



Charles Sturt
University

CSU - Higher Degree
by Research and
Honours Online
Symposium 2024
20th & 21st November

Contents

Programme Summary	pg 3
Session 1	pg 6
Session 2	pg 7
Session 3	pg 8
Session 4	pg 9
Session 5	pg 10
Poster List	pg 11

[Professional Development](#)

Workshop – Wednesday afternoon	pg 4
○ Project Management Workshop with Andrew Mashman	
Explore your Resources - Information Sessions – Thursday afternoon	pg 5
○ Maximise Your Research Potential with Charles Sturt Library: Resources, Support, and Success	
○ The Spatial Data Analysis Network (SPAN) & The Quantitative Consulting Unit (QCU) – HDR Research Support	
○ Safety, Security and Wellbeing	
○ Graduate Researcher Training & Support at Charles Sturt	

Abstracts	pg 12
---------------------------------	-----------------------

[2024 HDR & Honours Symposium web page](#)

The latest program and Posters can be found at the above web page.

'Future Leaders in Science and Health Research'

Welcome to the Faculty of Science and Health Higher Degree Research and Honours Online Symposium!

The Symposium is an opportunity for research students in the Faculty of Science and Health to present their research to their peers in a conference setting and to receive valuable feedback. There is an extraordinary variety of research being undertaken within the faculty and this breadth will be showcased during the Symposium. Our research investigates fundamental human needs such as food and water, through to the health of both humans and the environment. It is exciting to be able to present a Symposium that offers such a diversity of research.

This year we are excited to have Andrew Mashman present a practical workshop on project management. A skill that is in demand and frequently required to plan and execute our projects, and to deliver on the outcomes. This will be followed by presentations from some key people at Charles Sturt University that are there to assist and support you in your research journey.

The symposium has always provided an opportunity for participants to meet with each other and to network during the breaks. Recognising the importance of this, we have organised a lunch on our respective campuses for people to come together in a relaxed environment and to help foster those collaborations.

We hope you enjoy the 2024 symposium!

Day 1: Wednesday 20th November 2024		Stream
9:00am – 9:15am	Introduction and Acknowledgement of Country, hosted by Prof Sandra Savocchia, Sub Dean Graduate Studies, Join the stream here	A
9:15am – 10:50am	Student presentations – Session 1 Please see student presentation program below for stream links, pg 6 - 10	A, B & C
10:50am – 11:05am	<i>Break</i>	
11:05am – 12:40pm	Student presentations – Session 2 Please see student presentation program below for stream links, pg 6 - 10	A, B & C
12:40pm – 2:40pm	<i>Lunch on Campuses</i> - Information has been provided to those registered for lunch - View all posters on our dedicated web page , live 20 th November	
2:45pm – 4:45pm	Project Management Workshop with Andrew Mashman Join the stream here	A
4:45pm	First day events conclude	
Day 2: Thursday 21st November 2024		Stream
9:00am – 10:35am	Student Presentations – Session 3 Please see student presentation program below for stream links, pg 6 - 10	A, B & C
10:35am – 10:45am	<i>Break</i>	
10:45am – 12:00am	Student Presentations – Session 4 Please see student presentation program below for stream links, pg 6 - 10	A, B & C
12:00am – 12:45pm	<i>Lunch & Poster Viewing</i> View all posters on our dedicated web page , live 20 th November	
12:45 – 1:40pm	Student Presentations – Session 5 Please see student presentation program below for stream links, pg 6 - 10	A, B & C
1:40pm - 1:50pm	<i>Break</i>	
1:50pm – 2:05pm	Maximise Your Research Potential with Charles Sturt Library: Resources, Support, and Success, hosted by Faculty Librarian's Lorraine Rose and Lyndall Holstein Join the stream here	A
2:05pm – 2:35pm	The Spatial Data Analysis Network (SPAN) – HDR research support, hosted by Simon McDonald The Quantitative Consulting Unit (QCU) – HDR research support, hosted by John Xie Join the stream here	A
2:35 – 2:45pm	<i>Break</i>	
2:45pm – 3:15pm	Safety, Security and Wellbeing; hosted by Dr. Stacey Jenkins, Frank Tamsitt, Melinda Green, Jane Stevens and Shannon Conn Join the stream here	A
3:15pm – 3:45pm	Graduate Researcher Training & Support at Charles Sturt; hosted by Graduate Research Team: Monique Shephard & Jen Podesta Join the stream here	A
3:45 - 4:00pm	Thank you and Close with Sandra Savocchia, Sub Dean Graduate Studies Join the stream here	A

Professional Development Workshop

Managing your projects

Andrew Mashman



Hi, I'm a long-term Adjunct with CSU and Facilitate a range of courses around Leadership, Communication, and Project Management (non-construction). I love sharing Project skills and ideas as they are extremely useful for being more effective and efficient in your life and work. Outside of my facilitation world, my wife and I run a few Airbnb's in Bathurst, a small farm and a family of 4 with a couple of kids at Uni and 1 in Year 11! I like water sports, motorcycles, parkrun and our pets.

Abstract:

Projects are "how" organisations get stuff done, they are beyond business as usual and have specific goals, scope, resources and always involve something new or change from the status quo! A PhD is definitely a project and while it might seem quite an individual journey, there is still many stakeholders and resources to wrangle and scope to be managed to be successful, so taking a Project focussed approach will pay big dividends! In this session I'll get you thinking "Project" and give you some valuable tools to get ahead and keep your PhD manageable!

Explore your Resources – Information Sessions

Maximise Your Research Potential with Charles Sturt University Library: Resources, Support, and Success

Charles Sturt University Library is more than just a place to find books; it's here to support your research journey. From access to extensive digital and physical collections to specialised research databases, our resources are tailored to meet your research needs. Our librarians are here to assist you with using our resources, advanced searching, citation management with EndNote, and even publishing advice. By leveraging these services and our self-help guides, you can enhance your research efficiency to help achieve your goals. This session will explore how the library can be your partner in success.

The Spatial Data Analysis Network (SPAN) – HDR research support

HDR researchers can access quantitative data analysis and visualization support for spatial data (data with location information) through the Spatial Data Analysis Network (SPAN). The support is in the areas of geographical information systems, remote sensing and statistical analysis. SPAN can also provide field equipment for loan and access to high performance computing.

<https://www.csu.edu.au/research/span/home>

The Quantitative Consulting Unit (QCU) – HDR research support

The Quantitative Consulting Unit (QCU) provides support for the statistical analysis of research data. QCU's services are free for HDR students but conditions apply.

<https://staff.csu.edu.au/researchers/research-support/data-methods-and-tools/specialised-units/quantitative-consulting-unit>

Safety, Security and Wellbeing

Join the panel discussion on DSSW services for HDR students and staff, with **Dr. Stacey Jenkins** | Executive Director, Safety, Security & Wellbeing, **Frank Tamsitt** | Director Security & Resilience (CSO), **Melinda Green** | Associate Director Safe & Respectful Communities, **Jane Stevens** | Acting Associate Director, Health, Safety & Wellbeing, **Shannon Conn** | Acting Associate Director Accessibility & Inclusion, followed by a Q&A and request for feedback.

Graduate Researcher training & support at Charles Sturt University

The graduate research team link HDR candidates with skills training and information that will ease the way through candidature and link you with others on the journey. This presentation will walk you through the range of opportunities and events available to you, and touch on the training we provide for both candidates and their supervisors.

Wednesday 20th November – 2 sessions

9:00am – 9:15am	Introduction and Acknowledgement of Country Join stream here		
Session 1	Stream A	Stream B	Stream C
	Join Zoom Meeting Meeting ID: 65751097927	Join Zoom Meeting Meeting ID: 65398025685	Join Zoom Meeting Meeting ID: 68563908492
Chair	Prof Sandra Savocchia	A/Prof Sam Pant	Thilini Munasinghe
Room Co-ordinator	A/Prof Cannas Kwok	A/Prof Sam Pant	Dr David Leaver
Assessors	Dr Elyce Green & Dr Asad (Md) Asaduzzaman	Dr Lachlan Schwarz & Mrs Natalie Ellis	Ms Rebecca Phillips & Dr Suman Gupta
9:15am – 9:35am	Deb Magee PhD Candidate Building and sustaining a positive organisational culture in aged care in rural and regional Australia: Registered nurses' perspectives	Alexandra Bastick Honours Student Does radiation impact the growth of an Australian tropical marine microalgae? Informing potential risks from offshore oil and gas infrastructure	Sophea Aing PhD Candidate Designing novel drugs to treat Helicobacter pylori infection
9:35am – 9:55am	Alisha McFarlane PhD Candidate Assessing the baseline for gender equality at ambulance Tasmania	Tewodros Jember PhD Candidate Genotyping <i>Staphylococcus aureus</i> from bovine milk: Insights from PCR-HRM analysis of mastitis suspects	Ash Sabuz PhD Candidate Effects of storage on raw and processed rice composition and rancidity
9:55am – 10:15am	Sarah Stenson PhD Candidate How can education improve nurses' preconceptions and attitudes around mandatory reporting and child maltreatment?	Krystal Dacey PhD Candidate Navigation behaviour and terrain analysis for spatial modelling human movement in the wilderness	Nayomi Danthararyana PhD Candidate Zoonotic arboviruses of Papua New Guinea and their vectors: Characterising the mosquito microbiome and evaluating novel surveillance methods
10:15am – 10:35am	Steph Hibburt Honours Student Initiatives that support mental health and wellbeing in rural communities – a case series	Lauren McIlveen Honours Student Sheep producers' perceptions of oral lice treatments and current lice management strategies in Australia	Sophie Wachter PhD Candidate Understanding the nuclear localisation of cytomegalovirus major immediate early proteins through their interactions with host factors
10:35am – 10:50am	Ferdous Rahman PhD Candidate Investigating hepatitis C virus (HCV) transmission patterns among people who inject drugs (PWID) in Dhaka & Chapai Nawabganj, Bangladesh: A network-based study	Nurun Naila PhD Candidate Rice-Vegetable-Aqua Culture Systems for Bangladesh: Impacts on Yield, Human Nutrition, Food Security, and Household Economies	Amjad Ali PhD Candidate Potential role of nuclear import in <i>Akabane orthobunyavirus</i> replication and infection
10:50am – 11:05am	Break		

Session 2	Stream A	Stream B	Stream C
	Join Zoom Meeting Meeting ID: 65751097927	Join Zoom Meeting Meeting ID: 65398025685	Join Zoom Meeting Meeting ID: 68563908492
Chair	A/Prof Abi Santhakumar	Laura-Anne Dennis	Dr Ben Stodart
Room Co-ordinator	A/Prof Abi Santhakumar	Prof Dale Nimmo	Dr Ben Stodart
Assessors	Dr Kristina Griffin & Dr Ketema Zeleke	Dr Randy Adjonu & Dr Edward Anyasodor	A/Prof Marina da Rosa Kaizer & Dr Jennifer Manyweathers
11:05am – 11:25am	Jo Bampoe PhD Candidate Developing the first Ghanaian English speech and language assessment tool	Dilki Adikari Arachchige PhD Candidate Impact of human milk oligosaccharide (HMO) supplementation on learning and memory ability of piglets in 8-armed radial maze	Natasha Lubke Honours Student Dance behaviour in cockatoos; implications for cognitive processes and welfare
11:25am – 11:45am	Kirsten Pini Honours Student Parental and caregiver perspectives of the key worker model use in early childhood approach settings	Sarah Stevens PhD Candidate The pharmacokinetics of Δ^9-THC in sheep	Kate Ferguson Honours Student A preliminary study of intraperitoneal fluid administration to neonatal calves
11:45am – 12:05pm	Steph Harman Honours Student “But a cog in the machine”: Perspectives of occupational therapists on health equity challenges across regional, rural and remote Australia	Md Shoriful Islam PhD Candidate Ecology and phenology study of sticky nightshade (<i>Solanum sisymbriifolium</i> Lam) for invasion management in Australia	Gab Goldsworthy Honours Student Evaluation of beekeeper perspectives of current honeybee pests, diseases and their impact in southern and eastern Australia
12:05pm – 12:25pm	Catherine Lockley PhD Candidate Theatrical improvisation in STEM Education: enhancing the sparkle of our educators	Natalie Perez De Villarreal Honours Student Does a low-fidelity canine suspensory ligament model improve veterinary student confidence and preparedness during live ovariohysterectomy surgery?	Kelly Tamang PhD Candidate Institutional analysis of agricultural water governance in Bhutan: An exploration of water sharing and allocation
12:25pm – 12:40pm	Lakshmi Gopinath PhD Candidate Insect-based animal feed: Australian consumer attitudes	Josette Fretton Professional Doctorate Student Investigation of equine corneal surgical techniques utilising an ex vivo large animal cornea model	Mariam Khanam PhD Candidate Biofertiliser-based organic amendments: A new approach to saline stress management in faba bean
12:40pm – 2:40pm	Lunch On Campuses & Poster viewing Poster web page will be live 20 th November https://science-health.csu.edu.au/research/hdr-honours-symposium		
2:45 – 4:45pm	Project Management Workshop with Andrew Mashman Join stream here		

Thursday 21st November – 3 sessions

Session 3	Stream A	Stream B	Stream C
	Join Zoom Meeting Meeting ID: 65751097927	Join Zoom Meeting Meeting ID: 65398025685	Join Zoom Meeting Meeting ID: 68563908492
Chair	Dr David Leaver	Sophie Shephard	Prof Julian Grant
Room Co-ordinator	Dr Ian Skinner	A/Prof Abi Santhakumar	Prof Julian Grant
Assessors	Ms Karen Hayes & Dr Ian Skinner	Dr Sharon Laver & Prof Marta Hernandez-Jover	Dr Vivian Isaac & Dr Nirodha Weeraratne
9:00am – 9:20am	Olivia Brunton PhD Candidate Does dual banding of phosphorus fertiliser promote better root growth at depth?	Rahmatuzzaman Rana PhD Candidate Effect of growing legumes one or two seasons prior to wheat on protein composition.	Andrew Lean Masters Candidate Effects of age at first calving on milk production, health and reproduction in primiparous Holsteins on Australian commercial farms
9:20am – 9:40am	Murray Parker PhD Candidate Changing and emergent cultural landscapes and heritage potential of European Christmas markets	Joshua Slattery Honours Student Development of a diagnostic pipeline to detect <i>Trichomonas tenax</i> using CRISPR-Cas12a	Marcos Andres Sodupe PhD Candidate Elucidating the role of <i>Cryptovalsa ampelina</i> in Australian vineyards
9:40am – 10:00am	Keira Brown PhD Candidate Parasites from Australian invasive species and their prevalence in native marsupial species	Nadeeka Narasinghe Arachchige PhD Candidate Characterisation of nuclear localization mechanisms of Herpesvirus Basic Leucine Zipper (bZIP) proteins	Darby Taguam PhD Candidate Identification and pathogenicity of persimmon dieback pathogens in Australia
10:00am – 10:20am	Calvin Lam PhD Candidate Grapevine root distribution and implication for water and nitrogen uptake in cover cropped vineyards	Clare Sutton PhD Candidate Can volunteering enhance mental resilience in student paramedics?	Colin Starkey PhD Candidate Assessing pruning method to prevent infection of grapevines by trunk disease pathogens
10:20am – 10:35am	Natalie Jefferson Honours Student Is raw meat and seafood a source of gastrointestinal disease in Australian cats? A meta-analysis, survey of cat owners and microscopic examinations of cat faeces	Milad Kazemi PhD Candidate Valorisation of canola oil refining waste-streams - potential for recovery of bioactive compounds	Georgia Kennedy PhD Candidate Circulating miRNA as a novel biomarker for the early detection of <i>M. paratuberculosis</i> infection in dairy cattle
10:35am – 10:45am	Break		

Session 4	Stream A	Stream B	Stream C
	Join Zoom Meeting Meeting ID: 65751097927	Join Zoom Meeting Meeting ID: 65398025685	Join Zoom Meeting Meeting ID: 68563908492
Chair	A/Prof Melissa Nott	Sophie Wacher	Deb Magee
Room Co-ordinator	A/Prof Melissa Nott	Dr Ketema Zeleke	Dr Vivian Isaac
Assessors	Dr Ben Stodart & A/Prof Sam Pant	Dr Boris Budiono & A/Prof Abi Santhakumar	Dr Catherine Pohlman & Dr Amina Price
10:45am – 11:05am	Thomas Dicks PhD Candidate Missing replicate imputation for metabolomics experiments	Mahmudul Amin PhD Candidate Effect of dietary human milk oligosaccharides intervention on brain neurotransmitters and metabolites in piglets: an in vivo MRS study	Haley Findlay Masters Candidate The impact of paramedic communication in shaping women's birth experiences
11:05am – 11:25am	Emily Healy Honours Student A retrospective study investigating the incidence, frequency, severity and cumulative duration of hypotension in dogs admitted to a referral hospital for CT imaging	Belal Hossain PhD Candidate Projection of climate change and extreme climatic events during cropping seasons in northwest Bangladesh	Erin Isaacs Honours Student Addressing knowledge gaps in out-of-hospital cardiovascular care for female patients
11:25am – 11:45am	Tanjina Amin PhD Candidate Molecular determinants of human milk oligosaccharides as a bioactive compound for eye and vision development and cognitive behaviour in piglets	Tahura Khanam Munmun PhD Candidate Biosecurity in backyard poultry in Australia: impact on the emergence of zoonosis and antimicrobial resistance	Soph Shephard PhD Candidate A systematic review of interventions for the treatment of chronic pain in adults residing in regional, rural and remote Australia
11:45am – 12:00am	Siobhan Ogle-Lang Honours Student Risk factors associated with the occurrence of Canine Gastric Dilatation and Volvulus in Australia: a retrospective descriptive analysis	Alexander Tynan PhD Candidate A novel multi-domain Schistosoma mansoni vaccine	Sade Franklin Masters Candidate - withdrawn Promoting pro-climate behaviour in healthcare for value-based outcomes
12:00am – 12:45pm	Lunch & Poster Viewing Poster web page will be live 20 th November https://science-health.csu.edu.au/research/hdr-honours-symposium		

Session 5	Stream A	Stream B	Stream C
	Join Zoom Meeting Meeting ID: 65751097927	Join Zoom Meeting Meeting ID: 65398025685	Join Zoom Meeting Meeting ID: 68563908492
Chair	Dr David Leaver	Jaishree Ravindran	Prof Dale Nimmo
Room Co-ordinator	Dr David Leaver	Dr Ian Skinner	Prof Dale Nimmo
Assessors	A/Prof Cannas Kwok & Dr Brian Sengstock	Dr Doaa Hanafy & Dr Paul Prenzler	Dr Brian McSharry & Dr Nisa Perera
12:45pm – 1:05pm	Ruth Pape PhD Candidate Construction of the female thorax (ribcage) sizes and female body habitus using computed tomography (CT) images	Tridip Das PhD Candidate A Design of Experiment (DoE) approach to develop an immunogenic thermostable novel spray-dried vaccine against Psittacine Beak and Feather Disease	Gideon Stemmet Professional Doctorate Student Can self-tensioning suture material (Dynacord™), minimize postoperative loss of abduction in equine prosthetic laryngoplasty?
1:05pm – 1:25pm	Uptal Mondal PhD Candidate Assessing the burden and major risk factors of metabolic syndrome among adults in rural Australia	Aliati Iswantari PhD Candidate Conserving stocky galaxias: Opportunities and challenges in husbandry and translocation	Pradeep Rai PhD Candidate Quantifying Farmer's Economic, Social, and Environmental Preferences and Choices
1:25pm – 1:40pm	Sarah Amr Masters Candidate Assessing the risk of noise-induced hearing loss among dentists	Laura-Anne Dennis Professional Doctorate Student The effect of nicotinic acid supplementation on NAD+ metabolite concentrations in follicular fluid and serum of aged mares: Can we reverse the age associated decline in oocyte quality?	Shauna McTernan Professional Doctorate Student Prevalence and risk factors for salmonella shedding in horses presenting with gastrointestinal disease in Australia: A retrospective multicentre study
1:40pm – 1:50pm	Break		
1:50pm – 3:45pm	Explore your Resources – Information sessions! Join stream here		

Posters on Show

The poster web page will be live Wednesday 20th November 2024. It will be able to be accessed through the symposium web page, <https://science-health.csu.edu.au/research/hdr-honours-symposium>

Honours Students

- **Alexandra Bastick:** Does radiation impact the growth of an Australian tropical marine microalgae? Informing potential risks from offshore oil and gas infrastructure
- **Emily Fryett:** Sarcoptic mange in wombats: diagnosis, distribution, environmental influences and treatments
- **Shannon Gilding:** Investigating The Role of IL-17A Signalling In Protection Against Helicobacter pylori Infection
- **Natalie Jefferson:** Is raw meat and seafood a source of gastrointestinal disease in Australian cats? A meta-analysis, survey of cat owners and microscopic examinations of cat faeces
- **Joshua Slattery:** Using CRISPR to hunt for the parasite T. tenax

Higher Degree Research

- **Sophea Aing:** Designing novel drugs to treat Helicobacter pylori infection
- **Amjad Ali:** Potential role of nuclear import in Akabane orthobunyavirus replication and infection
- **Setognal Aychiluhm:** Impact of lifestyle, behavioural and pharmacological interventions on childhood central obesity
- **Olivia Brunton:** Deep banded phosphorus: plants digging deeper for P use efficiency
- **Tana Cuming:** The longitudinal impact of Adverse Childhood Experiences upon rural Australian youth
- **Nani Das:** Nutritional Manipulations to Alleviate Heat Stress in Feedlot Lambs
- **Tridip Das:** An immunogenic thermostable novel spray-dried vaccine against Beak and feather disease
- **Farjana Haque:** Alleviating Biosecurity Risks: A New Volatile Organic Compound (VOC) based BioSniffer for Field detection of Pests
- **Somphou Phaasulath:** Restoring fish passage to a large urban wetland in Vientiane, Lao PDR
- **Tanvir Saikat:** Unveiling the Structures of N0-P Complex in High-Risk Paramyxoviruses: Development of Small Inhibitors against Paramyxoviral Infections
- **Milkiyas Tantu:** A Point of Care (POC) Test for Accurate NASH/MASH Risk Screening
- **Paige Taylor:** ANP32 as a Proviral Factor in RNA Virus Replication
- **Sash Tynan:** Multi-domain schistosome vaccine
- **Sophie Wachter:** Understanding the nuclear localisation of cytomegalovirus major immediate early proteins through their interactions with host factors
- **Emily Wagon:** Investigation of two newly emerged henipaviruses: how the Langya and Angavokely virus matrix proteins interact with host cell nuclear import proteins

Abstracts

Session 1

Building and sustaining a positive organisational culture in aged care in rural and regional Australia: Registered nurses' perspectives

Deborah Magee^{1*}, Marguerite Bramble,¹ Holly Randell-Moon², Karen Francis¹

¹School of Nursing, Paramedicine and Healthcare Sciences, Charles Sturt University

²School of Indigenous Australian Studies, Charles Sturt University

*dmagee@csu.edu.au

This presentation reports on themes from a qualitative study privileging the voices of registered nurses (RNs) employed in residential and community aged care in rural and regional Australia. Fourteen RNs employed in the aged care sector in varying roles were interviewed. The participants identified that RNs should be supported to work to their full scope of practice. A lack of congruence between the values of board and executive management and staff was identified as a critical issue. Staff must be engaged with developing organisational values and embodying them in their work so that the complexity and challenges of their contribution are recognised. Collaboration between nursing peak bodies and regulatory authorities must refine structures that support quality care delivery and an organisational culture reflective of staff capacity and capability. Further research is required to develop and integrate contemporary nurse-led models of care with a view to advancing policy and practice.

Does radiation impact growth of an Australian tropical marine algae? Informing potential risks from offshore oil and gas infrastructure

Alexandra J Bastick^{1,2*}, Cresswell, T.², Tout-Lyon, J.¹, Koppel, D.³, Adams, M.⁴, & Gissi, F.²

¹School of Agriculture, Environment and Veterinary Sciences, Charles Sturt University, Port Macquarie, NSW 2444, Australia

²ANSTO, Lucas Heights, NSW 2234, Australia

³Australian Institute of Marine Science, Perth, WA 6000, Australia

⁴NSW Department of Climate Change, Energy, the Environment and Water, Lidcombe, NSW 2141, Australia

*alexandrabastick@hotmail.com

Australian legislation currently mandates the complete removal of decommissioned offshore oil and gas facilities, but there is discussion around the benefits of leaving certain infrastructure as artificial reefs to enhance local biodiversity in these ecosystems. However, radionuclides (e.g. Radium 226 and 228) can accumulate in scales on the internal surfaces of subsea infrastructure, potentially exposing marine organisms to radiation levels that exceed environmental protection guidelines. The effects of such contaminants, known as Naturally Occurring Radioactive Material (NORM), on Australian marine organisms remains unclear as current guidelines are based on data mostly from terrestrial and freshwater species in the northern hemisphere. We aimed to assess the impact of gamma radiation on the Australian marine microalgae *Tisochrysis lutea* using a Caesium-137 source and flow cytometry in 72-hour chronic toxicity tests. While no significant effect on population

growth rates were observed, reaffirming current guidelines, other cellular processes may be impacted, having broader ecological implications.

Designing novel drugs to treat *Helicobacter pylori* infection

Sophea Aing^{1*}, Bernd Kalinna, B.B¹, Thiru Vanniasinkam, C.C², Jessica Holien, D.D³, Lucy Barr, E.E³, Paul Ramsland, F.F³, Anna Walduck, G.G¹

¹Rural Health Research Institute, Charles Sturt University, PO Box 883, Orange, NSW 2800.

²School of Dentistry and Medical Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2658, Australia.

³School of Science, RMIT University, GPO Box 2476, Melbourne, VIC 3001, Australia.

*saing@csu.edu.au/sophea_aing@yahoo.com

Helicobacter pylori (*H. pylori*) is a bacterium that causes chronic gastric disorders. Approximately 50% of the world's population, are infected. *H. pylori* infection is treated empirically with antibiotics. Due to antibiotic resistance, more effective drugs are urgently needed to treat *H. pylori*. The *H. pylori* protein glycosylation system is engineered by glycosyltransferase enzymes for its survival and virulence. In this project, eight *H. pylori* carbohydrate active transferases that have no similarity to mammalian enzymes and low similarity to bacterial enzymes were selected for study. Using an *in silico* computational approach, we have performed a virtual screening of >6 million drug-like molecules against three target enzymes as proof of principle. To date, >100 hit compounds were identified for screening against the enzyme proteins in a panel of *in vitro* and *in vivo* assays. This drug development pipeline is expected to generate 2-5 compounds that can be optimised for pre-clinical testing.

Assessing the baseline for gender equality at ambulance Tasmania

McFarlane, A^{1*}

¹School of Nursing, Paramedicine and Health Sciences Charles Sturt University,
Locked Bag 5000, Port Macquarie, NSW 2444, Australia.

*ahensby@csu.edu.au

This study protocol aligns to the workplace gender equality indicators developed by the Workplace Gender Equality Agency (WGEA). These indicators represent the focus areas where workplace gender inequality persists. The diagnostic process consists of evaluating key focus areas of gender equality through a series of binary ('yes'/'no') questions. The responses are used to generate an overall score, which reflects the organisation's standing in each area and its progress toward achieving gender equality and best practice standards. The results of this study will provide valuable insights into the current status of gender equality within the organisation, identifying specific gaps and areas for improvement. Findings from this study will establish a baseline for gender equality within Ambulance Tasmania, highlighting key areas of inequality and offering a foundation for targeted strategies and future policies.

NB Although analysis is ongoing, the preliminary results will be presented at the HDR symposium.

Genotyping *Staphylococcus aureus* from bovine milk: Insights from PCR-HRM curve analysis of mastitis suspects

Tewodros Fentahun Jember^{1,2*}, Mark E. Westman³, Sameer Dinkar Pant^{1,4} and Seyed Ali

Ghorashi^{1,4}

¹Charles Sturt University, Faculty of Science and Health, School of Agricultural, Environmental and Veterinary Sciences, Wagga Wagga, Australia

²University of Gondar, College of Veterinary Medicine and Animal Sciences, Gondar, Ethiopia

³Elizabeth Macarthur Agricultural Institute (EMAI), Department of Primary Industries, NSW, Menangle, Australia

⁴Gulbali Institute, Charles Sturt University, Boorooma Street, Wagga Wagga, NSW 2678, Australia

*tjember@csu.edu.au

Staphylococcus aureus (*Staph. aureus*) is one of the most prevalent causes of bovine mastitis throughout the world. In this study, bovine milk samples from mastitis cases on dairy farms in New South Wales were received by EMAI. *Staph. aureus* was confirmed through bacterial culture and MALDI-TOF MS. The *spa* gene from these samples was amplified using PCR and genotyped using HRM curve analysis. The *spa* gene is often associated with virulence factors, making it valuable for understanding the pathogenic potential of different *Staph. aureus* isolates. HRM is a post-PCR application and helps to differentiate isolates without sequencing PCR products. Fifteen samples were genotyped into four distinct groups based on HRM curve analysis. Differences in melting curve profiles reflected sequence variation in the *Spa* gene and were confirmed by DNA sequencing. A mathematical model based on Genetic Confidence Percentage (GCP) was used in HRM curve analysis and a cut-off point value was established which differentiated *Staph. aureus* without requiring visual interpretation of curve profiles. In general, HRM curve analysis takes less time (~20 minutes) and fewer resources compared to sequencing techniques. This genotyping technique, without the need for sequencing, reveals relationships among isolates, helping in understanding their evolutionary history and tracking transmission routes during outbreaks.

Effect of storage on raw and processed rice composition and rancidity

Ashfak A Sabuz^{1,2*}, Randy Adjonu^{1,2}, Christopher L Blanchard^{1,2}, Abishek B Santhakumar^{1,2}

¹School of Dentistry and Medical Sciences, Faculty of Science and Health, Charles Sturt University, Wagga Wagga, New South Wales-2678, Australia

²Gulbali Institute, Charles Sturt University, Wagga Wagga, New South Wales-2678, Australia

*asabuz@csu.edu.au

Deterioration of rice quality, including changes in phenolic compounds, antioxidant activity, and fatty acid degradation during storage of raw and processed rice, is a major concern. Fatty acid degradation, caused by enzymatic action or oxygen exposure, leads to rancidity during storage and processing. Various studies have investigated the causes of rancidity and potential interventions, such as enzyme inhibition, selective breeding, and antioxidants, their effectiveness remains limited. Impact of long-term storage on rice's nutritional composition, phenolic compounds, and antioxidants requires further exploration. This study aims to: 1) assess how different storage and processing conditions affect fatty acid oxidation; and 2) evaluate the effect of natural antioxidants on fatty acid degradation. Raw and processed rice will be stored under controlled conditions (4°C and 37°C, ambient RH) for 12 months. The study will measure oxidation markers

(FAV, PV, CV) and secondary oxidation products, along with changes in phenolic composition and antioxidant activity, to identify sustainable methods to minimize fatty acid degradation.

How can education improve nurses' preconceptions and attitudes around mandatory reporting and child maltreatment?

Mrs. Sarah Stenson^{1*}, Prof. Alison Hutton², Dr. Angela Fenton³, Prof. Julian Grant¹

¹School of Nursing, Paramedicine & Healthcare Sciences, Charles Sturt University

²School of Nursing and Midwifery, University of Newcastle

³School of Education, Charles Sturt University

* sastenson@csu.edu.au

To examine the literature to explore how education can be optimised to give nurses opportunities to challenge their preconceptions and improve attitudes to mandatory reporting of child maltreatment. Nurses' preconceptions about child maltreatment - including what constitutes child maltreatment - and their attitudes to mandatory reporting and the child protection system influence their reporting. Research describes nurses' fear of consequences of reporting - for the child, the family, and the nurse themselves – and beliefs that mandatory reporting is either unhelpful or harmful for the child and family. These preconceptions and attitudes present a barrier to nurses making reports of suspected maltreatment. Researchers conclude that nurses' inaccurate preconceptions about the harm of child maltreatment and poor attitudes to mandatory reporting need to be challenged to improve nurses' reporting rates. A narrative review of the literature investigating "is pre-service education preparing registered nurses for their role in child protection and mandatory reporting of child maltreatment?". The literature demonstrates that RNs generally believe they have a moral and legal duty to report child abuse, yet they are hampered by poor-confidence in their ability to recognise child maltreatment and poor faith in the child protection system. Pre-service education on mandatory reporting of child maltreatment presents an opportunity for nurses to examine their attitudes and preconceptions around child maltreatment and mandatory reporting. Evidence from other professions and other topics suggests pre-service education for nurses could have an important role in addressing nurses' preconceptions and attitudes around child maltreatment and mandatory reporting. This evidence can drive change to the way nurses are taught about mandatory reporting and child maltreatment, resulting in nurses feeling better prepared and more confident in their role as mandatory reporters.

Navigation behaviour and terrain analysis for spatial modelling human movement in the wilderness

Dacey, K.^{1*}, Whitsed, R.¹, & Laidlaw, P.²

¹ School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, 86 Elizabeth Mitchell Dr, Thurgoona NSW 2640, Australia.

² School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, 7 Major Innes Rd, Port Macquarie NSW 2444, Australia.

*kdacey@csu.edu.au

Getting out into nature and hiking is an excellent activity for both physical and mental health. With so many people spending time in the wilderness, it is essential to understand and model how people move to ensure their safety and protect the environment. This research incorporates real-life human navigation behaviour and terrain data into a spatial model to predict human movement in the wilderness. Data from 108 study participants were analysed to find commonalities reflective of human navigation in a wilderness environment. Additionally, terrain analysis techniques were developed to identify terrain features affecting a person's movement over the land surface. The navigation behaviour and terrain data have been combined and transformed into algorithms for incorporation into a spatial model. The model output is anticipated to benefit the safety of people who spend time in the wilderness and protect wilderness areas by better understanding how people move within wilderness environments.

Zoonotic arboviruses of Papua New Guinea and their vectors: Characterising the mosquito microbiome and evaluating novel surveillance methods

Nayomi Danthanarayana^{1,2*}, James O'Dwyer¹, Joelyn Goi³, Vittoria Stevens¹, Martin Pal^{2,4,5}, Brian P. McSharry^{2,7}, Marta Hernandez-Jover^{6,7}, Stephan Karl^{3,8}, Justin A. Roby^{2,7}, Jade K. Forwood^{2,7}, Matthew J. Neave¹, David T. Williams¹

¹CSIRO, Australian Centre for Disease Preparedness, Geelong, VIC 3220, Australia.

²School of Dentistry and Medical Sciences, Charles Sturt University, Wagga Wagga, NSW 2678, Australia.

³Papua New Guinea Institute of Medical Research, Goroka, Papua New Guinea.

⁴Department of Medical Biology, University of Melbourne, Parkville, VIC 3010, Australia.

⁵Walter and Eliza Hall Institute of Medical Research, WEHI, Parkville, VIC 3052, Australia.

⁶School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Wagga Wagga, NSW 2650, Australia.

⁷Gulbali Institute, Charles Sturt University, Wagga Wagga, NSW 2678, Australia.

⁸Australian Institute of Tropical Health and Medicine, James Cook University, Smithfield, QLD 4878, Australia.

*ndanthanarayana@csu.edu.au | Nayomi.danthanarayana@csiro.au

The mosquito microbiome is highly diverse and poorly understood. This large reservoir of bacteria and viruses within mosquitoes plays a significant role in the transmission of mosquito-vector-borne arboviruses. Xenosurveillance is a relatively novel technique that utilizes mosquitoes to detect circulating pathogens within a specific geographical area. This study employed next-generation sequencing and 16S rRNA gene sequencing to determine the mosquito microbiome and the arboviruses in *Culex* mosquitoes collected from five Papua New Guinea provinces in 2019 and 2020. Sequencing was performed on 167 samples consisting of 27,117 mosquitoes. A preliminary analysis has identified over 700 known virus species, mostly insect-specific viruses. *Japanese*

encephalitis virus and *Liao ning virus* were among the arboviruses detected, and suspected novel viruses are currently under investigation. Among the bacteria, *Klebsiella*, *Staphylococcus*, and *Wolbachia* species were abundant in the samples. Future analysis will explore the phylogenetics and associations between sample variables.

Initiatives that support mental health and wellbeing in rural communities – a case series

Stephanie Hibbert^{1*}, Hazel Dalton, & Peter Micalos

Rural Health Research Institute, Dentistry and Medical Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2658, Australia.

*stephaniehibbert@gmail.com

This research explores the role of community-led initiatives in addressing rural health inequities by focusing on community mental health and wellbeing. Using a case series of rural mental health initiatives presented at the Global Leadership Exchange – Rural Behavioural Health Collaborative in 2022, this research aims to uncover common challenges, guiding principles, and outcomes of these initiatives. Findings from this research will identify common elements and unique aspects of each rural health initiative as a guide for future community-led initiatives. The methodology involves a qualitative case study approach, using content and thematic analysis of documents, online materials, and interviews with key stakeholders. Data will be analysed using the Powell framework to identify key themes and reviewed through discussions with stakeholders. By documenting and analysing these rural mental health initiatives, this research will enhance the sustainability and impact of future community-led projects, with implications for addressing health disparities in rural settings worldwide.

References

Powell, N., Dalton, H., Perkins, D., Considine, R., Hughes, S., Osborne, S., & Buss, R. (2019). *Our healthy clarence: a community-driven wellbeing initiative. International journal of environmental research and public health*, 16(19), 3691.

Sheep producers' perceptions of oral lice treatments and current lice management strategies in Australia

McIlveen, L.R^{1*}, Allworth, M.B.^{1,2}, Hernandez-Jover, M.^{1,3}, & Hayes, L³

¹School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Wagga Wagga, NSW, Australia

²Fred Morley Centre, School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Wagga Wagga, New South Wales, Australia;

³Gulbali Institute, Charles Sturt University, Wagga Wagga, NSW 2650, Australia

*Lmcilv01@postoffice.csu.edu.au

Body lice (*Bovicola ovis*) pose significant impacts to the productivity and profitability of Australian sheep enterprises. Market volatility and producer desire to minimise cost of production has further illustrated the need for efficacious and financially viable lice management solutions. Novel lousicide products are emerging in Australia with the first ovine oral lice treatment, Flexolt™, being registered in 2023. The project objective is to determine (1) producer perception of oral lice treatments, (2) perceived product efficacy, (3) current lice management strategies utilised by Australian sheep producers and (4) the biosecurity practices being implemented for lice mitigation. In addition, this research endeavours to develop an understanding of where producers are obtaining lice treatment advice from, which will contribute to a growing body of research into

producer perceptions on engaging veterinary services for disease management within sheep enterprises.

Understanding the nuclear localisation of cytomegalovirus major immediate early proteins through their interactions with host factors

Sophie C. Wacher^{1,2*}, Cecilia Moriarty¹, Martin Pal¹, Crystall M. D. Swarbrick², Jade K. Forwood^{1,2} & Brian P. McSharry^{1,2}

¹School of Dentistry and Medical Sciences, Faculty of Science and Health, Charles Sturt University

²Gulbali Institute, Charles Sturt University

*swacher@csu.edu.au

Human cytomegalovirus (HCMV) is a ubiquitous β -herpesvirus associated with significant morbidity and mortality in immunocompromised and immunosuppressed individuals. The two major immediate early proteins of HCMV, immediate early protein 1 & 2 (IE1/IE2) are nuclear localised proteins expressed immediately after viral infection. These multifunctional proteins are potent transactivators of viral gene expression and are key regulators of host and viral protein function during lytic infection. IE1/IE2 share a common N-terminal region of 85 amino acids and diverge at the C-termini due to alternative splicing and polyadenylation. A predicted nuclear localisation signal (NLS) in the N-terminus of IE1 and IE2 has been identified, with two additional NLSs predicted in exon 5 of IE2. However, the mechanistic basis regulating nuclear localisation of these two proteins and the physiological importance of encoding multiple NLS remains to be elucidated. To identify the structural basis of binding of the NLS of IE1/IE2 to nuclear import receptors (importins) each NLS was crystallised with importin α before the atomic structure of the complex was resolved. In addition, the specificity of the IE1/IE2 NLS for specific importin family members was determined by fluorescence polarisation and electromobility shift assays, with enhanced affinity for importin α 3 identified. The crystal structure of the shared IE1/IE2 NLS in complex with multiple importin family members elucidated that this NLS was bipartite in nature with key basic residues binding in both the major and minor binding site of the importin molecules. The NLS sequences unique to IE2 exhibited monopartite binding to the major site of importin alpha. This biochemical and structural analysis provides a platform for understanding viral-host structure function relationships during CMV infection as well as providing insights into the contribution of specific importin α isoforms to regulating the initiation of the viral gene expression cascade.

Investigating hepatitis C virus (HCV) transmission patterns among people who inject drugs (PWID) in Dhaka & Chapai Nawabganj, Bangladesh: A network-based study

Md Ferdous Rahman¹

¹Rural Health Research Institute, Charles Sturt University, 346 Leeds Parade, Orange, NSW 2800, Australia.

*mdfracman@csu.edu.au

Hepatitis C virus (HCV) is a critical global health issue, with 58 million cases globally. Among people who inject drugs (PWID), HCV prevalence exceeds 50% globally. In Bangladesh, 2020 data showed 68.5% prevalence in Chapai Nawabganj and 32.6% in Dhaka among PWID, indicating high transmission risks. This study examines HCV transmission among PWID in these areas by analyzing social, injecting, and genotypic networks to identify core transmitters. A mixed-method approach will use Respondent Driven Sampling (RDS) for quantitative data and qualitative methods, including key informant interviews and focus group discussions. The study will analyze demographic, behavioral, and network data, alongside HCV testing and genotyping, to inform targeted prevention strategies.

Rice-Vegetable-Aqua Culture Systems for Bangladesh: Impacts on Yield, Human Nutrition, Food Security, and Household Economies

Nurun Nahar Naila^{1*}, Jen Bond¹, Geoff Gurr¹

¹School of Environmental, Agricultural and Veterinary Science, Charles Sturt University
346 Leeds parade, Orange, NSW 2658, Australia.

*nnaila@csu.edu.au

Rice dominates Bangladesh's agriculture, providing 70% of daily caloric intake, however, monocropping has led to decreased production and household income, and limited nutritional diversity. This study aims to diversify rice farming by integrating crops like pulses, mustard, maize, and vegetables alongside aquaculture (fish, shrimp, carp). Using a mixed-method approach, we combine qualitative interviews with rice farmers across two districts of Bangladesh to identify barriers and willingness to adopt new diversification. Insights from qualitative data will inform the development of a more realistic and sustainable system from the same field in a same agricultural year. A pilot study will compare these integrated systems with conventional farming, analysing differences in yield, nutrition, and socioeconomic impact using t-tests or ANOVA. This research will not only enhance food security but also provide a scalable, sustainable model for smallholder farmers, ensuring environmental resilience, increased yield, food security as well as household income and improved nutritional outcomes.

Potential role of nuclear import in Akabane orthobunyavirus replication and infection

Amjad Ali^{1,2*}, David J. Leaver^{1,2}, Colin X. Cheng², Justin A. Roby²

¹School of Dentistry and Medical Sciences, Faculty of Science and Health, Charles Sturt University, Wagga Wagga, NSW, 2678, Australia.

² Training Hub promoting Regional Industry and Innovation in Virology and Epidemiology (THRIIVE), Gulbali Institute, Charles Sturt University, Wagga Wagga, NSW, 2678, Australia.

*amali@csu.edu.au

Akabane orthobunyavirus (AKAV), an arbovirus that primarily infects ruminants, is a negative sense, single-stranded, segmented RNA virus that belongs to the family *Peribunyaviridae* and is transmitted by midges of the genus *Culicoides*. AKAV is prevalent worldwide including in Australia and is teratogenic to the fetus, causing significant economic losses. Targeting host nuclear transport could be an effective antiviral strategy as has been shown for other viruses, which is the main goal of our study. To accomplish this, AKAV infected cell lines are being studied with respect to various inhibitors. Our results show that importazole, an inhibitor of the classical and non-classical nuclear import, inhibits AKAV infection while gossypol (which targets only classical nuclear import) does not affect AKAV replication. This suggests that a host factor is transported into the nucleus via non-classical pathway that promotes infection—this proviral signaling molecule(s) identification and inhibition are the targets of this study.

Session 2

Developing the first Ghanaian English speech and language assessment tool

Josephine Ohenewa Bampoe¹, A/P Sarah Verdon¹, Dr. Karen Wylie², Dr. Laura Hoffman¹

¹School of Allied Health, Exercise and Sports Sciences, Charles Sturt University, Albury, Australia.

²Curtin School of Allied Health, Faculty of Health Sciences, Curtin University, Perth, Western Australia.

* jbampoe@csu.edu.au

Speech-language pathologists in Ghana lack culturally appropriate assessment tools to accurately identify speech and language disorders in children. The aim of this study was to develop a culturally appropriate assessment tool to identify speech and language disorders in Ghanaian English-speaking children. An exploratory mixed-method design was employed to develop the tool in three phases: (1) Developing a speech and language assessment; (2) Piloting the tool; (3) Collecting data from 100 children to standardise the tool. The presentation will discuss the results from the three phases in the development of the first Ghanaian English speech and language assessment tool for children between aged 5 and 10. This study provided a framework for developing a culturally appropriate assessment tool for multilingual children. It also provided speech and language therapists and children and their families with a culturally appropriate tool to identify speech and language disorders in Ghana.

Impact of human milk oligosaccharide (HMO) supplementation on learning and memory ability of piglets in 8-armed radial maze

Adikari Arachchige Dilki Indrachapa Adikari^{1*}, Bing Wang¹, Amin Md Mahmudul¹, Tanjina Amin¹, Wentian Li¹ & Lucy Walsh¹

¹School of Agricultural, Environmental and Veterinary Sciences, Gulbali Research Institute, Charles Sturt University, Wagga Wagga, New South Wales 2650, Australia

*dadikariarachchige@csu.edu.au

HMOs are the third most abundant carbohydrates after lactose and lipids. HMOs have a wide range of health benefits, yet debates persist regarding their potential merits on cognitive behaviour and neurodevelopment in infants' brain at cellular and molecular level. The present study investigates whether a combination or individual intervention of HMOs are able to improve cognitive behaviours and neurodevelopment in piglets, an ideal animal model for human infant. Domestic male piglets of aged 3 days (n=80) were randomly allocated to one of 5 groups fed pig milk replacer supplemented with different type of HMOs at dose level of 1.8g/L and a commercial pig milk replacer with methylcellulose as the control for 35-36 days. On 23 days of age, learning performance and memory of each piglet were assessed with the use of easy and difficult visual cues in an 8-arm radial maze. Raw data was analysed using SPSS (SPSS Inc, Chicago, IL) statistical analysis software considered statistically significant at * p<0.05.

The project was funded by Junlebao Dairy Group Ltd, and signed a confidentiality agreement with CSU.

Dance behaviour in cockatoos; implications for cognitive processes and welfare

Natasha Lubke^{1*}

¹School of Agriculture, Environmental and Veterinary Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2658, Australia.

*lubke.natasha@gmail.com

Parrots have been reported to dance, which is a form of play behaviour. Due to the nature of play being rewarding, dancing may have the potential to be a positive welfare indicator. In this study, I assessed cockatoo dancing behaviour, in two parts. First, I identified and defined cockatoo dance movements from videos on social media to reveal the extent of this behaviour in cockatoo species. Second, I conducted a preliminary experimental study on captive cockatoos in the Wagga Wagga Zoo to test whether music elicited dance behaviour. Key findings were that dancing behaviour in cockatoos is composed of many different movements than originally identified. Dance movements do not appear to be restricted to companion birds, since the cockatoos in the zoo showed dancing behaviour. In conclusion this research has allowed a greater understanding of cockatoo dancing behaviour and the potential of this behaviour to be a positive welfare indicator.

Parental and caregiver perspectives of the key worker model use in early childhood approach settings

Kirsten Pini^{1*}, Rassafiani, M.,¹, Cuming, T¹.

¹School of Allied Health, Exercise & Sport Sciences, Charles Sturt University, PO Box 789, Albury, NSW 2640, Australia.

* kirstenapini@gmail.com

Since the introduction of the National Disability Insurance Scheme (NDIS) in 2013, the Key Worker Model (KWM) has been utilised in Early Childhood Approach (ECA) settings. This study presents findings from a scoping review that explored parental and caregiver perspectives on the KWM's use in these settings. The review followed Mak and Thomas's (2022) procedural guidelines for scoping reviews, applying a systematic and comprehensive literature search to identify relevant studies without a restrictive theoretical framework. Several themes emerged regarding the implementation of the KWM, including its perceived benefits and challenges from the perspective of parents and caregivers. This presentation will highlight these themes and discuss the implications for practice, particularly in relation to family-centred care. Additionally, suggestions for future research will be offered to further explore how the KWM can best support families in ECA settings.

The pharmacokinetics of Δ^9 -THC in sheep

Stevens, S. A.^{1*}, Edwards, S. H.¹, Noble, G. K.¹, Scrivener, C. J.¹, Krebs, G. L.¹, Petzel, C. E.¹, May, C. D.², Tai, Z. X.², Blake, B. L.³ and Dods, K. C.⁴

¹School of Agricultural, Environmental & Veterinary Sciences, Charles Sturt University, Wagga Wagga, NSW 2678, Australia.

²ChemCentre, Bentley, WA 6102, Australia

³Hemp Feed Solutions, Vasse Valley, WA, Australia

⁴SAGE Consultancy, Dianella, WA 6059, Australia

*sastevens@csu.edu.au

With the ever-increasing interest in industrial hemp (iHemp) as a feed for livestock it is important to investigate how the cannabinoids contained therein are absorbed, metabolised, distributed and eliminated by ruminants, including Δ^9 -tetrahydrocannabinol (Δ^9 -THC). Eight Merino ewes were orally dosed with 177 mg Δ^9 -THC/kg BW (two half doses, 12 h apart). This dose was calculated based off a realistic dose of Δ^9 -THC that a sheep could consume over a day if they were to graze an iHemp crop in Australia. Following administration, Δ^9 -THC was detectable in the plasma of all eight sheep 216 h post dosing but by 264 h Δ^9 -THC was only detectable in the plasma of two sheep, resulting in an average elimination half-life of 31.4 (\pm 13.87) h. Δ^9 -THC was detectable in the subcutaneous fat of four of the eight sheep 28 d post administration but was undetectable in all eight sheep at d 91.

A preliminary study of intraperitoneal fluid administration to neonatal calves

Ferguson K.P.^{1*}, Quinn, C.T.¹, Moffat, A.G.¹, & Gunn, A.J.¹

¹School of Agricultural, Environmental and Veterinary Sciences Charles Sturt University, Locked Bag 588, Boorooma Street, Wagga Wagga, NSW 2678, Australia.

*katefergo15@live.com

Fluid therapy is required to treat dehydrated neonatal calves. Intraperitoneal fluid therapy (IPFT) has been cited to be an effective treatment for these dehydrated animals. It has not been considered a routine treatment option because of reported risks and unknown efficacy of fluid and electrolyte absorption. This study aims to investigate the safety and efficacy of IPFT. Six calves were used in this study. Four litres of isotonic saline was administered IP to four calves. Clinical and blood parameters were collected before, during and after fluid administration in all of the study animals. Preliminary data demonstrated changes in fluid dynamics and blood electrolyte concentrations, illustrating the occurrence of absorption. No evidence of inflammation or other adverse effects were detected. This data will be analysed further to provide an insight into the efficacy of IPFT as a rehydration regimen for dehydrated neonatal calves.

“But a cog in the machine”: Perspectives of occupational Therapists on health equity challenges across regional, rural and remote Australia

Harman, Stephanie¹, Hayes, Karen¹, Skinner, Ian¹, & Dos Santos, Vagner¹

¹School of Allied Health, Exercise and Sports Science, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2658, Australia.

*stephharman07@hotmail.com

As geographical remoteness increases across Australia, health outcomes decrease. Occupational therapists working in regional, rural, and remote areas are more likely to see injustices that may be invisible to metropolitan therapists; however, this perspective has not yet been investigated. Examining health equity challenges from occupational therapists' perspectives aims to provide meaningful information to inform change. A mixed methods study was designed to collect qualitative and quantitative data by completing an online survey. A snowballing sampling method was used for recruitment. Data was collected and analysed using thematic analysis. Seventy-seven occupational therapists completed the study, with varying themes emerging within the data relating to health equity challenges in non-metropolitan Australia. Themes are explored to analyse how occupational therapists view attempts at mitigating inequitable service provision across the nation. Results of this study will provide valuable information on the effectiveness of implementing nationwide policies in regional, rural, and remote areas.

Ecology and phenology study of sticky nightshade (*Solanum sisymbriifolium* Lam) for invasion management in Australia

Md Shoriful Islam^{1,2*} John Broster^{1,2}, Hanwen Wu³, & Asad Asaduzzaman^{1,2}

¹School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Wagga Wagga, NSW 2658, Australia.

²Gulbali Institute for Agriculture, Water and the Environment, Charles Sturt University, Wagga Wagga, NSW 2678, Australia

³Department of Primary Industries and Regional Development, New South Wales

*mdshislam@csu.edu.au

Sticky nightshade is an annual or short-lived perennial, herbaceous weed species that has been seen to endanger agricultural and local biodiversity globally. This exotic species introduced into Australia competes with crops and pastures. Unfortunately, over the last few years, there has been a marked increase in infestation records of this weed in NSW, Victoria, ACT, and QLD. Sticky nightshade contains toxic substances (steroidal glycoalkaloids) that are suspected to have detrimental effect on livestock. Its stress tolerance capacity, high seed production rate, and propagation through roots and stems contribute to its widespread distribution of this species and makes its management more challenging. However, the key to a sustainable weed management programme relies on a thorough understanding of the biology and ecology of the target weed. Such information helps to understand the key mechanisms of weed that lead to the establishment, adaptation, spread, and persistence of invasive plant species in agroecosystems.

Evaluation of beekeeper perspectives of current honeybee pests, diseases and their impact in southern and eastern Australia

Gabrielle Goldsworthy^{1*}, Allworth, M.B.¹, Hernandez-Jover, M¹, Somerville, D², Whitten, M³

¹ School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2658, Australia.

² NSW Apiarists Association, PO BOX 3055, West Tamworth, NSW 2340, Australia

³ When Bee Foundation, 96 Harbours Road, Yendon, VIC 3352, Australia

*gabrielle@beechworthhoney.com.au

The Australian honeybee industry is facing significant pest and disease challenges after the Varroa mite (*Varroa destructor*) incursion in 2022. As beekeepers transition to a management strategy and learn to live with the disease; it is expected that the impacts of endemic pests/diseases will become greater due to weakened hives with varroa infestation. This coincides with low honey prices and poor future honey production prospects, exacerbating the effects of increased cost of production with increasing costs associated with control and management of pests and diseases. The aim of this research is to determine commercial beekeepers' perceptions towards honeybee pests, diseases and their impacts within southern and eastern Australia. This will be achieved through a survey asking for information on their beekeeping enterprise, outlook on the industry, ranking of pests/diseases in order of their perceived importance and then specific questions related to the pests/diseases managed in their hives.

Theatrical improvisation in STEM Education: enhancing the sparkle of our educators

Catherine Lockley^{1*}

¹School of Dentistry and Medical Sciences, Faculty of Science and Health, Charles Sturt University, Wagga Wagga, NSW, 2678, Australia.

*clockley@csu.edu.au

This narrative literature review explores the impact of dramatic improvisation training on the science communication skills and job well-being of university STEM teachers. It delves into the historical context of science communication, the psychological implications of adopting an arts-based approach, and the practical benefits of integrating dramatic techniques into STEM pedagogy. The review also considers the future of STEM education, emphasizing the importance of screen dialogue, lighting, and camera angles in the digital age.

Does a low-fidelity canine suspensory ligament model improve veterinary student confidence and preparedness during live ovariohysterectomy surgery?

Perez De Villarreal, N.^{1*}, Dockray, E.¹ & Rotne, R.¹

¹School of Agricultural, Environmental, and Veterinary Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2658, Australia.

*nperezdv@gmail.com

Canine ovariohysterectomy (COVH) is a routine surgical procedure performed in veterinary practice and may be considered a day-one competency for veterinary graduates. Existing low-fidelity COVH models fail to realistically replicate suspensory ligament rupture; a challenging component of COVH, that contributes to student feelings of being underconfident and unprepared. This study aims to develop a low-fidelity canine suspensory ligament model to support the development of student confidence and preparedness in rupturing the suspensory ligament, creating a mesovarium window, and triple-clamping the ovarian pedicle prior to live animal surgery.

Project methodology includes paired, retrospective, cross-sectional questionnaires distributed to fourth-year veterinary students undergoing spey clinic in 2024, along with expert evaluation of the model from experienced veterinary surgeons. Qualitative, descriptive statistical data analysis of questionnaire responses will be undertaken to determine if the model improves student confidence and preparedness by providing an inexpensive, realistic surgical training tool prior to live animal surgical exposure.

Institutional analysis of agricultural water governance in Bhutan: An exploration of water sharing and allocation.

Kelly Tamang^{1*}

¹School of Agricultural, Environmental, and Veterinary Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2658, Australia.

* ktamang@csu.edu.au

Access to water is essential for food production and institutions responsible for managing water resources play a pivotal role in its protection and distribution. This study seeks to explore the role of institutions in agricultural water sharing and allocation in Bhutan. The investigation will be conducted at three levels: national, district, and local. At the national and district levels, the study will examine the evolution of institutional arrangements for water governance and the factors driving these changes. The analysis will also focus on the key actors involved and the mechanisms for water sharing and allocation in the agricultural sector. At the local level, the study will evaluate the institutionalised processes of customary and traditional practices for water sharing and allocation, and how these have evolved over time. The study will also investigate how institutions either facilitate or constrain access to water resources for agricultural purposes and assess its implications on community livelihoods. This study will adopt an exploratory sequential design of mixed-methods. This involves document analysis, interviews with key stakeholders, and household surveys. Semi-structured interviews with key informants will inform a questionnaire survey with households. A deductive and inductive approach of data analysis will be followed, which will include descriptive statistics as well as thematic and narrative analysis. The findings from this study aim to deepen the understanding of the institutions involved in water sharing and allocation by employing a methodological combination that could provide valuable insights for informing policy and practice.

Insect-based animal feed: Australian consumer attitudes

Lakshmi Gopinath^{1,2*}, Abishek Santhakumar^{1,2}, Anthony Saliba³ and Christopher Blanchard^{1,2}

¹School of Dentistry and Medical Sciences, Faculty of Science and Health, Charles Sturt University, Wagga Wagga, NSW 2678, Australia.

²Gulbali Institute, Charles Sturt University, Wagga Wagga, NSW 2678, Australia.

³ School of Psychology, Charles Sturt University, Wagga Wagga, NSW 2678, Australia

*lgopinath@csu.edu.au

With rising global population and ever-increasing protein demand, finding sustainable animal feed alternatives to animal protein, soy and fishmeal is imperative. Insects with their high protein content, ability to grow on biowaste, high feed conversion efficiency, low resource utilisation and reduced greenhouse gas emissions are sustainable sources of nutritive and bioactive compounds for feed. *Hermetia illucens* or black soldier fly larvae (BSFL) grow on varied biowaste, with nutritional composition influenced by rearing substrates. This study involves comparative

compositional analysis of BSFL reared on different biowaste using chromatographic and mass spectrometric techniques. This would offer insights into optimising BSFL feed nutritive value and provide pathways for valorising biowaste. Given low consumer acceptance of edible insects and limited studies on acceptance of insect-fed animal products, another objective is evaluating Australian consumer attitudes to insect-fed animal products to understand consumer barriers to uptake of such products, enabling the commercial application of this research.

Investigation of equine corneal surgical techniques utilising an ex vivo large animal cornea model

Fretton, J.S.^{1*}, Hughes, K.J.¹, Peters, A.¹ & Labens, R.¹

¹School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2678, Australia.

*jfretton@csu.edu.au

Management of diseases of the equine cornea frequently requires surgical intervention, including the application of amniotic membrane transplants or corneal grafts. Techniques for equine corneal surgery have been developed from surgical principles in other species. Surgical fixation of graft materials requires placement of sutures or the use of tissue adhesives, which can be implicated in surgical complications or failure. This research project aims to develop an ex vivo large animal cornea model on which surgical interventions can be performed and simulation of eye movement and eyelid pressure can be applied. The effect of suture material and size on suture integrity will be investigated in corneal graft and amniotic membrane transplant models. It is anticipated that the findings of these investigations will contribute to the refinement of equine corneal surgical techniques, including the application to clinical cases, with improved outcomes.

Biofertiliser-based organic amendments: A new approach to saline stress management in faba bean

Mariam Khanam^{1,2*}, Jason Condon^{1,2}, Jeffrey McCormick^{1,2} & K. M. Shamsul Haque^{1,2}

¹School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Wagga Wagga, NSW 2678, Australia

²Gulbali Institute for Agriculture, Water and the Environment, Charles Sturt University, Wagga Wagga, NSW 2678, Australia

* mkhanam@csu.edu.au

Salinity is encroaching in Australia's cropping soils, primarily due to poor water management, including a massive expansion of irrigated croplands in southern NSW and elevated water tables due to deforestation, which hampers grain yield by causing osmotic, ionic, and oxidative stress to broadacre crops. Salinity could impact soil nutrient availability, pH, and microbial activity, and a salinity-sensitive crop like faba bean could lose up to 25% yield with an EC of ~3dS/m. A sustainable solution should include an environment-friendly mitigation of salinity. Biofertiliser-based organic soil amendments may increase the relative abundance of beneficial halo-tolerant microbes to enhance nutrient uptake and plant recovery from salt-induced injury. A dynamic salt movement within a landscape will also be assessed to see the spatial and temporal change in salinity in selected soil-impacted soils. The current research project may open a new strategy to bring 4.5 million hectares of land in Australia under cultivation.

Session 3

Does dual banding of phosphorus fertiliser promote better root growth at depth?

Olivia Brunton^{1, 2*}, McCormick, J.¹, Haling, R.², Condon, J.¹, & Watts-Williams, S.³

¹School of Agriculture, Environmental and Veterinary Sciences, Charles Sturt University and Gulbali Research Institute, Wagga Wagga, NSW 2658, Australia.

²CSIRO Agriculture and Food, GPO Box 1700, Canberra, ACT 2601, Australia.

³The Waite Research Institute and School of Agriculture, Food and Wine, The University of Adelaide, PMB 1, Glen Osmond, SA, 5064, Australia

*obrunton@csu.edu.au

Phosphorus (P) fertiliser placement deep in the soil profile has improved crop production, particularly in environments where surface P availability is low and/or frequent soil surface drying occurs during crop growth. Modelling studies indicate that 'favourable' conditions for deep banding are likely to occur infrequently in southeastern Australia but may still benefit crops by promoting more root growth at depth. A field experiment in southern NSW was conducted to investigate the response of species with contrasting root systems (wheat and lentil/chickpea) to different P fertiliser strategies. P fertiliser was applied as a single surface band or as dual P bands, i.e., both a surface and deep band (20 cm). Dual P provided no additional benefit to aboveground yield or root growth at depth cf. surface application alone. Under scenarios where soil surface fertility is moderately high and the soil surface remains moist during crop growth, dual P placement is not recommended.

Effect of growing legumes one or two seasons prior to wheat on protein composition.

Md Rahmatuzzaman Rana^{1,2}, Randy Adjonu^{1,2}, Abishek Santhakumar^{1,2}, Christopher Blanchard^{1,2}

¹School of Dentistry and Medical Sciences, Faculty of Science and Health, Charles Sturt University (CSU), Wagga Wagga, NSW, 2678, Australia.

² Gulbali Institute, Charles Sturt University, Wagga Wagga, New South Wales, 2678, Australia.

*rzaman.fet@gmail.com

Wheat is unique among cereal crops due to its exceptional rheological properties, primarily attributed to its storage proteins (gliadins and glutenins). These proteins, collectively known as gluten, play a crucial role in determining the end use quality of wheat products. The composition and quantity of gluten proteins are influenced by genetic factors, environmental conditions, and agronomic management practices such as fertilization, irrigation, and stubble management etc. While nitrogen fertilisation has great impact on grain yield and protein content and quality, inefficient application can result in high production costs and adverse environmental impacts. Artificial N fertilization is mostly used because it can be readily adjusted, but inefficient application leads to high production costs and negative environmental consequences through water pollution and greenhouse gas emissions. However, biological nitrogen fixation (BNF) is an attractive option for sustainable agriculture, whereby legumes in association with soil rhizobia fix atmospheric nitrogen that subsequent plants can use. Therefore, legume-wheat crop sequence may positively impact wheat grain yield and quality traits like protein content and composition. Although the positive impacts of legume prior crops on wheat protein content have been documented, there is limited knowledge on the impact of growing different legume types one or two seasons prior on wheat grain quality. Furthermore, the potential impact of several agronomic management like

artificial N fertilization rate, timing, splitting etc. on protein quality and dough rheology warrants investigation. This study aims to quantify the effect of crop sequence and different agronomic management on wheat quality (e.g. protein composition and dough rheological properties).

Effects of age at first calving on milk production, health and reproduction in primiparous Holsteins on Australian commercial farms.

A. Lean^{1,2,3,4}, Dr H Golder^{1,2}, Adj. Prof. I. Lean^{1,2}, Prof. J. Quinn^{3,4}, Dr D Sheedy^{1,2}, Assoc. Prof. A. Gunn^{3,4}

¹Scibus, Camden ²Dairy Up, Camden, ³Charles Sturt University, School of Agriculture, Environment and Veterinary Sciences, Wagga Wagga ⁴Gulbali Institute, Wagga Wagga

*andrewl@scibus.com.au

Calving heifers at younger ages is a method of management suggested to increase farm efficiency. The benefits of younger age at first calving (AFC) suggested are increased lifetime milk production, earlier return on investment, decreased greenhouse gas emissions, reduced generation interval and improved reproductive performance. Risks associated with breeding heifers earlier are decreased first lactation production, fatty udder syndrome, calving difficulties and stillbirths. Effective growth of heifers before and after breeding can lower the chances of these occurring. A meta-analysis and cohort study will investigate the most effective AFC in dairy heifers for production, reproduction and health. 492 heifers were weighed and enrolled into groups based on their first mating age. A smaller cohort of heifers were blood sampled for targeted metabolomic, hormonal and amino acid analysis. Heifers will be monitored for reproductive performance, health outcomes and milk production during their first lactation. These studies will look to increase the understanding of AFC management and its effects on heifers in dairy herds.

Changing and emergent cultural landscapes and heritage potential of European Christmas markets

Murray Parker^{1*}, Dirk HR Spennemann², Jennifer Bond²

¹ Faculty of Science and Health, Charles Sturt University,
PO Box 789, Albury, NSW 2640, Australia.

² Gulbali Institute of Agriculture, Water & Environment, Charles Sturt University,
PO Box 789, Albury, NSW 2640, Australia.

*muparker@csu.edu.au

Multisensory cultural research is an emerging field. Whilst studies have investigated individual sensory heritage components, on-site research of integrated multisensory heritage is currently lacking. We aimed to investigate heritage significance of five multisensory-rich European Christmas markets (Germany, UK), using on-site interviews (n=58) and a stallholder survey (n=74) over the 2023 Christmas period. This study enabled comparison of imparted heritage significance with respect to participant localness and cultural background, addressing questions of heritage authenticity and intergenerational heritage potential. We found that each market had distinctive levels of sensory and non-sensory heritage significance, reflecting variance of population, cultural diversity, market histories, commercial exploitation, religion and politics. Heritage issues were evident across all markets, with degree of change reflecting transition speeds. It is concluded that heritage bestowal and potential cannot be assumed to be similarly impactful across all market sites and that Christmas markets which cannot be singularly representative as places of culture.

Development of a diagnostic pipeline to detect *Trichomonas tenax* using CRISPR-Cas12a

Slattery, J.^{1,2*}, Walduck, A.¹, Kalinna, B.¹, & Pal, M.²

¹Rural Health Research Institute, Charles Sturt University, PO Box 883, Orange, NSW 2800, Australia.

²School of Dentistry and Medical Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2678, Australia.

*JoshRSlattery@gmail.com

The aetiology of periodontal disease, the greatest cause of tooth loss in adults, is poorly understood. Research suggests the protozoan *Trichomonas tenax* is associated with the disease. However, microscopy, the primary detection method, lacks specificity and sensitivity — hindering understanding. Cas12a, a CRISPR associated protein, utilises guide RNA (crRNA) to bind and cleave target DNA. Cas12a-crRNA targeting *T. tenax* DNA may bind and — through collateral activity — cleave a fluorescent reporter. To develop a highly specific and sensitive detection method for *T. tenax* using Cas12a technology. crRNAs, designed in silico to target *T. tenax* DNA, were complexed with Cas12a, then combined with synthetic *T. tenax* DNA and a fluorescent reporter, with fluorescent output measured via a plate reader. 12 crRNAs demonstrated acceptable specificity, with 4 pM DNA the lowest detection limit determined. The specificity of the assay was acceptable; however, future studies are required to improve sensitivity.

Elucidating the role of *Cryptovalsa ampelina* in Australian vineyards

Andres-Sodupe, M.^{1,2*}, Sosnowski, M. R.^{3,4}, Hrycan, J.², Steel, C.C.^{1,2}, Savocchia, S.^{1,2}

¹ Faculty of Science and Health, School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Wagga Wagga, New South Wales, 2678, Australia.

² Gulbali Institute, Charles Sturt University, Wagga Wagga, New South Wales, 2678, Australia

³South Australian Research and Development Institute, Adelaide, SA, 5001, Australia.

⁴ School of Agriculture, Food and Wine, Waite Research Institute, The University of Adelaide, Adelaide, SA 5005, Australia

*mandressodupe@csu.edu.au

Eutypa dieback is a grapevine trunk disease caused by several different ascomycete fungi belonging to the Diatrypeaceae family. *Cryptovalsa ampelina* is one of the fungal species implicated in this disease complex, however little is known about this fungus despite it being prevalent in Australian wine regions. To further understand the role of *C. ampelina* in Australian vineyards, woody tissues were sampled from 12 wine regions across the country and 47 isolates of the fungus were recovered. A high prevalence of this fungus has been found in the Clare Valley and Derwent Valley regions. The identity of *C. ampelina* was confirmed using Loop-mediated isothermal amplification (LAMP). *In vitro* evaluation of the effect of temperature on mycelial growth has been completed with optimal growth occurring between 22.5°C and 27.5°C, varying between isolates. These results provide a basis for subsequent experiments which will analyse pathogenicity, fungal interaction, and optimum climatic conditions for its development.

Parasites from Australian invasive species and their prevalence in native marsupial species

Keira Brown^{1*}, Shamsi, S.¹, Barton, D.¹, & Rendall, AR.²

¹Charles Sturt University (School of Agricultural, Environmental, and Veterinary Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2658, Australia.

²Deakin University (School of Life and Environmental Sciences, Deakin University, Burwood, Vic 3125, Australia)

*keibrown@csu.edu.au

Australia is home to many unique and endemic animal species that have suffered extensively due to invasive species invasions. Since the arrival of European settlers countless species have been introduced for farming, aesthetics, hunting, pest control, and as pets. However, since their introduction many have become over abundant and a pest in Australia. The direct impacts of these species are the focus of many studies, with indirect impacts receiving less attention. Even rarer are parasitic infections that were simultaneously introduced with these species considered as a threatening process. Research has demonstrated the impacts; particularly protozoan parasites can have on Australian endemic species. This project therefore aims to identify the prevalence of parasitic infections of protozoan parasites within the Sarcocystidae family in invasive and native species in Australia and develop a broader understanding of the life cycle of these species to further inform appropriate management actions.

Characterisation of nuclear localization mechanisms of Herpesvirus Basic Leucine Zipper (bZIP) proteins

N. A. Nadeeka Nethmini^{*}, Camilla M. Donnelly, Jeffrey D. Nanson, Martin Pal, Jade K. Forwood, Brian P. McSharry

Gulbali Institute and School of Dentistry and Medical Science, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2658, Australia.

* nnarasinghearachchige@csu.edu.au

bZIP transcription factors are dimeric cellular proteins that play a key role in regulating host gene expression. Herpesviruses are important pathogens of both animals and humans, often capturing host encoded proteins to facilitate their infection and replication. A number of herpesviruses encode homologues of bZIP transcription factors, including the MEQ protein (from Marek's disease virus, an oncogenic herpesvirus affecting chickens) and Zta (from Epstein-Barr virus, a human herpesvirus associated with a number of cancers). These proteins are important virulence factors, that traffic to the nucleus of the cell, enabling herpesviruses to control both host and viral transcription. This study characterizes interactions between viral bZIP proteins and the host importin α/β complex, which mediates nuclear transport via recognition of nuclear localization signals. Techniques used will include electrophoretic mobility shift assays, fluorescence polarization and X-ray crystallography to reveal biochemical and structural interactions. Preliminary data suggest distinct bZIP-importin binding motifs, potentially informing antiviral strategies targeting these interactions to regulate nuclear import efficiency.

Identification and pathogenicity of persimmon dieback pathogens in Australia

Taguam, J.D.W^{1,2,*}, Stodart, B.J^{1,2}, Steel, C.C^{1,2}, Billones-Baaijens, R³, Fuss, A.M⁴, Savocchia, S.^{1,2}

¹Faculty of Science and Health, School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Wagga Wagga, New South Wales, 2678, Australia.

²Gulbali Institute, Charles Sturt University, Wagga Wagga, New South Wales, 2678, Australia.

³Affinity Labs, Australian Wine Research Institute, Adelaide, South Australia.

⁴Persimmons Australia Inc., Queensland, 4350, Australia.

*jtaguam@csu.edu.au

Persimmon dieback has emerged as a significant issue for Australian growers, exhibiting symptoms such as vascular tissue staining and, in severe cases, tree death. While dieback is well-studied in other woody crops, it remains understudied in persimmons. This study aimed to identify the causal pathogens of persimmon dieback using a polyphasic approach and to assess their pathogenicity on Jiro and Fuyu cultivars. Diseased persimmon samples were collected from major growing regions across five Australian states. Pathogenicity tests using detached stem assays, combined with morphocultural and molecular analyses, identified *Neofusicoccum* spp., *Diaporthe* spp., and *Neopestalotiopsis* spp. as the causal fungal pathogens. All three genera were found to be pathogenic to both Jiro and Fuyu, with *Neofusicoccum parvum* being the most aggressive. Ongoing pathogenicity tests using potted persimmon trees aim to further elucidate the disease dynamics. This is the first report on the aetiology and pathogenicity of persimmon dieback pathogens in Australia.

Grapevine root distribution and implications for water and nitrogen uptake in cover cropped vineyards

Calvin Lam^{1*}, Xinyi Zhang², Stewart Field³, Junqi Zhu⁴, Damian Martin⁴, James Bristow⁴, Jason Smith¹

¹Gubali Institute, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2658, Australia

²School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2658, Australia

³Nelson Marlborough Institute of Technology, Budge St., Blenheim, New Zealand

⁴Plant and Food Research, Budge St., Blenheim, New Zealand

*calam@csu.edu.au

The use of cover crops is increasing in viticulture as a natural soil management option to improve the sustainability of vineyard production. However, concerns remain for possible negative impacts of water and nutrient competition on grapevine yield and fruit composition. This research aims to improve the management of grapevine-cover crop competition using field-based characterization of grapevine and cover crop root distribution, through to testing the functional implications with whole grapevine production models. An extraction-modelling approach will be used, combining traditional soil coring methods with a 3D structural root generator to quantify the distribution of roots in multiple vineyard ground management contexts across Orange and Marlborough wine regions. These quantified root distribution patterns produced from the root generator will then be inputted to two distinct computational models to simulate grapevine uptake and production. The current presentation will be a report on the progress so far first year into this project.

Can volunteering enhance mental resilience in student paramedics?

Clare Sutton^{1*}, Patricia Logan², Russell Roberts³

¹School of Nursing, Paramedicine and Healthcare Sciences, Charles Sturt University, Bathurst, NSW 2795, Australia.

²School of Dentistry and Medical Science, Charles Sturt University, Bathurst, 2795, Australia.

³School of Business, Charles Sturt University, Orange, 2800, Australia.

*csutton@csu.edu.au

A higher incidence of mental illness is evident among Paramedics. Resilience has been identified as a protective factor that positively influences coping strategies to mitigate the negative impact of organisational stressors and traumatic events. Volunteering has reported benefits on mental health and wellbeing. To explore impact of volunteering on resilience in student paramedics; To develop an understanding of how volunteering may contribute to mental health and wellbeing of student paramedics. Semi-structured interviews were conducted to explore the impact of volunteering on resilience in student paramedics. Data was analysed using a constructivist grounded theory methodology. HREC H20240. Key themes: operationalisation of resilience; sense of purpose; social connectedness; developing experience through exposure and reflection. Participants identified attributes developed or enhanced through volunteering that allowed them the opportunity to demonstrate resilience through the utilisation of coping strategies and identified other factors supportive of mental health and wellbeing.

Assessing pruning method to prevent infection of grapevines by trunk disease pathogens

Colin Starkey^{1*}, Billones-Baaijens, R.^{2,3}, Stodart, B.^{1,2}, Smith, J.P.², & Savocchia, S.^{1,2}

¹School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2658, Australia.

²Gulbali Institute, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2658, Australia.

³Affinity Labs, PO Box 197, Glen Osmond, SA 5064, Australia.

*cstarkey@csu.edu.au

Grapevine trunk disease pathogens infect via pruning wounds resulting in significant yield loss, dieback and eventual death of vines. Organic producers currently have no preventative methods to protect pruning wounds, therefore alternative methods to protect the vines are required. Alternate pruning techniques (1cm above the node, 3cm above the node, 45° angle towards the infection source, and 45° away from the infection source) randomly allocated to detached canes in a rainfall simulator were assessed, under glasshouse conditions. Visual assessments of cane health resulted in no difference between pruning methods, but a higher proportion of live canes were found within the *Neofusicoccum luteum* (NL) treatment. No statistical significance was observed with either the cut angle or pathogen viability on media for either pathogen... The pruning methods across both inoculum sources demonstrated similar results with no pruning method being statically significant Therefore, on detached canes, no alternative pruning technique offered adequate protection.

Is raw meat and seafood a source of gastrointestinal disease in Australian cats? A meta-analysis, survey of cat owners and microscopic examinations of cat faeces

Jefferson, N. S.^{1,2*}, Malik, R.³, Thotagamuwa, A.¹ & Shamsi, S.^{1,2}

¹School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2658, Australia.

²Gulbali Institute, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2658, Australia.

³School of Veterinary Science, The University of Sydney, Camperdown, NSW 2050, Australia.

*njefferson@csu.edu.au

The main objective of this project was to identify if meat- or seafood-borne parasites could be sources of gastrointestinal disease in Australian cats. The project involved a meta-analysis of the VetCompass Australia database, a survey of Australian cat owners and cat faecal sample examinations. The purpose of conducting a meta-analysis was to identify signs of disease related to the diets of cats. This was done to examine the prevalence of gastrointestinal signs of disease in cats fed raw food. An online survey was used to understand the types and sources of raw foods being fed to Australian cats. Faecal floatations and microscopic examinations were performed to identify any food-borne parasites, their eggs and/or their larvae in the faeces of cats. The project is still in progress, and the outcomes will be available upon submission of the Bachelor of Animal Science Honours dissertation.

Valorisation of canola oil refining waste-streams – potential for recovery of bioactive compounds

Milad Kazemi^{1*}, Randy Adjonu^{1,2}, Paul Prenzler^{2,3}, & Lachlan Schwarz^{4,5}

¹School of Dentistry and Medical Sciences, Charles Sturt University, Wagga Wagga, NSW 2658, Australia

²Gulbali Institute, Charles Sturt University, Wagga Wagga, NSW 2678, Australia

³School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Wagga Wagga, NSW 2658, Australia

⁴School of Agricultural and Wine Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2678, Australia

⁵Australian Research Council (ARC) Industrial Transformation Training Centre (ITTC) for Functional Grains, Graham Centre for Agricultural Innovation, Charles Sturt University, Wagga Wagga, NSW 2650, Australia

*mkazemi@csu.edu.au

Agri-food waste is a global issue, with 1.3 billion tons of food wasted annually, valued at over 1 trillion USD. Effective management, especially through circular economy strategies, is required to mitigate environmental and economic challenges. The canola oil industry, an AU\$ 5.2 billion agribusiness in Australia, generates significant waste through its refining process, including gum, soap-stock, spent bleaching earth and deodorizer distillate. These waste-streams are removed to improve the stability and sensory qualities of the oil. However, this process also results in the loss of valuable bioactive compounds such as tocopherols, sterols and polyphenols, affecting nutritional properties of the final oil. Currently, these by-products have limited uses, are often discarded or added to animal feed, and represent an underutilized resource. Valorising these waste-streams and putting valuable compounds back into economy offers innovation, economic gain, and significant potential for sustainable growth in both the canola and agri-food industries.

Circulating miRNA as a novel biomarker for the early detection of *M. paratuberculosis* infection in dairy cattle.

Georgia Kennedy^{1,2*}, Sameer Pant¹, Marina Alexander².

¹Charles Sturt University (¹School of Agricultural, Environmental and Veterinary Sciences, Locked Bag 588, Wagga Wagga, NSW 2658, Australia.

²CSIRO (²Australian Centre for Disease Preparedness, 5 Portarlington Rd, East Geelong, VIC 3219, Australia.)

*gekennedy@csu.edu.au

Johne's Disease (JD) is a fatal, chronic wasting disease of concern to the dairy industry caused by *Mycobacterium avium subspecies paratuberculosis* (MAP) infection^[1]. JD impacts dairy herds worldwide and causes losses due to decreases in milk production, slaughter value and premature culling^[2]. MAP has a several yearlong latency period in which intermittent shedding of bacteria in faeces and milk perpetuates the cycle of infection^[3]. During the latency animals show no clinical signs of disease and current diagnostics (ELISA, faecal culture, PCR) are not adequate in detecting infection prior to the onset of clinical disease^[4]. miRNA are small (~22 nucleotides) non-coding RNA molecules produced by lymphatic cells and circulated in blood within extracellular vesicles^[5]. Emerging as diagnostics in human disease, we propose that miRNAs could serve as a novel diagnostic biomarker for early detection of MAP infection in dairy cows ^[6].

1. Field, N.L., et al., *Mycobacterium avium subspecies paratuberculosis* infection in cattle – a review in the context of seasonal pasture-based dairy herds. *Irish Veterinary Journal*, 2022. 75(1).
2. Rasmussen, P., et al., Economic losses due to Johne's disease (paratuberculosis) in dairy cattle. *Journal of Dairy Science*, 2021. 104(3): p. 3123-3143.
3. Whitlock, R.H. and C. Buergelt, *Preclinical and Clinical Manifestations of Paratuberculosis (Including Pathology)*. *Veterinary Clinics of North America: Food Animal Practice*, 1996. 12(2): p. 345-356.
4. Nielsen, S.S. and N. Toft, Ante mortem diagnosis of paratuberculosis: a review of accuracies of ELISA, interferon-gamma assay and faecal culture techniques. *Vet Microbiol*, 2008. 129(3-4): p. 217-35.
5. Li, Y., et al., EV-origin: Enumerating the tissue-cellular origin of circulating extracellular vesicles using exLR profile. *Comput Struct Biotechnol J*, 2020. 18: p. 2851-2859.
6. Abdipourbozorgbaghi, M., et al., Circulating miRNA panels as a novel non-invasive diagnostic, prognostic, and potential predictive biomarkers in non-small cell lung cancer (NSCLC). *British Journal of Cancer*, 2024.

Session 4

Missing replicate imputation for metabolomics experiments

Thomas Dicks^{1*}, Paul Prenzler¹, Douglas Rutledge^{1,2,3,4}, & Danielle Ryan¹

¹School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University

²Université Paris-Saclay, Faculté de Pharmacie, France

³Muséum national d'Histoire naturelle, France

⁴Universidade Tecnológica Federal do Paraná, Brazil

*tdicks@csu.edu.au

Metabolomics is an analytical chemistry approach that can be used to investigate and predict disease or outcomes from disease treatment. An important aspect of metabolomics is the preparation and/or analysis of samples in replicate. However, it is common that data for a sample replicate, or replicates of multiple samples are lost. This can cause the number of observations in treatment groups to become unbalanced, precluding the use of important statistical analyses. Data imputation may provide a means restore balance among treatment groups, but current approaches are not directly applicable.

In this work we devised and tested two data matrix reshaping methods which would allow data imputation algorithms to impute missing replicates and restore balance to treatment groups. To do this, three data base data matrices were employed in the simulation of over 800 data matrices with increasing numbers of samples missing a replicate. These simulated matrices were then reshaped and imputed. Imputed matrices were compared to the base matrices. Results showed that reshaping allowed the accurate imputation of missing replicates, thus demonstrating this as a useful approach for balancing treatment groups.

Effect of dietary human milk oligosaccharides intervention on brain neurotransmitters and metabolites in piglets: an in vivo MRS study

Md Mahmudul Amin^{1*}, Xiaoming Zheng², Zhaolin Chen³, Bing Wang¹

¹School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2658, Australia.

²School of Dentistry and Medical Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2658, Australia.

³Faculty of Information Technology, Monash University, 770 Blackburn Rd, Clayton, VIC 3800, Australia.

*mdamin@csu.edu.au

Human milk oligosaccharides (HMOs) are the third most abundant biomolecules with more than 200 structures and are rarely found in cow's milk based infant formulas. This research will use magnetic resonance spectroscopy (¹H-MRS) technique to evaluate how dietary sialylated HMOs (sHMOs) and neutral HMOs (nHMOs) alone or in combination or in combination with lactoferrin enhance brain metabolites in neonatal piglets, an ideal animal model for human infants. Three-days-old, 80 male domestic piglets will be double blind randomly assigned to one of five groups and fed either a pig milk replacer with methylcellulose (placebo control) or sHMOs or nHMOs or sHMOs and nHMOs or sHMOs, nHMOs and lactoferrin for 35~36 days. On 38~39-day, all piglets will undergo ¹H-MRS using a Siemens Skyra 3T MR scanner. The successful research outcomes would visualize how 33 neurotransmitters and metabolites respond to different types of HMOs alone or in combination or in combination with lactoferrin.

The impact of paramedic communication in shaping women's birth experiences

Haley Findlay^{1*}, Supervisors Maria, S.¹, Francis, K.², Anderson, J.¹ & Clegg, L.³

¹School of Nursing, Paramedicine and Healthcare Sciences, Charles Sturt University, Panorama Avenue Bathurst, NSW 2795, Australia.

² School of Nursing, Paramedicine and Healthcare Sciences, Charles Sturt University, Wagga Wagga, NSW 2627, Australia.

³ School of Nursing, Paramedicine and Healthcare Sciences, Charles Sturt University, 7 Major Innes Rd Port Macquarie, NSW 2444, Australia.

*hfindlay@csu.edu.au

Globally, over one-third of women experience birth trauma, which can lead to maternal mental health conditions. Inadequate communication from healthcare professionals is a significant contributing factor. Paramedics play a key role in providing care during out-of-hospital childbirth however, there is a dearth of existing literature on their contribution. This research aims to examine how paramedic communication influences women's birth experiences from a feminist perspective. Using a constructivist grounded theory methodology, data will be gathered through semi-structured interviews. Purposive sampling will be employed to recruit between fifteen and twenty participants. Concurrent data collection and constant comparative analysis will inform theoretical sampling until theoretical saturation is reached. The research aims to generate a theory grounded in data, co-constructed by the researcher and participants. Ultimately, this theory seeks to inform paramedic education to enhance communication skills and improve women's experiences during out-of-hospital childbirth.

A retrospective study investigating the incidence, frequency, severity and duration of hypotension in dogs admitted to a referral hospital for CT imaging.

Emily Healey^{1*}, Christopher Quinn & Francesca Male

¹School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2658, Australia.

*emilyvhealey@gmail.com

Hypotension is a commonly reported canine anaesthetic complication and has the capacity to be life threatening if not corrected. Previous studies have reported a wide incidence range in healthy surgical patients undergoing routine desexing. However, it is currently unknown if these findings persist in other canine populations, such as those anaesthetised for diagnostic CT imaging. Patients undergoing CT are often of a higher ASA classification and are generally older than those undergoing routine desexing and may have an increased likelihood of comorbidities. Existing studies have largely defined hypotension as a dichotomous finding, where mean arterial pressure (MAP) ≤ 60 mmHg throughout the anaesthetic period. This retrospective study investigates the incidence, frequency, severity and cumulative duration of hypotension in canine patients admitted to the Veterinary Clinical Centre for CT imaging. This was achieved by retrieving patient anaesthetic records to evaluate hypotension as well as subject and procedural risk factors.

Projection of climate change and extreme climatic events during cropping seasons in northwest Bangladesh

Md Belal Hossain^{1*}, Ketema Zeleke^{1,3}, Shamsul Haque^{1,3}, Bin Wang^{2,3} & De Li Liu^{2,3}

¹School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Wagga Wagga, NSW 2658, Australia.

²Department of Primary Industries and Regional Development, New South Wales

³Gulbali Institute for Agriculture, Water and Environment, Charles Sturt University, Wagga Wagga, NSW 2658, Australia

*mdbhossain@csu.edu.au

This study investigated the changes in key climatic variables and extreme events for the near future (2031-2065) and far future (2066-2100) during the major crop growing periods in the northwest Bangladesh. Results indicate that maximum and minimum temperatures are expected to rise consistently in all seasons, while the rise is more pronounced in high emission scenarios. Potato and wheat crops are anticipated to receive the greatest maximum and minimum temperature rise, respectively, while rainfed rice will see the least. Rainfall is expected to increase notably during rainfed rice but decrease during potato season. All crops are projected to face more heat stress days and accumulated growing degree days, indicating shorter crop growing periods in the future. Furthermore, heavy rainfall days are predicted to increase during rainfed rice period at all locations, while the total number of rainy days are expected to decline, suggesting higher rainfall intensity in the future.

Addressing knowledge gaps in out-of-hospital cardiovascular care for female patients

Erin Isaacs^{1*}, Timothy Spokes¹, Tegan Brown¹, & Sokcheon Pak¹

¹School of Nursing, Paramedicine and Healthcare Sciences, Charles Sturt University, Bathurst NSW 2795, Australia.

*es.isaacs@outlook.com

Medical studies have primarily focused on male physiology, with recent acknowledgment on the impacts of sex differences disease recognition and management. This is compounded by epidemiological data in female mortality and morbidity compared to males, which shows significant contrasts between both sexes. The objective of this project is to explore sex-based differences in out-of-hospital cardiovascular care and awareness. A literature review will be conducted to explore current paramedic cardiovascular assessment and treatment variables, alongside associated subjects in clinician practice to analyse themes and contributing factors. Additionally, differences and effects of sex variances in physiology, steroid sex hormones, electrocardiograms, pharmacokinetics and pharmacodynamics will be included. It is hypothesised females receive worse health outcomes due to physiological differences requiring alternative methods of care. This research will highlight gaps in current Australian practitioner education standards, addressing aspects of cardiovascular emergency education that can be improved at a tertiary level.

Molecular determinants of human milk oligosaccharides as a bioactive compound for eye and vision development and cognitive behaviour in piglets

Tanjina Amin^{*}, Allan Gunn, Bing Wang

¹School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2658, Australia.

*tamin@csu.edu.au

Human milk oligosaccharides (HMOs) are crucial bioactive components in human milk, known for supporting immunity, gut, and neurodevelopment. However, their effects on vision and cognition remain underexplored. This double-blind, randomized study investigates the impact of HMOs and lactoferrin on the visual system and working memory in piglets. Eighty piglets will be assigned to five groups receiving different diets for 35 days: a control group receiving pig milk replacer with methyl cellulose; a group with acidic HMOs; a group receiving neutral HMO; a group with both neutral and acidic HMOs; and a group receiving the same HMO combination plus lactoferrin. A 5 board-based paradigm will be conducted to assess working memory. RNA sequencing and immunohistochemistry will analyze gene expression and protein localization in the retina, optic nerve, and cerebral cortex. This study aims to uncover how early nutrition with HMOs and lactoferrin influences vision development, providing insights into optimizing early-life outcomes.

Biosecurity in backyard poultry in Australia: Impact on the emergence of zoonoses and antimicrobial resistance

Tahura Khanam Munmun^{1,2*}, Marta Hernandez-Jover^{1,2}, Jade Forwood^{1,2}, Subir Sarker³, Suman Das Gupta^{1,2}

¹School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2658, Australia.

²Gulbali Institute, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2658, Australia.

³College of Public Health, Medical, and Veterinary Sciences, James Cook University, 1 James Cook Drive, Townsville, Queensland 4811, Australia.

*tmunmun@csu.edu.au

Biosecurity is crucial across all poultry production systems, including backyard poultry, yet there is a notable lack of comprehensive data on biosecurity measures, zoonotic disease risks, and antimicrobial usage in backyard poultry in Australia. This project aims to address these gaps by investigating current biosecurity practices and antimicrobial usage among backyard poultry farming and exploring their relationship to zoonotic disease risks and antimicrobial resistance (AMR). A cross-sectional study will be conducted with backyard poultry farmers using an online survey questionnaire, followed by follow-up research with consenting participants to collect samples, including poultry swabs, environmental samples, and eggs. Next-generation sequencing will be employed to analyse pathogens, while advanced epidemiological modelling will assess the impact of biosecurity practices on disease emergence and AMR. The findings will help quantify risks associated with biosecurity measures, contributing to enhanced zoonotic diseases management and AMR strategies, ultimately promoting public health safety and sustainable agricultural practices.

A systematic review of interventions for the treatment of chronic pain in adults residing in regional, rural and remote Australia

Shephard, S.^{1*}, Freire, K², Thomas, C.J³, Newton-John, T⁴, & Skinner, I. W⁵

¹ School of Allied Health, Exercise and Sports Sciences, Charles Sturt University, Wagga Wagga NSW 2678 Australia

² Three Rivers DRH, Charles Sturt University, Albury NSW 2640, Australia

³ School of Social Work and Arts, Charles Sturt University, Wagga Wagga NSW 2678, Australia

⁴ Graduate School of Health, University of Technology Sydney, Chippendale NSW 2008 Australia

⁵ School of Allied Health, Exercise and Sports Sciences, Charles Sturt University, Port Macquarie NSW 2444, Australia

*sshephard@csu.edu.au

This systematic review aimed to assess the extent to which rural Australians are represented in clinical pain management research. The review protocol was registered on OSF and PROSPERO, and five databases were searched in September 2023. Studies involving adults with chronic pain residing in rural and remote Australia were included. Eligible studies evaluated any interventions and comparators for pain, psychosocial outcomes, disability, and quality of life. Independent dual reviewers screened records and assessed risk of bias using Cochrane RoB-2 or RoBINS-I tools. Of 6078 studies screened, 10 met inclusion criteria, and 1 additional record was found via citation tracking. Preliminary analysis indicates that rural Australians are underrepresented and largely invisible in pain management research, and existing evidence is generally of low quality. This review highlights the critical gaps in rural representation within pain management research. Overall evidence was limited, and many interventions studied did not specifically consider the rural context, nor align with current guidelines for high value care.

Risk factors associated with the occurrence of Canine Gastric Dilatation and Volvulus in Australia: a retrospective descriptive analysis

Ogle-Lang, S^{1*}, Fountain, J.¹, Rotne, R.¹

¹School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2658, Australia.

*shivvlang@gmail.com

Gastric Dilatation and Volvulus (GDV) is a rapidly life-threatening, acute disease state that may impact any canine, but primarily affects large deep-chested breeds. Currently, there is no known cause for this potentially fatal condition, making identifying the factors that may place individual canines at increased GDV risk crucial. With such information, owners and practitioners alike can be empowered to enact appropriate preventative procedures and risk mitigation strategies more effectively; reducing the mortalities associated with GDV. While such research into factors has been conducted overseas, limited research into identifying risk factors to the Australian canine demographic specifically has been conducted. Hence this retrospective study, accessing patient records collated by VetCompass from over 200 general practice clinics all around the country, aims to explore patient and environmental risk factors, describe the classic patient profile for an Australian GDV case, and generate directed acyclic graphs to display the many interrelationships between factors.

A novel multi-domain *Schistosoma mansoni* vaccine

Alexander Tynan^{1*}, A/Prof H. Kalinna¹, Prof Shokoofeh Shamsi², & Dr Justin Roby³

¹Rural Health Research Institute, Charles Sturt University, PO Box 883, Orange, NSW 2800.

²School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2678, Australia. ³Gulbali Institute, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2678, Australia.

*atynan@csu.edu.au

Schistosomiasis impacts over 200 million people globally, with treatment limited to one drug that is facing issues like drug resistance and failure to prevent reinfection. This study aims to develop a multi-domain vaccine that targets key proteins in *Schistosoma mansoni*, enhancing immune response and efficacy. Five antigens—FABP, TPI, TSP, Calpain, and Cathepsin B—were combined into a single protein construct through epitope prediction and structural modelling. The construct is expressed in *E. coli* and yeast systems, with immunogenicity assessed in mice through antibody and cytokine profiling. Using tools like AlphaFold, the 3D structure was optimised to closely mimic native proteins, improving immune recognition potential. This multivalent approach provides a promising pathway towards sustainable schistosomiasis control.

Promoting pro-climate behaviour in healthcare for value-based outcomes

Franklin, S.^{1*}, Brabin, J.¹, & Jakimowicz, S¹

¹School of Nursing, Paramedicine and Healthcare Sciences, Charles Sturt University, Panorama Ave. Bathurst NSW 2795, Australia.

*sfranklin@csu.edu.au

Introduction: In healthcare, the pursuit of healing and well-being often stands in contrast to its significant environmental footprint. This study explores the tension between healthcare's role as a contributor to and a solution for climate change. **Methods:** Employing a mixed-methods approach, we analysed literature, conducted a cross-sectional survey, and performed interviews to assess the barriers and facilitators of pro-climate behaviour (PCB) adoption. **Results:** While healthcare professionals demonstrate a high awareness of climate change, systemic barriers such as insufficient infrastructure, policy gaps, and workplace cultures hinder widespread PCB engagement. Despite this, participants acknowledged the value of aligning sustainability efforts with healthcare's mission. **Conclusions:** Overcoming these challenges requires more decisive leadership, policy reforms, and cultural shifts within institutions, positioning healthcare to not only reduce its carbon footprint but also enhance patient outcomes by promoting sustainable practices.

Session 5

Construction of the female thorax (ribcage) sizes and female body habitus using computed tomography (CT) images

Ruth Pape^{1*}, Xiaoming Zheng¹, Cynthia Cowling²; Caryn West³, Ann Carstens^{4,5}, John Xie⁶

¹School of Dentistry and Medical Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2678, Australia.

²Department of Medical Imaging and Radiation Sciences, School of Primary and Allied Health Care Medicine, Nursing and Health Sciences, Monash University, Wellington Road, Clayton Victoria, Australia.

³School of Nursing, Paramedicine and Healthcare Sciences, Charles Sturt University, Bathurst, NSW, Australia.

⁴School of Animal, Environment and Veterinary Sciences, Veterinary School, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2678, Australia.

⁵Companion Animal Clinical Studies, Faculty of Veterinary Science, University of Pretoria, Onderstepoort, South Africa.

⁶Quantitative Consulting Unit, Office of Research Services and Graduate Studies, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2678, Australia.

Address correspondence to: Mrs Ruth Pape

*E-mail: rpape@csu.edu.au

Positioning of the breast during mammography examination is critical to the successful production of optimum quality images. However, the variation in female body habitus affects mammography positioning and image quality. This study aims to report the construction of female thorax (ribcage) sizes and quantified categories of female body habitus.

A retrospective analysis of 347 female computed tomography (CT) chest axial scans were retrieved from an open access database to construct female ribcage sizes. A Bayesian Network (BN) model was used to predict 3-D ribcage image data and female body habitus categories were quantified.

Majority of the chest images reflect females aged 40-89 years. Female body habitus were categorised into four types with quantified percentages; extremely lean (0.29%), lean (20.2%); norm (55.6%) and curvaceous (23.9%).

This study constructed a range of female thorax using CT chest images to support improved positioning practices and subsequent breast cancer diagnosis.

A Design of Experiment (DoE) approach to develop an immunogenic thermostable novel spray-dried vaccine against Psittacine Beak and Feather Disease

Tridip Das^{1,2,3}, Babu K. Nath², Pangkaj K. Dhar^{1,3}, Suman Das Gupta¹, Andrew Peters¹, Jade K. Forwood^{2,3,4}, Shane R. Raidal⁵, Shubhagata Das^{1,2,3}

¹School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Wagga Wagga, NSW-2678, Australia

²Biosecurity Research Program and Training Centre, Gulbali Institute, Charles Sturt University, Wagga Wagga, NSW-2678, Australia

³Training Hub Promoting Regional Industry and Innovation in Virology and Epidemiology, Gulbali Institute, Charles Sturt University, Wagga Wagga, NSW-2678, Australia

⁴School of Dentistry and Medical Sciences, Charles Sturt University, Wagga Wagga, NSW-2678, Australia

⁵Association of Avian Veterinarians Australasian Committee, Australia

* tdas@csu.edu.au

Beak and feather disease virus (*Circovirus parrot*) associated Psittacine Beak and Feather Disease (Pbfd) is a major health concern for parrots and cockatoos worldwide that threatens several endangered psittacine species with extinction. A practical and safe antigen delivery system for vulnerable and nestling birds is critical for a robust vaccination regimen. We developed a novel spray dried Pbfd vaccine in thermostable powder formulation for minimally invasive non-parenteral delivery of circovirus antigen. Design of Experiment (DoE) approach was used to optimise spray drying parameters to achieve an optimum yield of homogenous powder with a desired macromolecular size range (>5µm). This spray dried formulation demonstrated high thermostability and long shelf-life of the capsid antigen. Safety and suitable delivery routes for this vaccine formulation were tested in an experimental chicken model followed by multiple modalities of immunodiagnosics for proof of seroconversion. Detectable seroconversion was observed after two booster doses (six-week post inoculation) in ocular and intramuscular routes, whereas per-cloacal route of delivery did not demonstrate positive seroconversion. No significant tissue damage or adverse vaccine reaction was identified by histopathological assessment of vaccine sites or by haematology and biochemistry assays. This research developed an innovative spray dried formulation for virus-like particle-based subunit vaccine candidates with desired antigenicity, thermostability and shelf life. This formulation could be beneficial for captive management practices and future wildlife vaccination strategies against avian circoviruses.

Can self-tensioning orthopaedic suture material (Dynacord™), minimize postoperative loss of abduction in equine prosthetic laryngoplasty?

Stemmet, G.P^{1*}, Hughes, K.J and Labens, R.

¹School of Agricultural, Environmental, and Veterinary Sciences, Faculty of Science and Health, Charles Sturt University, Wagga Wagga, NSW, Australia, 2678

*gstemmet@csu.edu.au

Recurrent laryngeal neuropathy (RLN), common in athletic horses, involves neurogenic atrophy and dysfunction of the cricoarytenoideus dorsalis muscle, resulting in collapse of the arytenoid cartilage during exercise, airway obstruction, respiratory noise, and poor performance. Prosthetic laryngoplasty (PL) is the treatment of choice for RLN and involves a non-absorbable prosthesis to fix the arytenoid cartilage in partial abduction. Gradual loss of arytenoid abduction is an important post operative complication of PL. Adaptations to the technique have aimed at minimizing this loss of abduction. Recently, a novel, high-strength, self-tensioning orthopaedic suture material was developed to minimize suture laxity and knot slippage in human orthopaedic surgical procedures. This research project aims to apply self-tensioning suture material to PL constructs. First, a biomechanical study will be performed to compare the functional shortening of a self-tensioning orthopaedic suture (Dynacord™) with braided polyester (Ethibond) under loads relevant to PL. Second, performance of the suture in a physiological approximating laryngeal environment will be assessed ex vivo using cadaveric larynges. It is anticipated that the study findings will enhance PL and application could result in reduced loss of abduction post-operatively.

Assessing the burden and major risk factors of metabolic syndrome among adults in rural Australia

Uptal Mondal^{1*}

¹School of Dentistry and Medical Sciences, Charles Sturt University, Wagga Wagga, New South Wales, Australia

*umondal@csu.edu.au

Metabolic syndrome (MetS) is characterized by a cluster of conditions, including hypertension, hyperglycaemia, hypertriglyceridemia, reduced high-density lipoprotein cholesterol (HDL-C), and abdominal obesity. The prevalence of MetS in Australia is rising exponentially, driven by increasing rates of central obesity, visceral fat accumulation, lifestyle-related risk factors, and an aging population. Numerous studies have demonstrated that individuals living in rural and remote areas, including Indigenous Australians, are disproportionately afflicted by MetS and often mismanaged clinically due to remoteness. This study aims to assess the prevalence of MetS and its major risk factors among residents of rural and remote localities in Australia. It will include systematic reviews, narrative reviews, and an analysis of publicly available secondary data. The systematic reviews will be conducted and reported in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. As part of the secondary data analysis, we will analyse data from the National Health Survey (NHS) and the National Aboriginal and Torres Strait Islander Health Survey (NATSIHS). Systematic reviews will also assess the burden and major risk factors associated with metabolic syndrome in rural and remote populations and identify evidence-based interventions. Narrative reviews will assess the prevalence and trends of chronic diseases related to metabolic disorders. Through the secondary data analysis, we will investigate trends, distribution, prevalence, and risk factors of MetS within rural and remote populations in Australia. The results of this study will provide a better understanding of the aetiology of MetS in rural Australia and provide the foundation for future policy development.

Conserving stocky galaxias: Opportunities and challenges in husbandry and translocation

Iswantari, A.^{1,2*}, Baumgartner, L.¹, Doyle, K.¹, Price, A.^{1,2}, & Lintermans, M.³

¹School of Agricultural, Environmental and Veterinary Science, Charles Sturt University,
Elizabeth Mitchell Dr, Albury, NSW 2640, Australia.

²Gulbali Institute for Agriculture, Water and Environment, Charles Sturt University,
Elizabeth Mitchell Dr, Albury, NSW 2640, Australia.

³Centre for Applied Water Science, Institute for Applied Ecology, University of Canberra,
Bruce, ACT 2617, Australia.

*aiswantari@csu.edu.au

The Stocky Galaxias (*Galaxias tantangara*) is a native fish species with a highly restricted distribution and is listed as critically endangered. A population of Stocky Galaxias is currently housed at Charles Sturt University, Albury, where they have been successfully bred in captivity and captively bred juveniles have been released to a designated translocation site. Despite this success, challenges remain in optimising growth and breeding in captivity, as well as in increasing the survival of the fish at the translocation site. A key knowledge gap concerns the diet and nutritional requirements of the species, as food is crucial for fish growth and reproductive success. Additionally, environmental factors, particularly temperature, could influence these aspects of development. Understanding both dietary and environmental factors is essential to ensure that captive breeding success is maximised, and potential translocation sites can provide the necessary habitat to support the establishment of self-sustaining populations.

Quantifying Farmer's Economic, Social, and Environmental Preferences and Choices

Pradeep Rai^{1*}, Sosheel Godfrey¹, Tom Nordblom¹, Christine Storer¹, Ryan H.L. Ip³, & Karl Behrendt²

Institution 1 (¹School of Agricultural, Veterinary and Environmental Science, Charles Sturt University, Wagga Wagga, NSW 2658, Australia

prai@csu.edu.au; sgodfrey@csu.edu.au; tnordblom@csu.edu.au; cstorer@csu.edu.au).

Institution 2 (²Food, Land and Agribusiness Management, Harper Adams University, UK, kbehrendt@harper-adams.ac.uk)

Institution 3 (³Department of Mathematical Sciences, University of Technology, Auckland, New Zealand, ryan.ip@aut.ac.nz)

*prai@csu.edu.au

Industrial and green revolutions have transformed agricultural production systems resulting in a significant decline in food poverty. However, the earlier conventional agriculture is often associated posing environmental degradations across the world including Australia. Thus, Regenerative Agriculture (RA) has emerged as an environment-centric agriculture shunning synthetic inputs, emphasising holistic management and meeting sustainability objectives as their core priorities. On the other hand, today's modern conventional agriculture (MCA) also prioritises environmental stewardship and emphasises sustainability in a similar way to that of RA. Thus, gap exists as to how RA compared to MCA proponents perceive and achieve the interconnected economic, social and environmental outcomes of sustainability? Farmers' responses received through an online survey will be analysed using "Maximum Difference Scaling" and "Choice-based Conjoint" to quantify and determine the sustainability preferences prioritised by RA and MCA adherents

including the tradeoffs they face. Hence, contribute to new knowledge-building pertaining to agricultural sustainability in the Australian context.

Assessing the risk of noise-induced hearing loss among dentists

Sarah Amr^{1*}, Second-Author, B.B.^{1,2}, Third-Author, C.C¹, & So-on, D.D²

¹Institution 1 School of dentistry and medical sciences, Charles Sturt University, Wagga Wagga, NSW 2658, Australia.

*samr@csu.edu.au

Can prolonged and/or sudden exposure to certain noises from dental instruments induce hearing loss? Previous research seems to indicate they can, with dentists and dental assistants under a higher risk of noise-induced hearing loss (NIHL) than the general population. Although some information is available on the volume of noise produced by dental instruments, the issue is more complex than simply defining a volume threshold, with little to no consideration given to the proximity to the noise source; duration and rate of exposure; and the frequency of noise. Furthermore, communication is required between the dentist, assistant and patient, meaning that regular hearing protection to reduce the risk of NIHL may not always be an option. Therefore, the aim of the project is to identify the existing rates of NIHL among dentists through subjective means (survey) and objective means by conducting audiometric tests (optional). The project also aims to identify the volume and frequency of noise produced from different dental instruments in a clinical setting and assess the risk that this poses to NIHL over time. With this information, consideration will be made on ways to mitigate this risk and manage noise levels within a dental clinic.

The effect of nicotinic acid supplementation on NAD⁺ metabolite concentrations in follicular fluid and serum of aged mares: Can we reverse the age associated decline in oocyte quality?

Good, L.R.^{1*}, Grupen, C.G.², Gunn, A.¹, Gibb, Z.³, and Clulow, J.R.^{1,3}.

¹School of Agricultural, Environmental, and Veterinary Sciences, Faculty of Science and Health, Charles Sturt University, Wagga Wagga, NSW, Australia, 2678.

²Sydney School of Veterinary Science, Faculty of Science, The University of Sydney, Camden, NSW, 2570

³Priority Research Centre for Reproductive Science, University of Newcastle, Callaghan, NSW, Australia, 2308

*laura.dennis999@gmail.com

The decline in fertility seen with increasing age is multifactorial, with reduced oocyte quality being a major contributor. Depletion of nicotinamide adenine dinucleotide (NAD⁺) concentrations has been implicated in the decline of oocyte quality. Nicotinic acid (NA) supplementation increases the concentration of NAD⁺ precursors in the follicular fluid of mares. Appropriate safe dose and treatment duration is unknown. A nonrandomised crossover study design with a 2 week washout period was employed utilising mares (n=13) between 15-22 years of age. Treatment was commenced from early oestrus with; 1) placebo, 2) 1.5g of NA, or 3) 3g of NA administered once daily *per os* for 4 days. Serum and follicular fluid were collected and analysed via mass spectrometry. The concentrations of multiple key metabolites involved in the NAD⁺ biosynthesis and secretion were increased in serum and follicular fluid in both treatment groups. Supplementation with 3g/day NA had more profound effect.

Prevalence and risk factors for salmonella shedding in horses presenting with gastrointestinal disease in Australia: A retrospective multicentre study

S.P. McTernan^{1*}, J. Heller¹, C. Y. Begg¹, L. M. Begg², D. J. Feary², M. A. Thirouin³, K. H. Todhunter³, M. Whiteford⁴, J. E. Clulow¹, S. L. Raidal¹, K. J. Hughes¹

¹School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University, Wagga Wagga, NSW, 2650; ²Randwick Equine Centre Equine Specialists, Horsley Park, NSW 2175;

³Newcastle Equine Hospital, Broadmeadow, NSW 2292; ⁴Bendigo Equine Hospital, Bendigo, Victoria 3550

*smcternan@csu.edu.au

Salmonella infection in horses is responsible for morbidity, mortality and economic and reputational losses, worldwide. Increased risk of shedding *Salmonella* in hospitalised horses with gastrointestinal disease has been reported. The prevalence and risk factors for *Salmonella* shedding in horses with gastrointestinal disease in Australia are unknown. A retrospective cohort study of 798 horses and foals presenting with gastrointestinal disease to four referral hospitals in south-eastern Australia between January 2020- May 2024. Faecal samples were submitted for *Salmonella* culture or PCR at admission and during hospitalisation. Clinical records, *Salmonella* status, and survival to discharge were analysed. Animal Ethics Committee approval: A22437. Overall, the prevalence of *Salmonella* shedding was 23.3% (95% confidence interval: 20.3-26.3%). There was an association between *Salmonella* shedding and horses presenting for colic ($p=0.003$), but no association with diarrhoea/colitis ($p=0.8$) or veterinary hospital ($p=0.8$). General anaesthesia/surgery for colic was also associated with *Salmonella* shedding ($p<0.001$). There was no association between *Salmonella* status and survival to discharge. Horses with colic, particularly those undergoing surgery, should be considered at high risk for *Salmonella* shedding and a potential source of environmental contamination and nosocomial infection. Accordingly, hospital biosecurity protocols to prevent *Salmonella* transmission should include post-operative colic patients.