Centre for
VETERINARY
EPIDEMIOLOGICAL
RESEARCH

CVER

CVER REPORT

2023–2024

UNIVERSITY of Prince Edward ISLAND

ATLANTIC VETERINARY COLLEGE · UNIVERSITY OF PRINCE EDWARD ISLAND · AVC

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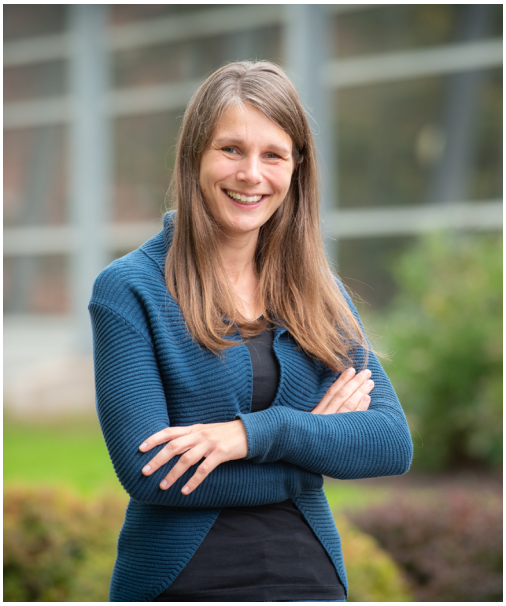
Message from the Director



The past couple of years have been marked by significant progress in our team at CVER, and in the tradition of biennial CVER reports, I am excited to present key activities and accomplishments of our members during 2023–2024.

Specifically, CVER continues its innovative, collaborative, and impactful research and has tackled pressing challenges in animal health and welfare while advancing One Health initiatives. The efforts of CVER members were amplified through strong partnerships with industry, governments, NGOs, and universities worldwide. For example, in the aquaculture context, projects informed management of sea lice, infectious salmon anaemia virus, and shell disease in lobsters. On dairy farms, studies have improved understanding of mastitis control, bovine viral diarrhea, antimicrobial stewardship and surveillance, and the benefits of enhanced animal comfort. I invite you to read more about these and many other research projects in the report. In addition, CVER continues to provide expertise to national and international organizations, and CVER members have been actively involved in expert panels for disease modelling, antimicrobial resistance, and emerging diseases.

CVER continues its strong commitment to training, and several ‘Epi on the Island’ courses were offered to provide opportunities for researchers from within and outside of Canada to further their expertise. Members of the group also supervised and trained numerous graduate students, many of whom contributed to scientific publications and presentations and earned competitive awards. Congratulations to all students who completed their degrees, and we wish you all the best for your future professional paths.

Thank you to all our members for their expertise and dedication, which ensures CVER’s strong reputation in veterinary epidemiology. The work of CVER members covered in this report reflects a commitment to scientific excellence, training of future leaders, and real-world relevance of our research.

Sincerely,
Dr. Caroline Ritter, Director

Partners

Ocean Frontiers Institute (OFI) by Dr. Krishna Thakur

Research on One Ocean Health continues to be carried out by the CVER group as part of the Ocean Frontiers Institute Phase-II research programs, respectively. As part of Phase-I work, the assessment of transmission patterns of sea lice among salmon farms in the Bay of Fundy, New Brunswick (PhD student Marianne Parent), was completed during this reporting period. Drs. Sonja Saksida and Krishna Thakur are leading CVER-related research activities under the OFI Phase-II project. One of the Phase-II research projects is on epidemiological and genomic determinants of epizootic shell disease in lobsters in Canada (PhD student Svenja Köpper) identifying key microbial community structure of lobsters in Atlantic Canada and worked on population dynamics modeling of lobsters in this region. Sitang Arkanit (PhD student) is furthering the work of Svenja and working on understanding the dynamics of juvenile lobsters in Atlantic Canada and comparing the microbial community between diseased and healthy crustaceans. Another activity under Phase-II projects aimed to evaluate the effectiveness of current antibiotic treatment practices on Atlantic salmon farms and will develop novel intervention strategies to avoid the need for commonly used therapeutants (Dr. Kristin Reynolds).

AVC Centre for Aquatic Health Sciences (CAHS) by Dr. Krishna Thakur

The AVC Centre for Aquatic Health Sciences (CAHS) is a long-standing academic centre of expertise for applied fish health research, operated entirely on external funding. The Centre continues to work with various groups in Atlantic Canada on a range of research projects, while also leading the activities of a World Organization for Animal Health (WOAH, formerly OIE) Collaborating Centre on Epidemiology and Risk Assessment of Aquatic Animal Diseases (ERAAAD).

FishiTrends (FiT) Database Management. This was an active sea lice data management project led by Larry Hammell since 2009 and involving three industry associations (ACFFA, NAIA, AANS). Matt Sanford (programmer) and Holly Burnley (project manager) were key to continuous adjustments to the evolving on-farm sea lice developments in the salmon aquaculture industry over those years. All sites in NB, NS, and NL were part of the FiT database which included records on sea lice counts and audits, and non-chemical and chemical controls for lice removal. The system has been useful for many epidemiology research projects and recently provided the basis for OFI research on sea lice infestation on the East Coast (PhD student Marianne Parent) and for Atlantic Fisheries Fund-related research on development of harmonized sea lice management plans in Atlantic Canada. Due to many factors, the industry associations discontinued their support of this data management system as of April 1, 2025.

Infectious Salmon Anaemia Virus (ISAv) Research. A few ISAv research projects have been undertaken over the last few years, in collaboration with the Aquatic Animal Health Division of the NL Department of Fisheries, Forestry, and Agriculture (NL FFA) along with other provincial aquatic health sections and salmon producers of the region. One study that began in late 2022, examines the prevalence of ISAv (based on RT-PCR results) between freshly dead, moribund, and apparently healthy fish from an ISAv-infected marine site and fish from neighbouring sites. ISAv outbreaks result in substantial financial losses to the industry due to fish mortality, depopulation, and potential pathogen spread. With the emergence of new strains of ISAv in recent years and the changing dynamics of the spread of the virus between cages within an infected site and between sites, the objective is to explore pathogen-spread dynamics at the fish level. Fish-level prevalence of ISAv will also be evaluated in apparently healthy fish samples collected from infected sites with different within-site exposure histories. This study will inform the provinces' pathogen-specific surveillance program and increase system sensitivity and earlier detection of the virus. The third ISAv study compiled all historic test results of ISAv from 2012 onward, estimating the annual incidence of ISAv in NL, and identified factors associated with time-to-detection of the virus in marine sites and time-to-depopulation.

Additionally, several studies are being conducted (PhD students Ahsan Raquib and Persia Carol Thapa) to summarize the risk factors, transmission dynamics, genetic diversity, and diagnostic test performances of commonly used diagnostic tests for the detection of ISAv in farmed salmon. These studies are part of the project "Research and Harmonization of Aquatic Animal Health Management in Atlantic Canada-One Coast Approach to Fish Health", funded by Atlantic Fisheries Fund.

Student Externship and VetSRA Placements. The primary focus in recent years in this collaboration with NL FFA has been on fourth-year DVM students who undertake a two- to three-week clinical externship as part of their rotation schedule to experience clinical veterinary practice in aquaculture. We were able to send one student to NL for an external rotation and one summer research student in 2024. We also have secured funding for both a Veterinary Summer Research Award placement and an externship in the coming year.

Shellfish Research Group by Dr. J. Davidson

Final-year veterinary rotation student exchanges between AVC and two veterinary colleges in Thailand, which had been cancelled the past few years due to COVID concerns, have resumed. AVC students, led by Dr. Sonja Saksida, were registered in a warm-water fish health rotation at Kasetsart University (KU), while KU students attended the cold-water fish health rotation at AVC. AVC students, led by Dr. Megan Jones, were registered in an ecohealth rotation at Mahidol University (MU), while MU students attended the ecohealth rotation at AVC.

International Smallholder Livestock Research Group (ISLRG) by Dr. John VanLeeuwen

The International Smallholder Livestock Research Group, formerly called the Smallholder Dairy Research Group (ISLRG), has a research, teaching, and service program involving faculty members, graduate students, veterinarians, veterinary students, and other animal health professionals, along with smallholder livestock owners, both inside and outside Canada. The ISLRG collaborates with researchers and students in Department of Applied Human Sciences, due to the spin-off benefits to farm families from better livestock productivity, and the School of Climate Change and Adaptation

because of the One Health approach to project efforts. The program has been a result of partnerships among UPEI and other universities (University of Nairobi and Kenyatta University in Kenya; Kasetsart University in Thailand), two Canadian non-governmental organizations (NGOs): Farmers Helping Farmers (FHF) and Veterinarians without Borders Canada (VWB), and livestock owners and their cooperatives. Research topics have included methods of enhancing livestock productivity while adapting to climate change (through infectious disease control and health management), and how higher productivity has improved sustainable livelihoods, human nutrition, and quality of life.

In 2023, Phase 2 of the Queen Elizabeth II Diamond Jubilee Scholarships (QES) interdisciplinary program ended and Phase 3 of the QES program began. Phase 2 was a six-year project with $0.77M worth of funding for research, teaching, and service in central Kenya which sent five UPEI students to Kenya in 2023 for three-month internships. During the past two years, the three Kenyan grad students funded by the project were able to continue to work on their research and theses. Research topics that were completed in 2023 included mastitis control through cow comfort and mastitis prevention efforts (MSc student Edward Kariuki), bovine viral diarrhea virus control through diagnostics and vaccination (PhD student Daniel Muasya).

For Phase 3 of the QES program, current research topics include understanding the costs and benefits of zero-grazing on smallholder dairy farms in the face of climate change (PhD student Essau Serem) and evaluation of an agro-nutritional education program adapted to climate change in primary schools in Kenya (MSc student Glory Karimi). In 2024, three UPEI students were selected to go to Kenya in the summer of 2025 for two-month internships to assist the two graduate students. Phase 3 also includes $0.75M worth of funding.

A folow-up cow comfort research project began in 2023 to evaluate the costs and benefits of enhancing cow comfort on smallholder dairy farms, based in western Kenya. The project has $245,000 of total funding from various sources, including the Sir James Dunn Animal Welfare Centre (SJDAWC), International Livestock Research Institute (ILRI), and University of Calgary (UCalgary) for project expenses and a PhD student co-supervised by David Hall at UCalgary (Emmanuel Muunda).

A construct validity project was initiated by Dr. Ian Dohoo and an international team of researchers, including other CVER members and ILRI, to quantify the differences in responses by veterinarians and para-veterinarians to questions asked in different ways regarding antimicrobial resistance. The project is funded by ILRI.

Dr. Martha Mellish has started a research program studying donkey welfare, determining the impact of cart pulling on trachea structural integrity, and evaluating new cart designs to reduce the damage on the donkeys' tracheas. She has over $97,000 worth of funding from the SJDAWC to pay for project expenses, including a MSc student at the University of Nairobi (Josphat Matara).

The partnerships with the two Canadian NGOs have provided helpful additional human resources for the Kenyan activities of the ISLRG, and the partnerships have also been good for these NGOs. VWB has continued its seven-year $9M project funded by Global Affairs Canada (GAC) in six countries: Kenya, Ghana and Senegal in Africa, and Laos, Vietnam and Cambodia in southeast Asia. In partnership with UPEI, FHF finished its four-year $1.7M food security project in Kenya, and started its $7.1M

One Health project, both funded through GAC. It is encouraging to see the many direct and vindirect benefits of the ISLRG to the partners involved, and we look forward to the continuedfruits of these partnerships in the future.

Daniel Muasya (veterinarian PhD student and QES Scholar) giving a vaccine to quantify its benefits against infectious diseases.

Sir James Dunn Animal Welfare Centre (SJDAWC) by Dr. Kathryn Proudfoot

The SJDAWC promotes animal welfare through research, service, and education. Over the past two years, research grants were awarded for the following projects:

2023

• Motivations and cost-effectiveness of improved cow comfort on smallholder dairy production systems in Kenya (J VanLeeuwen, D Hall, C Ritter, J Rao, E Muunda)
• The effect of common laboratory ultrasounds on rat behaviour and physiology (P Bernard, J Spears, L Bigelow)
• Environmental enrichment for stress reduction in land-based salmonids aquaculture (S Saksida, M Fast, K Reynolds, S Whyte)

2024

• Improving the welfare of working donkey harnesses in Meru County, Kenya, through participatory action research (M Mellish, C Ritter, J VanLeeuwen)
• Behavioral evaluation of bulls during semen collection using electroejaculation and alternative techniques (B Crane, K Proudfoot, S McKenna)

Several graduate students and veterinary summer research students were funded through these projects.

Funding was also awarded to one service project over a two-year period through which investigators work with community groups to provide direct services to animals.

• Medical and surgical care of homeless animals (A Ogilvie, P Foley, R MacDonald, R MacLean, M MacLean)

The following graduate students funded or partially funded through the SJDAWC (in whole or in part) defended their degree in 2023: Hannah Spitzer (MSc) and Camille Squair (MSc) and in 2024: Molly Mills (MSc) and Sherry Khoddami (MSc).

The SJDAWC's annual Animal Welfare in Practice Symposium was on end-of-life care for animals in 2023 and on the human dimension of animal welfare, including the interconnectedness between animal welfare and the community in 2024. The SJDAWC's 2023 webinar series was presented by Dr. Karen Overall who covered three important topics on animal welfare issues

Gabriel and Dr. Karen Overall

in veterinary behavioural medicine. The 2024 webinar series was on post-pandemic issues in veterinary behaviour featuring Dr. Karen Overall.

In collaboration with the AVC Animal Welfare Club, the SJDAWC awarded one $500 scholarship in 2023 and two $1,000 scholarships in 2024 to support students who were pursuing external rotations related to animal welfare. Assistance was also given to ten students in 2023 and six students in 2024 to participate in the annual Intercollegiate Animal Welfare Assessment Contest. To prepare for the contest, students were provided guest lectures in relevant species, including farmed bison, tortoises in a zoo, and cage-free laying hens for 2023, as well as penguins in zoos, laboratory xenopus, and breeding dogs for 2024.

Further details on all activities (including graduate students, publications, and presentations) can be found in the SJDAWC 2023 Annual Report and 2024 Annual Report.

AVC 2024 Animal Welfare Assessment Contest Team

Back row (L-R): Ciara Richter, Anna Varty, Mia Vargas
Front row (L-R): Brooklyn Kenny, Jocelyn Childers, Ainsley Monchesky

Antimicrobial Resistance and Risk Analysis Groups by Dr. Javier Sanchez

CVER was very active during the past year in the area of antimicrobial resistance (AMR) and risk analysis. Dr. Sanchez was selected as an expert member by the Canadian Academy of Health Science to work on the report *Assessment on Antimicrobial Resistance (AMR) and Antimicrobial Use (AMU) in Food ProducingAnimals for the Regarding AMR*. Dr. Sanchez led chapter 5 of the report in the Canadian Academy of Health Sciences. The final report can be found at https://cahs-acss.ca/amramu-ramuam/.

He was also invited to be part of the advisory board on a project entitled “Reimagining Resistance: A transdisciplinary approach to AMR”. This project is led by investigators from the University of British Columbia and has experts across Canada from different disciplines. The goals of this project are to use a One Health lens to investigate the policies and practices that may contribute to AMR in dairy production and apply a posthumanist philosophy to explore alternative framings of microbes that embrace their health-supporting functions and agency as fundamental contributors to healthy ecosystems. And finally, explore dairy farmers’ beliefs and thinking styles and how these may predict their attitudes and AMR practice in order to inform best practices and policy directives. As part of a collaboration with the Danish Technical University, Dr. Sanchez and Dr. Stryhn are developing a model to quantify the probability of transmission of AMR genes in dairy farms.

In risk analysis, Dr. Sanchez was selected by FAO as an expert member for the development of the strategic framework for early warning of animal health threats; the framework has been presented at several stakeholders and international scientific meetings. Details about this initiative can be found at https://www.fao.org/animal-health/news-events/events/detail/fao-strategic-framework-for-early-warning-of-animal-health-threats/en.

Dr. Sanchez was also selected for the expert group of disease modelling with the Public Health Agency of Canada (PHAC), and he has been very active participating in a working group for Highly Pathogenic Avian Influenza led by the University of Toronto with weekly and biweekly meetings.

Dr. Sanchez was awarded a one-year CIHR grant from November 2024 to March 2026 entitled "Modelling avian influenza". This grant will provide support for a MSc student and a postdoc. The MSc student will be working on Bayesian classification model using HPAI genomic data and will be co-supervised by Dr. Sanchez and Dr. Henrik Stryhn. The post-doc will be developing a One Health disease spread model.

Several LOI were submitted including a CIHR Centre for Research on Pandemic Preparedness and Health Emergencies for $1.5 million for two years. An AMR proposal with the Universidad de Caldas in Columbia has been submitted for three years for $1.5 million. Two LOI's submitted for calf health with Dairy Farmers of Canada and Beef Council that includes the NSER alliance and Mitacs for four years at $1.5 million.

Graduate students/training

Three graduate students are completing their degrees in AMR: Lauren McNeil, MSc, working on retrospective analysis CIPARS data on Campylobacter spp., Thitiwich Changtes, PhD student working on dairy beef, Landon Warder, PhD working on antimicrobial use (AMU) and resistome. An honors student working with Gen AI/Machine Learning to quantify AMU from vet clinics.

Dr. Sanchez is collaborator of the Canadian One Health Training Program on Emerging Zoonoses (https://onehealthcanada.ca/). This program will provide scholarships and internships with an upcoming conference in March to take place in Calgary. In addition, he is a collaborator of two LOIs for an exchange program and training in Epidemiology with Norwegian University Life Sciences.

Veterinary Epidemiology and Social Science for Animals (VESSA) Group by Dr. Caroline Ritter

The VESSA lab pursued two main streams of research in 2023–2024. First, Dr. Caroline Ritter and her students worked to understand the decision-making and behaviour of animal caretakers including horse owners (student: Megan Ross) and dairy farmers (student: Tunmise Faith Ehigbor). Second, an increasing focus of the lab's research has been on the mental well-being of veterinarians and the veterinary team, and Emily Morabito and Aiman Khattak focused on this topic through their PhD at AVC. Additionally, Dr. Ritter also worked with the Department of Psychology at UPEI in co-supervising two Doctor of Psychology students (Chaya Seale and Catherine Standage). In 2023, an international psychology student also joined the group for 12 weeks through the Mitacs Globalink internship program, and the lab works with VetSRA students during the summer months.

Dr. Ritter and her students presented their research at several national and international conferences. For example, Dr. Ritter was invited to speak at the Smart Calf Rearing Conference in Germany (2023) and at the Animal Health Canada Forum (2024). Her students presented at the International Society for Anthrozoology in Scotland (2023) and England (2024), at the Canadian Association of Veterinary Epidemiology and Preventive Medicine (2023), and at the Convention of the Canadian Psychological Association (2024). Students from

the VESSA lab also received several awards (see a complete list in this report's *Awards and Recognitions* section), including Zoetis Graduate Student Research Awards, Lévesque Graduate Fellowships, and a SSHRC Doctoral fellowship.

Biostatistics by Dr. Henrik Stryhn

As the AVC biostatistician, Dr. Stryhn offers statistical support and methodological development for data analysis in projects of graduate students and faculty members at AVC and beyond. He is also supervising graduate students in projects with a substantial analytical component (completed PhD projects of Marianne Parent and Mohamed Afifi). The statistical methods include time series and hierarchical modelling, systematic review and meta-analysis, multivariate analysis, spatial analysis, and latent variable Bayesian modelling—with applications in dairy science, aquaculture, antimicrobial resistance, scoring of text by reviewers—and more.

New CVER Team Members

Dr. Abdelmonem Mohamed joined CVER as a Postdoctoral Fellow in aquatic epidemiology in July 2024. He holds a Bachelor and Master of Veterinary Medical Science (BVSc, MVSc) from Zagazig University in Egypt and two PhDs in Clinical Sciences: one from Zagazig University, and the other from the University of Montréal. His doctoral and postdoctoral research from 2019 to 2025 focused on veal calf health, epidemiology, modeling, missing data imputation, and aquatic animal health. Dr. Mohamed's experience spans academic teaching, research, and collaboration with international projects on animal health surveillance. His current work focuses on the surveillance and control of infectious salmon anemia virus (ISAV) and antimicrobial use in Atlantic Canadian aquaculture. His career goal is to strengthen disease control strategies at the animal-human-environment interface. His research interests include systematic and scoping reviews, risk factor modeling, field investigations, missing data techniques, and AI applications in public health.

Guests

Visiting grad students

Vasurom Aroon, September 2023 to February 2024, from Mahidol University, Thailand
Thotsapol Kaewchomphunuch, September 2024 to February 2025, from Mahidol University, Thailand

Awards and Recognitions

Dr. Krishna Thakur
Atlantic Veterinary College Zoetis Award for Research Excellence (2024)

Dr. Ian Dohoo
Recognition through the International Livestock Research Institute (Nairobi, Kenya) through the planting of a tree (2023).

Dr. Mariana Fonseca
Faculty of Graduate Studies Award of Distinction (2023)

Tunmise Faith Ehigbor
SMART Training Platform scholarship (2024)

Emily Morabito
Lévesque Graduate Fellowship in Human Health & Mental Health (2023), Social Sciences and Humanities Research Council (SSHRC) Doctoral Fellowship (2024), Zoetis Graduate Student Research Award (2024)

Megan Ross
Canadian Graduate Student-Master's Award (2023), Zoetis Graduate Student Research Award (2024)

Dr. Daniel Muasya
Atlantic Veterinary College (AVC) Award of Distinction (2023)

Graduate Program Highlights

New Students:
• Sitang Arkanit started her PhD in September 2023 under the supervision of Dr. Krishna Thakur. Her project is titled "Comparison of microbiome of healthy and diseased crustacean".
• Persia Carol Thapa started her PhD in January 2024 under the supervision of Drs. Krishna Thakur and Larry Hammell. Her project is titled "Genetic diversity of infectious salmon anemia virus in Atlantic Canada".
• Tunmise Faith Ehigbor started an MSc in September 2024 under the supervision of Dr. Caroline Ritter (co-supervisor: Dr. Katy Proudfoot). He is working on improving antimicrobial stewardship on Canadian dairy farms.
• Aiman Khattak started her PhD in May 2024 under the supervision of Dr. Caroline Ritter (co-supervisor: Dr. Philip Smith, Department of Psychology). Her research focuses on mental well-being of veterinarians and the veterinary team.

Defenses:
• Svenja Kopper, PhD, 2023
• Mariana Fonseca, PhD, 2023
• Edward Kariuki defended his MSc thesis in 2023 on mastitis control through cow comfort and mastitis prevention efforts – supervised by John VanLeeuwen
• Daniel Muasya defended his PhD thesis in 2023 on bovine viral diarrhea virus control through diagnostics and vaccination (PhD student Daniel Muasya) – supervised by John VanLeeuwen

Epi on the Island Summer Courses

2023
Econ on the Island – An Introduction to Health Economics
Dr. David Hall and Dr. Mike Paulden
Quantitative Bayesian Risk Assessment in Animal Health and Food Safety
Dr. Javier Sanchez

2024
Introduction to Qualitative Research
Dr. Caroline Ritter and Dr. Katie Koralesky
Analyzing, Interpreting and Presenting Microbiome-Resistome Data
Lead Instructor: Dr. Noelle Noyes with co-instructors

Peer-Reviewed Journal Publications

Afifi, M., Stryhn, H., Sanchez, J., Heider, L.C., Kabera, F., Roy, J.-P., Godden, S., Dufour, S., 2023b. To seal or not to seal following an antimicrobial infusion at dry-off? A systematic review and multivariate meta-analysis of the incidence and prevalence of intramammary infections post-calving in dairy cows. Preventive Veterinary Medicine 213, 105864.

Arkanit, S., Lertwatcharasarakul, P., Thakur, K., Jala, S., Arunvipas, P., & Yatbantoong, N. (2024). Development of an indirect ELISA to detect bovine viral diarrhea virus antibodies by using recombinant NS3 protein. Indian Journal of Animal Research.

Brunt, M., Ritter, C., LeBlanc, S., & Kelton, D. (2024). Perspectives of dairy farmers on positive welfare opportunities for dairy cows in Ontario, Canada. Frontiers in Animal Science, 5.

Brunt, M., Ritter, C., Renaud, D., LeBlanc, S., & Kelton, D. (2024). Producer awareness and perceived barriers to the adoption of best management practices for the transportation of lactating cull dairy cows. Journal of Dairy Science, 107, 11353–11362.

Cazzuli, F., Durante, M., Hirigoyen, A., Sánchez, J., Rovira, P., Beretta, V., Simeone, A., Jaurena, M., Savian, J.V., Poppi, D., Montossi, F., Lagomarsino, X., Luzardo, S., Brito, G., Velazco, J.I., Lattanzi, F.A., Bremm, C., 2023a. Beef Cattle Grazing Native Grasslands May Follow Three Different Supplement Response Patterns. Grasses 2, 168–184.

Cazzuli, F., Sánchez, J., Hirigoyen, A., Rovira, P., Beretta, V., Simeone, A., Jaurena, M., Durante, M., Savian, J.V., Poppi, D., Montossi, F., Lagomarsino, X., Luzardo, S., Brito, G., Velazco, J.I., Bremm, C., Lattanzi, F.A., 2023b. Supplement feed efficiency of growing beef cattle grazing native Campos grasslands during winter: a collated analysis. Translational Animal Science txad028.

Cockram, M. S., Stryhn, H., Abdallah, A., & Buczinski, S. (2024). Relative merits of offering a milk replacer, glucose–electrolyte, or whey-based diet on the blood composition and health of unweaned calves after transport. Journal of Dairy Science, 107(11), 9735–9751.

Cockram, M. S., Stryhn, H., Abdallah, A., & Buczinski, S. (2024, June 20). Relative merits of offering a milk replacer, glucose–electrolyte, or whey-based diet on the blood composition and health of unweaned calves after transport. Journal of Dairy Science, 107(11), 9735–9751.

de Jong, E., McCubbin, K.D., Uyama, T., Brummelhuis, C., Bodaneze, J., Kelton, D.F., Dufour, S., Sanchez, J., Roy, J.-P., Heider, L.C., Rizzo, D., Léger, D., Barkema, H.W., 2024. Adoption and decision factors regarding selective treatment of clinical mastitis on Canadian dairy farms. J Dairy Sci 107, 476–488.

Dorrestein, L., Jansen, J., Plagis, T., Ritter, C., Vertenten, G., & Barkema, H. W. (2023). Use of an online gaming tool, the Veterinary DialogueTrainer, for teaching clinical communication skills to bovine veterinary practitioners. Frontiers in Veterinary Science, 10, 1192598.

Fonseca, M., Heider, L. C., Stryhn, H., McClure, J. T., Léger, D., Rizzo, D., Dufour, S., Roy, J.-P., Kelton, D. F., Renaud, D. L., Barkema, H. W., & Sanchez, J. (2023a). Frequency of isolation and phenotypic antimicrobial resistance of fecal Salmonella enterica recovered from dairy cattle in Canada. Journal of Dairy Science.

Fonseca, M., Heider, L. C., Stryhn, H., McClure, J. T., Léger, D., Rizzo, D., Warder, L., Dufour, S., Roy, J.-P., Kelton, D. F., Renaud, D. L., Barkema, H. W., & Sanchez, J. (2023b). Antimicrobial use and its association with the isolation of and antimicrobial resistance in Campylobacter spp. recovered from fecal samples from Canadian dairy herds: A cross-sectional study. Preventive Veterinary Medicine, 215, Article 105925.

Fonseca, M., Heider, L. C., Stryhn, H., McClure, J. T., Léger, D., Rizzo, D., Warder, L., Dufour, S., Roy, J.-P., Kelton, D. F., Renaud, D. L., Barkema, H. W., & Sanchez, J. (2023c). Intramammary and systemic use of antimicrobials and their association with resistance in generic Escherichia coli recovered from fecal samples from Canadian dairy herds: A cross-sectional study. Preventive Veterinary Medicine, 216, Article 105948.

Gautam, M., Hammell, L., Burnley, H., O'Brien, N., Whelan, D., & Thakur, K. (2023). Spatio-temporal patterns of Infectious Salmon Anaemia virus (ISAv) in marine salmon farms in Newfoundland and Labrador. Journal of Aquatic Animal Health.

Hasahya, E., Thakur, K., Dione, M., Kerfua, S., Mugezi, I., & Lee, H. S. (2023). Analysis of patterns of livestock movements in the Cattle Corridor of Uganda for risk-based surveillance of infectious diseases. Frontiers in Veterinary Science.

Hoet, A., Stull, J. W., et al. (2024). Design and application of an evaluation tool to assess World Organization for Animal Health competencies for graduating (Day 1) veterinarians. Journal of Veterinary Medical Education.

Jaramillo-Jaramillo, A. S., McClure, J. T., Stryhn, H., Tahlan, K., & Sanchez, J. (2024, August 9). Effects of storage conditions on the microbiota of fecal samples collected from dairy cattle. PLoS ONE, 19(8), e0308571.

Jeong, J., Awosile, B., Thakur, K., Boyce, B., Stryhn, H., & Vanderstichel, R. (2024). Longitudinal dissolved oxygen patterns in Atlantic salmon aquaculture sites in British Columbia, Canada. Frontiers in Marine Science.

Jyoti, S., Jia, B., Saksida, S., Price, D., Revie, C. W., & Thakur, K. K. (2024). Spatiotemporal patterns of mortality events in farmed Atlantic salmon in British Columbia, Canada, using publicly available data. Scientific Reports, 14(1), 32122.

Jyoti, S., Jia, B., Saksida, S., Price, D., & Thakur, K. K. (2024). Utilization of publicly available data to summarize spatio-temporal patterns of fish health events of Atlantic salmon (Salmo salar) reported by marine finfish industries in British Columbia, Canada. Journal of Fish Diseases.

Kariuki, E. N., VanLeeuwen, J., Gitau, G. K., Heider, L. C., & McKenna, S. L. (2023). Randomized control trial to investigate compliance with, and impacts of, cow comfort recommendations on smallholder dairy farms in Kenya. Research in Veterinary Science, 162.

Kivali, V., Roesel, K., Dohoo, I., Alinaitwe, L., Bugeza, J. K., Hoona, J. J., Mugizi, D. R., Kankya, C., Dang-Xuan, S., Szabo, I., Rösler, U., Friese, A., & Cook, E. A. J. (2024, September 17). Non-typhoidal Salmonella among slaughterhouse workers and in the pork value chain in selected districts of Uganda. Frontiers in Veterinary Science.

Koepper, S., Kelley, S., Thakur, K., & Clark, F. (2023). Interspecies and spatial differences in the shell microbiome of Atlantic rock crab (Cancer irrotatus) and European green crab (Carcinus maenas) from Atlantic Canada. Frontiers in Marine Science.

Koepper, S., Revie, C., Stryhn, H., & Thakur, K. (2023). Observed size distribution changes in American lobsters over a 12 year period in southwestern Nova Scotia, Canada. PLOS ONE, 18(12).

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