



CEVSS

Canadian Emerging Veterinary
Scholars Summit | **October 26-28, 2023**



Canadian Emerging
Veterinary Scholars Summit



Welcome to the 2023 Canadian Emerging Veterinary Scholars Summit

This annual forum brings the top DVM and graduate student researchers from each of the five Canadian veterinary colleges together to share their research projects and develop their scientific knowledge, research skills and professional networks.

This year, we are excited to welcome two international students from the United Kingdom's University of Surrey, adding a global perspective to our community.



The CEVSS is generously sponsored by:



MERCK
Animal Health

The Program

Thursday Oct 26, 2023 (ALT Hotel Calgary University District)

Time	Description
6:00 p.m. - 8:00 p.m.	Registration

Friday, Oct 27, 2023 (Foothills Campus, Theatre 3)

Time	Description
8:30 a.m.	Opening Remarks - Hermann Schätzl
8:35 a.m.	Keynote Speaker - Jeff Biernaskie
9:15 a.m.	Explanation of Participation Codes
9:20 a.m.	Break (10 mins)
9:30 a.m.	Presenter 1 - Keana Shahin (OVC PhD Candidate) - Mosquito Madness: Tracking the Great Canadian Mosquito Invasion Amid Climate Change
9:45 a.m.	Presenter 2 - Zihan Li (WCVM DVM Student) - Tire Mire: Cardiometabolic Effects of 6PPD - quinone in Subadult Fathead Minnow
10:00 a.m.	Presenter 3 - Devyn Enwright (AVC DVM Student) - Developing and evaluating an equine welfare assessment for teaching animals
10:15 a.m.	Presenter 4 - Cody Malone (WCVM PhD Candidate) - Role of wildlife in persistence and transmission of Trichinella spp. in the North American North: A One Health problem
10:30 a.m.	Presenter 5 - Kate Walmsley (U of Surrey BVSc Student) - Estimating the spread of canine rabies as a result of the Ukraine conflict
10:45 a.m.	Presenter 6 - Isabelle Bazin (U de M) - Retrospective study on the use of fluvoxamine in 72 dogs with anxiety disorders
11:00 a.m.	Break (10 mins)
11:10 a.m.	Presenter 7 - Miranda Bie (OVC DVM Student) - Investigation of the effects of the PI3K inhibitor LY294002 and the PI3K/mTOR dual inhibitor GSK2126458 on canine malignant melanoma cells
11:25 a.m.	Presenter 8 - Alyssa Butters (UCVM PhD Candidate) - Escherichia coli in a One Health continuum: Investigation of genetic relatedness and antimicrobial resistance using whole - genome sequencing
11:40 a.m.	Presenter 9 - Clare Henderson (AVC DVM Student) - Investigation on lung and heart parasites of Newfoundland coyotes
11:55 a.m.	Presenter 10 - Kylie Pon (WCVM PhD Candidate) - Establishment and utilization of cell blocks in cavitory effusion analysis
12:10 p.m.	Presenter 11 - Vitoria Régia Lima Campêlo (U de M PhD Candidate) - Biosecurity adoption in Quebec dairy farms: Results from a risk assessment questionnaire
12:25 p.m.	Lunch (65 mins)
1:30 p.m.	Presenter 12 - Jacob Maxwell (OVC DVM Student) - Steering Surplus: Behavioural Responses of Non - Replacement Dairy Calves to Transportation and Handling
1:45 p.m.	Presenter 13 - Fatima Warraich (UCVM DVM Student) - Navigating the Human Angle in Wildlife Management: Exploring Wood Bison, Disease and Beliefs

Continued to next page...

Continued: Friday, Oct 27, 2023 (Foothills Campus, Theatre 3)

2:00 p.m.	Presenter 14 - Meg Walker (AVC Small Animal Surgery Resident) - Development of a Patient Specific 3D - Printed Drill Guide for Ventral Slot Surgery in Dogs: An Ex Vivo Study.
2:15 p.m.	Presenter 15 - Jordan Bertagnolli (UCVM DVM Student) - Tracking Emerging Infectious Diseases in Wildlife of Inuit Nunangat through Researcher Surveys
2:30 p.m.	Presenter 16 - Eric Kim (WCVM DVM Student) - Enhancing Comparative Oncology Insights: 18F - FDG PET/CT imaging analysis of pulmonary nodules in dogs and establishing the WCVM tumor biobank program.
2:45 p.m.	Break (10 mins)
2:55 p.m.	Presenter 17 - Rochelle Thompson (OVC PhD Candidate) - Coping strategies for occupational stressors among farmers in Ontario
3:10 p.m.	Presenter 18 - Servane Payen (U de M PhD Candidate) - The role of lipoprotein Lmb ("Laminin - Binding protein") in the pathogenesis of infection caused by Streptococcus suis serotype 2.
3:25 p.m.	Presenter 19 - Eva Mutua (UCVM PhD Candidate) - Investigating the relationship between cow temperament, maternal behaviour, productive and reproductive traits in beef cattle across a 3 - year period.
3:40 p.m.	Presenter 20 - Louie Genis (AVC Large Animal Internal Medicine Resident) - Prevalence of chronic diseases affecting adult sheep on Prince Edward Island
3:55 p.m.	Presenter 21 - Asha Stone (U of Surrey) - A Retrospective Study of Neoplasia in UK Captive Snakes Submitted to a Specialist Diagnostic Pathology Service (IZVG Pathology)
4:10 p.m.	Break (10 mins)
4:20 p.m.	Closing Remarks
6:30 p.m.	Student Mixer (The Banquet Bar - University District)

Saturday Oct 28, 2023 - Reserved for Presenting Students only - Spy Hill Campus

Time	Description
8:30 a.m.	Bus Pickup at Hotel (Travel to Spy Hill Campus)
9:00 a.m.	Workshop 1 of 2 (1 hour) - Daniel Pang (Critical Evaluation of Scientific Literature)
10:00 a.m.	Break & Coffee
10:15 a.m.	Workshop 2 of 2 (1 hour) - Bethany Savoy (Mental Health & Wellbeing)
11:15 p.m.	Tour of Spy Hill Campus
12:00 p.m.	Lunch
1:00 p.m.	Career Panel
2:00 p.m.	Bus Pickup at Spy Hill Campus (Travel to Zoo) Zoo: Behind the Scenes with Doug Whiteside
4:45 p.m.	Bus Pickup at Zoo (Travel to ALT Hotel Calgary University District)
6:00 p.m.	Bus Pickup at ALT Hotel Calgary University District (Travel to Last Best Brewing and Distilling)
6:30 p.m.	Merck Awards Ceremony

Speakers



Jeff Biernaskie

Professor, Faculty of Veterinary Medicine, University of Calgary

Dr. Biernaskie completed his BSc in Neuroscience at the University of Lethbridge. He earned a PhD in Neuroscience at Memorial University studying the effects of focused rehabilitative experience on brain plasticity following stroke. He completed a postdoctoral fellowship at the Hospital for Sick Children in Toronto where he studied skin and neural stem cell biology. In 2009, he joined the Faculty of Veterinary Medicine at the University of Calgary, where he is currently a Professor in Stem Cell Biology and Regenerative Medicine. He is a member of the Alberta Children's Hospital Research Institute (ACHRI) and the Hotchkiss Brain Institute (HBI), and he holds the Calgary Firefighters Burn Treatment Society Chair in Skin Regeneration and Wound Healing. In 2019, Dr. Biernaskie was elected as a member of the Royal Society of Canada, College of Scholars, Artists and Scientists.



John Gilleard

Professor, Faculty of Veterinary Medicine, University of Calgary

Dr. John Gilleard is Professor of Parasitology at the University of Calgary Faculty of Veterinary Medicine. His research interests are in the field of anti-parasitic drug resistance and molecular diagnostics. His research group integrates parasitology, genetics and genomics to investigate the molecular basis, emergence and spread of anthelmintic drug resistance and to improve diagnostics. Dr. Gilleard's research program uses the small ruminant parasite *Haemonchus contortus* as a model and studies both livestock and human gastrointestinal nematode parasites in the field. Dr. Gilleard has been at the University of Calgary since 2008 and has held positions of Associate Dean Research, Faculty of Veterinary Medicine, University of Calgary (2012-2017, 2019, 2022-present) and President of the American Association of Veterinary Parasitology (2018). He is a Fellow of the Canadian Academy of Health Sciences.



Mark Ungrin

Associate Professor, Faculty of Veterinary Medicine, University of Calgary

Dr. Ungrin is a deliberately interdisciplinary scientist, interested in both basic and applied biomedical research and funded by all three of Canada's Tri-Agencies (CIHR, NSERC, SSHRC). His training includes a BSc in Biochemistry (University of Waterloo / Université Joseph-Fourier, Grenoble), PhD in telomere biology (Department of Medical Biophysics, University of Toronto), and a postdoc in stem cell bioengineering (Institute for Biomaterials and Biomedical Engineering, University of Toronto), with work experience at Atomic Energy of Canada and Merck-Frosst – initially as a co-op student and then after completing his BSc. His research program includes basic research in cell and molecular biology, as well as the development of technologies to support research and translation. He has a particular interest in rigour, reproducibility, and efficiency in research and its translation. His AggreWell platform for scalable organoid biomanufacturing has been commercialized via StemCell Technologies Inc. of Vancouver, and is in use on every continent except Antarctica as well as the ISS. His pseudoislet system is in the process of being translated to clinical applications by 3D bioprinting company Aspect Biosystems, and he was a member of the international Scientific Advisory Committee advising the development of the GCCP2.0 standard for cell and tissue culture.



Delores Peters

Manager, Animal Health Surveillance Unit, Alberta Agriculture and Irrigation

Delores Peters manages the Animal Health Surveillance Unit for the Government of Alberta, overseeing animal health and food safety surveillance, as well as responding to reportable diseases at the provincial and federal levels. She holds a DVM (1984), MSc in animal biochemistry (1994), and a MVPHMgt (2007) specializing in Veterinary Public Health Management. Delores has a rich career history, from mixed animal private practice to field studies for animal health, and has been with the Government of Alberta in veterinary epidemiology and regulatory medicine since 2006.



Bethany Savoy

Counsellor (Instructor), Student Wellness Services, University of Calgary

Bethany is a counsellor and instructor at the University of Calgary. She has degrees in psychology and social work and has worked in different fields for over twenty years. She teaches social work at two universities and cares about mental health and wellness for students, staff, and faculty. She is interested in mindfulness, group therapy, insomnia, grief and loss, adult ADHD, and personal/professional development. She is the first counsellor to work directly with the Faculty of Veterinary Medicine to support their students' wellness needs.



Daniel Pang

Associate Professor, Faculty of Veterinary Medicine, University of Calgary

Dr. Daniel Pang is an Associate Professor of veterinary anesthesiology at the University of Calgary. He received his veterinary degree in 2000 from the University of Bristol and completed a MSc and residency in veterinary anaesthetics at the Université de Montréal after a year in small animal practice and an internship (University of Glasgow). He received his doctorate in neuroscience (molecular mechanisms of volatile anaesthetics) from Imperial College, London (2011). Dr. Pang teaches anesthesia at UCVM and has supervised numerous undergraduate and graduate students and his research interests include pain assessment perioperative safety and improving clinical practice.



Presentation
Abstracts



Presenter #1

Keana Shahin

Ontario Veterinary College, University of Guelph

Mosquito Madness: Tracking the Great Canadian Mosquito Invasion Amid Climate Change

ABSTRACT

Zika, dengue, yellow fever, and chikungunya viruses are all pathogens predominantly transmitted by mosquitoes, specifically *Aedes aegypti* and *Ae. albopictus*. As we continue to experience climatic shifts, changes in precipitation, humidity, and temperature may all increase climatic suitability and establishment of mosquitoes in areas of Canada. *Aedes albopictus* was previously unable to survive Canada's cooler climate, however it is now established in Southern Ontario. Currently, the viruses of interest (Zika, dengue, chikungunya, yellow fever) are endemic in Asia, South America, and Africa; regions which are involved in trade with Canada and frequented by Canadian tourists. This presentation will introduce a scoping review to describe the current state of knowledge on the pathogens of interest, the current distribution of *Ae. aegypti* and *Ae. albopictus* and how they interact with their environment, and the current climatic conditions suitable for these vectors/pathogens. There will be a particular focus on the impact of climate change on the introduction and establishment of these pathogens and vectors in Canada. The scoping review will review articles published from 2000 to 2022, written in English, with no geographic restrictions. The results from the scoping review will include a comprehensive and updated review on importation of diseases modelling techniques, risk factors for the importation of diseases, and a summary of the vectors/pathogens of interest that can be used by researchers creating their own models. The scoping review design, protocol, and preliminary results will be presented for discussion.



Presenter #2

Zihan Li

Western College of Veterinary Medicine, University of Saskatchewan

Tire Mire: Cardiometabolic Effects of 6PPD-quinone in Subadult Fathead Minnow

ABSTRACT

A tire antioxidant, N-(1,3-dimethylbutyl)-N'-phenyl-p-phenylenediamine (6PPD) is rapidly oxidized in the environment to form the ubiquitous 6PPD-quinone. With rain, 6PPD-quinone deposits in local waters, causing acute mortalities in many salmonids. However, initial studies report that 6PPD-quinone toxicity is highly species-dependent. Sublethal 6PPD-quinone exposure causes increased blood glucose, elevated heart rate, and increased stroke volume in rainbow trout (6PPD-q sensitive) at concentrations as low as 1 µg/L, but not in Arctic char (6PPD-q tolerant) at 10 µg/L. These effects may be due to sympathetic stimulation, increased methemoglobin, and compromised oxygen delivery. In subadult fathead minnow, sensitivity and effects on blood glucose or cardiorespiratory effects are unknown.

In this study, fathead minnows (n=15/group) were aqueously exposed to 0 (vehicle control) and 10 µg/L 6PPD-quinone for 48 h in a static chamber, with 75% renewal at 24 h. Subsequently, fatheads were assessed with cardiac ultrasound under metomidate anesthesia, followed by blood glucose analysis just before euthanasia. No mortalities or effects on weight, body condition, or blood glucose were observed, confirming that subadult fathead minnows are tolerant to 6PPD-quinone. Exposed fish exhibited significant increases in end systolic and diastolic volumes, but a marked decrease in ejection fraction. This suggests increased ventricular filling and insufficient compensation of contractility. Atrioventricular node block was observed in one treatment fish. Mitochondria uncoupling and ion dysregulation observed in other 6PPD-quinone exposure studies may be responsible for these cardiac effects.

Further studies are warranted to investigate 6PPD-quinone's effects on other species to determine the extent of environmental risk to local ecosystems.



Presenter #3

Devyn Enwright

Atlantic Veterinary College, University of Prince Edward Island

Developing and evaluating an equine welfare assessment for teaching animals

ABSTRACT

The Canadian Council of Animal Care (CCAC) sets the standard of care for animals used in science. As part of their Animal Welfare Assessment guidelines, the CCAC provides a framework for evaluating animal welfare, allowing each university to create their own species-specific assessments. The objectives were to 1) create an equine welfare assessment for teaching animals kept at the Atlantic Veterinary College (AVC), and 2) calculate inter-rater reliability on six subjective measurements in the assessment. We created an equine welfare assessment using existing literature, the National Farm Animal Care Council's Codes of Practice for the Care and Handling of Equines, as well as the CCAC framework. The assessment included animal-, environment-, and management-based measurements on a 4-point grading system including "acceptable", "mild to moderate animal welfare concerns", "severe animal welfare concerns", and "unacceptable welfare/endpoint". Six subjective animal-based measurements were assessed for inter-observer reliability, including observer approach, response to physical contact, handling ease, body condition score (BCS), lameness, and abnormal repetitive behaviors. Four evaluators with variable horse knowledge underwent identical training then performed the assessment on 8 teaching horses at the AVC; inter-observer reliability was determined using Kendall's Coefficient of Concordance. There was good agreement between evaluators for abnormal behavior (0.77) and handling ease (coefficient = 0.62), moderate agreement for BCS (0.43), fair agreement for lameness (0.34) and observer approach (0.25), and poor agreement for response to physical contact (0.17). The results indicate that the equine welfare assessment should be refined so that the definitions for some subjective measurements are clearer.



Presenter #4

Cody Malone

Western College of Veterinary Medicine, University of Saskatchewan

Role of wildlife in persistence and transmission of *Trichinella* spp. in the North American North: A One Health problem

ABSTRACT

With the implementation of high biosecurity production and regulatory testing of post-slaughter swine, cases of *Trichinella spiralis* in humans and pigs have reduced drastically in most developed regions of the world. Although the incidence of trichinellosis from pork consumption have decreased, the majority of detected infections in Canada now occur from the consumption of wildlife. *Trichinella*'s unique life cycle and trophic transmission present a unique One Health challenge because of the parasite's ability to persist, often at high prevalence and intensity in wildlife, the ability to infect humans, and the impact changing climate can have on the transmission and distribution of *Trichinella* spp. Recently, a new *Trichinella* species, *T. chanchalensis* (T13), was discovered in wolverines in the Northwest Territories and the Yukon, but the full host and geographic ranges are unknown. To address this, we worked with northern stakeholders to sample terrestrial carnivores from Alaska, the Yukon, the Northwest Territories, and Nunavut. To date, larvae were recovered and genotyped from 50/88 (57%) animals. Larvae were genotyped using targeted deep amplicon next-generation sequencing on Illumina MiSeq. Most were T2/T6 co-infections (38/50, 76%), consistent with previous findings. However, T13 was detected in 2 lynx, 2 wolves, and 1 coyote, all of which are new host records for T13. *Trichinella* spp. present complex One Health challenges because of their unique life cycle, various wildlife species they can infect, meat consumption habits of humans, and how the changing climate can result in the expansion or reduction of the geographic range for certain *Trichinella* species.



Presenter #5

Kate Walmsley
University of Surrey

Estimating the spread of canine rabies as a result of the Ukraine conflict

ABSTRACT

It has been long known in human medicine that infectious disease prevalence and spread increases during wartime, due to people being displaced from their homes. This project explored whether conflict situations also impact the spread of animal diseases.

The majority of people displaced by the Ukraine conflict, unlike previous wars, are refusing to leave their dogs behind. Many European governments recognise this and are temporarily allowing dogs entry without rabies vaccination, with various vaccination and licensing schemes in place for after the dogs have entered the country. My objective was to estimate the number of dogs exposed to the rabies virus but not yet symptomatic, travelling out of Ukraine as a result of displaced community movement.

I estimated the human-to-dog ratio in Ukraine using pet food sales data for owned dogs, then from this estimated the number of dogs displaced to each country, assuming families moved with their dogs. From rabies case data, I approximated the likelihood that each of these dogs was in an exposed rabies state.

Preliminary results suggest that Russia has incurred seven rabies-carrying dogs, Germany six, Poland five, Czechia two, while the United Kingdom, Spain, Italy, Moldova, Slovakia, Netherlands, and Ireland each have one. Note that these are preliminary results, lacking consideration of factors such as stray dogs, varying vaccination requirements, and potentially incomplete epidemiological data. Nonetheless, they warrant further exploration, especially for countries regarded rabies-free. The study highlights the need for vigilance regarding infectious disease spread in any future cases of civil unrest causing displacement.



Presenter #6

Isabelle Bazin

Faculty of Veterinary Medicine, University of Montreal

Retrospective study on the use of fluvoxamine in 72 dogs with anxiety disorders

ABSTRACT

Fluvoxamine is a selective serotonin reuptake inhibitor used in human medicine for various anxiety disorders. The purpose of this study was to document its use for the first time in dogs, in combination with appropriate behavioural and environmental modifications. Our primary hypothesis was that fluvoxamine would have a positive effect on anxiety disorders without major side effects.

Dogs diagnosed with at least one anxiety disorder and who received at least 6 months of fluvoxamine were included (n=72). A telephone survey was conducted to validate medical record data and document the therapeutic effect of fluvoxamine. Data were categorized and statistically analyzed with parametric and non-parametric tests.

Out of 72 dogs, 11 were anxious without showing signs of aggression, 47 were aggressive towards humans, and 51 towards dogs, 5 exhibited compulsive disorders, and 32 suffered from separation anxiety. Marked improvement was noted in 45% of treated dogs, moderate improvement in 38%, minimal improvement in 15%, no improvement in 2%, and none deteriorated. Out of all the variables tested for their potential influence on the effect of treatment or time to reach the optimal dosage, only the optimal dosage and the presence of a treated medical condition influenced the effect of treatment. None of the other variables tested significantly correlated with treatment efficacy or the time required to reach the optimal dosage. Side effects were reported in 81% of dogs, mostly mild and temporary.

Fluvoxamine offers a safe and promising alternative for patients who do not respond to approved antidepressants in anxious dogs.



Presenter #7

Miranda Bie

Ontario Veterinary College, University of Guelph

Investigation of the effects of the PI3K inhibitor LY294002 and the PI3K/mTOR dual inhibitor GSK2126458 on canine malignant melanoma cells

ABSTRACT

Malignant canine melanomas (CM) often recur after surgical excision and predict a short survival time despite conventional chemotherapy. Therefore, more research is required into treatment options for more effectively controlling CM cancer activity. Drugs targeting the PI3K/mTOR pathway have been shown to decrease cancer cell viability. This study will investigate the effects of two small molecule inhibitors, LY294002 (a PI3K inhibitor) and GSK2126458 (a PI3K and mTOR dual inhibitor), on CM cells to understand the effects of these drugs on cancer metabolism. Seahorse ATP Rate assays were performed on CM cell lines to quantify the effects of drug treatment on mitochondrial and glycolytic ATP production. Both LY294002 and GSK2126458 were found to decrease ATP production through reduced glycolytic activity. More research is required for the drug effect on apoptotic activity. However, combined with previously published findings on the effects of these two drugs on cell viability and activation of downstream molecules in the PI3K/mTOR pathway, small molecule inhibitors targeting this pathway may be a viable treatment option to explore for extending survival time of CM patients.



Presenter #8

Alyssa Butters

Faculty of Veterinary Medicine, University of Calgary

Escherichia coli in a One Health continuum: Investigation of genetic relatedness and antimicrobial resistance using whole-genome sequencing

ABSTRACT

Many previous whole-genome assessments of antimicrobial resistance (AMR) carriage in *E. coli* have focused on clinical isolates or selected isolates based on resistance patterns of concern. However, a broader understanding of AMR transmission in a One Health context may require an epidemiological approach that considers the more numerous commensal and environmental *E. coli*.

The aims of the study are to assess the relatedness of generic *Escherichia coli* isolates within a One Health continuum using the genetic discrimination afforded by whole-genome sequencing. Further, the association between the genetic context of the isolates and their carriage of AMR will be investigated.

From sampling in Alberta in 2018 and 2019, 288 generic *E. coli* isolates from feedlot and broiler chicken fecal samples, beef and chicken retail meat, post-treatment wastewater, and well water were selected by a stratified random sampling method with strata defined by source and class level phenotypic AMR (pansusceptible, multidrug resistant, or resistant to one or two antimicrobial classes). Phylogenetic trees were inferred from core-genome single nucleotide polymorphisms in short-read whole-genome sequencing data. Genetic distances within isolate sources and AMR strata were assessed using PERMANOVA based on a Jaccard distance matrix from gene presence/absence data, with adjustment for phylogroup and interaction between source and phylogroup.

There was a marked diversity in *E. coli* isolates from all sources. Source and AMR strata account for small portions of the explained variability in the genetic distance between isolates (PERMANOVA $R^2=0.077$ $p=0.001$, $R^2=0.01$ $p=0.001$ respectively). These results will inform AMR assessment models and intervention strategies.



Presenter #9

Clare Henderson

Atlantic Veterinary College, University of Prince Edward Island

Investigation on lung and heart parasites of Newfoundland coyotes

ABSTRACT

Angiostrongylus vasorum, also known as the French heartworm, is a metastronglyoid parasite of wild and domestic canids that resides in the right ventricle and pulmonary arteries of its definitive host. In Europe *A. vasorum* is widespread, increasingly reported, and spreading to new areas. *Angiostrongylus vasorum* is also prevalent on insular Newfoundland, the only longstanding endemic region in North America. Up to 56% of foxes in Newfoundland are infected with *A. vasorum*, but the prevalence in coyotes remains unstudied. The aim of this research was to determine the prevalence of *A. vasorum* and other lungworms (i.e., *Crenosoma vulpis* and *Capillaria aerophila*) in the Newfoundland coyote population. Adult coyotes were collected between 2017 and 2020 for a different project and their lungs and hearts removed. One hundred and nine coyote hearts and lungs were dissected, and parasites identified and counted. The *A. vasorum* prevalence was 56% (n=61) in the sampled coyotes and the mean worm burden was 17. *Crenosoma vulpis* was identified in 5.5% (n=6) of coyotes. Two animals (1.8%) were infected with both *A. vasorum* and *C. vulpis*. No *C. aerophila* infections were detected. We conclude that the *A. vasorum* prevalence in Newfoundland coyotes is high and comparable to the fox prevalence, whereas the *C. vulpis* prevalence was low compared to the known high prevalence (87%) in Newfoundland foxes. Our findings furthermore confirm the lack of *C. aerophila* in Newfoundland canids.



Presenter #10

Kylie Pon

Western College of Veterinary Medicine, University of Saskatchewan

Establishment and utilization of cell blocks in cavitory effusion analysis

ABSTRACT

The cell block (CB) is a diagnostic technique of condensing cytologic material into sedimented cells that are then fixed and processed for further analysis as a histologic sample. Benefits of CBs include the capability to produce many sections for ancillary testing, preservation of architectural features, and long-term sample storage. CBs are underutilized in veterinary cytopathology. This study aimed to assess several CB preparation techniques and evaluate diagnostic utility of CBs for cavitory effusion analysis in veterinary patients. CBs were created from canine, feline, and equine cavitory effusions (n=88) classified on cytologic diagnosis as lymphocytic, atypical epithelial, inflammatory, suspect feline infectious peritonitis (FIP), or hemorrhagic. Two CB techniques were used: cell tube block method and plasma-thrombin method. CBs were successfully made from effusions using both methods. Further diagnostic information was obtained from CBs using histochemical stains and immunohistochemistry (IHC). IHC for CD3 and CD20 was applied to 17 lymphocytic effusions to highlight T-cell and B-cell populations. IHC for FIP was used to assess viral presence in 17 suspect FIP effusions. IHC for cytokeratin, vimentin, and Wilms tumor 1 was applied to 19 atypical epithelial effusions to differentiate epithelial and mesothelial cell origin. CBs provide additional diagnostic information when used in conjunction with conventional cytologic analysis for cavitory effusions in veterinary patients. Clinically, this may reduce the necessity for further invasive sample collection and result in better patient care. Planned future research includes evaluating improvement in diagnostic yield across different effusion categories and assessing CB utility for other types of cytologic samples.



Presenter #11

Vitoria Régia Lima Campêlo
Faculty of Veterinary Medicine, University of Montreal

Biosecurity adoption in Quebec dairy farms: Results from a risk assessment questionnaire

ABSTRACT

Dairy Farmers of Canada has implemented the proAction accreditation program, which requires biosecurity risk assessments to preserve and improve herd health. Using a cross-sectional design, 3,825 risk assessments completed between 2018 and 2021 were extracted from Vigil-Vet, a software that stores this data. Proportions of adopted practices and recommendations received were calculated. Additionally, multiple correspondence analysis was used to explore potential associations between the diseases of most concern and the practices that were adopted. Furthermore, we employed hierarchical cluster analysis to identify farm profiles based on the practices they have implemented.

Mastitis was identified as the disease of most concern among dairy farmers (40%). Moreover, practices aimed at limiting the introduction of diseases require improvement, as only 10% of dairy farmers (out of 2,237 who purchased animals) implemented quarantine measures for new additions. Conversely, cleaning stalls and health equipment were addressed by 95% and 86% of farms, respectively. No significant association between the disease of most concern and the farm's biosecurity profile, except for respondents who cited digital dermatitis as their primary concern. Through hierarchical cluster analysis, we identified three distinct farm profiles among the 3,581 farms: profile 1 included farms with good management of sick animals; Profile 2 included farms with good management of youngstock; and profile 3 included farms with poor management of sick animals and youngstock.

Analyzing data from mandatory accreditation programs serves as a valuable tool for assessing progress in the adoption of biosecurity practices and designing effective interventions tailored to the local context.



Presenter #12

Jacob Maxwell

Ontario Veterinary College, University of Guelph

Steering Surplus: Behavioural Responses of Non-Replacement Dairy Calves to Transportation and Handling

ABSTRACT

The dairy industry faces public scrutiny for its production and management of surplus calves, which are often transported away from home farms within weeks of birth(1). Industry stakeholders and researchers have not reached a consensus on how the frequency of stops and handling impact calf health and wellbeing(2).

Footage of 230 calves being unloaded across six timepoints was captured at two Ontario farms. Handling tests were performed on 20 focal calves, intended to assess the presence of characteristic fear responses. The most frequent human and calf behaviours were defined and organized into an ethogram. Seven major human techniques and eight major calf responses were quantified using dedicated software. Associations between human and calf behaviours were tested using a linear regression model.

Over 95% of calves required direct physical contact to be moved off and away from the trailers. 30% of the focal sample showed no reaction to the handling tests, while the others showed varied expressions of fear. 9.5% of all handling events included a calf slipping or falling. Unloading calves with no ramp, without supporting the animal's weight during the step down was significantly associated slips and falls.

An increased sample size may uncover more associations between human and calf behaviours. Controlled trials could inform how the transition from trailer to ground impacts losses of balance, including how using a ramp affects calves and handlers. Further study into the ontogeny of the flight zone in dairy cattle could inform when calves become easier to handle during their development.



Presenter #13

Fatima Warraich

Faculty of Veterinary Medicine, University of Calgary

Navigating the Human Angle in Wildlife Management: Exploring Wood Bison, Disease and Beliefs

ABSTRACT

Wood Buffalo National Park (WBNP) houses a large portion of the remaining wood bison (*Bison bison athabascae*) in North America. The presence of bovine tuberculosis and brucellosis in the WBNP bison compromises conservation efforts while posing a health risk to humans, wildlife, and livestock. Successful management of bison health requires the input and support of stakeholders and rightsholders. Much of the past research on stakeholder views of wildlife diseases has been outside of Canada. We focused on Canadian stakeholders (e.g., civil society, hunters, livestock producers) and investigated how underlying value orientation, beliefs about the effectiveness of specific strategies, and support for those strategies are connected. We used online questionnaires (n= 309) with a mixture of Likert and unipolar questions. In the case of eco-management, linear regression analysis revealed that respondents' beliefs about effectiveness tended to be higher in respondents who: 1) are women; 2) have high non-use values; 3) have low use values; and 4) have lower formal education ($p < 0.05$). The results provide insights into developing effective targeted communication strategies for the public and lay the foundation for including stakeholder views in policy formulation, as management is most constructive when supported by the people involved. Including the views of stakeholders and rightsholders in policy helps ensure it is equitable and addresses the well-being of bison populations and their coexistence with people. Ultimately, our project contributes to the broader goal of self-sustaining bison populations in WBNP and supports using the Cognitive Hierarchy Framework to understand the people component of wildlife disease.



Presenter #14

Meagan Walker

Atlantic Veterinary College, University of Prince Edward Island

Development of a Patient Specific 3D-Printed Drill Guide for Ventral Slot Surgery in Dogs: An Ex Vivo Study

ABSTRACT

Ventral slot decompression is the treatment of choice for canine cervical intervertebral disc extrusion. Complications associated with surgery have been reported in 9.9% of cases and include vertebral subluxation, hemorrhage, and neurologic deterioration. To minimize the risk of complications, slot dimensions should not exceed 33% of the length or width of the vertebral body. Achieving these dimensions intra-operatively is challenging, thus use of a surgical guide may result in more accurate outcomes. The objective of this study was to compare performance between guide-assisted ventral slots and the conventional freehand technique in canine cadavers.

CT data was used to create patient-specific surgical guides for 8 large breed canine cadavers. Intervertebral sites were randomized to undergo either a guided (n=12) or freehand (n=12) ventral slot by a novice surgery resident. Postoperative CT images were used to compare ventral slot dimensions, shape, and position.

Freehand ventral slots were significantly shorter than the planned dimensions ($p < 0.01$). Dimensions of the guided ventral slots were not statistically different from the planned dimensions. Use of the guides resulted in improved precision for ventral slot position, divergence from midline, and slot shape (difference in coefficient of variations, 32%, 2%, and 40% respectively).

This study confirms that the use of a 3D-printed patient specific surgical guide improves accuracy of ventral slot creation in canine cadavers and improves surgical precision in novice surgeons. Future studies investigating the benefit of these guides when used by experienced surgeons and in live patients are warranted.



Presenter #15

Jordan Bertagnolli

Faculty of Veterinary Medicine, University of Calgary

Tracking Emerging Infectious Diseases in Wildlife of Inuit Nunangat through Researcher Surveys

ABSTRACT

Erysipelothrix rhusiopathiae (ER), an emerging opportunistic Arctic pathogen, has caused muskox mortalities. Limitations to Arctic wildlife health surveillance make understanding the distribution, spread, and host range of this pathogen challenging. To address knowledge gaps, a survey was developed to capture undocumented and unusual wildlife morbidities/mortalities. Survey participants were identified from public databases at university research institutes, research review boards, and research grants. Participants were limited to those with possible Arctic fieldwork, working in academia/research, industry, federal government, and non-governmental organizations. They were asked to describe any observed wildlife abnormalities. Thematic analysis was conducted on responses and observations were mapped with ArcGIS for spatiotemporal analyses. Of those invited, 14.3% (60/420) completed surveys, with 31 participants identifying 74 abnormalities. Population changes were the most common abnormality reported (62.2%, 46/74), followed by illnesses (18.9%, 14/74), mortalities (13.5%, 10/74) and range alterations (5.4%, 4/74). Illnesses with symptoms resembling known ER syndromes were identified in 13.5% (10/74) of observations. Cross-referencing mortalities/illnesses with the Canadian Wildlife Health Cooperative database, 12 out of the 24 cases had no possible case match within 2 years prior to/post observation. Mapping datapoints showed possible clustering in caribou and muskox illnesses and population declines on Victoria Island and near Rankin Inlet. Increased survey engagement may enhance our ability to better identify inter-species interactions or unidentified outbreaks within such clusters. Despite limitations, such surveys show potential as a surveillance tool for identifying previously undocumented abnormalities in Arctic wildlife. With refinement, they can prove invaluable for the study of several Arctic emerging infections.



Presenter #16

Eric Kim

Western College of Veterinary Medicine, University of Saskatchewan

Enhancing Comparative Oncology Insights: 18F-FDG PET/CT imaging analysis of pulmonary nodules in dogs and establishing the WCVM tumor biobank program

ABSTRACT

Cancer is one of the deadliest diseases in dogs, cats, and humans, primarily attributed to a poor comprehension of cancer formation mechanisms. In summer 2023 at WCVM, we aimed to alleviate this gap in knowledge with two objectives: 1. to characterize the appearance and metabolic activity of metastatic pulmonary nodules in dogs and 2. to establish a tumor biobank at WCVM to facilitate future cancer research.

The VMC's medical record database was searched for dogs with pulmonary nodules of known cancerous or non-cancerous origins, that have undergone 18F-FDG PET/CT imaging between March 2020 and March 2023. 13 dogs matched the inclusion criteria, among which there were 713 neoplastic and 8 non-neoplastic nodules found. Upon analyzing the maximum diameter and SUVmax of each nodule, there were no differences found in the SUVmax between neoplastic and non-neoplastic nodules regardless of their size.

Thus far, twenty different types of tumors have been archived in the tumor biobank from 77 canine and feline patients, each sampled in PBS, formalin, liquid nitrogen and RNAlater. Three cell lines including osteosarcoma, pulmonary carcinoma and soft tissue sarcoma have been characterized via immunohistochemistry and soft agar colony formation assays to confirm their cancerous origins.

Our work addresses the current challenges in comparative oncology by providing the fundamental characteristics of metastatic pulmonary nodules on 18F-FDG PET/CT scans – an imaging modality utilized in both human and veterinary medicine. Furthermore, the high-volume and quickly accessible biobank of 20 different cancer types will have lasting impacts in facilitating future cancer research.



Presenter #17

Rochelle Thompson
Ontario Veterinary College, University of Guelph

Coping strategies for occupational stressors among farmers in Ontario

ABSTRACT

Introduction: Prolonged high psychosocial stress among farmers impacts job strain, animal welfare, and productivity. Canadian farmers have scored more severely across mental health outcomes (e.g. anxiety, depression) including high perceived stress, compared to the general population. Although there is some investigation of farming stressors and coping strategies to extreme weather (e.g. drought in Australia), research on everyday farming stressors and farming-specific coping strategies is scarce, particularly in Canada. The objectives of this study were to describe 1) the occupational stressors experienced by farmers in Ontario, Canada and 2) the coping strategies they employ, with the overall aim to inform avenues to reduce stress and/or boost wellbeing for farmers.

Methods: Qualitative data were collected from 75 in-depth interviews with farmers and industry professionals from Ontario, Canada in 2017-2018. Participants were asked “What are some of the everyday stresses that you experience in farming?” and “What sorts of things do you do to support your resilience/yourself? What are your coping strategies?” Thematic analyses were conducted on separate stressor and coping datasets to identify farming stressors and coping strategies used by farmers in Ontario.

Results: The farmers in this study attributed stress to a variety of chronic and episodic stressors, which they described as complexly inter-related, cumulative, and overwhelming. They also described flexible coping strategies that could be implemented despite time and place constraints of farming.

Conclusion: Existing avenues to reduce universal occupational stress may be inappropriate for use among farmers. Implications and focus areas for well-being promotion among farmers will be discussed.



Presenter #18

Servane Payen

Faculty of Veterinary Medicine, University of Montreal

The role of lipoprotein Lmb (“Laminin-Binding protein”) in the pathogenesis of infection caused by *Streptococcus suis* serotype 2

ABSTRACT

Streptococcus suis serotype 2 (SS2) is an important pathogen in swine. Although several components of SS2 have been suggested to be factors involved in its virulence, the notion of the critical virulence factor for this bacterium is controversial.

The Lmb protein has been suggested as a virulence factor candidate in SS2. Its putative function would be adhesion to laminin, a component of extracellular matrix of cells. Adhesion of *S. suis* to the respiratory epithelium is a critical first step in infection. Lmb would also be involved in the acquisition of zinc in the extracellular environment, an essential element for the growth of microorganisms.

The results obtained with an SS2 mutant lacking the gene coding for Lmb showed that Lmb does not have a major role in the adhesion of the bacteria to laminin and it does not influence the adhesion of the pathogen to epithelial cells. However, this mutant demonstrates significantly reduced virulence due to decreased blood bacteremia. Studies on the growth of this mutant in plasma, a medium poor in zinc, show a significant reduction in growth. The reduction in virulence of this mutant would be due to a defect in zinc metabolism rather than a lack of laminin recognition.

This study denotes the importance of understanding molecular pathways and host-bacteria interactions comprehensively to elucidate the actual role of a putative virulence factor or bacterial component in pathogenesis of infection.



Presenter #19

Eva Mutua

Faculty of Veterinary Medicine, University of Calgary

Investigating the relationship between cow temperament, maternal behaviour, productive and reproductive traits in beef cattle across a 3-year period

ABSTRACT

Cow-calf production systems in Canada and worldwide are usually extensive, involving less frequent human-animal interactions. Extensively reared cattle are more fearful and prone to aggressive reactions (components of animal temperament) toward humans than those reared intensively due to infrequent human-animal interactions. These more natural conditions influence not only cow reactions towards humans but also predispose them to wild predation, making maternal protective behaviour critical in such environments. Human-animal interactions have strongly influenced cattle selection, favouring less reactive animals due to human and animal safety concerns. However, when selecting a specific behavioural characteristic (e.g., reduced fear response to humans), other important characteristics, including maternal behaviour traits, can be affected. Thus, it is crucial to understand the association and stability of cattle behavioural traits such as cow temperament and maternal behaviour, and their relation to their fitness to improve animal selection strategies under domesticated conditions. This study aims to investigate the relationship between temperament and maternal behaviour traits of 150 individuals (68 heifers, 82 cows 2-3 parity) over three consecutive years (2023-2025), and their effects on cow and calves' productive performance. The study involves behaviour evaluation of recently calved cow-calf pairs (cow maternal behaviour and newborn calf behaviour), cow temperament, and calves' and cows' productive traits. The study results will provide the beef cow-calf sector with crucial knowledge on the phenotypical expression of these traits as an initial step towards improving animal selection by identifying cows with favourable temperament, better mothering ability, and suitable reproductive and productive fitness traits.



Presenter #20

Margaret Louie Genis

Atlantic Veterinary College, University of Prince Edward Island

Prevalence of chronic diseases affecting adult sheep on Prince Edward Island

ABSTRACT

Introduction: There is limited research on Canadian sheep flock health and individual animal health, especially in the Atlantic Provinces, as the sheep population here is small compared to that of other provinces.

There are several chronic, production-limiting diseases that can affect adult sheep. Two major diseases of interest in adult sheep include Maedi-Visna virus and caseous lymphadenitis (*Corynebacterium pseudotuberculosis*). These diseases can cause reduced production in a variety of ways, including, but not limited to: premature culling due to reduced reproductive performance or general debilitation; reduced litter sizes or reduced lamb birthweights, affecting average daily gain (ADG) and time to market weight; reduced milk production, also affecting ADG and time to market weight; and secondary economic effects such as the inability to market breeding stock to flocks or regions that are certified free of the specific disease.

Hypothesis: The authors hypothesize that the prevalence of *Corynebacterium pseudotuberculosis* and Maedi-Visna virus are lower in adult sheep in sheep flocks in Prince Edward Island than those commonly reported for North American flocks.

Methods: The objective of this study is to determine the prevalence of caseous lymphadenitis and Maedi-Visna virus in adult sheep in sheep flocks on Prince Edward Island. Blood samples will be collected and evaluated by ELISA for antibodies to *C. pseudotuberculosis* and Maedi-Visna virus.

Results: Results will provide information that can aid in disease control protocols, improve individual profitability by identifying poor-producing sheep and provide a baseline for further research.



Presenter #21

Asha Stone
University of Surrey

A Retrospective Study of Neoplasia in UK Captive Snakes Submitted to a Specialist Diagnostic Pathology Service (IZVG Pathology)

ABSTRACT

Amongst Reptilia, Serpentes are reportedly over-represented for neoplastic disease, although estimated prevalence within the literature is inconsistent. With increased captive lifespans and improved diagnostic potential in snakes, the relevance of neoplasia becomes progressively apparent.

This retrospective study assessed the prevalence of neoplasia in routine histology/cytology submissions to IZVG pathology between 2003–2023. Samples from 894 individual snakes (comprising 11 families and 87 species) were examined by specialist veterinary pathologists, revealing 148 neoplasms. These records were subsequently assessed for associations between snake species, age, sex, tumour location, histogenesis, and malignancy.

Overall neoplastic prevalence was 16.6% (n=148). Colubridae were over-represented (n=103, 69.6% of neoplasms; 30.8% of Colubridae submissions), with a significantly higher prevalence than the study population ($p < 0.005$). Of colubrids, the two primary genera were Pantherophis (corn snakes/rat snakes; n=60/103, 40.5%) and Lampropeltis (king snakes/milk snakes; n=24/103, 16.2%). Neoplasms were primarily observed within the integumentary system (n=43/148, 29.1%), followed by the digestive system (n=28/148, 18.9%), and urinary system (n=10/148, 6.8%). Location was unspecified for 21% (n=31/148) neoplasms. Malignant neoplasia predominated (n=123/148, 83.1%), encompassing 58.5% (n=72/123) mesenchymal, 34.1% (n=42/123) epithelial, and 7.3% (n=9/123) round-cell lineages. Spindle cell sarcomas were most prevalent (n=45/148, 30.4%) followed by adenocarcinomas and carcinomas (n=21/148, 14.2% each). Lymphoid/haematopoietic neoplasms were less prevalent (n=8/148, 5.4%). Only 12.8% (n=19/148) neoplasms were benign. Numerous lipomas (n=13/148, 8.8%) were detected, with corn snakes (*P. guttatus*) predisposed.

Continued surveillance of neoplastic incidence, in conjunction with clinical and pathological investigations, will be required to establish risk factors and aetiologies for ophidian neoplasia.





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