR CHARACTERIZATION OF FOWL ADENOVIRUSES ISOLATED FROM CHICKENS IN MALAYSIA**

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### **ABSTRACT**

Fowl adenovirus has been reported in many countries worldwide. It is a contagious agent related with inclusion body hepatitis (IBH) and hydropericardium syndrome (HPS) in chickens. Fowl adenoviruses (FAdVs), belonging to the Aviadenovirus genus of the family Adenoviridae. The virus has been classified into five species (A to E) and it further divided into 12 serotypes. Different serotype has diverse characterizations of virus and the virus can be either of pathogenic or nonpathogenic strain. Detection of FAdVs strain monitoring is very important from the epidemiological point of view and vaccine development. Several molecular studies have been performed, but the results obtained are still limited. The objective of this study was to identify the serotype classification of four Malaysian FAdV isolates obtained from field outbreaks in 2017-2018. Polymerase chain reactions (PCR) was performed based on Hexon gene and the nucleotide sequence analysis revealed the 4 isolates were highly identity with FAdV-8b strains. High bootstrap values in phylogenetic analysis supported the clustering of the Malaysian FAdVs isolates into FAdVs species E. Therefore, the current investigation provides important information on the epidemiology and highlights the importance of control strategies against FAdVs infection in Malaysia.

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## PERFORMANCE OF NEWCASTLE DISEASE VIRUS VACCINE BY DIFFERENT ROUTE OF ADMINISTRATION

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### ABSTRACT

The performance of Newcastle Disease virus vaccine 1174/08 strain (NDVAC 1174/08) that was developed at Veterinary Research Institute (VRI) was evaluated in broiler chickens. The objective of this study was to evaluate the of NDVAC 1174/08 performance when given by different routes of administration. A total of 30 broiler chickens was obtained from local commercial farm. They were divided into three groups according to the administration route assigned, which were intramuscular, intranasal and control group. Each animal in every group except control was vaccinated once with a NDVAC 1174/08 at dose of 106.5/ per bird. The control group was inoculated with Phosphate Buffer Saline (PBS) only. After that, serum samples of each experimental animals were collected at 3,5,7,10,14,21 and 28 days post vaccination (dpv). All serum samples were subjected to Newcastle Disease (ND) antibody detection by Haemagglutination Inhibition (HI) test. The result for efficacy of intramuscular route revealed mean HI titer  $\log_2 \geq 3$  with the mean HI titer 4.35 starting to increase at 7 dpv. However, for intranasal route showed mean HI titer  $\log_2 \geq 3$  starting at 10dpv. No ND antibody was detected in the control group. As conclusion, in this study intramuscular route give a good antibody respond compared to intranasal route.

**Keywords:** Newcastle disease virus vaccine, intramuscular, intranasal, Haemagglutination inhibition

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## **SEROPREVALENCE OF BRUCELLA MELITENSIS IN GOATS IN MALAYSIA BASED ON SURVEILLANCE CASES RECEIVED IN VRI FROM 2012 UNTIL 2017**

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### **ABSTRACT**

Although the population of goats in Malaysia is lower compared to other livestock, health monitoring and surveillance of zoonotic diseases are important due to increasing demand of its meat and milk among local consumer. Every year, an estimated of 25,000 goat samples will be tested for Brucella melitensis Complement Fixation Test (BMCFT) in the Veterinary Research Institute (VRI) for many purposes including animal movement between states, monitoring, control and surveillance program. The aim of this study was to determine the seroprevalence for B. melitensis in goats from 2012 until 2017 based on surveillance cases received in VRI. The overall prevalence during study period was 1.00% from 93,466 sample tested, which was slightly higher than the previous study of 0.91% for the year 2000 until 2009. The highest seroprevalence was in 2014 with 1.95%, while the lowest was in year 2016 (0.30%). Penang (4.90%) had the highest seroprevalence while the states with the lowest and consistent zero prevalence were Sabah and Sarawak. States with high number of goat population such as Kedah, Kelantan and Johor showed an overall seroprevalence of 0.63%, 0.20% and 1.34%. This study showed the target to reduce seroprevalence to 0.20% by 2015 has not been achieved, but there are possible opportunities for future improvements. The veterinary authority may need to consider for others holistic approaches including banning live animal importation from B. melitensis endemic countries because no single test can detect every stage of infection in animals.



## **EVALUATION OF AMINO ACIDS, NEUTRAL DETERGENT FIBER (NDF), ACID DETERGENT FIBER (ADF) AND ACID DETERGENT LIGNIN (ADL) IN DRIED MORINGA OLEIFERA LEAVES AS A POTENTIAL FORAGE FOR RUMINANTS**

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### **ABSTRACT**

Moringa oleifera (MO) has been studied worldwide as an animal feed compared to Malaysia. This study is to evaluate the contents of amino Acid (AA), Neutral Detergent Fiber (NDF), Acid Detergent Fiber (ADF) and Acid Detergent Lignin (ADL) of the dried MO leaves. Five samples were collected from wild grown MO trees in VRI with height approximately 25 feet, unknown age and with no proper irrigation and fertilization. This study found that 18 AAs were detected including glutamic acid ( $2.79 \pm 0.54\%$ ), aspartic acid ( $2.67 \pm 0.78\%$ ), serine ( $2.55 \pm 1.06\%$ ), Glycine ( $1.95 \pm 0.65\%$ ), Histidine ( $0.69 \pm 0.24\%$ ), Arginine ( $1.17 \pm 0.55\%$ ), threonine ( $2.19 \pm 0.47\%$ ), alanine ( $0.98 \pm 0.30\%$ ), proline ( $1.73 \pm 0.43\%$ ), tyrosine ( $0.82 \pm 0.25\%$ ), valine ( $1.51 \pm 0.47\%$ ), methionine ( $0.48 \pm 0.40\%$ ), cystine ( $1.04 \pm 0.39\%$ ), isoleusine ( $2.12 \pm 0.65\%$ ), leusine ( $1.71 \pm 0.45\%$ ), phenylalanine ( $1.15 \pm 0.30\%$ ), tryptophan ( $0.03 \pm 0.01\%$ ) and lysine ( $0.97 \pm 0.20\%$ ). This study found that Arginine, Isoleusine, Leusine, Lysine, Phenylalanine, Threonine and Valine had significantly higher level ( $p < 0.05$ ) compared to prior research findings. The MO leaves samples had  $22.64 \pm 0.06\%$  of NDF,  $13.26 \pm 0.30\%$  of ADF and  $1.93 \pm 0.15$  of ADL. This comprise of  $9.38 \pm 0.28\%$  hemicellulose and  $11.33 \pm 0.15\%$  cellulose which were significantly higher ( $p < 0.05$ ) compared to other studies. The completeness in AA played a very important role in immunity, reproductive and digestive system as growth promoter and improvement in milk production in dairy animals. In conclusion, dried MO leaves have all 18 essential AA with acceptable levels, good percentage of NDF, ADF, hemicellulose and cellulose which have great potentials as supplements for ruminants feed. It is recommended to increase the number of samples for reliable and better result.

## IDENTIFICATION OF SELECTED ANIMAL SPECIES USING POLYMERASE CHAIN REACTION-RESTRICTION FRAGMENT LENGTH POLYMORPHISM (PCR-RFLP) TECHNIQUE

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### ABSTRACT

Adulteration of food is fast becoming one of the most important global issues with increased awareness and emphasised made on authenticity and traceability of food. In the meat industry, adulteration of meat posed not just economic problems but could also relate to religion and cultural issues. The polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) of mitochondrial 12S rRNA gene is a technique developed to identify animal species based on DNA using a universal primer, followed by digestion with restriction enzymes. The PCR amplification of DNA using the universal primer will yield a 456-bp fragments for all species tested, namely pig, cattle, buffalo, sheep and goat. Digestion of the amplicons with restriction enzymes of AluI, HhaI, ApoI and BspTI resulted in species-specific band patterns that could confirm, identify and differentiate the animal species. The PCR-RFLP technique was suitable and successfully used to identify single animal species in raw and processed food of animal origins as well as animal feed.

## VERMINOUS PNEUMONIA IN AN ASIAN PALM CIVET

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### ABSTRACT

Respiratory infections caused by parasitic organism are widely known to infect a variety of hosts in domestic and wild animals. In Malaysia, incidence of lungworm infection or verminous pneumonia is rare or are under-reported in Asian Palm Civets. The Asian Palm Civet (*Paradoxurus hermaphroditus*) is a small nocturnal omnivore and their habitat is mainly in the temperate and tropical forests. Since Asian Palm Civet is an adaptive animal, they also can be found at the park, fruit orchards, agricultural lands as well as housing area. This is a case report of a wild Asian Palm Civet that had exhibited clinical signs of anorexia, paleness and rough coat prior to death. Field post-mortem conducted revealed presence of multiple abscess in the lung parenchyma. Lung samples were fixed in 10% formalin and further processed by the Histology Unit (Pathology Section), Veterinary Research Institute, Ipoh. Histopathological examination revealed a mild subacute verminous interstitial pneumonia. Eggs and larvae were localized within the pulmonary interstitial and surrounded by eosinophilic infiltrate. Thus, the histopathological findings could have been attributed to the immunological response of the pulmonary tissue toward the eggs and larvae which leads to the formation of the multiple lung abscesses. Early treatment with anthelmintic may provide good prognosis in this case. Since lungworms in wild Asian Palm Civet is currently under-reported, further study is needed to know the prevalence of the disease in Malaysia.

## **VIRULENCE ASSOCIATED GENES PROFILES OF *Pasteurella multocida* TYPE A FROM AVIAN ORIGIN TO BE USE AS FOWL CHOLERA VACCINE SEED IN MALAYSIA**

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### **ABSTRACT**

*Pasteurella multocida* Type A (PMA) is the aetiology agent of Fowl Cholera (FC) that is often related to avian disease outbreak with sudden death. The virulence factors of PMA were coded by certain virulence associated genes (VAGs) in PMA's genome but their roles and actions were still poorly understood. Therefore, this study was performed to profile 12 different VAGs in 20 PMA isolates of avian origin obtained from clinical case of FC outbreak that including five vaccine seed. These isolates were revived on blood agar and subjected to multiplex polymerase chain reaction for capsular typing and VAGs detection. Results showed that all five vaccine seeds and eight PMA possessed ten VAGs except nanH and toxA. Six PMA isolates contained nine VAGs and the remaining isolates has eight VAGs. The six VAGs that were commonly detected in all isolates of this study were exBD-tonB, hgbA, nanB, oma87, ompH and pfhA. The nanH and toxA were not found in any PMA isolates while HgbB was less likely to occur at 75% (15/20). By comparing vaccine seed VAGs profile to others in this study, it can be concluded that they were highly virulence as the vaccine seed were derived from FC outbreak cases and content the highest VAGs among all. Considering that these virulence factors plays a major role in pathogenesis, it is recommended to study local isolates in terms of their virulence genes profiles so that formulation of the current vaccine can be improved to provide better protection.

## **EFFECTS OF FEED RESTRICTION ON GROWTH PERFORMANCES OF IKTA QUAIL**

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### **ABSTRACT**

This study was conducted to investigate effect of food restriction (90% and 85% of an ad libitum consumption) on growth performance of IKTA quail. A total of 750 unsexed IKTA quail aged 0 to 35 days were used in this study, divided randomly to three groups as follows; (T1) feed ad libitum, (T2) 10% feed restricted and (T3) 15% feed restricted respectively. All groups were housed in similar management. Weekly data on growth parameters were recorded. Maximum feed intake was observed in ad libitum fed group whereas the highest body weight gain was observed in T2 fed group. Mortalities were low under 10% feed restriction. As a result, the effects of 10% and 15% feed restriction during growing period for quail in this study showed no significant difference with the ad libitum feeding group. These data indicate that by 85% of an ad libitum consumption can achieve the target body weight at 35 days of age. Further studies can be done on other limit feed restriction programs that may have economic benefits.



## **SURVEILLANCE TESTING FOR AFRICAN SWINE FEVER IN MALAYSIA**

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### **ABSTRACT**

African swine fever (ASF) is a highly contagious viral disease affecting domestic and wild pigs of all ages. The disease originated from Africa continent and spread to other part of world including Asia. ASF was first reported in Liaoning province in China back in early August 2018. The disease spread rapidly throughout China and into neighbouring countries like Vietnam, Cambodia and Laos. Although humans are not affected by ASF, the mortality rate in pigs are up to 100%. As such, ASF causes substantial socio-economic implications. Since November 2018, Veterinary Research Institute (VRI) has been instrumented to conduct surveillance testing for ASF through close collaboration with Malaysian Quarantine and Inspection Services (MAQIS), State Department of Veterinary Services and Department of Wildlife and National Parks Peninsular Malaysia (PERHILITAN). The present study reported the results of surveillance testing of various samples received at VRI from November 2018 till July 2019. The samples tested includes confiscated or imported pork products (frozen pork, rib, sausages, canned pork products, cured meat and etc), swabs from commercial pig surveillance program, organ and ticks from wild boars surveillance program. Up to July 2019, a total of 419 samples were tested with molecular approach and none were detected positive for ASF. Nonetheless, surveillance is crucial in continue to prevent ASF from entering the country, minimise virus spread and serve as early warning system. Active monitoring, high public awareness and strict biosecurity measures are needed to keep ASF from spreading into Malaysia.

**Keywords:** African swine fever, pig, surveillance

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## ANALYSIS OF COPPER LEVEL TRENDS IN PALM OIL BASED BY-PRODUCT SUBMITTED TO IVM KLUANG MALAYSIA

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### ABSTRACT

Copper (Cu) is essential trace element that plays a vital role in the physiology of animals, but it can be toxic if excessive amounts of Cu are ingested. Cu deficiency leads to physiological disturbance if the animal did not get a sufficient Cu concentration in their daily diet. The purpose of this study was to evaluate Cu levels in palm oil based by-product used by Malaysian farmers as ruminant's feeding during 2008-2018 period analysed by Feed Analysis Laboratory, IVM. Additionally, this study aims to provide information to the population that may be beneficial to public health. A total of 106 palm oil by-product samples were analysed to evaluate Cu levels. Cu levels was determined using atomic absorption spectrophotometry method in flame. Results shown that all analysed samples contained Cu residues in detectable amounts. The average values of Cu levels of palm oil product and by-product is  $19.59 \pm 1.07$  mg/kg with mean ranged from 0.17 mg/kg in crude palm oil to 73.33 mg/kg in decanter cake. High variability in Cu content of in palm oil based by-product analysed in this study suggests that ruminant farmers and ruminant feed producers should be concerned about the potential for both Cu toxicity and deficiency.

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## RAISING RABBITS: PREVENTIVE HYGIENE

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### ABSTRACT

Rabbit is a productive and fast-growing non-rodent animal that has the potential to produce a substantial amount of meat in a relatively short time. Rabbits will breed year-round in well-managed rabbitries with a good sanitation program which costs far less than the cure. Practicing good preventive hygiene is usually enough to prevent major disease crises. Livestock rabbit farming, especially for commercial purposes requires greater attention in various aspects such as breeding, feeding, housing and equipment, production, health as well as hygiene practices. This paper discusses a few basic rules for preventive hygiene that can be applied in raising rabbits. The information discussed in this paper will be very useful as a first step to prevent disease transmission in both human and domestic animals.

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## GROWTH PERFORMANCE OF SHEEP FED BY OIL PALM EMPTY FRUIT BUNCHES PELLET

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### ABSTRACT

The use of palm oil residue in livestock feed largely involves palm kernel cake, palm kernel expeller, palm oil mill effluent, palm frond compared to empty fruit bunch. It is because of the poor quality in terms of nutrient value, palatability and digestibility. The purpose of this study was to evaluate the level of empty fruit bunch pellet on the growth performance of sheep reared in intensive system. A total of 20 sheep were used in this study. The animal were divided into four groups and fed with four different combinations of 10, 20, 30 and 40% oil palm empty fruit bunches pellet and sheep pellet for 56 days. The data were analysed by one-way analysis of variance (ANOVA) using the general linear model (GLM) program of SAS (package version 9.4). Statistical significance of differences between group means was compared by Duncan post-hoc test. The level of significance used to determine the differences between treatments is  $p < 0.05$ . The combination of 10% EFB in the diet showed the highest result with average final weight gain (26.9 kg), average weight gain (6.76 kg), average daily gain (0.121 kg) and feed conversion ratio (6.57). In conclusion, lower level of EFB gave a better result on performance of sheep.

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## ANTIBIOTIC RESISTANCE PROFILE OF PUBLIC HEALTH CONCERN BACTERIA, *VIBRIO* SP, ISOLATED FROM CULTURED FISH IN SELANGOR, MALAYSIA

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### ABSTRACT

The rise of antimicrobial resistance (AMR) among bacteria of public health importance from farm-raised fish is a concern because of the potential detrimental effect on human health and the dissemination of resistance materials to the vast environment. In this study, the antibiotic resistance of *Vibrio* sp isolated from seabass fish (n = 110) raised from several locations in Selangor was determined. A total of 22 *V. parahaemolyticus* isolates were obtained from Kuala Kelanang, Air Tawar, and Port Klang. These isolates were subjected to antibiotic susceptibility test using 11 antibiotics from several antibiotic classes. The study found resistance toward Ampicillin (95.45%), Streptomycin (40.91%), Ciprofloxacin (27.27%) and Erythromycin (4.55%). All isolates were susceptible to Florfenicol, Tetracyclin, and Chloramphenicol. The Multiple Antibiotic Resistance (MAR) Index ranged between 0 – 0.36 where 18.2 % belong to MAR > 0.2 group and 86.36 % belong to MAR < 0.2. Port Klang has the highest MAR index, suggesting a high level of antibiotic contamination in the water system while Kuala Kelanang has the lowest MAR.

**Keywords:** antibiotic resistance, *Vibrio* sp, Seabass, MAR Index



## THE IDENTIFICATION OF POTENTIAL NICKEL (II) COMPLEXES OF AMINO ACIDS AND DITHIOCARBAMATE SALT AS ALTERNATIVE TREATMENTS FOR BACTERIA ORIGIN

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### ABSTRACT

Nickel(II)bis(N-methylglycine)diaqua dihydrate (Ni-S), nickel(II)bis(glycine)diaqua dihydrate (Ni-G) and potassium N,N-bis(hydroxyethyl)dithiocarbamate (KL3) were screened for their potential antibacterial activity against 4 bacteria; Streptococcus canis, Staphylococcus aureus, Pseudomonas aeruginosa and Escherichia coli. The nickel complexes adopt the octahedral geometry while the dithiocarbamate salt is a bidentate compound through the sulfur atoms.

Disc diffusion method was used to detect the presence of zone of inhibition followed by broth microdilution to determine minimum inhibitory concentration (MIC). The effect to selected bacteria were further assessed by inoculation onto Mueller Hinton agar to determine the minimum bactericidal concentration (MBC). There were presence of zone of inhibition exhibited by Ni-G and Ni-S against Escherichia coli at 0.1M while KL3 displayed zone of inhibition at against Streptococcus canis (0.01M) and Staphylococcus aureus (0.05M). The MIC for Ni-G and Ni-S was determined at 0.013M against E. coli and its MBC was determined at 0.025M. The study demonstrated Ni-G and Ni-S compounds possessed antibacterial effect only against E. coli and not against S. aureus, S. canis and P. aeruginosa.

**Keywords:** Ni-G, Ni-S, KL3, Disc diffusion method, MIC and MBC.

## **ANTIMICROBIAL RESISTANCE OF CLINICALLY IMPORTANT BACTERIA ISOLATED FROM COMPANION ANIMALS WITH URINARY TRACT INFECTION**

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### **ABSTRACT**

Urinary tract infection (UTI) is a global threat of immense significance to the health of companion animals, especially in dogs and cats. Increased emergence of antimicrobial resistance (AMR) is a growing concern to both human and veterinary medicine. A retrospective examination of data was performed on the antimicrobial resistance of 135 isolates from 23 bacterial strains isolated from urine samples taken from animals with UTI. These cases were submitted to Bacteriology Laboratory, Faculty Veterinary Medicine, UPM between January 2015 and December 2017. Out of 23 bacterial species isolated, *Escherichia coli* was the most common isolate (20%), followed by *Klebsiella pneumoniae* (17%), *Proteus mirabilis* (14%), *Staphylococcus pseudintermedius* (10%) and others (39%). Data analysis using WHONET 5.6 revealed that highest resistance, 25/25 isolates (100%) to metronidazole, 19/23 isolates (82.6%) to azithromycin, 26/32 isolates (81.2%) to trimethoprim/sulfamethoxazole, 71/92 isolates (77.2%) to cephalexin and 97/132 isolates (73.5%) to amoxicillin/clavulanic acid. In conclusions, the antimicrobial agents should be selected on the basis of bacterial culture and sensitivity tests.

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## SCREENING WORK OF ANTIBACTERIAL ACTIVITY IN FIELD MASTITIS USING SECRETOME

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### ABSTRACT

Mastitis affecting local dairy cows is a piece of alarming news to farmers. It is the most prevalent disease in dairy animals and is rather challenging to overcome. With antibacterial aggressively used in livestock, the resistant bacteria had created a hole in need for discovery of new antibacterial. Secretome from cells harvested from conditioned medium had a few promising criteria suggesting a new strategy to treat and prevent mastitis. In this study, secretome from bovine mammary epithelial cells successfully collected at 24 hours, 48 hours and 72 hours. The secretomes were screened for its antibacterial activity. There is total 7 type of bacterias isolated from milk sample sent by farmers in Malacca to Makmal Kawalan Kualiti Susu. From 7 type of bacterias that the secretomes inhibits 2 types at all hours of collection at concentrations of 1ug/ml.

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## SEQUENCE ANALYSIS OF H9N2 AVIAN INFLUENZA VIRUSES FROM LAYER CHICKENS IN 2018

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### ABSTRACT

Avian Influenza (AI) H9N2 has become a major problem in the poultry industry in many countries. Although H9N2 viruses are considered as Low Pathogenic Avian Influenza (LPAI), they pose a significant threat to public health as they are considered viruses with pandemic potential. In the last quarter of 2018, H9N2 outbreaks have been occurred in Peninsular Malaysia commercial poultry farms. Due to this disease, Malaysia had to face shortage of eggs during the outbreaks as it had affected the layer chickens. Therefore, in the present study, we report the genetic variations and phylogenetic analysis of H9N2 virus isolated from layer commercial farms in states of Negeri Sembilan, Penang, Perak and Melaka based on neuraminidase (NA) protein. The sequence analysis of NA genes showed 98% homology with the H9N2 recently isolated from Indonesia and Vietnam. The phylogenetic analysis revealed that all the isolates belonged to the Y280- lineage which is currently circulating in China and Southeast Asia. This lineage is also associated with human infections. This highlights the necessity of implementing farm biosecurity, continuous and thorough surveillance paired with risk-assessment of circulating H9N2 influenza viruses.

**Keywords:** LPAI, H9N2, poultry, neuraminidase, chickens, layers, Malaysia

## EMERGING OF AVIAN REOVIRUS GENOTYPE CLUSTER IV OUTBREAK IN MALAYSIA: A CASE REPORT

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### ABSTRACT

Avian Reovirus (ARV) of broiler is ubiquitous and causing significant clinical disease leading to economic losses worldwide. Most infected birds suffered from viral arthritis, malabsorption syndrome, runting-stunting syndrome and others. In Malaysia, the occurrence of the diseases is poorly documented, thus this paper aims to report a case of ARV outbreak at a broiler-breeder farm in Kota Tinggi, Johor. General examination revealed approximately 5% out of 40,000 birds (62 weeks old) suffering from abnormal gait and ruffled feathers. Upon physical examinations, mild swelling of the digital flexor tendon and hardening of the gastrocnemius tendon, dorsal to hock joint were noticed. The post-mortem was conducted and stratified random sampling was performed. Suitable samples were taken for further diagnostic analysis. Histopathological examination revealed evidence of viral arthritis while the antibody of ARV was detected in the serum in conjunction with detection of ARV RNA in the tendon and caecal tonsil samples through polymerase chain reaction (PCR) test. Partial gene sequencing of  $\gamma$ C gene and phylogenetics analysis was performed which classifying the ARV under genotype cluster IV. In conclusion, the diagnostic findings confirmed that ARV genotype cluster IV as the aetiology agent which is a new emerging ARV in Malaysia. Thus, for further understanding of the origin and introduction of this virus, a complete whole-genome sequencing and epidemiological studies were recommended. Finally, surveillance and control measures should also be taken into consideration to contain the disease from spreading to other areas.



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## **MOLECULAR CHARACTERIZATION OF S1 GENE OF AVIAN INFECTIOUS BRONCHITIS VIRUS ISOLATED IN VETERINARY RESEARCH INSTITUTE, IPOH DURING 2017- 2018**

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### **ABSTRACT**

Avian infectious bronchitis (IB) is a highly contagious disease which can cause huge economic losses to the poultry industry. IB variants constantly emerged, some are generally distributed, and some are restricted to certain area. The aim of the study is to characterize the S1 gene of IB virus (IBV) isolated in Veterinary Research Institute, Ipoh from year 2017 to 2018. Sixteen IBVs were isolated and the S1 gene of the virus was amplified by RT-PCR. The amplicon was sent for DNA sequencing. The nucleotide sequences of the local isolates and the published sequences were aligned and compared. Phylogenetic analysis of the S1 gene revealed that all isolates were clustered into three groups; the QX-like (37.5%), Mass-type (37.5%) and 4/91-type (25%). Three types of S1 protein cleavage recognition motifs, the HRRRR, RRSRR and RRFRR were found among the isolates. The presence of Mass and 4/91 type of IBV is common in Malaysia. However, the possibility of re-isolation of vaccine strains used in the field cannot be ruled out as vaccines derived from both types are the authorized IB vaccine in the country. Though there is no QX based vaccine available in Malaysia, the development of new vaccines to control the QX-like strain is not a necessity as vaccination using two or more antigenically distinct strains may provide broader protection against different IBV serotypes. Hence, further study needs to be carried out to determine whether the current available IB virus vaccine is able to provide protection against the circulating field virus.

## **DETECTION OF RABIES ANTIGEN IN VARIOUS ANIMAL SPECIES BY DIRECT FLUORESCENT ANTIBODY TEST TECHNIQUE**

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### **ABSTRACT**

During Rabies outbreak since 2015 till forth, various animal species being tested with fluorescent antibody test (FAT) besides dogs. Issues of Rabies in other wildlife species which are increasingly being taken care as pet animals have arisen recently. Rabies fluorescent antibody test is a gold standard test determining the presence of antigen in the sample tested. Similar principles of FAT were applied even though the samples sent for testing were from different species and potentially infected with Rabies. Ideally, the test was meant for dogs but as per requested, species like cat; monkey; deer; bat; wild boar; as well as squirrel were also tested against FAT. Brain samples from those species were obtained through post-mortem and smeared onto glass slide before proceeding with fixation in the absolute acetone for at least 30 minutes at -20°C. Staining and observation under fluorescent microscope as routine procedure. The results in 2015 showed three monkeys and two deer were negative against Rabies. As for 2017, seven out of 39 tested cats were positive against Rabies antigen. Other samples came from four bats; one hamster and one wild boar that were negative respectively. For 2018, seven from 32 cats were tested positive while one squirrel negative from Rabies. In conclusion, dogs and cats still remain the most prominent species detected positive during Rabies outbreak compared to the other wildlife animals.

## RETROSPECTIVE STUDY OF NEWCASTLE DISEASE CASES SENT TO JOHOR BAHRU REGIONAL VETERINARY LABORATORY (JBRVL)

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### ABSTRACT

Newcastle Disease (ND) is one of the most important avian diseases that significantly affect poultry production all over the world. Despite intensive vaccination programs, the virus remains a constant threat to the commercial poultry farms in Malaysia. This paper is to report the trend and prevalence of ND in Johor based on cases received in JBRVL. This is a five year retrospective study (2014-2018) of the Newcastle disease (ND) diagnosed at Johor Bahru Regional Veterinary Laboratory. In total, 2097 cases of ND were recorded from various categories of samples received such as diagnostic, monitoring, salt, survalen, and others. Data of positive cases were compiled and analysed. It showed that pattern of ND in Johor District is fluctuated from year 2014 until 2018. The high incidence of ND occurred in year 2014. This may be due to number of samples received in JBRVL. It is suggested that as more samples were received in JBRVL, the chances of detecting ND in these samples were increased. Out of 11 districts in Johor, Kluang and Batu Pahat have been the highest count for ND positive cases in the last 5 years. It is not surprisingly because these two districts have highest poultry farms.

**Keywords:** Newcastle disease, Johor Bahru Regional Veterinary Laboratory

## HARNESSING CRISPR CAS9 TECHNOLOGY TO INHIBIT CMV REPLICATION

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### ABSTRACT

Cytomegalovirus (CMV) infection is a leading cause of birth defects and can be very severe and life threatening in immunocompromised patients. There are currently no approved vaccines and the current therapy for CMV disease is using antiviral agent focusing to reduce the rate and symptoms of infection found to have some major drawbacks such as resistance and dose-related toxicities. For these reasons, the development of new therapeutic agents to treat CMV infections should be a major public health priority. The newly developed CRISPR CAS9 system is a powerful tool to target cellular genome DNA for gene editing. In order to investigate the possibility of using the CRISPR Cas9 system to disrupt the CMV DNA templates, two guide RNAs (gRNAs) were designed that targeted the Immediate early 2 (IE2) and DNA polymerase regions respectively. Antiviral effects of CRISPR CAS9 were assessed via mutation identification, titration of extracellular virus and the assessment of cytopathic effect (CPE) rate in cell culture. The CMV-specific gRNA/Cas9 system could successfully edit the targeted region and the virus titre were reduced significantly compared to control groups. Moreover, the development of virus cytopathic effect (CPE) rate on REF cell line was observed to be absence compared to commercial drug treatment. Therefore, for the first time, high specificity and efficacy of the CRISPR technology for targeting Malaysia isolate CMV regions were demonstrated, which led to the editing of CMV DNA. These observations support the potential use of CRISPR/Cas9 technology as a curative strategy that warrants further investigation.

## **SEROLOGICAL SCREENING OF BLUETONGUE DISEASE IN MALAYSIA FROM 2013-2018**

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### **ABSTRACT**

Bluetongue (BT) is an infectious and non-contagious arthropod borne viral disease of domestic and wild ruminants. The disease is caused by Bluetongue virus (BTV), a member of the genus Orbivirus of the Reoviridae family. Currently, there are 27 recognized BTV serotypes been reported worldwide and 6 serotypes were found in Malaysia. The aim of this paper is to access the current status of BT disease in Peninsular Malaysia from 2013 until 2018 through serological testing. A total of 9,382 ruminant blood samples from various background were collected in January 2013 until December 2018. Serum were harvested and tested using Agar Gel Immunodiffusion Test (AGID) for antibody detection toward BTV as recommended by OIE. Of these, 20.3% (n=1,908) samples were tested positive against BTV antibodies. Compared to other species, cattle had the highest percentage of positive antibodies (48%) against BTV. Conversely, Negeri Sembilan and Johor showed highest percentage of positive antibodies against BTV at 44% and 40%, respectively. The distribution of BTV among livestock is dependent upon the presence of its vector (*Culicoides* sp.), geographical distribution, climates and host preference. BT disease is regarded as an important disease in Malaysia and need to be monitored constantly.

**Keyword:** Bluetongue virus, Antibodies, Serology, AGID, Malaysia



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## PRELIMINARY SEROLOGICAL DETECTION OF WEST NILE VIRUS IN STRAY DOGS AROUND KLANG VALLEY

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### ABSTRACT

West Nile virus (WNV), derived from Flavivirus genus is a causative agent of febrile illness in human and animals. The transmission cycle of WNV involves Culex spp. and Aedes spp mosquitoes as vector while the wild birds as the reservoir and amplifying hosts. Human and other mammals, reptiles and amphibians can be infected through biting of the infected mosquitoes and served as dead end host. In Malaysia, there are evidences of WNV seropositivity in wild birds, companion birds and Orang Asli. However, thus far, there is no data reported on the status of WNV infection in dogs in Malaysia as dogs are also susceptible to the mosquito bite which make this study served as a preliminary research. Therefore, the aim of this study is to determine the presence of antibody against WNV among stray dogs via serological methods by using competitive ELISA (ID Screen ® West Nile Competitive Multi-species). Convenient sampling was performed by obtaining serum from 46 stray dogs. By using ELISA, 9/46 samples were positive against WNV anti-prE antibodies. This data showed that there were exposure of WNV among stray dogs located in Klang Valley.

**Keywords:** West Nile virus, stray dogs, ELISA, Klang Valley

## COMPARISON OF VARIOUS PARASITOLOGICAL METHODS FOR PINWORM DETECTION IN BALB/C MICE

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### ABSTRACT

The laboratory mice (*Mus musculus*) is one of the most common choices of animal model used in research. However, they can be presented with low number of parasites in the skin and intestinal tract despite strict biosecurity practiced. This study aims to identify the presence of parasites in the laboratory mice of UPM Animal Resource Unit (ARU) and to compare different parasitological methods commonly used to detect endoparasite and ectoparasites. Detection of helminths, ectoparasites and blood parasites were done using various conventional techniques on a total of 24 BALB/C mice. Pinworms; *Syphacia obvelata* (*S. obvelata*) and *Aspicularis tetraptera* (*A. tetraptera*) were identified based on their parasitological distinct characteristics of ova shape, cervical alae, tail end, and vulvar location. Both pinworms were seen in 8.33% BALB/C while infection by *S. obvelata* only was detected in 33.33% BALB/C mice. There was no infection of mice by *A. tetraptera* only. Results showed that perianal tape test is the best method to identify *S. obvelata* while *A. tetraptera* is best detected by faecal floatation. The type of helminth is significant when associated with the strains of mice ( $P=0.043$ ). Overall, helminths and ova were found in low amounts with the absence of ectoparasites and blood parasite in BALB/C mice at ARU indicating good biosecurity management.

## AMINO ACID DIGESTIBILITY IN BROILER BIRDS FED WITH PREMIUM PALM KERNEL CAKE BASED DIET

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### ABSTRACT

A feeding trial was conducted to investigate the effect of premium palm kernel cake (PKC) based diet on amino acid digestibility. Four groups of one hundred and fifty day-old broiler chickens in each group were fed with four isocaloric diets: commercial feed on both starter and grower phase (Diet 1), broiler feed containing 30% PKC on starter phase + commercial grower (Diet 2), commercial starter + broiler feed containing 45% PKC on grower phase (Diet 3) and broiler feed containing 30% PKC on starter phase + broiler feed containing 45% premium PKC on grower phase (Diet 4). At day 31 of the experiment, samples of bird faeces were collected according to group diets to estimate amino acid digestibility based on balance experiment. Ultra-Performance Liquid Chromatography with photo diode array detector was used for amino acid analysis. The results showed that comparison on feeding broiler chickens with commercial feed in addition with different level of palm kernel cake based diet did not show a significant difference on amino acid digestibility ( $p < 0.05$ ). The present study indicates that the inclusion of 30-45% of premium PKC in poultry diet could be utilized as a protein source in broiler feed production with an appropriate supplementation of essential amino acid. Further studies with combination of analysis of excreta, ileal digesta and growth performance are needed to obtain more concrete findings.

**Keywords:** amino acid digestibility; poultry; palm kernel cake.

## STUDY ON COMPARISON OF DRYING PERFORMANCE BETWEEN A GREENHOUSE SOLAR DRYER AND OPEN SUN DRYING

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### ABSTRACT

A greenhouse solar dryer was designed and constructed at Malaysia Veterinary Institute, Kluang, Johor. The dryer consists of a greenhouse made from transparent polycarbonate and drying system using solar energy. In this study, the drying performance of Napier grass using greenhouse solar dryer and open sun drying were compared. A total of 5 kg samples was used and the experiment was carried out continuously until the product reached a moisture content of about 15%. The air temperature, relative humidity and moisture content of products were monitored and recorded during the experiments. The results showed that the average temperature inside the drying bed with heater and drying bed without heater was 41.7oC and 38.9oC, respectively with a relative humidity of 55.1% and 56.2%, respectively. While the average temperature recorded in open sun drying was 29.0oC with the relative humidity of 76.1%. In terms of drying time, drying with or without heater was found to speed up the drying process for almost 20 hours and 16 hours compared to open sun drying, which were shown significantly difference ( $p < 0.05$ ). As a conclusion, the moisture levels of less than 15% from an initial moisture content of 89.3% can be achieved using greenhouse solar dryer within a period of 26 to 30 hours, which is 1.5 to 1.7 time faster compared to open sun drying. In this study, the greenhouse solar dryer has been designed as an alternative technique to dry fodder and it was found to be more efficient than the open sun drying.

## **BREEDING IN FEEDLOT (BREEDLOT) : AN ALTERNATIVE RUMINANT PRODUCTION SYSTEM TO PRESERVE GENETIC VALUE OF BRAKMAS.**

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### **ABSTRACT**

Genetic preservation is one of the advantages of Breedlot system. Animal genetic value preserve as only selected female and male cattle are breed under the system. Breeding cycles can also planned under the system. The objective of the study was to evaluate the effect of energy level on Brakmas cattle breeding performance, raised under breedlot system. 80 heads of Brakmas female cattle were divided into eight (8) group pen. Four group pens received breeding feed which its energy follows animal requirement; while another four pens receive breeding feed which its energy level were 20% higher than animal requirement. One Brakmas bull were introduce to 10 Brakmas female; for each group pen. The breeding period were two (2) months and pregnancy detection (PD) conducted 60 days after the bull was removed. Three (3) breeding cycles were conducted under breedlot system. From two (2) breeding cycles, data recorded were pregnancy rate, birth rate and calf weight according to the feed consumed. From the data, conception rate were 48.61% for cycle 1 and 30.56% for cycle 2. Calves weight from two breeding cycles were comparable with calves weight in nucleus herd; from the literature. Male calves weight were 25.07kg to 26.77kg; while female calves were 22.83kg to 23.27kg. Comparable calves weight suggesting breedlot is suitable production system to be implement in nucleus and / or multiplier herd, to preserve genetic value of beef cattle.



## **TREND OF REGISTERED SWIFTLET PREMISES IN PENINSULAR MALAYSIA FROM 2014 TO 2017**

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### **ABSTRACT**

Swiftlet industry in Malaysia can be traced way back in the 1990's in Perak and Penang where at that time shop lots were renovated to resemble the ambience and atmosphere of the cave which is the natural nesting habitat of swiftlet. The exploration of new and suitable location from rural to urban and coastal areas to build bird houses has been done extensively due to good returns from this lucrative business. The objective of this study is to give an overview of current area preferences for building bird houses throughout the Peninsular Malaysia. The following areas in which GIS and GIS-functions were incorporated are presented: (1) the distribution of registered swiftlet houses for Peninsular Malaysia from the year 2014-2017, (2) distribution of registered bird houses in urban, coastal and inland agriculture areas. A total of 5,614 bird houses was registered in 2017, compared with 4777 bird houses in 2016. However, despite the yearly increment there have been a decrease on the average annual bird house accretion of 17.52% for the period 2016-2017. Most of the premises are located in urban areas (45.36%), followed by coastal and rural areas (28.86%) and agriculture areas (25.78%). There is significant reduction in total percentage of bird houses in urban areas similar from previous study done due to increasing trend of building bird houses towards more inland rural areas and agriculture areas. These findings are essential for better understanding of the potential birdhouse management and future planning for a successful swiftlet farming.

## COMPARATIVE PATHOGENICITY OF MALAYSIAN ORF VIRUS CULTIVATED ON LAMB TESTIS CELLS

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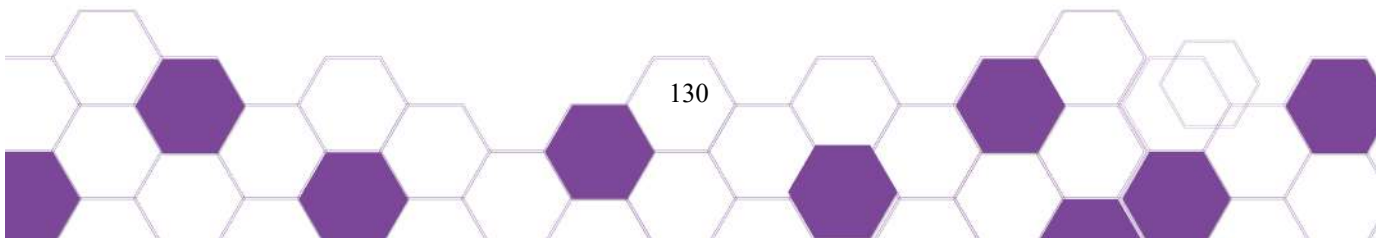
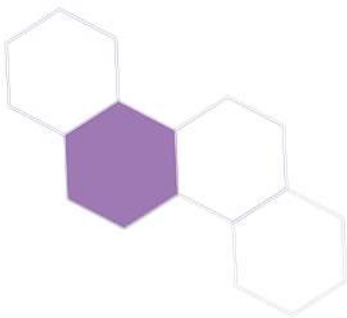
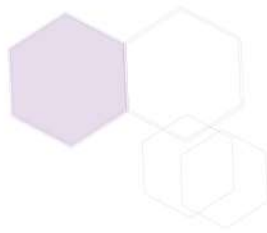
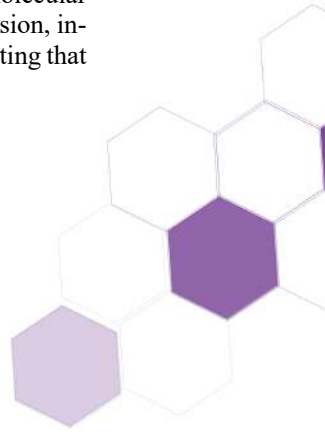
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### ABSTRACT

Orf virus causes a debilitating skin disease in sheep and goats which is of zoonotic importance. It results in high mortality among animals leading to huge economic losses. The aim of this study is to evaluate the rate of cytopathic effect development of Malaysian Orf virus isolated from animals that suffered contagious ecthyma disease. Scab materials were processed for virus isolation using standard procedure. A 100ul of the 10% virus suspension was used for infecting lamb testicle cells line in DMEM media supplemented with 1% FBS for optimal growth rate of this virus and progressive CPE changes were monitored at 1, 6, 8- and 10-days post infection. PCR test targeting B2L gene was used for the molecular confirmation of the Orf virus. Subsequently, the virus was harvested and re-infected on LT cell line continuously in order to achieve higher number of passaging. For the comparative study, a low passage at P4 (UPM1/14-P4) and high passage at P50 (UPM1/14-P50) isolates were infected on confluent monolayer of LT cells with 105.53 and 105.80 TCID<sub>50</sub>, respectively. Morphological changes including cellular ballooning, rounding and vacuolation were observed which were more pronounced within 6days post infection.

The virus grows faster at P4 compared to P50 which tends to be slower. The molecular detection was found to be positive for each of the propagated virus. In conclusion, in-vitro pathogenicity of the Malaysian Orf virus has been established and indicating that the CPE has reduced after several passaged in cell culture system.



## THE WASTEWATER CHARACTERISTIC STUDY FROM PIG FARMING IN KUALA LANGAT, SELANGOR

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### ABSTRACT

Pig farming wastewater is known to contain high concentrations of solids, organic matter and nutrients. However, studies on wastewater characteristics from pig farm final discharge point remain incommensurate. In this study, wastewater quality of different pig farms was investigated. Studies were carried out to investigate water quality parameters in wastewater effluent and assess their 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 region that are managed by Department of Veterinary Services. There are 125 pig farms located in Kuala Langat, Selangor in total. Samples of two liters each were collected in polyethylene bottles at the outflow points of each pond between 9.00am till 1pm. Wastewater collected was then transported in an icebox back to laboratory for analysis. Methods used are in accordance with American Public Health Association (APHA). The parameters determined include pH, dissolved oxygen (DO), biochemical oxygen demand (BOD) and chemical oxygen demand (COD). Results shown that pH value ranged from 10 to 14, dissolved oxygen ranged from 0.2 mg/L to 18.8 mg/L whereas BOD5 ranged from 7.5 mg/L to 258.8 mg/L and COD were 67.1 mg/L to 1516.7 mg/L respectively. These data were found higher than the wastewater discharge regulations set by DOE (Malaysia) permissible limit of 100 mg/L for TSS, 50 mg/L BOD5 and 100 mg/L COD. Principal component analysis (PCA) was conducted to characterize the pollutant loadings. PCA demonstrates positive loadings on pH, BOD5 and COD and negative loading for DO. This indicates that pH, BOD5 and COD increase with DO reduction. High pollutant loading in pig farm wastewater can be alarming as it will cause unpleasant smell whilst harming the ecosystem. Wastewater discharge should be monitored from time to time in order to prevent environmental pollution and health hazards caused by pig farming wastewater contamination. Based on the results, wastewater treatment prior discharge is necessary to safeguard river ecosystem and to ensure sustainable pig farming.

## **A PROSPECTIVE COHORT STUDY ON LAMENESS AND CLAW LESIONS AND THEIR ASSOCIATION WITH ANIMAL-BASED WELFARE MEASURES IN DAIRY COWS IN SELANGOR, MALAYSIA**

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### **ABSTRACT**

The aim of this study was to investigate the incidences of lameness and claw lesions and their association with animal-based welfare measures (ABWMs) in dairy cows in Selangor, Malaysia. Using a prospective study design, four intensively managed dairy herds with a total of 120 non-lame lactating cows ( $n = 30$  from each farm) and having no claw lesions were enrolled in the study. Inclusion criteria of study units included normal hock condition score (HCS), absence of body injuries, and normal claw length. The cows were assessed monthly for locomotion scores, claw lesions and ABWMs for one lactation. Cox and logistic regression models were used for data analysis. The cumulative incidence of lameness in the studied herds was 24% (29/120; 95%CI 17-35%) over the study period. The risk of lameness was associated with previous history of lameness with hazard ratio (HR) 7.4 (95% CI 2.42-23.07), presence of overgrown claw (HR = 3.77; 95% CI 1.12-12.62) and low body condition score (BCS) (HR = 4.54; 95% CI 1.33-16.66). Majority of the lameness cases were due to claw horn lesions (CHLs), i.e. non-infectious type (75.4%) compared to infectious type (24.7%). The odds of having CHLs tended to be higher in cows with lower BCS ( $P = 0.08$ ). Significant association was present in those with previous history of lameness (OR = 5.44; 95% CI 2.41-23.3). The findings indicated that low BCS, overgrown claw and previous history of lameness are important factors for incidence of lameness and CHLs in dairy cows during lactation. Maintenance of cows at moderate BCS, improved care for cows with history of lameness and claw trimming could improve lameness management in the studied herds.



## MOLECULAR DETECTION OF MYCOBACTERIUM TUBERCULOSIS COMPLEX IN CAPTIVE ASIAN ELEPHANTS IN NATIONAL ELEPHANT CONSERVATION CENTRE

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### ABSTRACT

Tuberculosis (TB) is a zoonotic disease was reported worldwide with the aetiological agent is Mycobacterium tuberculosis complex (MTBC), a group of the multi-host pathogen that moribund at the wildlife–livestock interface. In 2012, a study on the prevalence of elephant TB detection revealed 25.93% were seropositive TB in the National Elephant Conservation Centre (NECC) but there is no further screening. Therefore, the study was designed to re-evaluate and determine the occurrence of MTBC in captive Asian elephant in the NECC. Sixty-three trunk washes and twenty-one fresh whole blood were collected from 21 elephants. Trunk wash samples were examined for acid-fast bacillus (AFB) by Ziehl-Neelsen (Z-N) staining. The serological test was carried out using DPP VetTB assay from the extracted serum sample. Trunk washes and whole blood were subjected for polymerase chain reaction (PCR) by using two sets of primers, 16MYC-F and 16MYC-R for detection of genus Mycobacterium, whereas TB1-F and TB1-R for MTBC. All AFB, serological antibody detection and PCR from the trunk wash were tested negative while PCR of the whole blood revealed 23.8% (5/21) detection with further sequencing identical for MTBC. In conclusion, the study has provided fundamental information on the presence of MTBC in captive elephants in Kuala Gandah. However, more conclusive affirmation needs to be further tested by repetitive analysis and combination of other diagnostic protocols.

## **ELECTROENCEPHALOGRAPHIC CHANGES OF GOATS SUBJECTED TO DIFFERENT ROAD TRANSPORTATION DURATIONS**

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### **ABSTRACT**

Livestock transportation is an essential element of the meat industry. However, transportation components including loading, unloading, road conditions, novelty, noise, vibration and social disruption cause physical and psychological stress in livestock animals. Prolonged transportation would also cause exhaustion. Electroencephalography (EEG) had been used to assess pain and consciousness in ruminants, however studies in humans had demonstrated EEG changes associated with prolonged stress and fatigue. Therefore, in this study, the effect of different road transportation durations on EEG in goats was investigated. Twenty-seven adult Boer cross goats were used and assigned to either 1 (PT1), 2 (PT2) or 6 (PT6) hours (h) of road transportation. Electroencephalography recordings were taken at farm (baseline) and post-transportation (PT) and EEG parameters including total power (P<sub>tot</sub>), median frequency (F<sub>50</sub>), and frequency waves beta and delta were derived. Results show that the P<sub>tot</sub> and delta power intensity decreased at PT in all transportation groups compared to baseline, indicating that transportation stress caused decrease in cerebral activity. The F<sub>50</sub>, an indicator of nociception, did not change in all transportation groups. However, beta power intensity, an indicator of arousal, decreased in PT1 and PT6 goats at PT, but did not change in PT2. This suggests that within 1h of transportation, animals experienced stress in attempt to adapt with the transport conditions. After 2h, the animals may have adapted, but prolonged transportation up to 6h may have led to exhaustion. These results also suggest that EEG can be used to assess non-painful stimuli such as transportation in goats.

## SERUM BIOCHEMICAL ALTERATIONS IN ANAEMIC AND NON-ANAEMIC CATTLE WITH ACUTE INFLAMMATORY CONDITION

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### ABSTRACT

This study aims to evaluate the relationships between serum electrolytes, hepatobiliary and kidney parameters in anaemic and non-anaemic Kedah-Kelantan x Brahman cattle with an acute inflammatory condition, which was diagnosed based on the evidence of a degenerative left shift. A total of 61 blood samples (5 mL) obtained via coccygeal vein were subjected for haematology and serum biochemical analysis using automated analysers. The cattle were divided into anaemic and non-anaemic groups based on the haematological findings. Results showed serum sodium, potassium, chloride, total protein, globulin and blood urea nitrogen (BUN) levels increased above the reference ranges in both anaemic and non-anaemic cattle with degenerative left shift, but the differences between the two groups statistically were not significant ( $P>0.05$ ). However, serum alkaline phosphatase (ALP) activity of the anaemic cattle was elevated and also significantly ( $p<0.05$ ) higher than non-anaemic cattle, which had normal level of serum ALP activity. Similar finding was recorded for gamma glutamyl transferase (GGT), albeit it was slightly elevated in the non-anaemic cattle. In contrast to the serum ALP and GGT, although serum total and unconjugated bilirubin values of the anaemic cattle were significantly higher ( $P<0.05$ ) than the non-anaemic cattle, but the values were still within the reference ranges. Further analysis on the correlation between all serum biochemical parameters using Pearson's correlation coefficient test revealed positive relationships between acute inflammation and ALP, GGT and BUN in the anaemic cattle group. Similar observations were not observed in the non-anaemic cattle with acute inflammatory condition.

**Keywords:** Electrolyte, hepatobiliary, kidney biomarkers

## MYCOTOXIN TESTING IN ANIMAL FEEDS – VETERINARY PUBLIC HEALTH LABORATORY'S EXPERIENCE

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### ABSTRACT

Animal feed safety in Malaysia is becoming an important criteria where mycotoxins are considered to be among the most significant hazards at international level of trade. Determination of aflatoxins, fumonisins, ochratoxins and others in animal feeding stuffs by Veterinary Public Health Laboratory did not depend much on how the samples were brought to the laboratories by the senders, but as received basis for analysis. Based on the compiled data, inconsistent results produced for the past 10 years have made the real situation of occurrences of mycotoxins in animal feedstuffs as inconclusive. Animal consumption of mycotoxin-contaminated crops may cause adverse health effects where proper laboratory results representing a national concern for the livestock industry must be consistently reliable. Mycotoxin growth normally non-uniform making the sampling protocol become more vital than sampling of more homogeneous compounds for quality testing. Step to obtain representative sample accounts for the greatest source of error since the analytes under discussion often appear in trace levels.

**Keywords:** mycotoxis, representative samples, source of error

## **THE CONSUMER PREFERENCE ON FRESH LOCAL BEEF AND FROZEN IMPORTED BUFFALO MEAT: A SURVEY BY CONVENIENCE APPROACH**

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### **ABSTRACT**

Consumer preference on either fresh local beef or imported frozen buffalo meat is one of the factors that may influence the demand of the meat. The purpose of this study is to determine the consumer preference on fresh local beef and imported frozen buffalo meat, and to investigate the affordable and preferable price for fresh local beef by consumer. A set of questionnaires was developed and specifically distributed to fresh local beef and imported frozen buffalo meat consumer commencing from July 2018 to January 2019. A total of 727 of respondents participated in the survey and the data were statistically analyzed using Microsoft Excel and SPSS software. The result shows 90.3% of the consumer bought less than 2 kg of fresh local beef and frozen imported buffalo meat in a month and 48.2% consumed 1 to 2 kg per house monthly. Among all, 78.5% of the consumers prefer to consume fresh local beef compared to frozen imported buffalo meat, but only 66.0% frequently bought the meat. The study also shown that 61.3% of the consumers agreed that the current retail price (RM26 to RM40 per kg) for fresh local beef is within their affordable range. However, 93.9% of the consumers prefer if the price of fresh local beef can be reduced to less than RM30 per kg. The survey also revealed that 91.0% of the respondents will choose to buy the fresh local beef rather than frozen imported buffalo meat if the prices are similar.

**Keywords:** fresh local beef, imported frozen buffalo meat, preference, consumer



## COMMON ENDOPARASITES FROM FECAL SAMPLES OF PET CATS FROM LOCAL CLINICS AND HOUSEHOLDS AROUND IPOH IN 2019

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### ABSTRACT

The aim of this study is to screen the common endoparasite infestation in pet cats from local clinics and household around Ipoh. A total of 60 samples were collected from 35 male and 25 female cats with age ranging from three months to six years old. Fecal samples from cats were collected from their individual cages. Flootation method was performed to examine the presence of endoparasite eggs in the fecal samples. The microscopic examination revealed six cats were positive for *Ancylostoma* sp. egg (10.00%), two cats positive for *Strongyloides* egg (3.33%) and three cats were each positive for *Spirocerca* sp. egg (1.66%), *Toxocara* sp. egg (1.66%) and *Isospora felis* oocysts (1.66%), respectively. These endoparasite infestations may cause diarrhea, constipation, anemia and other complications if the cat is not immediately treated. Some of these parasites are zoonotic and human can get gastrointestinal discomfort when coming in contact with cats carrying these endoparasites. Measures that can be taken to reduce and prevent endoparasitic infestation in cats are routine check-up by authorized veterinarians, adapting best practices for fecal handling and maintaining the cleanliness of the cages.

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## **CASE REPORT OF ASCITES SYNDROME IN 28 DAYS OLD BROILER CHICKENS**

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### **ABSTRACT**

Ascites is referring to the accumulation of transudate in the abdominal cavity due to many underlying causes including genetics, diet, environment and also management. This case report described the of ascites syndrome in 28 days old broiler chicken in an open house system at Pasir Puteh, Kelantan. The mortality was high (16%) in 28-33 days old broiler chickens. Clinical signs showed the chickens having abdominal distension, stunted growth, dyspnea, ruffled feathers and reluctant to move. Postmortem findings revealed the presence of yellowish transudate fluid at abdomen cavity. There was also presence of right ventricular dilation, renomegaly and pericarditis. Histopathological findings displayed pneumonic lung with alveolar emphysema, and atelectasis. Escherichia coli (E.coli) were isolated from the samples of lung, liver, and kidney. Based on the physical examination, bacterial culture, post-mortem and histopathological findings, all the infected chickens were showed common findings and diagnosed with ascites concurrent with colibacillosis infection. The prognosis of this case was grave, and the chickens were cull due to more cost effective. The farmer was advised to control the environmental temperature and humidity to prevent excessive loss of body heat especially during the hot season. Besides that, reducing feed density was also recommended.

14<sup>th</sup> Proceedings of the Seminar on Veterinary Sciences, 19 – 20 October 2019

## PREVALENCE AND ASSOCIATED RISK FACTORS ASSOCIATED WITH RUMINANT FASCIOLIASIS IN SELECTED FARMS IN PAPAR, SABAH

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### ABSTRACT

Fascioliasis is caused by *Fasciola hepatica* and *Fasciola gigantica* affecting ruminants causing significant economic losses and have zoonotic implication. There is lack of study done in Papar, Sabah related on the prevalence and associated risk factors of fascioliasis. Therefore, this study is done to determine the prevalence of ruminant fascioliasis in selected farms in Papar, with its associated risk factors namely management system, deworming practice, age and sex of animals. 352 ruminants including cattle, goat and sheep from 14 farms in Papar were selected randomly for faecal sampling. Sedimentation and Flukefinder® methods were carried out to diagnose for *Fasciola* sp. Sedimentation method showing the overall prevalence of 1.4% (5/352) while Flukefinder® technique shows the prevalence of 1.989% (7/352). Animal in semi-intensive farming showed a higher risk in association with fascioliasis as compared to animal in intensive and extensive farming. In addition, risk of being infected with *Fasciola* was higher among farms practicing symptomatic treatment compared to without the practice and scheduled practice. This study highlights the overall prevalence of fascioliasis among ruminants in Papar is relatively low, however precautions should be taken due to zoonotic impact. Fascioliasis was found to be associated with management type and deworming practice with ruminant fascioliasis in selected farms in this study.

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## ANTIMICROBIAL RESISTANCE OF COMMENSAL ESCHERICHIA COLI ISOLATED FROM CHICKEN IN CENTRAL REGION OF PENINSULAR MALAYSIA

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### ABSTRACT

In animal production, antibiotics play an important role in order to prevent and treat animal diseases and improve animals' growth performance. The development of antimicrobial resistance (AMR) in zoonotic bacteria in animals and foods shall compromise the effective treatment of infection diseases in humans and animals. *Escherichia coli* (*E. coli*) is a member of family Enterobacteriaceae and commonly known as intestinal microflora in humans, warm-blooded animals and reptiles. With its ability to survive in many different ecological habitats and adapt to constantly changing environments, commensal *E. coli* are regarded as an indicator of antimicrobial load in their hosts. This study was carried out to determine phenotypic characteristics of antibiotic resistance of commensal *E. coli* isolated from pooled cloacal swabs of broiler and layer chicken in central region of Peninsular Malaysia. In 2018, a total of 250 *E. coli* isolates from 86 farms were tested for antimicrobial susceptibility using disk diffusion method for nine different types of antibiotics. The data entry and analysis were done using WHONET software. A total of 98.4% (186/189) of *E. coli* isolates from broiler and 37.7% (23/61) of *E. coli* isolates from layer were multi-drug resistant (MDR). High percentage of resistance was found against tetracycline (96.3%), ampicillin (93.1%) and chloramphenicol (92.1%) in broiler. Meanwhile, tetracycline (70.5%) was found to be the highest percentage of resistance in layer. All *E. coli* isolates in layer were susceptible to ceftiofur, cefotaxime and gentamicin.

**Keywords:** Antimicrobial resistance, commensal *Escherichia coli*, chicken, broiler, layer, WHONET 5.6

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## EXPRESSION LEVEL OF PRO INFLAMMATORY CYTOKINES, INTERLEUKIN 1? (IL-1?) OF EXCISIONAL WOUND TREATED WITH *Melastoma malabathricum* LEAF EXTRACT IN SPRAGUE DAWLEY RATS

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### ABSTRACT

This study aims to measure the effectiveness of *M. malabathricum* leaf ethanolic extract as an alternative treatment for wound via expression of pro-inflammatory cytokine during inflammation phase of healing. A total of 120 male Sprague Dawley rats were divided equally into two treatment groups and two control groups. All rats were inflicted with a circular excisional wound (500 mm<sup>2</sup> in size) on the dorsal thoracic region. Rats in the treatment groups were treated topically with low and high (% w/w) concentrations of the herbal extract, respectively, daily for 21 days, while rats in the control groups received silver sulfadiazine (positive) and no treatment (negative). Six rats from each group were euthanised at days 4 and 8 and blood samples were collected for serum concentration of Interleukin 1? (IL-1?) via Enzyme Linked Immunosorbent Assay. The wounds treated with low and high concentration of the herbal extract showed significant ( $p < 0.05$ ) increase in the serum IL-1? expression level (274.33 and 244.68 pg/ml) respectively compared to negative control (67.42 pg/ml) at day 4. Meanwhile, a significant ( $p < 0.05$ ) decrease in IL-1? expression level was demonstrated only in group of rats treated with low concentration of the extract (52.33 pg/ml) at day 8 of study compared with negative control (199.23 pg/ml). Rats treated with high concentration of the extract showed decrease (174.91 pg/ml) in IL-1? expression level compared to negative control. This study shows low concentration of *M. malabathricum* leaf ethanolic extract promotes wound healing via regulating the expression of pro-inflammatory cytokine.



## INVESTIGATION ON POTENTIAL FOODBORNE DISEASES FROM RABBIT MEAT FROM A COMMERCIAL RABBIT FARM IN SELANGOR

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### ABSTRACT

Rabbit farming is gaining popularity in recent years mainly for production of meat as an alternative protein source with high nutritive values but low in fat and cholesterol. Despite having 216 registered rabbit farms, there is a lack of study concerning foodborne diseases transmitted through rabbit meat consumption in Malaysia. Therefore, this preliminary study was conducted to investigate the potential foodborne diseases that might be present in rabbit meat in a commercial rabbit farm in Selangor, Malaysia. The microbiological profile was established by culturing fresh rabbit meat obtained immediately post-slaughter (5 meat samples) and on chilled meat after storage at 4°C for 7 days (20 meat samples). Results revealed that *Staphylococcus aureus* (80%), *Staphylococcus intermedius* (40%), and *Enterobacter cloacae* (40%) were isolated from the fresh meat sampled post-slaughter. On the other hand, *Staphylococcus aureus* (75%), *Staphylococcus intermedius* (65%), and *Enterobacter cloacae* (25%), *Acinetobacter* sp. (25%) and *Pseudomonas aeruginosa* (5%) were isolated from the chilled meat. Histopathological evaluation was conducted on 10 sets of randomly selected abandoned organs collected post-slaughter. Histopathological evaluation revealed that 2 out of 10 rabbits were suspected to be infected with encephalitozoonosis characterised by typical lesions of chronic interstitial nephritis and granulomatous meningoencephalitis. In conclusion, except for the noticeably high number of *Staphylococcus aureus* in the meat, other isolates as well as *Encephalitozoon cuniculi* are of minor concern in terms of foodborne diseases. Thus, rabbit meat is considered to be a relative safe protein source for human consumption.

**Keywords:** foodborne diseases, rabbit meat, microbiology, histopathology

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## INVESTIGATION ON POTENTIALLY ZOONOTIC FUNGAL AND BACTERIAL DISEASES OF RABBITS IN A COMMERCIAL RABBIT FARM IN SELANGOR

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### ABSTRACT

In Malaysia, commercial rabbit farming is becoming popular and lucrative due to the high demand for rabbits as pets and highly nutritive meat source. However, there is no reported study on potential fungal and bacterial zoonoses among commercial rabbit farms in Malaysia. Thus, this study was undertaken to investigate the presence of potentially zoonotic fungal and bacterial diseases in a commercial rabbit farm in Selangor. Thirty, New Zealand White mixed rabbits were randomly selected immediately post-slaughter. All rabbits had crusty lesions of variable severity on the nose and ear pinna while 4 rabbits had diarrhoea. Hair and scales samples were collected using Mackenzie's brush technique for direct microscopic examination and fungal culture. Bacterial cultures were performed for detection of *Pasteurella multocida* via nasal swabs; *Salmonella* spp. and *Escherichia coli* via rectal swabs. Nasal mucosa, skin and congested intestinal sections were collected for histopathological examination. All thirty rabbits were negative for dermatophytes, *Pasteurella multocida*, and *Salmonella* spp. However, 26.67% (8/30) of the cultures were positive for *Escherichia coli*, which was consistent with enteritis from histopathological findings. In conclusion, there is a potential public health risk due to transmissible colibacillosis from the commercial rabbits which can be controlled through improved husbandry to reduce stress in rabbits.

**Keywords:** commercial rabbit farming, zoonosis, bacteria, fungal, histopathology

## TISSUE CULTURE BASED ORF VACCINE: AN IMPROVED AND SAFER APPROACH FOR THE DEVELOPMENT OF VACCINE AGAINST CONTAGIOUS ECTHYMA DISEASE

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### ABSTRACT

Contagious ecthyma disease is caused by an epitheliotrophic Orf virus belonging to the genus paprapoxvirus of the poxviridae family. The disease has resulted in severe economic losses to rural farmers and adversely jeopardized livestock productivity due to high rate of mortality in animals. Until today, there is no effective Orf vaccine throughout Southeast Asian region. In this study, two forms of Orf vaccines; the live attenuated Orf vaccine (LAOV) and binary ethyleneimine killed orf vaccine (BKOV) were produced using Orf virus isolated in Malaysia from diseased animal. LAOV was prepared using a highly passaged (45th) Orf virus following standard protocol while BKOV was prepared by the chemical inactivation of the lower passage (First) of the very virulent field Orf isolate using binary ethyleneimine through alkaline cyclization process. A representative sample from the prepared vaccine was tested for viability

and sterility by incubation for seven days to observe for evidence of microbial contaminants. The vaccines were subsequently standardized in compliance with Good Manufacturing Practice requirements. The results indicated no adverse cytopathogenic effect upon in-vitro culture analysis, while phylogenetic analysis of the passaged vaccine seed viruses was found to be homologous to the Norwegian and USA vaccines. Therefore, the produced vaccines could serve as potential vaccine candidates capable of inducing protective immunity for the prevention and control of contagious ecthyma.

**Keywords:** Orf vaccine, Tissue culture, LAOV, BKOV, Immunity, Protection

## BLOOD TRANSFUSION IN A COLT

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### ABSTRACT

Blood transfusion is the administration of blood and/or partial blood constituents from one horse (donor) to another horse (recipient) in which the recipient has a clinical disease and reduced number of red blood cells (RBC) that necessitates these components as therapy to prolong life. Reduced numbers of red cells occurs from loss (haemorrhage), destruction (haemolysis), or failure to replace red blood cells (erythropoietic failure). An anaemic one year old Siam A colt was diagnosed with Progressive Ethmoid Hematoma on the right and left ventral meatus in the nasal cavity. Complete blood count (CBC) revealed microcytic hypochromic anaemia (22.3 % PCV). A frontonasal bone flap surgery was conducted to surgically remove the mass. After the surgery, the PCV was dropped into 18.8% which prompted him for emergency blood transfusion. Three litres of whole blood from a suitable donor was successfully administered via intravenous infusion. A month after the transfusion, the PCV increased to 21.5%.



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## BILATERAL CLOSED COMPLETE PROXIMAL DIAPHYSEAL TRANSVERSE TIBIA AND FIBULA FRACTURE REPAIR IN 2-YEAR-OLD SERVAL CAT - A CASE REPORT

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### ABSTRACT

A 2-year-old intact male Serval cat (*Leptailurus serval*) was presented for hind limb dragging after suffering high rise syndrome in a 2-storey enclosure. Physical examination and radiographs revealed bilateral closed complete proximal diaphyseal transverse tibia and fibula fractures. Intramedullary pinning with Steinmann pins for the left and right tibia was carried out. Bandaging and casting were done to both legs post-operatively but, they came off after 4 days. Bandage was reapplied was removed 24 days post-surgery. The cat was able to bear weight from day 29 onwards. Complications faced after the surgery were self-inflicted wounds due to bandaging and bending of the intramedullary pins. Pins were removed after 154 days following fracture union. This paper describes the successful surgical repair of bilateral tibia fracture in a Serval cat with manageable post-operative complications.

**Keywords:** bilateral tibia fibula fractures, intramedullary pinning, pin bending, serval cat

## SUBLINGUAL MUCOCELE IN A PERSIAN: CASE REPORT

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### ABSTRACT

A one year old Persian tomcat was presented with chronic hypersalivation for the past 6 weeks. Primary clinical finding revealed raised, transparent and fluid filled mass on the right-side of the sublingual region and the cat showed no sign of discomfort during eating. There were also marked engorgement of right submandibular lymph node. A fine needle aspiration of the mass under general anaesthesia highly suggestive of sublingual mucocele or ranula. Therefore, marsupialisation of mucocele was performed allowing the mucocele to remain open as to drain the saliva into the mouth. The cat recovered impeccably and no recurrence of clinical sign was reported within 3 weeks after the procedure. The selection of surgical intervention of mucocele is dependant on the severity of presenting clinical sign and chances of recurrence of clinical signs.

**Keywords:** sublingual mucocele, ranula, marsupialisation,

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## NATURAL INFECTION OF TRYPANOSOMA EVANSI IN A MARE: A CASE REPORT

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### ABSTRACT

A 10-year-old Siam B mare was presented with signs of severe emaciation, pale oral mucous membrane, presence of petechiation and gelatinous material on vulvar mucosa. There was also presence of urticaria at the neck region, frontal region of the head and all extremities. Haematologic findings showed the horse had normocytic hypochromic anaemia, monocytosis, hyperbilirubinemia, hypocalcemia, hypoglycaemia and hypophosphatemia while peripheral blood smear revealed the presence of high parasitaemia by *Trypanosoma* sp. The mare was treated with 15 litres of 0.9% sodium chloride to stabilize the condition of the horse. Diaminazine aceturate (7 mg/kg), was planned to be administered, intramuscularly a week after the definitive diagnosis as Trypanosomiasis was obtained. However, the mare was found dead and post-mortem was performed four hours later. Post mortem revealed presence of congested, oedematous and emphysematous lung. The pericardium was icteric with presence of haemorrhage at the ventricular septum and the apex of heart with iron out effect observed on the endocardium. The spleen and lymph nodes were enlarged and there were extensive multifocal haemorrhage observed in the spleen, kidney and liver. Histopathological results demonstrated the presence of *T. evansi* between the cardiomyocyte of the heart, in the spleen, medulla of the kidney, spinal cord, cerebrum and cerebellum. Blood sample and organs including heart, kidney, spleen, liver, brain and spinal cord were subjected to PCR and demonstrated the presence of *Trypanosoma evansi* in all organs. Thus, it was concluded that this is a case of Trypanosomiasis caused by *Trypanosoma evansi*.

**Keywords:** Trypanosomiasis, Surra, *Trypanosoma evansi*.

## TRENDS OF HIGHLY PATHOGENIC AVIAN INFLUENZA IN KELANTAN, MALAYSIA BETWEEN 2014-2017

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### ABSTRACT

As a consequence of the recent outbreak of H5NI virus in Kelantan state, the theoretical probability of the current prevalence of the disease and its associated risk factors remains largely unclear. This study examines retrospectively the trends of Highly Pathogenic Avian Influenza (HPAI) in poultry industry in Kelantan state, Malaysia. Data of three years, 2014-2017, of Highly Pathogenic Avian Influenza (HPAI) cases was reviewed. Odds ratio was used to determine the trend in Highly Pathogenic Avian Influenza (HPAI) prevalence. P-values less than 0.05 were considered statistically significant. From January 2014 to December 2017, a total of 2,002 poultry (chicken = 1555; ducks = 152; poultry = 295) were randomly sampled by the Department of Veterinary Services (DVS) in Kelantan state. Of these, 49 (2.45%) were confirmed positive for Avian Influenza using RT-PCR tests, including 41 (0.03%) in chicken, 7 (0.02%) in poultry and 1 (0.01%) in ducks. Mixed flocks were 14 times (87.8%) more frequently infected than non-mixed flocks (12.2%). There was a higher disease positivity rate of HPAI in adult poultry (49.0%) than young ones (10.2%). Monthly prevalence peaked (98%) in March and suddenly vanishes in April (0%) suggesting epidemic pattern with short period variations. Most of the cases were from six districts with most, frequent infections being from in Kota Bharu with prevalence rate of 1.4% out of the overall prevalence rate of (2.45%). Bivariate analyses revealed that sex, age, locality and time trend were significant potential risk factors of contracting the disease.

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## **QUALITY OF GRAIN CORN SILAGE AT DIFFERENT CUTTING AGE PLANTED AT MARDI SERDANG, SELANGOR.**

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### **ABSTRACT**

The biggest cost for the livestock industry is the cost of feed production. Increased prices of imported raw materials such as corn, soybeans and others have led the price of raising in the market. Therefore, the study was conducted to evaluate the potential of the use of leftover corn crop material may be one of the alternative sources of fibres for cattle and goat herds. Grain corn was planted at a distance of 0.75 cm x 0.25 cm. The plants were grown for different harvesting time at 80, 90 and 110 days. Then, the grain corn were chopped using mechanical machine and packed into 5 kg plastic bag to ensilage for 21, 28 and 35 days. Data on quality silage in pH and dry matter were collected. Based on data obtained showed that the grain corn silage were significantly different ( $p < 0.001$ ) on dry matter when harvesting at different age (80, 90 and 110 days) but no significant different in different times of fermentation recorded. However, pH result on grain corn silage showed significantly ( $p < 0.001$ ) when grain corn harvest at different times and there also showed an effect of fermentation times. From the results presented that grain corn silage will achieve greater dry matter when late cutting. pH result on late harvesting grain corn also showed the highest pH reading. Based on the trait, the average cutting interval that suitable for grain corn silage is at 90 days since it high in dry matter and pH below 4.0.

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## **A CASE OF INFECTIOUS BRONCHITIS IN 11 DAYS OLD BROILER CHICKENS, IN BESUT, TERENGGANU**

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## ABSTRACT

Infectious Bronchitis is an acute, highly contagious viral disease of chickens caused by virus belongs to the Coronaviridae family. It has a significant economic impact in broiler chickens when the weight gain is poor and mortality is high. This study was conducted to diagnose and solve the problem faced by broiler chicken's farmer in Besut, Terengganu. The mortality rate of the chickens rise up to 17% per day. Upon physical examination, common clinical presentation findings were weak, dyspnea, nasal discharge, torticollis, droopy wings and ruffled feathers. Post mortem findings revealed the presence of hemorrhagic tracheitis and pulmonary congestion. The trachea and lung samples were further tested using Reverse Transcriptase Polymerase Chain Reaction (RT-PCR) for detection of Coronavirus. The test was repeated twice for reproducibility. The results showed positive for Coronavirus. Based on clinical signs, post mortem and RT-PCR findings, the broiler chickens were diagnosed with Infectious Bronchitis. The infected chickens were recommended to cull. This result warrants the need to relook the vaccination program on the farm. Further studies are required to determine the strains that involve and control strategies of the said disease that may lead to huge economic losses to the farmer.

**Keywords :** Infectious Bronchitis, Coronavirus Hemorrhagic tracheitis, Pulmonary congestion, RT-PCR

## DETECTION OF PORCINE CIRCOVIRUS TYPE 3 (PCV3) IN CLINICALLY ILL AND APPARENTLY HEALTHY ANIMALS IN SELECTED PIG FARMS IN MALAYSIA

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### ABSTRACT

Porcine circovirus type 3 (PCV3) belongs to the genus *Circovirus* in the family *Circoviridae*. Many countries including Malaysia have reported the prevalence of PCV3 in the swine herd. PCV3 infection is associated with different clinical syndromes and sometimes in apparently healthy animals. The current study is aimed to detect PCV3 in clinically ill field animals and apparently healthy animals of weaner, grower, and finisher stage. Using convenient sampling method, 46 clinically ill animals and 18 healthy animals from farms of different states were selected. Organs collected include inguinal and mesenteric lymph node, lung, spleen, kidney and tonsil. The organs were subjected to PCR assay targeting the capsid gene (OFR2), followed by partial sequencing and phylogenetic analyses. Result revealed that 28.26% (13/46) of the clinically ill field animals were positive for PCV3 while all healthy animals were negative. Selected 6 local PCV3 strains were highly homologous with each other and identical to previously reported PCV3 strains. All Malaysian strains were most likely grouped into 2 clusters and are closely related to USA, Spain and Germany strains. It was speculated that PCV3 of Malaysian strains are originated from importation of breeder animals from those countries. In conclusion, PCV3 is prevalent in clinically ill field animals. However this preliminary study showed that apparently healthy animals were negative for PCV3.

## **MOLECULAR DETECTION OF SCHMALLEMBERG VIRUS IN SMALL RUMINANTS IN TERENGGANU AND NEGERI SEMBILAN, MALAYSIA**

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### **ABSTRACT**

The Schmallenberg virus (SBV) was first discovered in Germany in 2011. Since then, the vector-borne virus has spread to various parts of the world, causing clinical manifestations in ruminants such as abortions, stillbirths and congenital malformations. This study intends to perform molecular detection of SBV, which is the first to be done in Malaysia. In this study, 87 serum samples collected from selected farms in Terengganu and Negeri Sembilan were analyzed for SBV antigen using reverse-transcription polymerase chain reaction (RT-PCR). The primers and positive control used were designed and optimized to target the L-segment of SBV. RNA from serum samples was extracted, with its concentration measured, prior to performing molecular detection using a one-step RT-PCR kit. Upon analysis by gel electrophoresis, none of the 87 serum samples demonstrated positive results for SBV antigen. This finding, however, does not confirm the absence of SBV, as seroconversion has occurred within a number of samples, indicating that the animal has been infected at some point in its life. The result could be attributed to the low viremic period of SBV, and low levels of antigen due to neutralizing antibodies. Thus, for future studies, serum samples from acutely infected animals or the external placental fluid and umbilical cord of infected offspring should be used for more successful molecular detection of SBV.

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## IN VITRO ANTHELMINTHIC ACTIVITY OF INDIAN BORAGE (PLECTRANTHUS AMBOINICUS) EXTRACT AGAINST L3 STAGE STRONGYLES IN SMALL RUMINANTS.

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### ABSTRACT

Parasitic gastroenteritis (PGE) is a prominent cause of mortality and morbidity in small ruminants in Malaysia. PGE control relies greatly on the use of anthelmintic drugs (AHD). However, the unwarranted prophylactic usage of AHD have led to anthelmintic resistance against many drug groups especially the benzimidazole group. Therefore, the search for ethnoveterinary options have gained popularity. This study aims to assess the anthelmintic activity of Indian borage extract (IBE), against L3 strongyle larvae in sheep. 300 L3 larvae were used in 5 groups (IBE at 10, 30 and 50 mg/ml, ivermectin and distilled water) with one replicate each. The percentage mortality of L3 larvae was recorded at timed intervals at 0 minute, 10 minutes, 30 minutes, 1 hour, 2 hours, 4 hours and at 24 hours. Results showed that the concentration of IBE exhibited a trend of increasing mortality in a dose dependent manner. The highest percentage of mortality was observed in the 50mg/ml treatment group whereby 97% mortality was recorded within 4 hours, resulting in only 13% lower average mortality rate than the positive control, ivermectin. All treatment groups were statistically significant from the control groups ( $p < 0.05$ ). In conclusion, IBE displayed anthelmintic properties and has the potential to be used as an alternative for the control of PGE in sheep.

## VERIFYING THE RELIABILITY OF AN INFRARED THERMOMETER (IT) USAGE IN A SMALL ANIMAL HOSPITAL WARD SETTING

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### ABSTRACT

Body temperature measurement is an integral part of physical examination for veterinarians. Rectal temperature has been extensively used in predicting core temperature and is currently considered the gold standard in veterinary practice. However, this method is not without limitations, tends to lag behind core temperature and is considered uncomfortable for the animal. Technology advancements in veterinary medicine incline to follow trends from human medicine. There are products intended for human use that have produced unsatisfactory results when used in animals. In recent years, infrared thermography has begun replacing digital thermography for core body temperature measurement in humans. Recently, certain companies have started devising infrared thermometers designed specifically for animal use. The current experiment was undertaken to test the reliability of an infrared thermometer designed specifically for use on animals. The efficiency of the thermometer was tested to see if it could reliably report an animal's, environmental and animal feed temperature. The experiment involved 210 paired readings from felines and canines, 100 paired readings of the environmental and 100 paired readings of the feed. Data was analysed using SPSS 25 and NCSS via correlations, Chi Square and Bland-Altman plots. Results showed that the thermometer was very reliable ( $r=0.951$ ) for measuring environmental temperature, reliable ( $r=0.824$ ) for measuring feed but not very reliable ( $r=0.611$ ) for measuring an animal's body temperature. However, using a built-in correction function within the thermometer showed that it yielded extremely reliable results once calibrated towards a specific animal. Although it is rapid and offers more comfort to the animal, it cannot be conveniently and reliably used from patient to patient. Nevertheless, it can be a useful tool to have for specific patients that cannot have their rectal temperature easily measured.



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## SEROPREVALENCE AND ASSOCIATED RISK FACTORS OF CAPRINE ARTHRITIS ENCEPHALITIS (CAE) INFECTION AMONG SMALL RUMINANT FARMS IN NEGERI SEMBILAN, MALAYSIA.

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### ABSTRACT

Caprine Arthritis Encephalitis (CAE) is a significant viral disease of small ruminants that can cause negative impact on several parameters leading to social and economic losses. It is known to affect the animal with a chronic multisystemic inflammatory disease featured by a long incubation period and a lifelong persistent infection. In Malaysia, the first reported case of CAEV outbreak was in 2010 but there is no further data being collected. Besides, there was a suspected CAE case in Ladang Angkat, UPM but there is no further screening. Moreover, recent study in 2018 stated that seroprevalence was 8.8% in selected goat farms in Selangor with significant risk factors of age and poor biosecurity management. Therefore, the study was designed to determine seroprevalence of CAE among selected goat farms in Negeri Sembilan and the risk factors associated with this disease. Blood samples were collected from 82 goats via random sampling method. The sera were analyzed by using Shanghai Qayee Biotechnology ELISA kit to detect antibody towards CAE virus. Data analysis was done by using JMP<sup>®</sup> Statistical Software with the p-value calculated using Pearson Chi-Square. The result revealed among 82 goat samples, 43 samples (52.44%) were positive for CAEV. The important risk factor throughout this study is gender of the animal. Higher number of doe showed seropositive results compared to bucks where 28/82 females were positive with percentage of 58.33% while 14/82 males were positive with percentage of 44.12%. The seroprevalence of CAE observed in this study are higher compared to previous study conducted in 2018, hence showing a trend of increased exposure towards this disease among small ruminants. Thus, more-research-required-to-identify-the-current-true-and-overall-prevalence-of-CAEV-infection-among-small-ruminant-in-Malaysia.

## **SEROPREVALENCE AND ASSOCIATED RISK FACTORS OF COXIELLA BURNETII (Q FEVER) INFECTION AMONG SMALL RUMINANTS IN SELECTED SMALL RUMINANT FARMS IN NEGERI SEMBILAN, MALAYSIA**

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### **ABSTRACT**

Q Fever, or coxiellosis is a disease primarily caused by *Coxiella burnetii*, a bacterium that infects a wide range of species and is a zoonotic threat. In ruminants, this disease causes reproductive issues including abortion, stillbirths, premature deliveries and weak offspring. Currently there is no record on the prevalence of this disease among small ruminants, specifically goats in small ruminant farms in Malaysia. Thus this study was carried out to determine the seroprevalence of coxiellosis among goats in selected small ruminant farms in Malaysia, specifically the state of Negeri Sembilan. This study also assessed the risk factors that are associated with the disease in goats, being the sex of the goats, breed, age, reproductive status, farm ownership, farm management, production type, vaccination and deworming status. This study utilised the ELISA method of serological testing to determine the seroprevalence. Blood samples were collected via jugular venipuncture from ninety-one (91) goats selected based on random sampling from two (2) farms in the state of Negeri Sembilan, Malaysia. Sera obtained from centrifugation of blood samples are subjected to serological testing using the Goat *Coxiella burnetii* (Q Fever) ELISA Kit (Sunlong Biotech Co. Ltd.). Data analysis was done by using JMP Statistical Software with the P-value calculated using Pearson Chi-Square. The results of this study showed that the seroprevalence of coxiellosis in the study goat population was 3.30% (3 of 91). The significant risk factor found in this study is the sex of goats where males goats (8.11%) had a higher seroprevalence compared to female goats (0%). In conclusion, the seroprevalence of coxiellosis among selected small ruminant farms in Negeri Sembilan is low but the detection of positive antibodies towards Q-Fever still gives dangerous and higher risk factor towards the zoonotic potential of the disease. Therefore, it is needed to have a holistic study to know the current and true prevalence of Q-Fever among small ruminants in Malaysia.

## **SEROPREVALENCE AND RISK FACTORS OF SCHMALLENBERG VIRUS (SBV) INFECTION AMONG SELECTED SMALL RUMINANTS FARMS IN NEGERI SEMBILAN, MALAYSIA**

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### **ABSTRACT**

Schmallenberg virus (SBV) is a virus recently discovered in Germany in the year 2012. SBV infection occurs prominently in cattle, followed by small ruminants such as sheep and goats. Numerous study on the virus has been conducted in European countries such as Germany, Netherlands, and France. In Malaysia, the degree of this infection is still unknown. Hence, this study was aimed to investigate the seroprevalence and risk factors of SBV infection among small ruminants in the state of Negeri Sembilan. Blood samples were randomly collected from three small ruminant farms in Negeri Sembilan. Parameters such as age, breed, gender and reproductive status were recorded and farmers were interviewed regarding the farm and animal management. Sera obtained from centrifugation of blood samples are subjected to serology testing by using ID-VET Schmallenberg virus Competition Multi-species ELISA kit. Data analysis was done by using JMP Statistical Software with the P-value calculated using Pearson Chi-Square. In this study, the result revealed that 59 out of 182 samples were positive towards SBV infection with a seroprevalence rate of 32.42% and the significant risk factors being species, reproductive status, management, ownership and breed. Goats (40 %) showed higher seroprevalence rate compared to sheep (20.83% in this study). Pregnant animals had the highest seroprevalence rate (78.95%) followed by mature animals (34.18%), lactating animals (30%) and lastly the immature animals group (11.36%). Furthermore, semi-intensive management (55.10%) showed the highest seroprevalence rate compared to extensive management (35.14%) and intensive management (10.17%). Private small ruminant farms (43.09%) had higher seroprevalence rate than government farms (10.17%). For goats, Boer (50%) had-shown-higher-seroprevalence-rate-compared-to-local-breeds (35.14%). In sheep, mixed breed sheep (69.23%) had higher seroprevalence rate than pure White Dorpers (10.17%). As conclusion, detection of positive seroprevalence towards SBV infection in this study showed a new breakthrough that this SBV disease among small ruminant in Malaysia is a newly reported disease and an emerging viral

disease in ruminants of Malaysia. Therefore, it is suggested to conduct overall study in all states on Malaysia with a larger sample size involving large and small ruminants to know the true prevalence and endemicity of SBV infection among ruminants in Malaysia.

## COMPARISON OF SERUM GRANULOCYTE-MACROPHAGE COLONY-STIMULATING FACTOR, INTERLEUKIN 12 AND INTERLEUKIN 10 LEVELS IN ANAEMIC AND NON-ANAEMIC CATTLE WITH DEGENERATIVE LEFT SHIFT

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### ABSTRACT

Degenerative left shift in association with neutropenia, accompanied by anaemia causes significant economic losses in farms. It stimulates a potent immune response with the aid of pro-inflammatory and anti-inflammatory cytokines in order to maintain the immune haemostasis balance. Therefore, the objective of this study is to determine serum pro-inflammatory cytokines (granulocyte-macrophage colony-stimulating factor [GM-CSF] and interleukin 12 [IL-12]) and anti-inflammatory cytokine (interleukin 10 [IL-10]) levels in anaemic and non-anaemic cattle with degenerative left shift. Forty-one sera samples were harvested from blood samples of cattle and divided into two groups based on the haematological results. The serum concentrations of GM-CSF, IL-12 and IL-10 were measured using sandwiched bovine ELISA kits. Results showed no significant ( $P>0.05$ ) differences for the IL-12 and IL-10 levels between the two groups. However, mean serum concentration of GM-CSF was significantly ( $P<0.05$ ) higher in non-anaemic cattle with degenerative left shift compared to the anaemic cattle with degenerative left shift. This indicates that GM-CSF influences the growth of burst-forming unit-erythroid (BFU-E) and the state of anaemia in cattle. The low level of GM-CSF in the anaemic cattle could be attributed by decreased activity of the haemosiderin-laden macrophages in the spleen; presumably anaemia in these cattle is caused by blood protozoa which had resulted in the



occurrence of extravascular haemolytic anaemia. Further detection of blood protozoan DNA in the blood samples will be conducted. In conclusion, serum concentration of GM-CSF is higher in non-anaemic cattle with degenerative left shift compared to anaemic cattle with degenerative left shift.

**Keywords:** Haemosiderin-laden macrophages, haemolytic anaemia, cattle, blood protozoa

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## ANALYSIS OF TOTAL SOLID FOR FRESH MILK QUALITY GRADING IN PERAK

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### ABSTRACT

Total solids are one of the measurements to ensure the quality of fresh milk. The Department of Veterinary Services (DVS) serves the assurance of quality and safety of fresh milk from dairy farm to milk processors through Milk Collection Centre (MCC). The aim of this study is to review the performance of dairy farms from four MCC in Perak which located at Parit, Sungai Siput, Tapah and Taiping based on the grading for fresh milk grades from highest Grade A, Grade B and Grade C that are set by the DVS for milk pricing. The Biochemistry section of Veterinary Research Institute (VRI) had received a total of 2397 samples of fresh milk sample from MCCs in Perak in the year of 2018. Statistical analysis showed that there are significant differences in the mean of four MCC (where  $p < 0.05$ ) using one-way analysis of variance (ANOVA). Results showed, 69.17% samples were Grade A, 24.81% were Grade B and 6.02% were Grade C. This study showed that MCC in Sungai Siput is the main contributor for Grade A while Taiping is the highest contributor of Grade C. The data obtained in this study can be used as reference to identify the lower grade fresh milk producing dairy farms in Perak in order to assist them to improve quality. This study also indicates the milk producers require more trainings and better monitoring services to solve the milk quality issues in their farms immediately.

**Keywords:** Total solids, quality of fresh milk, milk collection centre, milk grading parameters

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## ANTIBIOTIC SUSCEPTIBILITY OF STAPHYLOCOCCI AND OCCURRENCE OF *S. PSEUDOINTERMEDIUS* ISOLATED FROM CATS AND DOGS ADMITTED TO KLINIK VETERINAR

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### ABSTRACT

Staphylococci are gram-positive opportunistic bacteria, that commonly constitute part of the natural skin flora of diverse animal species. In human the main infecting species are *Staphylococcus aureus* (*S. aureus*) and in small animal such as cat and dog, *Staphylococcus pseudointermedius* (*S. pseudointermedius*). Discriminatory between both pathogens are challenging due to the difficulties to differentiate both pathogens using the common biochemical test. Increasing resistance towards Staphylococci decreases the treatment outcome and increases chances of transmission of bacteria between animal and human. This study aims to determine the antibiotics susceptibility of Staphylococci isolated from cats and dogs admitted to KVUMK and to determine the occurrence of *S. pseudointermedius* from the isolated Staphylococci. A total of 41 Staphylococcal isolates were tested to the following antibiotics; cephalexin, amoxicillin-clavulanic acid, clindamycin, neomycin, chloramphenicol, gentamicin, amoxicillin, and enrofloxacin. Isolates were also subjected for polymerase chain reaction (PCR) analysis for confirmation of *S. pseudointermedius*. The following percentage of resistance were recorded; cephalexin (41%), amoxicillin-clavulanic acid (39%), clindamycin (56%), neomycin (56%), chloramphenicol (46%), gentamicin (44%), amoxicillin (56%), enrofloxacin (46%). The PCR analysis confirmed that 44% of the Staphylococci isolates were *S. pseudointermedius*. This data showed high occurrence of Staphylococci resistance towards the antibiotics commonly used for the treatment. A more prudent usage of antibiotics are necessary to ensure the antibiotics will be continuously effective for the treatment. This study also showed the ability of PCR method to identify *S. pseudointermedius* from the Staphylococci isolates. Correct identification of the bacteria is necessary to ensure specific treatments to be given to animals infected by these pathogen.

**Keywords:** *Staphylococcus pseudointermedius*, zoonotic, skin infections, cat, dog, antibiotic resistance

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## EXPLORING LIPID SIGNALLING PATHWAY GENE EXPRESSION IN HEP-G2 CELLS SUPPLEMENTED WITH EXOGENOUS LIPIDS AND STEVIA EXTRACT

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### ABSTRACT

Dyslipidaemia such as hypertriglyceridaemia or hypercholesterolaemia can lead to atherosclerosis and it is rarely reported in feline, but commonly found in canine. Although simvastatin has been used widely to control hypercholesterolaemia in human, it is of interest to seek alternative treatment, especially in the veterinary medicine. Stevia (*Stevia rebaudiana*) was previously reported to have a hypolipidaemic effect on rodents, thus we hypothesized that mammalian cells supplemented with stevia extract will not express the same lipid signalling pathway gene as cells supplemented with only exogenous lipid. This study has been designed to observe the effect of stevia on mammalian cell lines (Hep-G2) supplemented with commercial stevia extract and stevia derived glycosides such as stevioside or Rebaudioside A. The expression of genes involved in lipid signalling pathway such as low-density lipoprotein receptor (LDLr), 3-hydroxyl-3methylglutarylcoenzyme A reductase (HMGCR), scavenger receptor protein class b type 1 (SCAR-B1), acylcoenzyme A:cholesterol acyltransferase (ACAT2), perilipin 2 (PLIN2), proprotein convertase subtilisin/kexin type 9 (PCSK9) were assessed using gel electrophoresis after RT-PCR was performed. Glyceraldehyde-3 phosphate dehydrogenase (GAPDH) was chosen as a housekeeping gene. LDLr were quantified using RT-qPCR and significantly showed an increase of 10.8, 14.0, 19.1 fold in the positive control, high dose commercial stevia, and high dose stevioside respectively.

**Keywords:** Dyslipidaemia, Hep-G2 cells, LDLr, RT-PCR, stevia