



Charles Sturt  
University

2025 Higher Degree by  
Research and Honours  
Symposium  
18th & 19th November

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[2025 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 Symposium!

This year's Symposium is an opportunity for research students in the Faculty of Science and Health to present their research to their peers in a hybrid 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 an unprecedented number of students presenting their research.

We hope you enjoy the 2025 symposium!

# Program Summary

Day 1: Tuesday 18 <sup>th</sup> November 2025		Room/Stream
8:30am – 9:00am	In Person Registration	Foyer of Convention Centre, Wagga
9:00am – 9:20am	Introduction by A/Prof Samantha Jakimowicz, Sub Dean Graduate Studies with Welcome to Country by Luke Wighton <a href="#">Join stream here</a>	A
9:20am – 9:45am	Guest speaker Professor Sarah O'Shea, Dean Graduate Research <a href="#">Join stream here</a>	
9:50am – 10:50am	Student presentations – Session 1 <i>Please see student presentation program below for stream links, <a href="#">pg 5</a></i>	A, B & C
10:50am – 11:30am	<b>Break</b>	Foyer of Convention Centre, Wagga
11:30am – 1:05pm	Student presentations – Session 2 <i>Please see student presentation program below for stream links, <a href="#">pg 6</a></i>	A, B & C
1:05pm – 2:15pm	<b>Lunch Break</b>	Foyer of Convention Centre, Wagga
2:15pm – 3:30pm	Student presentations – Session 3 <i>Please see student presentation program below for stream links, <a href="#">pg 7</a></i>	A, B & C
3:30pm – 3:40pm	<b>Mini Break</b>	
3:40pm – 4:35pm	Student presentations – Session 4 <i>Please see student presentation program below for stream links, <a href="#">pg 8</a></i>	A, B & C
4:35pm	<b>First Day of Events Concluded</b>	
Day 2: Wednesday 19 <sup>th</sup> November 2025		Room/Stream
9am – 9:45am	Welcome to Day 2: Panel Discussion with Prof Marta Hernandez, Prof Jane Quinn, Dr Martin Pal, Prof Sandra Savocchia and Professor Megan Smith, hosted by A/Prof Samantha Jakimowicz <a href="#">Join stream here</a>	A
9:50am – 11:05am	Student presentations – Session 1 <i>Please see student presentation program below for stream links, <a href="#">pg 9</a></i>	A, B & C
11:05am – 11:30am	<b>Break</b>	Foyer of Convention Centre, Wagga
11:30am – 1:05pm	Student presentations – Session 2 <i>Please see student presentation program below for stream links, <a href="#">pg 10</a></i>	A, B & C
1:05pm – 2pm	<b>Lunch Break</b>	Foyer of Convention Centre, Wagga
2pm – 3:15pm	Student presentations – Session 3 <i>Please see student presentation program below for stream links, <a href="#">pg 11</a></i>	A, B & C
3:15pm – 3:30pm	<b>Closing Comments</b> <b>Thank you for joining the symposium</b> <a href="#">Join stream here</a>	A

# Professional Development

## Keynote Speaker



Professor Sarah O'Shea is a nationally awarded educator and globally recognised expert in higher education equity, she has a particular passion for working with first-in-family students. As Distinguished Professor and Dean at Charles Sturt University, she brings over three decades of leadership in advancing equity, access, and student success across the tertiary sector. Professor O'Shea has secured over \$4 million in research funding and managed \$8 million in federal grants. A Principal Fellow of the HEA, Australian Learning and Teaching Fellow, and Churchill Fellow, she also co-edits the Research in Higher Education (SRHE/Routledge) book series and serves on global editorial boards, shaping policy, research, and practice across the sector.

## Research Panel: Who inspired your research journey?

Join this engaging panel session, chaired by Associate Professor Samantha Jakimowicz, Sub Dean (Graduate Studies), where senior researchers Professor Marta Hernandez, Dr Martin Pal, Professor Jane Quinn, Professor Sandra Savocchia, Associate Dean Research, and Professor Megan Smith, Executive Dean, share the people, moments, and mentors that shaped their research paths. We aim to inspire and connect new and completing HDR students across the Faculty of Science and Health.

## Explore your Resources – Information Posters

Please join us in thanking the support services that are always there in your research journey. Their information posters will be on display throughout the days. You can also contact any of the support services via the below.

- Academic Skills: [csu.edu.au/academicskills](https://csu.edu.au/academicskills)
- International Student Support: [international@csu.edu.au](mailto:international@csu.edu.au)
- Researcher Development: [researchsupport@cu.edu.au](mailto:researchsupport@cu.edu.au)
- Spatial Data Analysis Network (SPAN): [span@csu.edu.au](mailto:span@csu.edu.au)

OL = Online  
IP = In Person in Wagga

## Tuesday 18<sup>th</sup> November – 4 sessions

9:00am – 9:20am	<b>Introduction and Welcome to Country</b> <a href="#">Join stream here</a>		
9:20am – 9:45am	Guest speaker Professor Sarah O’Shea, Dean Graduate Research <a href="#">Join stream here</a>		
<b>Day 1</b>	<b>Room/Stream A</b> <a href="#">Join stream meeting</a> <b>Meeting ID:</b> 654 8571 8871	<b>Room/Stream B</b> <a href="#">Join stream meeting</a> <b>Meeting ID:</b> 676 2600 7866	<b>Room/Stream C</b> <a href="#">Join stream meeting</a> <b>Meeting ID:</b> 679 0893 0071
Chair	IP: Jodie Brabin	IP: Monjurul Islam	IP: Miss Saba
In Person Assessor	Dr Randy Adjonu	A/Prof Thiru Vanniasinkam	Prof Sandra Savocchia
Online Assessor	Dr Edward Anyasodor	Prof Kerrie Doyle	Dr Kristina Griffin
9:50am – 10:10am	<b>Dilki Adikari Arachchige</b> PhD Candidate  <a href="#">From diet to cognition: the role of human milk oligosaccharides (HMOs) in piglet learning and memory</a>	<b>Keira Brown</b> PhD Candidate  <a href="#">Presence and impact of parasites in Australian invasive species and native marsupials</a>	<b>Tom Dicks</b> PhD Candidate  <a href="#">Understanding the effects of fontan surgery by metabolomics: does it work?</a>
10:10am – 10:30am	<b>Tewodros Jember</b> PhD Candidate  <a href="#">Comparative analysis of PCR-high-resolution melt curve (HRM) and DNA sequencing for the identification of bacteria causing bovine mastitis</a>	<b>Tiarna Scerri</b> PhD Candidate  <a href="#">Emerging biotechnology in bovine mastitis treatment: farmer perspectives and preferences</a>	<b>Mitchell Lenehan</b> PhD Candidate  <a href="#">Woodland wellbeing: the benefits of woodland management</a>
10:30am – 10:50am	<b>Jordan Bathgate</b> PhD Candidate  <a href="#">Quantifying the shift in Australian spring and winter wheat traits and the link to increased grain yields</a>	<b>Pradeep Rai</b> PhD Candidate  <a href="#">The balancing act: quantifying farmers’ value-based sustainability choices</a>	<b>Letro</b> PhD Candidate  <a href="#">Modelling habitat suitability and conflict risk for tigers and dholes in Bhutan using species distribution models</a>
10:50am – 11:05am	<b>Marcos Andres Sodupe</b> PhD Candidate  <a href="#">Evaluation of the pathogenicity of cryptosporidium ampelina isolates collected from vineyards</a>	<b>Lachlan Cope</b> Honours Student  <a href="#">An investigation into perioperative surgical complications within CSU spey and neuter clinic between 2019-2025</a>	
11:05am – 11:30am	<b>Break (25min)</b>		

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<b>Day 1 Session 2</b>	<b>Room/Stream A <a href="#">Join stream meeting</a> Meeting ID: 654 8571 8871</b>	<b>Room/Stream B <a href="#">Join stream meeting</a> Meeting ID: 676 2600 7866</b>	<b>Room/Stream C <a href="#">Join stream meeting</a> Meeting ID: 679 0893 0071</b>
Chair	OL: Francette Geraghty-Dusan	IP: Calvin Wong	OL: Patience Moyo
In Person Assessor	Dr Asad (MD) Asaduzzaman	Dr Boris Budiono	Joanne Ashnest
Online Assessor	Dr Jed Brown	Prof Kerrie Doyle	A/Prof Paul Humphries
11:30am – 11:50am	<b>Sam Sheridan</b> PhD Candidate  <a href="#">Rethinking physical readiness in paramedicine education</a>	<b>Jaini Fakhruddin</b> PhD Candidate  <a href="#">Aerobic and flooded incubation of mo-enriched biochar: a study of molybdenum dynamics</a>	<b>Jodie Brabin</b> PhD Candidate  <a href="#">Engage, empower, explore: participatory action research in small island healthcare settings</a>
11:50am – 12:10pm	<b>Tana Cuming</b> PhD Candidate  <a href="#">Re-orienting a PhD project to centre Aboriginal research</a>	<b>Belal Hossain</b> PhD Candidate  <a href="#">Modelling climate change impact on rainfed rice production in northwest Bangladesh</a>	<b>Ann-Marie Brown</b> PhD Candidate  <a href="#">Enablers and barriers for high school students pursuing nursing as a career in Tasmania</a>
12:10pm – 12:30pm	<b>Jordan Treloar</b> PhD Candidate  <a href="#">Exploring the lived experiences of Australian sports fans and their interactions with the supercars championship</a>	<b>Mariam Khanam</b> PhD Candidate  <a href="#">Impact of summer rainfall variation on bacterial diversity in native salt-affected soils</a>	<b>Ash Gallagher</b> PhD Candidate  <a href="#">Towards safer practice: predicting and preventing injury in paramedics</a>
12:30pm – 12:50pm	<b>Caitlin Slaney</b> PhD Candidate  <a href="#">The multifaceted nature of community participation for children with communication support needs and their parents</a>	<b>Villy Kotevski</b> PhD Candidate  <a href="#">The potential of Australian macroalgae in wound healing</a>	<b>Wei Wang</b> PhD Candidate  <a href="#">Sustaining the health information management profession in a transforming health system: a normative approach</a>
12:50pm - 1:05pm	<b>Setognal Aychiluhm</b> PhD Candidate  <a href="#">Central obesity and its association with youth physical and mental health: evidence from the Australian national health survey</a>		<b>Luke Marks</b> PhD Candidate  <a href="#">The lived experience of leadership practice among advanced practice nurses in regional New South Wales: a hermeneutic phenomenological study</a>
1:05pm – 2:15pm	<b>Lunch Break (1hr 10 min)</b>		

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Day 1 Session 3	Room/Stream A <a href="#">Join stream meeting</a> Meeting ID: 654 8571 8871	Room/Stream B <a href="#">Join stream meeting</a> Meeting ID: 676 2600 7866	Room/Stream C <a href="#">Join stream meeting</a> Meeting ID: 679 0893 0071
Chair	IP: Ahmed Ishtiaque	IP: Jodie Brabin	OL: Sam Sheridan
In Person Assessor	Dr Leena Awawdeh	Dr Andreia Schineanu	A/Prof Samantha Jakimowicz
Online Assessor	Dr Toufique Soomro	A/Prof Pauletta Irwin	Dr Vivian Isaac
2:15pm – 2:35pm	<b>Yogita Sharma</b> PhD Candidate  <a href="#">Modulating the nutritional profile of sorghum through germination</a> IP	<b>Anais Blacklock</b> PhD Candidate  <a href="#">Assessing vegetation change and disturbance regimes in coastal headland ecosystems of the New South Wales (NSW) Mid-North Coast (MNC)</a> OL	<b>Nazia Rahman</b> PhD Candidate  <a href="#">Mechanistic insights into adenoviral nuclear import mediated by fiber-importin binding</a> IP
2:35pm – 2:55pm	<b>Milad Kazemi</b> PhD Candidate  <a href="#">Optimisation of saponification method for simultaneous quantification of tocopherols and phytosterols in canola oil refining by-products</a> IP	<b>Shahin Solgi</b> PhD Candidate  <a href="#">Future viticulture irrigation demand under climate change</a> OL	<b>Tayla Price</b> Honours Student  <a href="#">Evaluation of creatinine clearance in horses undergoing exploratory laparotomy</a> IP
2:55pm – 3:15pm	<b>Md Rahmatuzzaman Rana</b> PhD Candidate  <a href="#">Impact of prior legume crops on wheat flour protein composition and dough quality</a> IP	<b>Maddison Kersting</b> Honours Student  <a href="#">Perceptions and practices of veterinarians regarding diagnosis and treatment of acute pancreatitis in domestic canines</a> OL	<b>Tanvir Saikat</b> PhD Candidate  <a href="#">Elucidating the structures of nucleoprotein-phosphoprotein complexes for the development of inhibitors against high-risk paramyxoviruses</a> OL
3:15pm - 3:30pm	<b>Mamun Kabir</b> PhD Candidate  <a href="#">Effect of helicobacter pylori acquisition on gut microbiota alteration and cognitive development in children in Bangladesh</a> IP	<b>Calvin Wong</b> PhD Candidate  <a href="#">Development of a soil coring-modelling approach to better map grapevine root distribution in cover cropped vineyards</a> IP	<b>Teagan Colless</b> Honours Student  <a href="#">The effects of oral rehydration solution on rumen pH and blood glucose in feed restricted ewes</a> IP
3:30pm – 3:40pm	<b>Break (10 min)</b>		

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IP = In Person in Wagga

Day 1 Session 4	Room/Stream A <a href="#">Join stream meeting</a> Meeting ID: 654 8571 8871	Room/Stream B <a href="#">Join stream meeting</a> Meeting ID: 676 2600 7866	Room/Stream C <a href="#">Join stream meeting</a> Meeting ID: 679 0893 0071
Chair	OL: Farjana Haque	IP: Tegan Colless	OL: Miliqiyas Tantu
In Person Assessor	Dr Ben Stodart	Dr Glenys Noble	TBC
Online Assessor	Dr Nnamdi Mgbemena	Prof Rod Pope	Dr Brian Sengstock
3:40pm – 4:00pm	<b>Cassie Sutton</b> Honours Student  <a href="#">Evidence of renal tubular injury in feline patients after elective desexing</a> IP	<b>Md. Shoriful Islam</b> PhD Candidate  <a href="#">Unravelling the germination ecology of sticky nightshade in response to key environmental factors</a> IP	<b>Faisal Rehan</b> PhD Candidate  <a href="#">Epilepsy and oral health: exploring the connections</a> OL
4:00pm – 4:20pm	<b>Ireen Shanta</b> PhD Candidate  <a href="#">Trends and impacts of alternative chicken production in Bangladesh</a> IP	<b>Tanjina Amin</b> PhD Candidate  <a href="#">Bioactive roles of human milk oligosaccharides in working memory development in piglets</a> IP	<b>Noyal Tharayil</b> PhD Candidate  <a href="#">Investigating sorghum-derived peptides for cardiovascular disease and diabetes</a> IP
4:20pm - 4:35pm	<b>Ausraful Islam</b> PhD Candidate  <a href="#">Public health importance of paramyxovirus and hantavirus circulating among the common rodents and paramyxovirus among bats in and around human settlements in two selected districts of Bangladesh</a> OL		<b>Nayomi Danthanarayana</b> PhD Candidate  <a href="#">Metagenomic detection and characterisation of a novel Orthoflavivirus in Papua New Guinea mosquitoes</a> IP
4:35pm	<b>End of Day 1, We look forward to seeing you on Day 2</b>		

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## Wednesday 19<sup>th</sup> November – 3 sessions

9am – 9:45am	Welcome to Day 2: Panel Discussion with Prof Marta Hernandez, Dr Martin Pal, Prof Jane Quinn, Prof Sandra Savocchia and Professor Megan Smith hosted by A/Prof Samantha Jakimowicz		
	<a href="#">Join stream meeting</a>		
<b>Day 2 Session 1</b>	<b>Room/Stream A</b> <a href="#">Join stream meeting</a> <b>Meeting ID: 672 4102 2755</b>	<b>Room/Stream B</b> <a href="#">Join stream meeting</a> <b>Meeting ID: 675 7717 7501</b>	<b>Room/Stream C</b> <a href="#">Join stream Meeting</a> <b>Meeting ID: 685 1156 2149</b>
Chair	IP: Toni Hawkins	IP: Dr Andreia Schineanu	OL: Sam Sheridan
In Person Assessor	Prof Jane Quinn	Dr Nirodha Weeraratne	Prof Bing Wang
Online Assessor	Kathy Tori	Prof Robyn Watts	IP - Dr Paul Prenzler
9:50am – 10:10am	<b>Francette Geraghty-Dusan</b> PhD Candidate  <a href="#">Valuing one health</a>	<b>Nicki Duncan</b> PhD Candidate  <a href="#">Mapping off-channel habitats for holistic fish passage restoration benefiting fish and people</a>	<b>Nadeeka Narasinghe Arachchige</b> PhD Candidate  <a href="#">Characterisation of nuclear localization mechanisms of herpesvirus basic leucine zipper (bZIP) proteins</a>
10:10am – 10:30am	<b>Emily Wagon</b> PhD Candidate  <a href="#">Exploring equine encephalitis virus: how the viral capsid protein hijacks host cell receptors during nucleocytoplasmic transport</a>	<b>Negash Roba</b> PhD Candidate  <a href="#">Climate change will accelerate seasonal fire weather severity by 8–24% in Southeastern Australia</a>	<b>Yenealem Kebede</b> PhD Candidate  <a href="#">Role of sorghum phenolic compounds in modulating cardiovascular disease (CVD) risk: a systematic review</a>
10:30am – 10:50am	<b>Tanisha Cragg</b> Honours Student  <a href="#">The prevalence of pseudomonas aeruginosa in clitoral swabs from thoroughbred mares in eastern Australia from 2019-2025</a>	<b>Nani Das</b> PhD Candidate  <a href="#">Maize-rich diet: mitigating heat stress and improving production of lambs</a>	<b>Pete Tually</b> PhD Candidate  <a href="#">Correlating subjective evaluations in equine nuclear scintigraphy with radiomic profiles, serum osteocalcin and c-terminal telopeptides of type I collagen</a>
10:50am - 11:05am	<b>Naomi Kirkwood</b> PhD Candidate  <a href="#">Pharmacokinetics and pharmacodynamics of a sodium-glucose co-transporter 2 inhibitor in healthy horses</a>		<b>Md. Nazmus Sakib</b> PhD Candidate  <a href="#">Tracking the footprints of pandemic-generating vibrio cholerae in Australia</a>
11:05am – 11:30am	<b>Break (25 min)</b>		

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Day 2 Session 2	Room/Stream A <a href="#">Join stream meeting</a> Meeting ID: 672 4102 2755	Room/Stream B <a href="#">Join stream meeting</a> Meeting ID: 675 7717 7501	Room/Stream C <a href="#">Join stream Meeting</a> Meeting ID: 685 1156 2149
Chair	OL: Wei Wang	IP: Jaishree Ravidran	OL: Nicki Duncan
In Person Assessor	Dr Paul Prenzler	Dr Ben Stodart	Dr Alex Wittorff
Online Assessor	A/Prof Richard Culas	A/Prof Marco Paschoal	IP: Dr Martin Pal
11:30am – 11:50am	<p><b>Patience Moyo</b> PhD Candidate</p> <p><a href="#">Nurses working in acute care settings: experiences and perceptions of using structured clinical handover frameworks: a scoping review</a></p> <p>OL</p>	<p><b>Joshua Slattery</b> PhD Candidate</p> <p><a href="#">Using CRISPR to diagnose parasitic infections at the point-of-care</a></p> <p>OL</p>	<p><b>Abdullah Toqeer</b> PhD Candidate</p> <p><a href="#">A spatiotemporal machine learning framework to detect woody plant encroachment into hydrologically altered wetlands</a></p> <p>OL</p>
11:50am – 12:10pm	<p><b>Tameeka Mulquiney</b> Master's Student</p> <p><a href="#">Exploring the lived experiences of student midwives who have provided perinatal loss care: a systematic review</a></p> <p>OL</p>	<p><b>Benjamin Pak</b> Master's Student</p> <p><a href="#">The effects of modified rice bran arabinoxylan supplementation on the nutritional status of patients with colorectal cancer</a></p> <p>OL</p>	<p><b>Sang Le</b> PhD Candidate</p> <p><a href="#">Climate-driven agricultural transformation in the Vietnamese Mekong Delta: visibility, inclusion, and empowerment in gender, youth, and ethnicity</a></p> <p>OL</p>
12:10pm – 12:30pm	<p><b>Santosh Giri</b> PhD Candidate</p> <p><a href="#">The effects of parental adverse childhood experiences (ACEs) and childhood threat and deprivation on adolescent depression and anxiety: an analysis of the longitudinal study of Australian children</a></p> <p>OL</p>	<p><b>Md. Akeruzzaman Shaon</b> PhD Candidate</p> <p><a href="#">ExoPorous: an integrated platform for point-of-care detection of placental exosomal mRNAs in pregnancy complications</a></p> <p>OL</p>	<p><b>Ben Wilson</b> PhD Candidate</p> <p><a href="#">Danger at the door: are feral cats targeting Australia's social skinks at their communal shelter sites?</a></p> <p>OL</p>
12:30pm - 12:50pm	<p><b>Alicia Carey</b> PhD Candidate</p> <p><a href="#">Beyond 'With Woman': midwifery in a gender-diverse world</a></p> <p>IP</p>	<p><b>Ash Sabuz</b> PhD Candidate</p> <p><a href="#">Impact of genetics and environmental factors on fatty acid composition of rice</a></p> <p>IP</p>	<p><b>Budi Prasetyo</b> PhD Candidate</p> <p><a href="#">The role of place attachment in the dynamics of infrastructure development and environmental conflict: a case study of Poso, Indonesia</a></p> <p>OL</p>
12:50pm – 1:05pm	<p><b>Bright Jose</b> PhD Candidate</p> <p><a href="#">Cardiac self-efficacy, self-management and health related quality of life of patients with coronary artery disease in regional, NSW</a></p> <p>IP</p>	<p><b>Andrew Lean</b> PhD Candidate</p> <p><a href="#">Effects of a bacterial and enzymatic product on physical and chemical properties of bedding and cow behaviour in compost bedded pack barns</a></p> <p>IP</p>	<p><b>Pangkaj Dhar</b> PhD Candidate</p> <p><a href="#">Development and validation of a virus-like particle (VLP) based indirect ELISA (iELISA) for the diagnosis of psittacine beak and feather disease (Pbfd)</a></p> <p>OL</p>
1:05pm – 2:00pm	<b>Break (55 min)</b>		

OL = Online  
IP = In Person in Wagga

Day 2 Session 3	Room/Stream A <a href="#">Join stream meeting</a> Meeting ID: 672 4102 2755	Room/Stream B <a href="#">Join stream meeting</a> Meeting ID: 675 7717 7501	Room/Stream C <a href="#">Join stream Meeting</a> Meeting ID: 685 1156 2149
Chair	OL: Nurun Naila	tbc	IP: Mr Allan Gunn
In Person Assessor	Dr Doaa Hanafy	Dr Brian McSharry	A/Prof Samantha Jakimowicz
Online Assessor	Dr Peter Micalos	Prof Rod Pope	IP:Dr Randy Adjonu
2:00pm – 2:20pm	<b>Kelly Tamang</b> PhD Candidate  <a href="#">Agricultural water governance in Bhutan: institutional analysis of water sharing and allocation</a>	<b>Md. Mahmudul Amin</b> PhD Candidate  <a href="#">Dietary human milk oligosaccharides intervention improves brain macrostructures in piglets: an MRI study</a>	<b>Dawa Yoezer</b> PhD Candidate  <a href="#">Conservation status and threats to freshwater forested wetlands: a global systematic review</a>
2:20pm – 2:40pm	<b>Darby Taguam</b> PhD Candidate  <a href="#">Preliminary evaluation of fungicide efficacy against key pathogens of persimmon dieback</a>	<b>Jaishree Ravindran</b> PhD Candidate  <a href="#">Evaluating step and gradient elution methods for the isolation of lactoferrin from bovine milk using a chromatographic process</a>	<b>Ahmed Ishtiaque</b> PhD Candidate  <a href="#">Structural and functional characterisation of the molecular interactions of non-structural proteins in Japanese encephalitis virus infection</a>
2:40pm – 3:00pm	<b>Georgia Kennedy</b> PhD Candidate  <a href="#">miRNA expression of bovine CD4+, CD8+ and <math>\gamma\delta</math> T cells</a>	<b>Oli Fakir</b> PhD Candidate  <a href="#">Enhancing nitrogen-use efficiency and yield in dryland wheat using Methylobacterium symbioticum: a field study in southeastern Australia</a>	<b>Clara Maurizzi</b> PhD Candidate  <a href="#">Japanese encephalitis virus genetic diversity in hosts and viral fitness</a>
3:00pm - 3:15pm	<b>Tahura Khanam Munmun</b> PhD Candidate  <a href="#">Backyard poultry in Australia: safe practice or rising biosecurity challenge?</a>	<b>Murray Parker</b> PhD Candidate  <a href="#">The multisensory experience of European Christmas markets: perceptions of sensory and multisensory heritage</a>	<b>Sara Esmaeili</b> PhD Candidate  <a href="#">A bipartite, mutation-tolerant NLS regulates interaction of <math>\Delta</math>Np63<math>\alpha</math> with importin alpha, nuclear transport and transcriptional activity</a>
3:15pm – 3:30pm	<b>Closing Comments</b> Thank you for joining the symposium		

# Student Research Posters on Show

The poster web page will be live Tuesday 18<sup>th</sup> November 2025. It will be able to be accessed through the symposium web page, <https://science-health.csu.edu.au/research/hdr-honours-symposium>

## Higher Degree Research

### PhD Candidate

- Jordan Bathgate
  - o *Applying a recent development classification system<sup>A</sup> to Australian wheat highlights adaptation to different dryland environments*
- Omar Hamza Bin Manjur
  - o *An amplification-free Surface-enhanced Raman Scattering (SERS) method for detecting femtogram level of miRNA*
- Jodie Brabin
  - o *Understanding Clinical Governance and Quality of Care in the Pacific: Findings from a Scoping Review*
- Tana Cuming
  - o *How Do Relationships, Program Support, and Context Shape Mentoring for Vulnerable Young People?*
- Sara Esmaeili
  - o *A bipartite, mutation-tolerant NLS regulates interaction of  $\Delta$ Np63 $\alpha$  with importin alpha, nuclear transport and transcriptional activity*
- Farjana Haque
  - o *Amplification-free detection of Xylella Fastidiosa DNA Inxylem sap for rapid field diagnostics*
- Nazia Rahman
  - o *Structural insights into the nuclear import of human adenovirus fiber proteins*
- Pradeep Rai
  - o *The Balancing Act: Quantifying Farmers Value-Based Sustainability Choices*
- Jaishree Ravindran
  - o *Evaluating step and gradient elution methods for the isolation of lactoferrin from bovine milk using a chromatographic process*
- Kiran Sharma
  - o *New artemisinin redesigns for improving plasma solubility and cellular uptake*
- Milkiyas Tantu
  - o *Development of a POC test for Early MASH Prediction*
- Wei Wang
  - o *Sustaining the Health Information Management Profession in the Era of Healthcare Transformation*

### Masters Student

- Shiprah Tagore
  - o *Radioiodine and Feline*

## Abstracts

### Day 1

## Session 1

### From diet to cognition: the role of human milk oligosaccharides (HMOs) in piglet learning and memory

**Adikari Arachchige Diliki Indrachapa Adikari<sup>1\*</sup>, Mahmudul, A.MD.<sup>1</sup>, Amin, T.<sup>1</sup>, Li, W.<sup>1</sup>, Walsh, L.<sup>1</sup>, Zheng, X.<sup>1</sup>, Wang, S.<sup>1</sup> & Wang, B.<sup>1</sup>**

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Human milk oligosaccharides (HMOs) are the third most abundant carbohydrates in human milk and provide multiple health benefits. However, their role in cognition and brain development is still debated. This study investigates whether individual or combined supplementation of HMOs improves cognitive behaviours and stress responses in piglets, an ideal animal model for human infants. Domestic male piglets aged 3 days (n=80) were randomly allocated to one of 5 groups fed milk replacer supplemented with different structural HMOs at a dose level of 1.8g/L, and no HMOs were added to the pig milk replacer as the control. Piglets were fed for 35 days. Data were analysed using SPSS (SPSS Inc., Chicago, IL) with significance set at \*p < 0.05. On third day of behaviour testing, compared to control, cHMO fed group and 2'-FL group showed significantly fewer total mistakes in Easy and Difficult tasks, respectively (p < 0.05). Serum cortisol levels were not significant (p > 0.05).

### Presence and impact of parasites in Australian invasive species and native marsupials

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Australia's ecosystems are unique with a high level of endemism. Substantial biodiversity loss has been observed since the arrival of European settlers, largely attributed to direct predation by invasive species (i.e. red foxes *Vulpes vulpes* and feral cats *Felis catus*). As a result, biodiversity and conservation of Australian natives is of high priority. However, limited research considers how parasites of these invasive species could impact native mammalian communities. With new research finding cases of protozoan parasites of the Sarcocystidae family in both invasive and native animals around Australia, identification of transmission pathways and potential effects is vital. My research aims to identify parasites from the Sarcocystidae family that may be present in both native and invasive mammals. Through these identifications, parasite assemblages, parasite interaction hot spots, or highlighting susceptible animals may be achieved. This work will thus assist conservation efforts by providing a more complete assessment of the environment.

### The effects of oral rehydration solution on rumen pH and blood glucose in feed restricted ewes

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Pregnancy toxemia is a life-threatening metabolic disease of late gestation ewes with a relative energy deficit, resulting in inappetence. Glucose and electrolyte oral rehydration solutions (ORS) have been recommended to treat the condition. Oral glucose administration could induce rumen acidosis and exacerbate inappetence. This study investigates the effects of administering a proprietary ORS on rumen pH, blood glucose and insulin, and selected electrolytes in feed-restricted ewes. Twelve non-pregnant two-year-old Merino ewes were assigned to ORS treatment or control groups and administered 160 mL of ORS or water at 0, 4, and 8 hours after 24 hours of fasting. Rumen pH was measured before treatments, and at 10 time points over 10 hours. Blood glucose, insulin, and selected electrolyte and acid-base parameters were analysed prior to treatment, and 2 hours after the initial treatment. Findings from this study will provide evidence-based treatment strategies for ewes with pregnancy toxemia

### **Emerging biotechnology in bovine mastitis treatment: farmer perspectives and preferences**

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The increasing prevalence of antimicrobial resistance within mastitis-causing bacteria evokes the need for research into practical, farmer-endorsed treatments that can serve as an alternative and eventual replacement for antibiotics. We conducted a social investigation that aimed to capture the perspectives of Australian dairy farmers on mastitis and the antimicrobial resistance issue, as well as their preferences for emerging alternative mastitis treatments. An in-depth, online survey was disseminated through various personal and professional channels, which collected data from consenting participants about their dairy farm, mastitis management protocols, preferences for certain biotechnological solutions and overarching views towards sustainability policy. A mixed-methods analysis approach was implemented on a final sample size of 20 individuals, that involved traditional associative analyses, thematic analysis and Bayesian modelling. Such analysis revealed crucial insights on farmer attitudes towards biotechnology research within the Australian dairy industry and has vitally informed the design of novel mastitis treatments.

### **Development and validation of a virus-like particle (VLP) based indirect ELISA (iELISA) for the diagnosis of psittacine beak and feather disease (PBFD)**

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Psittacine Beak and Feather Disease (Pbfd), caused by *Circovirus Parrot* (previous Beak and Feather Disease Virus; BFDV), is a significant threat to wild and captive parrots worldwide, with clinical outcomes ranging from acute mortality to chronic feather, beak, and claw deformities, underscoring the need for robust diagnostic strategies. In Australia, where infection is endemic and widespread, comprehensive disease evaluation requires integration of serological tools to assess adaptive immune-status and inform clinical decision-making. Traditional serological gold-standard testing, haemagglutination inhibition (HI) assay, is technically demanding and depends on continuous supply of Galah erythrocytes, limiting its broader application, including commercial outreach. To overcome this, an indirect enzyme-linked immunosorbent assay (iELISA) was developed and validated based on recombinantly expressed virus-like particles (VLPs) of BFDV capsid antigen. The assay demonstrated high analytical performance, with a TG-ROC determined cut-off (OD<sub>450</sub>) value of 1.73, 96.6% sensitivity, and a Youden's index of 0.75. Receiver operating characteristic (ROC) analysis confirmed strong discriminative capacity (AUC 0.896) and very strong concordance with HI gold-standard testing, assessed by Gwet's AC1 coefficient (0.843). This iELISA represents a species-independent, scalable, and practical serodiagnostic tool, providing an equitable alternative to HI for routine diagnostics, surveillance, and conservation programs targeting BFDV infection in psittacine birds.

### **Comparative analysis of PCR-high-resolution melt curve (HRM) and DNA sequencing for the identification of bacteria causing bovine mastitis**

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Bovine mastitis is an etiologically complex and economically significant infectious disease of dairy cattle, primarily caused by bacteria. The objective of this study was to differentiate key bacterial pathogens causing bovine mastitis through PCR-High-resolution melt (HRM) curve analysis targeting the 16S rRNA gene. A total of 547 milk samples from mastitis-suspected cows were collected by the Elizabeth Macarthur Agricultural Institute (EMAI), Department of Primary Industries, New South Wales, Australia. Bacterial isolates (n=19) were obtained from milk culture, including *Escherichia coli*, *Streptococcus uberis*, *Staphylococcus aureus*, *Streptococcus dysgalactiae*, *Streptococcus agalactiae*, *Corynebacterium bovis*, *Klebsiella pneumoniae*, *Serratia marcescens*, *Trueperella pyogenes*, *Staphylococcus chromogenes*, *Pasteurella multocida*, *Mannheimia haemolytica*, *Pseudomonas aeruginosa*, *Mycoplasma bovis*, *Staphylococcus simulans*, *Staphylococcus hyicus*, *Providencia stuartii*, *Pantoea agglomerans* and *Bacillus cereus*. HRM curve analysis was employed to differentiate bacterial isolates and was validated by Sanger sequencing. Thus, HRM analysis successfully distinguished these isolates and grouped them into three categories based on distinct melting curve profiles, melting temperatures (T<sub>m</sub>), and genotype confidence percentages (GCP), with results obtained within 10 minutes. This approach provides a rapid, cost-effective, and high-throughput method for the preliminary identification of mastitis-associated pathogens, thereby significantly reducing the reliance on conventional sequencing. Overall, HRM presents a valuable diagnostic tool for large-scale surveillance, early detection, and management of bovine mastitis in dairy herds.

### **The balancing act: quantifying farmers' value-based sustainability choices**

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Regenerative Agriculture (RA) has emerged as an environmentally oriented alternative production system that supports sustainability objectives. However, unlike the conventional agricultural system of the past (e.g. 1950s-1960s), today's modern conventional agriculture (MCA) prioritises environmental stewardship and emphasises sustainability in a similar way like RA in Australia. Against this backdrop, gaps exist as to how RA proponents prioritise, and value interconnected elements of sustainability (social, economic, and environment) compared to MCA? Online survey was launched, and 103 self-identified RA farmers, MCA and RA+MCA (Blend) farmers responses were analysed using "Maximum Difference Scaling" and "Choice-based Conjoint" methods to determine the sustainability preferences made by the farmers. Results indicate that RA farmers highly preferred environment more than MCA and RA+MCA (Blend). While MCA farmers prioritised economic followed by environment compared to other two farming types. Lastly, all farmers prioritised social domains equally and was least preferred compared to economic and environmental domains of sustainability. The findings from the study will contribute to new knowledge-building and possibly for informed decision-making pertaining to agricultural sustainability in the Australian context.

### **Understanding the effects of fontan surgery metabolomics: does it work?**

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Fontan circulation is a physiology resulting from necessary surgery treating complex congenital heart disease. The rates of major surgical complications and mortality have decreased over time though minor complications persist which may cause longer periods of post-surgical care. There is a need to understand the poorly characterised biochemical mechanisms related to post-surgical complications. Metabolomics – a chemistry-based methodology – may provide a means to do so. Metabolomics investigates small molecules contained in biological samples, like urine, and aims to correlate them with disease outcomes in a bid to identify markers of disease.

This pilot study applied metabolomics to urine samples collected pre- and post-surgery from patients undergoing Fontan surgery to determine whether metabolomics could track biochemical changes due to surgery. It was found that the small molecule profile of pre- and post-surgery samples were distinct. This work evidences the applicability of metabolomics to understanding the acute effects of Fontan surgery.

### **Quantifying the shift in Australian spring and winter wheat traits and the link to increased grain yields**

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In Australia, breeders classify wheat as either spring or winter habit. Farmers can plant winter wheat earlier and benefit from a longer growing season, often grazing livestock on the early growth and harvesting the grain. Although winter wheat grows longer, its yields are often similar or lower than those of later-sown spring varieties. This study aims to identify the physiological mechanisms behind these yield differences. We collected detailed physiological data from crop emergence through grain harvest across four Australian states, using randomised and blocked field experiments. These included both spring and winter wheats released from 1980 onwards. Both habits showed phenotypic changes, with winter wheats having a lower average grain-to-total biomass ratio due to reduced spike allocation and increased stem biomass. Larger seed size mainly drives yield improvements, with winter and spring habits showing increases of 1.8 and 1.6 g/m<sup>2</sup>/year in yield, respectively. Findings will help breeders target traits to boost yield.

### **Modelling habitat suitability and conflict risk for tigers and dholes in Bhutan using species distribution models**

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Species distribution models (SDMs) are widely applied in conservation science to identify priority areas and to assess potential zones of human–wildlife conflict. This study modelled the distribution of two endangered carnivores, the tiger (*Panthera Tigris*) and the dhole (*Cuon alpinus*), in Bhutan using BIOMOD2 in R. Presence-only occurrence records were obtained from national wildlife surveys. To ensure robust predictions, four algorithms—Generalized Additive Models (GAM), Maximum Entropy (Maxent), Generalized Boosted Models (GBM), and Random Forests (RF) were implemented, with ensemble modelling used to integrate results. Climatic, anthropogenic, and biophysical predictors were incorporated to capture ecological and human-driven factors influencing species distributions. The resulting suitability maps identify potential conservation priority areas while also highlighting landscapes where carnivore ranges overlap with human activities, thereby indicating conflict risk zones. These spatial insights provide foundation for conservation planning and support strategies aimed at balancing biodiversity protection with livelihoods of rural communities in Bhutan.

### **An investigation into perioperative surgical complications within CSU spey and neuter clinic between 2019-2025**

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A retrospective cohort study will be undertaken on the data collected from the last 7 years of the Charles Sturt University (CSU) Spey and Neuter Clinic, to determine the morbidity and mortality rates, as well as perioperative surgical complications. Ultimately, the study aims to compare the CSU spey and neuter clinic perioperative complication rate with other teaching hospitals and to demonstrate trends in complications, to direct the modification of formative teaching curriculum for future CSU Veterinary Science students.

## Session 2

### Rethinking physical readiness in paramedicine education.

**Samantha Sheridan<sup>1\*</sup>, Pope, R.<sup>3</sup>, MacQuarrie, A.<sup>4</sup>, R.S.<sup>5</sup>, Rayner, R.<sup>2</sup>, Stack, H.<sup>1</sup>, Rose, L.<sup>6</sup> & Fischer S.<sup>7</sup>**

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The paramedic role is physically demanding, but limited attention has been given to how paramedicine students are physically prepared for practice within tertiary education programs and whether student fitness levels meet the demands of the paramedic role in Australia and New Zealand.

A scoping review was conducted and reported following PRISMA-ScR guidelines. Electronic databases (MEDLINE, CINAHL, Scopus, ERIC, Emcare, Informit) and grey literature sources (university handbooks, policy documents, and online searches) were searched, with searches completed in June 2025.

There is limited and inconsistent integration of physical fitness training in paramedicine education. Embedding structured physical readiness frameworks into curricula may improve student preparedness and reduce injury risk, improving career longevity.

### Aerobic and flooded incubation of mo-enriched biochar: a study of molybdenum dynamics

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Molybdenum (Mo) is an essential micronutrient that supports plant nitrogen metabolism, serving as a cofactor for nitrate reductase and nitrogenase enzymes. In rice systems, where nitrogen is often yield-limiting, Mo availability is critical for enhancing nitrogen use efficiency (NUE). However, Mo dynamics are strongly influenced by soil pH, and redox conditions, creating challenges under alternating aerobic–flooded regimes typical of paddy cultivation. Biochar, a carbon-rich amendment, has shown potential to improve nutrient retention and buffer redox fluctuations. Recent studies suggest Mo-enriched biochar may provide a slow-release Mo source while enhancing soil conditions for nutrient uptake. This preliminary study evaluates Mo dynamics in rice soil amended with ultrafine biochar and Mo-enriched biochar under aerobic and flooded incubation. Soil samples are analyzed for pH, redox potential (Eh), and extractable Mo. Results will inform Mo management strategies to improve NUE in rice systems.

### **Engage, empower, explore: participatory action research in small island healthcare settings**

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A proposed study of clinical governance and healthcare quality in Kiribati is premised on the need to build strong partnerships with the local community. Participatory Action Research (PAR) offers an approach that centres people within the research, emphasising collaboration rather than observation, listening rather than data collection, trust, patience, openness, and respect. In Kiribati, decision-making and trust-building occur through face-to-face interactions, botaki meals, and shared experiences. To facilitate these interactions, an early in-country visit was undertaken to:

- (1) re-establish relationships with health professionals, managers, and community members;
- (2) gather perspectives to shape the research focus from the outset; and
- (3) seek formal endorsement to proceed.

Beginning the project with personal engagement reflects cultural norms and signals commitment to partnership. Insights from the visit will inform the final project proposal, co-developed with Kiribati health managers. The research will then proceed in-country, guided by PAR principles and tools to ensure meaningful collaboration and culturally aligned processes.

### **Re-orienting a PhD project to centre Aboriginal research**

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This presentation shares the process of re-orienting a PhD project to align with Aboriginal research ethics principles, cultural governance, and community priorities. Initially designed to examine the impact of mentoring on vulnerable adolescent males in rural Australia, the project was re-evaluated in recognition of the need for a culturally safe, ethically sound, and community-guided approach when involving Aboriginal participants.

Key steps in this re-orientation included community consultation, establishing an Aboriginal Advisory Group, engaging an Aboriginal male co-researcher, ethics protocols, and embedding Indigenous data sovereignty and relational accountability. Rather than treating Aboriginal inclusion as an afterthought, the project was reshaped to be Aboriginal-led to prioritise reciprocity and respectful engagement.

This presentation reflects on the challenges, critical conversations, and learning involved in this process, offering practical insights for early-career researchers working in communities, regional, rural, or health contexts who are committed to conducting culturally responsive research.

### **Modelling climate change impact on rainfed rice production in northwest Bangladesh**

**Md Belal Hossain**<sup>1,4\*</sup>, Zeleke, K.<sup>1,3</sup>, Liu, D.L.<sup>2,3</sup>, Shamsul Haque, K.M.<sup>1,3</sup> & Wang, B.<sup>2,3</sup>

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This study assessed the impacts of projected climate change on rainfed rice growth and yield in northwest Bangladesh across two future periods: near future (NF, 2031–2065) and far future (FF, 2066–2100). Using APSIM model with climate projections from 27 GCMs under SSP245 and SSP585 scenarios, we found consistent increases in temperature, with maximum and minimum values rising by up to 3.1 °C and 3.3 °C, respectively. This warming is expected to shorten rice growth duration by up to 10 days in the FF period. Rice yield is projected to increase in NF by 6.5% while decrease by 11% in FF. The increased yield is largely explained by increased CO<sub>2</sub> and rainfall, while yield decrease is due to increased maximum temperature during anthesis resulting in spikelet sterility. While yield gains are possible in the NF, long-term resilience will require heat-tolerant rice varieties and adaptive agronomic practices to sustain production.

### **Enablers and barriers for high school students pursuing nursing as a career in Tasmania**

**Ann-Marie Brown**<sup>1\*</sup>, Tori, K.<sup>1</sup>, Laver, S.<sup>1</sup>, Mather, C.<sup>1</sup> & Anderson, J.<sup>1</sup>

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Tasmania's nursing workforce faces growing sustainability challenges, with an ageing student population and declining interest among younger entrants. This study investigates the factors shaping Tasmanian school leavers' consideration of nursing as a career. A focused ethnographic design was employed, involving semi-structured focus groups across high schools in the North,

Northwest, and South of the state. Thematic analysis revealed key enablers: early exposure to nursing, strong role models, job security, and financial support. Barriers included limited understanding of career pathways, perceptions of high stress and workload, geographic inaccessibility, and negative media portrayals. Social perceptions were found to significantly influence career decision-making. By amplifying youth voices, this research offers actionable insights to inform recruitment strategies, enhance education accessibility, and guide policy reforms aimed at attracting younger entrants. Findings contribute to addressing workforce sustainability and ensuring a resilient future for nursing in Tasmania.

### **Exploring the lived experiences of Australian sports fans and their interactions with the supercars championship**

**Jordan D. Treloar<sup>1\*</sup>, Litchfield, C.<sup>1</sup> & Osborne, J.<sup>1</sup>**

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This presentation will focus on my current PhD research project which investigates the impact of Holden, Ford and Australian motorsport on Australian sports fandom and sporting culture. Specifically, this study focuses on participant interactions with the Ford and Holden brands and to what extent these brands, automotive and Australian motorsport culture has had on their lives. This study also investigates the differences in experiences between participants of differing generations and gender identities in this traditionally male-dominated domain. Given the discontinuation of Holden in 2020, the potential and ability for the Holden vs Ford rivalry to transition into alternative rivalries will also be examined. Data has been collected via one-on-one interviews of motorsport community members ranging from 18-75 years old, and thematic analysis has been used to identify themes and specific findings. These themes, findings and my overall PhD progress will be showcased in this presentation.

### **Impact of summer rainfall variation on bacterial diversity in native salt-affected soils**

**Mariam Khanam<sup>1,2\*</sup>, Condon, J.<sup>1,2</sup>, McCormick, J.<sup>1,2</sup> & Shamsul Haque, K.M.<sup>1,2</sup>**

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Soil bacteria play a vital role in soil health and nutrient cycling, particularly in salt-affected soils where microbial activity is influenced by geochemical processes. This study assessed bacterial diversity under varying salinity conditions across two native saline sites in NSW with contrasting summer rainfall. Results showed that summer rainfall significantly influences soil salinity and associated chemical properties, with increased rainfall reducing salinity through salt leaching. A strong correlation between the soil bacterial community and multiple soil properties was observed. At the low-rainfall site, *Gemmatimonadota* abundance in the topsoil was correlated with Colwell P, exchangeable sodium percentage (ESP), sodium adsorption ratio (SAR), and pH. In contrast, at the high rainfall site, *Firmicutes* and *Actinobacteria* were closely linked with ESP, SAR, and potassium. These novel findings highlight the potential of specific microbial taxa as indicators of soil salinisation and could be an important tool to determine salt stress tolerance of field crops.

### **Towards safer practice: predicting and preventing injury in paramedics**

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It is well-established that paramedics experience high occupational injury rates, with annual rates reportedly as high as 34.6 injuries per 100 full-time workers. Despite this, the specific factors that may predispose paramedics to injury development remain unknown.

A systematic review of the existing literature, from inception to June 2024, was conducted in accordance with PRISMA guidelines. All peer-reviewed publications on factors associated with paramedic occupational injuries were eligible for inclusion. Associations between risk factors and injuries were analysed and reported narratively.

Searches of electronic databases (MEDLINE, Embase, Scopus, CINAHL, Web of Science) returned 9137 unique studies, with 149 eligible for inclusion in analyses.

A range of factors that increase the risk of paramedic occupational injuries were identified; however, most studies have examined these factors in isolation. Given the dynamic and complex environments in which paramedics work, more integrated and multifactorial approaches are necessary to completely explain, predict and prevent injuries.

### **The multifaceted nature of community participation for children with communication support needs and their parents**

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Background: Community participation is a right of every child with many associated benefits. Much existing research focuses on school-age children's participation. Less is known regarding younger children, particularly those with communication support needs (CSN).

Aim: This study explores parents' lived experiences of community participation for their child with CSN.

Method: Applying a phenomenological approach, semi-structured interviews were conducted with parents of young children with CSN. Data were analysed using reflexive thematic analysis.

Results: Participants were 11 parents of 10 children aged 3-6 years with CSN who lived across rural and metropolitan Australia. Major themes encompassed the child's active involvement in communities, parents' role in mediating these experiences, and similarities and differences between children with and without disability. Minor themes included others as communication partners, and communication differences.

Conclusions: The stories shared by parents highlight the multifaceted nature of experiences when children with CSN access community spaces.

### **The potential of Australian macroalgae in wound healing**

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Wound healing is a complex, multi-phase process involving haemostasis, inflammation, proliferation, and tissue remodelling. Chronic wounds, often associated with diabetes, venous insufficiency, or pressure injuries, arise when this process is impaired, leading to prolonged inflammation and significant healthcare burdens. In Australia, over 450,000 people are affected annually, costing more than AUD \$6 billion. Current treatment options remain limited, highlighting the need for novel, cost-effective therapies. Seaweeds are rich in unique metabolites, including polyphenols and polysaccharides, with known antioxidant, anti-inflammatory, and antimicrobial properties relevant to wound healing. Australia's temperate marine environment hosts one of the most diverse macroalgal floras globally, yet its therapeutic potential remains underexplored. This study aims to chemically profile Australian seaweed species and assess their bioactivity against key processes involved in chronic wound pathophysiology. The ultimate goal is to apply bioactivity-guided fractionation to identify compound classes or specific metabolites that may contribute to enhanced wound repair.

### **Sustaining the health information management profession in a transforming health system: a normative approach**

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This presentation provides an overview of my PhD research, which explores the sustainability of the Health Information Management (HIM) profession in Australia amidst rapid healthcare transformation. The project investigates how HIM roles, competencies, and workforce structures are evolving in response to digital health, policy reforms, and workforce challenges. Guided by the ecological systems model, the study integrates evidence from a scoping literature review, analysis of national workforce census data, and a national survey of HIM professionals. Preliminary findings highlight concerns around workforce ageing, professional identity, and future role relevance, particularly in light of digitalisation and automation. A key outcome of this project is the development of a draft normative framework to guide future workforce planning, professional development, and policy advocacy. This presentation will outline the research design, methods, and early insights, demonstrating how the findings aim to support the long-term sustainability and recognition of the HIM profession within Australia's changing health landscape.

### **Central obesity and its association with youth physical and mental health: evidence from the Australian National Health Survey**

**Sentognal B. Aychiluhm<sup>1,2\*</sup>, Ross, A.G.<sup>1</sup>, Isaac, V.<sup>3</sup>, Thapa, S.<sup>1</sup> & Ahmed, K.Y.<sup>1,4</sup>**

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**Background:** Central obesity is a key contributor to cardiometabolic and mental health disorders. In young people, excess abdominal fat often persists into adulthood, increasing long-term health risks. This study examined the prevalence, determinants, and health impacts of central obesity among Australian youth aged 15–24 using nationally representative data. **Methods:** We analysed data from 3,087 youth in the ANHS using Bayesian multilevel models to examine central obesity and related morbidity.

**Findings:** Central obesity affected 33.1% (95% CI: 31.4–34.8) of Australian youth. Higher odds were observed among those aged 18–24 years (AOR = 2.31; 95% CI: 1.64–3.27), males (AOR = 1.73; 95% CI: 1.39–2.15), youth in the most disadvantaged households (AOR = 2.76; 95% CI: 1.91–4.02), those living in major cities (AOR = 1.39; 95% CI: 1.01–1.92), and individuals with depression (AOR = 1.61; 95% CI: 1.04–2.49). Central obesity was associated with mental disorder (AOR = 1.25; 95% CI: 1.04–1.50), multimorbidity (AOR = 1.27; 95% CI: 1.01–1.59), and combined physical–mental multimorbidity (AOR = 1.56; 95% CI: 1.21–2.01).

**Interpretation:** Central obesity is a prevalent and modifiable risk factor linked to both physical and mental health conditions in Australian youth.

### **Woodland wellbeing: the benefits of woodland management**

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The ecological and economic benefits of woodlands are often invoked to promote their conservation. However, the human, social, personal, and cultural benefits of these ecosystems may be even more highly valued. This study aimed to systematically identify common and preferred woodland benefits to inform the design of conservation projects that might mutualistically enhance social, ecological, and economic wellbeing. A survey questionnaire was developed and distributed through agricultural and environmental land management networks. Responses were analysed to identify woodland ecosystem services and the influence of woodland management on wellbeing outcomes. A range of ecosystem services and disservices relevant to land managers were identified and modelled. Commonly affirmed ecosystem services linked woodland attributes to caring, recreation, and inspiration benefits. The findings indicate opportunities to promote wellbeing outcomes through conservation projects that purposefully integrate people with nature.

### **The lived experience of leadership practice among advanced practice nurses in regional New South Wales: a hermeneutic phenomenological study**

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This study explores how Advanced Practice Nurses (APNs) working in rural and regional New South Wales experience professionalism and leadership in their everyday work. These nurses often manage complex responsibilities with limited support, balancing clinical care, administrative duties, and research expectations. While leadership frameworks are designed to guide practice, little is known about how nurses in non-metropolitan areas understand and apply them. Using Van Manen's hermeneutic phenomenology, this research will involve reflective conversations to uncover how professionalism is shaped by place, relationships, and time. Rural voices are largely missing from current research, despite the unique challenges and contributions of nurses in these settings. By focusing on lived experience, this study aims to inform leadership development strategies that are practical, culturally safe, and relevant to the realities of rural nursing.

## Session 3

### Modulating the nutritional profile of sorghum through germination

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Sorghum (*Sorghum bicolor* L.) is a climate-resilient cereal, rich in bioactive polyphenols such as tannins, flavonoids, and phenolic acids, known for their antioxidant and metabolic health benefits. Germination, a simple and sustainable processing technique, has shown potential to enhance the nutritional quality of grains, yet its impact on pigmented sorghum's polyphenolic profile and bioactivity is least explored. This study aims to investigate the effects of germination on the polyphenol composition, antioxidant capacity, bioavailability and bioactivity of black sorghum. Advanced analytical techniques including UHPLC-QTOF-MS will be used to profile polyphenolic changes, while antioxidant capacity will be assessed through DPPH, FRAP, and ABTS assays. Caco-2 cellular transport models will evaluate polyphenol bioavailability and in vitro models using hepatic, pancreatic, and endothelial cells will assess health-related bioactivities targeting pathways of type 2 diabetes, cardiovascular disease, and obesity. The anticipated outcomes will help develop innovative, health-promoting sorghum-based products, support Australia's transition to climate-smart, value-added grains, and contribute to national efforts in improving population health through sustainable, locally grown crops.

### Assessing vegetation change and disturbance regimes in coastal headland ecosystems of the New South Wales (NSW) mid-north coast (MNC)

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Coastal headland ecosystems of the New South Wales Mid-North Coast are increasingly impacted by human activities, including urban expansion, recreation, and infrastructure development. Since European colonisation, these areas have faced disruptions to their natural fire regimes, leading to changes in vegetation. Human activities can alter species composition and structure, reduce biodiversity, and disrupt ecological functions, potentially resulting in further degradation. This research will examine the spatial and temporal patterns of vegetation change in selected coastal

headlands using geospatial analysis to identify vegetation loss, fragmentation, and succession. Key anthropogenic drivers will be mapped with Geographic Information Systems and analysed using multivariate models for a landscape-level understanding of disturbances. Field research will also assess the impacts of these drivers on vegetation structure and species diversity. By combining remote sensing with field assessments, this study aims to enhance understanding of human-induced changes in coastal headland ecosystems and inform conservation and land-use management strategies.

### **Elucidating the structures of nucleoprotein-phosphoprotein complexes for the development of inhibitors against high-risk paramyxoviruses**

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Paramyxoviruses are deadly zoonotic viruses causing severe outbreaks in humans and animals, resulting in high mortality rates and serious economic consequences. A critical step in their replication cycle is the interaction between the viral nucleoprotein (N) and phosphoprotein (P), forming the N0-P complex to facilitate viral RNA transcription. So, disruption of the N0-P complex could present a promising antiviral strategy to inhibit viral replication. This research aims to utilize a structural biology approach to determine the structures of N0-P complexes of some high-risk paramyxoviruses using X-ray crystallography and/or cryogenic electron microscopy (cryo-EM) techniques. The study will identify conserved structural features to design, in-silico screen and laboratory experiments of inhibitors that can interfere with N0-P binding. Targeted N0-P complexes have been expressed and purified in prokaryotic system and using them for crystallography and Cryo-EM to determine structures. Ultimately, this research will contribute to global efforts in preparedness for paramyxoviral infections.

### **Optimisation of saponification method for simultaneous quantification of tocopherols and phytosterols in canola oil refining by-products**

**Milad Kazemi<sup>1\*</sup>, Prenzler, P.<sup>2, 3</sup>, Schwarz, L.<sup>3</sup> & Adjonu, R.<sup>1, 2</sup>**

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Refining edible oil generates substantial quantities of by-products, including soapstock, spent bleaching earth, and deodoriser distillate. Despite their frequent disposal in landfills, refining by-products are rich in phytonutrients, such as tocopherols and phytosterols. Accurate quantification of these compounds is vital to enable their recovery. Saponification is a critical process that hydrolyses lipids and releases esterified tocopherols and phytosterols. While harsher saponification conditions can improve phytonutrient release, they also risk degradation. Therefore, optimisation is required to achieve reliable quantification. Although previous studies have used

saponification for vegetable oils, saponification conditions have never been optimised. In this study, saponification procedure for simultaneous quantification of tocopherols and phytosterols in canola oil refining by-products was optimised. A Central Composite Design was applied to evaluate effects of four parameters: temperature, time, KOH concentration and pyrogallol concentration. The optimised method maximised lipid hydrolysis, minimised degradation of tocopherols and phytosterols, and provided a foundation for future valorisation.

### **Future viticulture irrigation demand under climate change**

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Grapevines consume around 10% of the irrigation water of the Murray-Darling Basin. Most of the vineyards are located in downstream regions of the basin under warm climates and rely on the river water for irrigation, which is highly regulated due to the upstream demand. Also, viticulture is a long-term investment, and consistent irrigation is essential every year to keep the crops productive. As viticulture is vulnerable to climate change, this research aims to provide a clear picture of its long-term irrigation demand to enable stakeholders to make informed decisions and avoid costly mistakes in a timely manner. One of the key approaches is to integrate multiple methods, rather than relying on a single method, as each method captures a valid but limited aspect of reality. By using this approach, this research not only provides a reliable decision-making tool but also improves the knowledge around irrigation demand projection.

### **Evaluation of creatinine clearance in horses undergoing exploratory laparotomy**

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Acute kidney injury is an under-recognised but clinically significant complication of equine colic surgery, with reduced intraoperative urine output linked to poorer survival outcomes. This prospective study investigating renal function in horses undergoing exploratory laparotomy will be performed at Charles Sturt University Veterinary Clinical Centre between November 2024 and November 2025. The objectives of this study include firstly assessment of intra-operative renal function via quantify intraoperative urine output and calculation of urinary creatinine clearance. Secondly, to evaluate the influence of pre-operative, anaesthetic and surgical variables on renal function. We hypothesise that horses with reduced intraoperative urine production will demonstrate significantly lower creatine clearance compared to those with normal or increased urine output. As intraoperative oliguria is associated with poorer prognosis, the findings of this study will advance

understanding of renal responses to colic surgery and support earlier, targeted perioperative monitoring and management strategies.

### **Impact of prior legume crops on wheat flour protein composition and dough quality**

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Wheat possesses unique rheological properties among cereal crops, primarily due to its gluten protein fractions—gliadins and glutenins. The composition and concentration of these proteins are influenced by genotype, environmental conditions, and agronomic practices. While legumes are well known for their role in biological nitrogen fixation, their impact on wheat grain protein composition in subsequent cropping seasons remains underexplored.

This study evaluated the effects of different preceding crops—chickpea, faba bean, vetch, and canola—grown one or two seasons prior to wheat, on wheat protein composition and dough quality. Wheat flour protein profiles were analyzed using size-exclusion high-performance liquid chromatography (SE-HPLC), and dough rheological properties were assessed using the doughLAB.

Results demonstrated that legume inclusion in crop sequences significantly altered gluten protein composition. Wheat grown one season after chickpea exhibited the highest accumulation of both glutenin and gliadin compared to continuous wheat. When legumes were grown two seasons prior, certain pulses, particularly vetch enhanced water absorption and dough strength in wheat flour. These findings underscore the potential of strategic legume integration in crop rotations to improve wheat quality and functionality.

### **Perceptions and practices of veterinarians regarding diagnosis and treatment of acute pancreatitis in domestic canines**

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Acute pancreatitis is a common disorder of the exocrine pancreas that presents with variable severity, posing significant diagnostic and therapeutic challenges in canine patients. This study aimed to determine whether the practices and perceptions of Australian veterinarians align with a one-size-fits-all approach, or whether the variability and uncertainty of diagnostic and therapeutic options result in a spectrum of care between different presentations of canine acute pancreatitis. A cross-sectional, semi-quantitative survey was distributed to Australian veterinarians to capture their diagnostic and treatment practices and perceptions. The collection of quantitative data provided insight into the frequency and consistency of diagnostic and treatment practices, while qualitative data captured the veterinarians' perceptions of canine acute pancreatitis and the use of diagnostic tools and therapies. The research highlighted current trends and built an evidence base that

reflects real-world practice and informed educational strategies that support a high-quality spectrum of care.

### **Mechanistic insights into adenoviral nuclear import mediated by fiber-importin binding**

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Human adenoviruses (HAdVs) commonly infect the respiratory, gastrointestinal, ocular, and urinary tracts, with children, immunocompromised individuals, and military personnel being particularly vulnerable. HAdVs depend on the nuclear import of viral proteins, such as the fiber, to initiate their replication cycle. However, the precise molecular mechanisms governing the fiber protein's nuclear entry have remained unclear. To address this, we characterized the interactions between the fiber's nuclear localization signal and host nuclear import receptors (importins). Using high-resolution crystallography and binding assays, we identified key residues responsible for binding to importin  $\alpha 2$  and showed that different HAdV fibers have varying binding affinities. Intriguingly, we found that the NLS of the HAdV-C fiber protein specifically binds to the minor site of importin  $\alpha 1$ , as demonstrated using peptide inhibitors, mutant importin proteins, and structural analysis. This finding highlights the sophisticated ways by which HAdVs exploit host cellular machinery. A deeper understanding of these host-pathogen interactions not only advances our knowledge of HAdV biology but also reveals potential targets for the development of novel antiviral therapeutics

### **Effect of Helicobacter pylori acquisition on gut microbiota alteration and cognitive development in children in Bangladesh**

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Helicobacter pylori (H. pylori) is a bacterium that infects the stomach and duodenum, potentially causing chronic inflammation associated with gastric ulcers and cancer. Though often asymptomatic, it disrupts gut microbiota, contributing to growth retardation, cognitive impairment, and iron deficiency in children. The first 1000 days of childhood are crucial for neurodevelopment, and H. pylori may affect cognitive function through the Gut-Brain Axis. This study aims to examine how H. pylori infection in early childhood alters gut microbiota and impacts cognitive development. Stool samples will be screened for H. pylori antigen using ELISA and qPCR collected from Mirpur, Dhaka, Bangladesh. Gut microbiota alteration will be assessed through 16S rRNA sequencing, and cognitive development will be evaluated with the Bayley-4 Scales. The study will explore how H. pylori infection affects gut microbiota diversity and cognitive development, highlighting the need for early intervention.

### **Development of a soil coring-modelling approach to better map grapevine root distribution in cover cropped vineyards.**

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Cover crops in viticulture offer benefits including reduced herbicide use, improved soil health, and increased biodiversity. However, water and nutrient competition remains a concern. Recent studies found interactive effects between rainfall, irrigation, and cover crop competition on grapevine root distribution, with functional implications to date poorly understood due to difficulties currently available techniques have in mapping root distribution and function. This study addresses limitations of current methods by developing a novel extraction-modelling approach to characterize varying grapevine root system architectures (RSA). Root length data from soil coring is input into a newly developed deep-learning 3D RSA generator, creating representative digital snapshots of field grown vine root systems. These digital RSA snapshots enable subsequent whole plant functional-structural modelling to better understand varying grapevine RSA function and inform better optimized cover cropped vineyard water and nutrient management.

## Session 4

### Evidence of renal tubular injury in feline patients after elective desexing

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General anaesthesia is associated with a small but concerning risk of vital organ damage and mortality in feline patients. Renal tubular injury is a major form of acute kidney injury (AKI) as renal tubular epithelial cells are susceptible to injury due to their high metabolic demand. Finding renal tubular epithelial cells or their casts in urine sediment provides evidence of renal tubular injury with >90% specificity. Both AKI and general anaesthesia are recognised in the pathogenesis of chronic kidney disease, a common cause of morbidity and mortality in cats. Therefore, investigations were conducted to identify the incidence of perioperative AKI, specifically renal tubular cell injury, via urine sediment analysis from cats before and after desexing surgery. As AKI is a relatively common complication following routine anaesthesia and surgery in other species, determining if perioperative AKI occurs in cats is fundamental to ensure actions to minimise or prevent this are implemented.

## Evaluation of the pathogenicity of *Cryptovalsa ampelina* isolates collected from vineyards

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*Cryptovalsa ampelina* is a fungal species associated with Eutypa dieback (ED), a grapevine disease complex. Previous studies on the virulence of *C. ampelina* had conflicting results. To address this, 32 isolates of *C. ampelina* and seven of *Eutypa lata* were screened for pathogenicity using detached grapevine canes. After 3 months of incubation, the bark was removed, and the lesion length was measured. Tissue sections at 5 mm intervals from the point of inoculation, including the area beyond the lesion margins, were plated onto artificial media to assess the colonisation length. Lesions caused by *C. ampelina* were found to be non-significant compared with the control, but isolates were able to colonise the tissue up to 45 mm from the inoculation point. *Eutypa lata* caused longer lesions than *C. ampelina* and controls. These results suggest that these fungi can exist in apparently healthy grapevine tissue beyond the point of necrosis.

## Epilepsy and oral health: exploring the connections

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Epilepsy affects over 50 million people worldwide and is often linked with oral health problems that are frequently overlooked. Seizure activity, combined with the long-term use of anti-seizure medications (ASMs), plays a key role in shaping oral and gingival health. This work aims to explore the mechanisms that connect epilepsy to oral health deterioration, highlighting both neurological and pharmacological factors. A narrative review of current literature was undertaken, drawing on clinical studies, pharmacological data, and case reports. Findings show that seizure activity can lead directly to oral trauma, including tongue biting, fractured teeth, and temporomandibular joint injury. ASMs—especially phenytoin, valproate, and phenobarbital—are strongly associated with gingival overgrowth, xerostomia, and salivary changes that increase the risk of caries and periodontal disease. These findings emphasise the need for greater awareness among dental and neurological professionals. Interdisciplinary collaboration and patient-focused education are essential to improve prevention, early detection, and quality of life.

## Trends and impacts of alternative chicken production in Bangladesh

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Poultry production in Bangladesh is diversifying beyond commercial farms to include backyard, crossbred Sonali, and processed chicken. These alternative systems contribute to rural livelihoods and national food security but vary widely in biosecurity practices, posing potential risks to animal and public health. This PhD project aims to assess the current characteristics and emerging trends of these alternative chicken production systems in Bangladesh and their impacts on food security, animal and public health. A cross-sectional study will be conducted in three districts to estimate the prevalence of *Campylobacter* and avian influenza in backyard and Sonali chickens, alongside interviews with farmers. Processed chicken will be tested for antimicrobial resistance and heavy metal contamination. A consumer survey will explore purchasing behaviour and risk perceptions, while a multi-stakeholder workshop will forecast future production trends. Findings from this study will inform strategies to support sustainable poultry production, strengthen biosecurity, and safeguard public health in Bangladesh.

## Unravelling the germination ecology of sticky nightshade in response to key environmental factors

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Sticky nightshade (*Solanum sisymbriifolium* Lam) is a highly invasive weed of increasing concern in agricultural and natural ecosystems worldwide. This study investigated the effects of temperature, light, pH, salinity, and moisture stress on seed germination and soil burial depth on seedling emergence through controlled experiments. Germination peaked (85%) at alternating temperatures of 35/15°C and was unaffected by light. Seed germination remained high across a wide pH range of 4 to 10. However, germination was highly sensitive to salinity and osmotic stress, showing complete inhibition at 125 mM NaCl and significantly reduced germination at -0.8 MPa. Maximum seedling emergence was observed at 2.5 cm burial depth, with a significant decline with deeper placement. This study demonstrates that sticky nightshade can grow in a range of environmental circumstances, underscoring its potential for rapid spread. These insights can inform the development of sustainable weed management strategies to control its spread.

## **Investigating sorghum-derived peptides for cardiovascular disease and diabetes**

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Sorghum is a nutritious, sustainable cereal crop rich in health-promoting compounds. Plant-based proteins have recently gained interest as a potential source of bioactive peptides, released upon protein hydrolysis. Importantly, the bioactivity of sorghum-derived peptides remains largely unexplored. This research aims to investigate the glucose-modulating and cardioprotective effects of Sorghum Protein Hydrolysates (SPHs). Based on the unique functionality of sorghum protein, we hypothesise the hydrolysates will exhibit multifunctional bioactivity. Sorghum proteins will be extracted and enzymatically hydrolysed to produce SPHs, containing unique bioactive peptides. Hydrolysates will be assessed for antioxidant activity using biochemical assays, anti-diabetic activity using a cell culture model, and anti-thrombotic effects using an ex vivo platelet function study. This project will provide value to an underutilised cereal crop that is becoming increasingly important in the face of climate change, whilst also offering a potential therapeutic alternative to current synthetic drugs, which are limited by side effects.

## **Public health importance of paramyxovirus and hantavirus circulating among the common rodents and paramyxovirus among bats in and around human settlements in two selected districts of Bangladesh**

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Bats are a natural reservoir for zoonotic Paramyxovirus, and rodents can host both zoonotic Paramyxovirus and Hantavirus. Our objectives are to know the prevalence of paramyxovirus and hantavirus among rodents, the prevalence of paramyxovirus and its drivers among bats, and the level of exposure among high-risk human populations for hantavirus and paramyxovirus. We will collect swab/blood samples from 1000 bats and collect 1522 pooled bat roost urine. We will also sample 753 rodents and 366 house shrews for this study. From the high-risk human population, we will collect blood samples. We will test all the swab samples using PCR and serum samples using the Luminex assay/ELISA. This study has already been approved for human and animal ethics from icddr,b and Charles Sturt University. Partial data will be presented at the conference as the fieldwork is yet to start.

## **Bioactive roles of human milk oligosaccharides in working memory development in piglets**

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This study investigated the cognitive effects of dietary supplementation with human milk oligosaccharides (HMOs)—fucosylated (nHMO), sialylated (sHMO), and combined HMOs (cHMO)—on working memory in piglets using a 5-board-based task. Sixty-four male piglets were randomized into four groups, with trials conducted on postnatal days 35–36. Results demonstrated that all HMO-fed groups made fewer cognitive errors than controls, with sHMO and cHMO groups showing the most pronounced improvements, particularly during high-demand trials that required spatial adaptability. Spatial memory scores were higher in all HMO groups, most notably cHMO, suggesting improved memory retention. HMO-fed piglets also displayed more efficient exploratory strategies—spending less time in passive zones and requiring fewer visits to find the reward. Collectively, early-life HMO supplementation, particularly with sialylated and combined formulations, enhances working memory. These effects may reflect improved neural adaptability and motivation, offering insights into how early-life nutrition influences cognitive development and behavioural flexibility.

### Metagenomic detection and characterisation of a novel Orthoflavivirus in Papua New Guinea mosquitoes

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*Orthoflavivirus* is a genus within the family *Flaviviridae* that includes both vertebrate-infecting arboviruses and insect-specific flaviviruses (ISFVs). Lineage II ISFVs are of particular interest as they occupy an intermediate evolutionary position. Papua New Guinea (PNG), situated in the Australasian–Pacific ecozone, harbors high mosquito and viral diversity, yet its insect virome remains poorly characterized. We performed metagenomic sequencing of *Culex* mosquitoes collected from five PNG provinces between 2019 and 2021. From these samples, we assembled and characterized the complete genome of a novel lineage II orthoflavivirus from a *Culex pullus*

pool. The closest similarity was to *Barkedji-like virus*, with 64.3% amino acid identity. Structural predictions revealed features typical of ISFVs, together with traits resembling vertebrate-infecting flaviviruses, making this an interesting member of lineage II. Future studies on replication in vertebrate and mosquito cell lines, as well as interactions with medically important arboviruses, will further clarify its significance.

## Day 2 Session 1

### Valuing one health

**Francette Geraghty-Dusan<sup>1\*</sup>, B.B.<sup>1,2</sup>, C.C<sup>1</sup> & D.D<sup>2</sup>**

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With One Health now appreciated at a global level as a useful systems paradigm by which to address wicked problems that require transdisciplinary approaches, there is increased pressure to review outcomes and impacts of the approach to justify allocation of resources. Cost-benefit analysis (CBA) and other return on investment frameworks have previously been used however, several underlying assumptions inherent in CBA, that mean they poorly align with the OHHLEP One Health principles, particularly those of equity and justice. This project is using a grounded theory approach on Wiradjuri Country to investigate how health is currently valued across the One Health spectrum (humans, animals and the environment, including soil, water and micro-organisms) and whether understanding of these value frameworks can help us better measure the impact of One Health programs and improve cross-sectoral policy decisions.

### **The development of a systematic ultrasound protocol facilitates the visualisation of foreign bodies within the canine distal limb**

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Ultrasonography is a valuable tool for diagnosing soft tissue conditions and is routinely used in human medicine to detect vegetal foreign bodies (VFB), with protocol-based approaches proving more accurate than lesion-focused examinations. In veterinary medicine, however, such protocols

are not yet standardised. This study aimed to develop a systematic ultrasound protocol for evaluating canine distal limbs for VFBs (SUEDVEG). Using 12 MHz and 18 MHz linear transducers, cadaver limbs (n = 12) were scanned at three common VFB sites: interdigital webbing, palmar/plantar aspect, and dorsal region of the phalanges/metacarpus. A 13-step musculoskeletal protocol was created and applied to eight clinical cases. VFBs were successfully identified and removed in 7 of 8 cases, with steps 9 and 11 (orthogonal views) most effective. This method shows strong potential for improving VFB detection in dogs and may surpass lesion-focused approaches, pending further clinical validation.

### **Characterisation of nuclear localization mechanisms of herpesvirus basic leucine zipper (bZIP) proteins**

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Herpesviruses are important pathogens of humans and animals, with viruses including Marek's disease virus, Epstein-Barr virus and Kaposi's sarcoma-associated herpesvirus implicated in virus-associated cancers. Herpesviruses encode homologues of cellular basic leucine zipper (bZIP) transcription factors that regulate viral and host gene expression. MEQ from Marek's disease virus, Zta from Epstein-Barr virus, and K-bZIP from Kaposi's sarcoma-associated herpesvirus are critical virulence factors facilitating viral replication, immune evasion, and oncogenesis by controlling transcriptional programs. These viral bZIPs need to traffic to the nucleus via host importin  $\alpha/\beta$  transport machinery, which recognizes nuclear localization signals within proteins. This study investigates nuclear import mechanisms of bZIPs by characterizing their interactions with importin  $\alpha/\beta$  complex. Biochemical assays demonstrated that predicted NLS sequences from MEQ, Zta, and K-bZIP bind to members of all three importin- $\alpha$  subfamilies and directly to importin- $\beta$  proteins. X-ray crystallography of the MEQ-importin  $\alpha 2$  complex (2.3Å resolution) revealed that MEQ residues 29-36 engage both minor and major binding sites of importin  $\alpha 2$ . Immunofluorescence assays indicated that each viral bZIP NLS can drive nuclear localization of reporter fluorescent protein. Understanding these mechanisms advances knowledge of herpesvirus pathogenesis and identifies potential antiviral targets for disrupting protein-protein interactions required for nuclear localization and transcriptional regulation.

### **Exploring equine encephalitis virus: how the viral capsid protein hijacks host cell receptors during nucleocytoplasmic transport**

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Equine encephalitis viruses (EEVs) are mosquito-borne pathogens that include Venezuelan (VEEV), Eastern (EEEV), and Western (WEEV) species. EEVs are found across regions in North, South, and Central America and are known to cause pathogenic disease in both equines and humans. High viral loads can lead to severe encephalitis and long-term neurological dysfunction. Human and equine fatality rates vary between 1-75% and 20-80%, respectively. An equine vaccine is available but requires annual boosters. Currently, there are no human vaccines nor any effective treatment options. This project aims to investigate how EEV viral capsid proteins hijack nuclear import receptors responsible for trafficking cargo between the cytoplasm and nucleus within a host cell. Biochemical assays and protein X-ray crystallography will be used to determine binding affinities and structural characteristics at the viral capsid-host cell receptor interface. Results may help provide potential targets for antiviral therapy or vaccine development.

### **Mapping off-channel habitats for holistic fish passage restoration benefiting fish and people**

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Connected rivers and floodplains provide vital, nutritious fish to nutritionally insecure and fishery-dependent people, particularly in tropical regions where Earth's few remaining free flowing rivers are found. Floodplain food resources compete with expanding irrigation and water infrastructure that prevents fish dispersal into diverse habitats like off-channel wetlands and flooded rice fields. Fish passage technology implemented in tropical southeast Asia including Cambodia aims to reconnect fish migration routes past riverine and floodplain water infrastructure to protect nutritious food fish resources for communities. To date, efforts have focused on riverine connectivity, however off-channel habitats are vitally important as fish nursery areas and fishing grounds for family subsistence. We argue for off-channel habitat consideration in fish passage prioritisation and spatial planning. We present a novel spatial dataset of Cambodian rice field fish habitats and detail methods and challenges of mapping reliably in this context. Given off-channel habitats' importance to fish production and nutrition security in the tropics, sole focus on riverine connectivity risks fish passage investments falling short of achieving their objectives to support healthy fish and human populations. We propose novel metrics for off-channel fish passage barrier prioritisation which is rapidly becoming essential to protect critical fish food resources for vulnerable communities.

### **Role of sorghum phenolic compounds in modulating cardiovascular disease (CVD) risk: a systematic review**

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Cardiovascular disease (CVD) remains a major health problem and the leading cause of death worldwide. The incidence of CVD continues to increase despite advanced therapeutic interventions. Sorghum is a climate-resilient crop rich in phenolic compounds that offers various health benefits. However, a systematic assessment of existing studies is needed to inform future

research on the impact of sorghum on CVD risk factors. This systematic review evaluated in vivo, in vitro, and human studies, following PRISMA guidelines and the Cochrane risk of bias tool in Covidence. This review indicated that sorghum modulates CVD risk factors by exerting antioxidant and anti-inflammatory activities through enhancing reactive oxygen species detoxifying enzymes and suppressing pro-inflammatory marker expression. It also exerts anti-diabetic, anti-atherosclerotic, and anti-obesity effects by lowering glycaemic index, reducing cholesterol biosynthesis, and downregulating genes associated with adipogenesis, respectively. These suggest cardiovascular health-promoting properties of sorghum and encourage further innovation in developing sorghum-based functional foods.

### **The prevalence of *Pseudomonas aeruginosa* in clitoral swabs from thoroughbred mares in eastern Australia from 2019-2025**

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Pre-breeding screening for *Pseudomonas aeruginosa* in the clitoris of Thoroughbred mares is required by many studs in Eastern Australia. The classification of *P. aeruginosa* as a venereal pathogen has been challenged, creating uncertainty in the clinical relevance of a positive *P. aeruginosa* clitoral swab prior to breeding and the need for veterinary intervention. Limited studies have examined the prevalence of *P. aeruginosa* in clitoral swabs from Thoroughbred mares, and there is scant information on the veterinary treatment of these mares. We aim to retrospectively collate data from veterinary diagnostic laboratories, equine veterinary practitioners and clinics, to determine the prevalence of *P. aeruginosa* isolated from clitoral swabs of Thoroughbred mares in Eastern Australia from 2019-2025. Where available, treatment regimens following positive results will be described and their outcomes assessed. This will provide evidence to inform evaluation of the clinical significance of clitoral *P. aeruginosa* and support further research on pre-breeding requirements.

### **Climate change will accelerate seasonal fire weather severity by 8–24% in southeastern Australia**

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Fire weather activity is affected by climate variability, extreme events, and fire dynamics, with climate change accelerating these effects. However, the future severity and its sensitivity to weather variables are still not well understood. This study examines future fire weather in the Upper Murrumbidgee catchment using the Forest Fire Weather Danger Index (FFDI), based on daily meteorological variables from five CMIP6 models under two emission scenarios (SSP126 and SSP370) across three future periods. An ensemble of Random Forest (RF) and Extreme Gradient Boosting (XGBoost) models, combined with Shapley values for interpretability, was used to assess FFDI sensitivity. Results project that fire weather severity could increase by 9-19.9% in summer and 8.8-21.9% in spring by the 2040s and 2060s under both scenarios. Relative humidity is identified as the most influential factor, followed by the drought condition. These findings highlight key fire weather dynamics and the urgent need for adaptive resilience strategies.

### **Correlating Subjective Evaluations in Equine Nuclear Scintigraphy with Radiomic Profiles, Serum Osteocalcin and C-Terminal Telopeptides of Type I Collagen**

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Stress fractures are a major cause of lameness and early retirement in racehorses, highlighting the need for earlier detection of skeletal stress. This study examined whether combining serum bone biomarkers with nuclear scintigraphy (NS) imaging improves diagnostic accuracy. Serum osteocalcin (OC) and C-terminal telopeptide of type I collagen (CTX-I) were measured in lame and sound racehorses and compared with radiomic and subjective NS assessments. Of 68 lame horses, 28 had confirmed stress fractures, most often in the tibia and pelvis. Lame horses showed greater variability in OC levels, and abnormal radiomic Total Asymmetry Index scores were linked to lower CTX-I/OC ratios ( $0.76 \pm 0.82$  vs  $1.85 \pm 2.04$ ;  $p = 0.0132$ ; AUC = 0.77). Radiomic and subjective evaluations correlated strongly. These findings suggest that integrating imaging-derived metrics with serum biomarkers may enhance early detection of bone fatigue, supporting proactive welfare strategies in racehorse management.

### **Pharmacokinetics and pharmacodynamics of a sodium-glucose co-transporter 2 inhibitor in healthy horses**

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Insulin dysregulation (ID) is a common endocrinopathy of the horse, that causes considerable morbidity. Sodium-glucose co-transporter 2 inhibitor (SGLT2i) drugs are pharmaceutical agents used for the management of ID in horses, but there is little information on the pharmacodynamics, safety and pharmacokinetics of SGLT2is in horses. Determination of the pharmacological profile of SGLT2is in horses is integral to the understanding and clinical use of these drugs. Eight healthy horses were enrolled in the study, and underwent physical, haematological, biochemical and endocrine examinations. A single dose of an SGLT2i was administered enterally, and blood collected at designated time points for pharmacokinetic analysis. After a minimum of one month washout period, horses were administered the SGLT2i until steady state concentrations were achieved, and haematologic, biochemical and endocrine assessment performed for pharmacodynamic analysis.

These contributions will provide veterinarians with information on safety, optimisation of dosing regimens, and provide advances to the management of ID in horses.

### **Maize-rich diet: mitigating heat stress and improving production of lambs**

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This study examined the effects of a maize-rich pellet diet on the mitigation of heat stress (HS) and the production of lambs. Sixty lambs ( $36.1 \pm 4.47$  kg live weight [LW]) were allocated to 20 pens and fed either a control diet (no maize) or a maize-rich diet (30% maize, dry matter [DM] basis), offered ad libitum or at 3.5% LW, for 68 days. Lambs experienced moderate HS during the first 29 days (temperature humidity index [THI]:  $22.8 \pm 2.05$ ) and no HS thereafter (THI:  $17.2 \pm 2.69$ ). Mild HS increased rectal temperature and feed conversion ratio ( $39.9$  vs  $39.8^\circ\text{C}$ ,  $p = 0.001$ ;  $6.42$  vs  $5.73$ ,  $p = 0.020$ ), indicating effects on physiology and production of lambs. Compared to the control, the maize-rich diet significantly reduced respiration rate ( $153$  vs  $148$  bpm;  $p = 0.007$ ) and panting score ( $1.9$  vs  $1.6$ ;  $p = 0.007$ ), explaining that maize may mitigate mild heat stress. Lower intramuscular fat ( $3.47$  vs  $3.13\%$ ,  $p = 0.021$ ) suggests that a maize-rich diet may influence marbling of meat. Further research is needed to examine a maize-rich diet during a typical heat stress.

### **Tracking the footprints of pandemic-generating vibrio cholerae in Australia**

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Cholera remains a pressing global health problem, with recurring outbreaks driven by the adaptive nature of *Vibrio cholerae*. Despite major progress in genomic epidemiology, the diversity, transmission, and evolutionary patterns of this pathogen in underrepresented regions, such as

Australia, remain poorly studied. This proposal aims to investigate the genomic features of V. cholerae isolates from Australia alongside global strains to uncover their diversity, resistance, and phylogenetic relationships. By applying whole genome sequencing and comparative analyses, the study will contribute to understanding how cholera strains spread and adapt across regions. The findings are expected to strengthen knowledge of transmission dynamics, highlight potential public health risks, and provide insights that can support future outbreak preparedness and surveillance.

## Session 2

### **Nurses working in acute care settings: experiences and perceptions of using structured clinical handover frameworks: a scoping review**

**Patience Moyo<sup>1\*</sup>, Anderson, J.<sup>1</sup>, Francis, K.<sup>1</sup> & Biles, J.<sup>4</sup>**

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Structured clinical-handover-frameworks improve communication for safe, quality patient-centred care yet compliance utilising these frameworks is still a challenge. This study therefore aims to explore current clinical-practices and nurses' knowledge gaps in relation to the topic area. The Joanna-Briggs-Institute-guideline for scoping reviews informed this review. Only studies which met the predetermined Population-Concept-Context-framework, and the inclusion/exclusion criteria were included. 5 electronic databases were searched. 425-studies were imported into COVIDENCE™ for screening with 197-duplicates removed. 24-studies remained. The QualSys-tool was used to evaluate the relevance and quality of research of these studies. Screening-processes were independently undertaken by all reviewers. This study demonstrates that implementing structured clinical-handover-frameworks improves clinical-handover-processes and increases patient health outcomes/safety; yet knowledge gaps still exist. The study demonstrates that further research is required to explore why inconsistencies exist in the adoption of structured clinical-handover frameworks by nurses and healthcare services to develop strategies for improved communication and health outcomes.

### **Using CRISPR to diagnose parasitic infections at the point-of-care**

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Rural and remote Australian communities experience disproportionately high rates of parasitic infections. Diagnosis of these infections heavily relies on low-sensitivity microscopy or laboratory-based molecular techniques. Unfortunately, reduced access to pathology services within these communities presents major obstacles to timely diagnosis and treatment.

CRISPR-based diagnostics offer a solution. This technology requires no specialised equipment or technical expertise and can be performed at the point-of-care, potentially filling this diagnostic gap.

In this study, diagnostic tests based on CRISPR-technology are being developed for the parasitic trichomonads, *Trichomonas vaginalis* and *Trichomonas tenax*. Using guide RNA sequences targeting genomic regions of these organisms, target detection was achieved in a laboratory-based fluorescent assay. Further work is underway to develop the test for point-of-care application using lateral flow strips.

In summary, these tests will detect trichomonads in patients at the point-of-care, allowing rapid diagnosis and treatment.

### **A spatiotemporal machine learning framework to detect woody plant encroachment into hydrologically altered wetlands**

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Woody plant encroachment (WPE) is a globally significant process that alters ecosystem structure and function, particularly in floodplain environments where hydrological regimes regulate vegetation dynamics. In Australia, rapid expansion of River Red Gum (*Eucalyptus camaldulensis*) into open wetlands has raised ecological concerns, yet field surveys remain spatially restricted. This study develops a supervised machine learning framework to quantify WPE using multi-season Sentinel-2 imagery, spectral indices, and terrain variables. Focusing on the mid-Murrumbidgee floodplain (2016–2025), three classes, River Red Gum, Non-Forest Floodplain, and Water were mapped across five sub-regions (P1–P5). Random Forest (RF) and XGBoost achieved high accuracy (RF: 0.980, XGBoost: 0.987), with XGBoost yielding sharper boundary delineation. Ecological results revealed heterogeneous dynamics: P2–P4 showed strong RRG expansion (+18–20%), while P1 and P5 remained stable. The framework shows that multi-seasonal integration with ensemble learning provides decision-ready outputs for floodplain management and transferable ecological monitoring.

### **Exploring the lived experiences of student midwives who have provided perinatal loss care: a systematic review**

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Student midwives often encounter complex and emotionally charged situations in the clinical environment. One of the most profound challenges student midwives may face is providing care during perinatal loss. This review explores the emotional, educational, and professional challenges encountered by student midwives. It examines how exposure to perinatal loss during training can shape clinical confidence, emotional resilience, and preparedness for future practice.

At the time of submission, data extraction and thematic synthesis are underway. Key data include study characteristics, participant demographics, context, methodology, and findings relevant to the experiences of student midwives caring for women following perinatal loss. These findings will form the basis for the synthesis and interpretation of results, which will be discussed in the presentation.

The research aims to inform midwifery education by highlighting the lived experiences of students and identifying the need for proactive strategies to better support them in emotionally demanding clinical environments.

### **The effects of modified rice bran arabinoxylan supplementation on the nutritional status of patients with colorectal cancer**

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This research aims to investigate the potential of rice bran arabinoxylan compound (RBAC) as an immunonutrition supplement to improve the nutritional status and quality of life (QoL) of colorectal cancer (CRC) patients, with the goal of preventing malnutrition and complementing primary oncological treatments of surgery, chemotherapy and radiotherapy.

RBAC may help prevent malnutrition in CRC patients through antitumour, antioxidant, anti-inflammatory and gastroprotective properties. However, to date, no specific study has yet investigated its effects on the nutritional status of CRC patients.

The proposed research will be a prospective randomised placebo-controlled trial designed to obtain preliminary evidence on the efficacy of RBAC supplementation in CRC patients.

This research will contribute to an underexplored area of knowledge. Positive findings from this study will lay the groundwork for a larger, more rigorous controlled trial to validate the results and inspire further research into RBAC as a potential immunonutrition treatment for CRC patients.

### **Climate-driven agricultural transformation in the Vietnamese Mekong Delta: visibility, inclusion, and empowerment in gender, youth, and ethnicity**

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Agricultural transformation refers to the shift from traditional farming to climate-resilient and sustainable systems through innovative technologies, crop diversification and livelihood options. In the Vietnamese Mekong Delta (VMD), one of the regions most vulnerable to climate change, this transformation responds to salinity intrusion, drought and other climate-related pressures that destabilise farming systems, threaten rural livelihoods and drive migration. While transformation aims to modernise agriculture and enhance resilience, its benefits are unevenly distributed. Women, youth, and Khmer ethnic farmers often face barriers in land access, insecure tenure and limited participation in decision-making, reflecting power dynamics and inequalities. This study places the intersectionality lens at the centre to examine how gender, age and ethnicity intersect to shape adaptive capacity. Drawing on a political ecology perspective, the study will investigate power relations and inequality to guide inclusive interventions for sustainable rural development in the VMD.

### **The effects of parental adverse childhood experiences (ACEs) and childhood threat and deprivation on adolescent depression and anxiety: an analysis of the longitudinal study of Australian children**

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Evidence on the impact of parental adverse childhood experiences (ACEs) on adolescent mental health remains limited. This study used data from the Longitudinal Study of Australian Children (LSAC) to examine associations between parental ACEs, children's exposure to threat- and deprivation-related ACEs, and adolescent depression and anxiety. Caregivers retrospectively reported their ACEs. Children's ACEs were assessed from ages 4–17 and classified as threat-related (bullying, hostile parenting, unsafe neighbourhoods, family violence) or deprivation-related (financial hardship, parental substance abuse, psychological distress, family death, separation, legal problems). Adolescents self-reported depressive and anxiety symptoms between ages 12–17. Modified Poisson regression estimated independent and joint associations of parental and child ACEs (before ages 12, 14, and 16) with outcomes. By age 17, 30.4% reported depression and 9.4% anxiety. Parental ACEs ( $\geq 2$ ) were linked to higher depression risk at 12–13 years (RR=1.42, 95%CI:1.10–1.84) and 16–17 years (RR=1.19, 95%CI:1.02–1.39). Deprivation-related ACEs ( $\geq 2$ ) increased depression risk across all ages (RR=1.31–2.18), while threat-related ACEs ( $\geq 2$ ) predicted risk only at 12–13 years (RR=2.01, 95%CI:1.28–3.17). No interactions were observed. Findings highlight the importance of early identification and intervention for children facing deprivation and familial adversity.

### **ExoPorous: an integrated platform for point-of-care detection of placental exosomal mRNAs in pregnancy complications**

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We present an extraction-free diagnostic platform for direct detection of placental exosomal mRNAs to enable early, non-invasive prediction of preeclampsia (PE). The method combines ExoPorous, a ferric oxide-based nanomaterial (>75% antibody conjugation efficiency) for targeted isolation of PLAP(+) placental exosomes, with locked nucleic acid (LNA)-modified molecular beacons to enhance the specificity of reverse transcription loop-mediated isothermal amplification (RT-LAMP). A simple 90°C heat-lysis step releases exosomal mRNAs without extraction kits. Optimized RT-LAMP conditions, including reduced amplification temperature and exclusion of forward loop primers, improved quantitative resolution. Using KiSS1 mRNA as a model, the assay showed high concordance with RT-qPCR, linear calibration with synthetic templates, and dual-mode (fluorescent and colorimetric) readouts. NTA confirmed exosome integrity, while Western blotting validated antibody selectivity. Minimal nonspecific binding was observed in negative controls. This first integrated RT-LAMP workflow for placental mRNAs offers a low-cost, scalable tool with strong potential for point-of-care PE risk stratification.

### **Danger at the door: are feral cats targeting Australia's social skinks at their communal shelter sites?**

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Feral cats are a global threat to biodiversity, driving faunal declines across three continents and extinctions on numerous islands. In Australia they have been particularly damaging to our vertebrate fauna and are implicated in ~2/3 of the 44 mammal extinctions since the arrival of Europeans. While the impact of cats on Australia's birds and mammals has received significant attention, the impact of cats on reptiles is comparatively poorly understood. One group of Australian lizards which may be at particular risk are our unique social skinks. This group lives in colonies and are site faithful to a specific shelter site. Some evidence suggests that feral cats may be learning to target these shelter sites, causing substantial predation. In this talk I outline my methods and preliminary results aiming to determine if cats are targeting the shelter sites of 15 species of social skink from across Australia.

### **Beyond 'With Woman': midwifery in a gender-diverse world**

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This research will explore the perceptions and educational preparedness of midwives in providing inclusive maternity care to sexual and gender diverse people. Grounded in the philosophy of woman-centred care, midwifery education faces increasing pressure to evolve in response to the needs of diverse birthing populations. Through a mixed-methods approach, this study aims to identify gaps in current curricula and clinical practice, and to understand midwives' experiences

and confidence in delivering affirming care. A scoping review has been conducted to map existing literature, revealing limited integration of inclusive content in midwifery education. The findings will inform the development of targeted educational strategies and policy recommendations to support inclusive, respectful, and evidence-based care. This research contributes to the broader discourse on equity in maternity services and seeks to ensure that all individuals regardless of gender identity or expression receive competent and compassionate care throughout the perinatal period.

### **Impact of genetics and environmental factors on fatty acid composition of rice**

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Rancidity is a major constraint in developing rice-based gluten-free products, closely linked to fatty acid composition and stability. This study examined eleven rice varieties (Amaroo, Sherpa, Langi, Koshihikari, Viand, Opus, Kyeema, Doongara, Reiziq, Illabong, Topaz) grown across three locations in New South Wales, Australia. Eleven fatty acids were identified and categorized into saturated (SFA), monounsaturated (MUFA), and polyunsaturated fatty acids (PUFA). Palmitic, oleic, and linoleic acids were the dominant SFA, MUFA, and PUFA, respectively. Significant genotypic variation was observed, with Sherpa consistently exhibiting lower unsaturated fatty acid content, suggesting reduced susceptibility to rancidity. Although environmental effects were noted, varietal genetics primarily influenced fatty acid profiles. These findings demonstrate the importance of genetic selection in mitigating rancidity risks and provide a basis for improving storage and processing stability in rice-based food applications.

### **The role of place attachment in the dynamics of infrastructure development and environmental conflict: a case study of Poso, Indonesia**

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Poso has had a history of social conflict since 1998. Recent hydropower dam projects on the Poso River have exacerbated environmental disputes. Although the dams were intended to foster peace and economic stability, they have led to tensions over natural resources, affecting local communities. This research explores the role of place attachment in environmental conflicts related to infrastructure development in Poso, Indonesia. It aims to understand the origins of Poso as a contested site, particularly in freshwater ecosystems undergoing rapid infrastructural changes. The study examines how place attachment influences conflicts by analysing the perceptions, emotions, and behaviours of local actors involved. Additionally, it investigates the role of formal and informal institutions in mediating these conflicts to promote sustainable peace and development. Key research questions include: (1) the causes of environmental conflicts in rapidly developing freshwater systems, (2) the impact of historical factors and place attachment on these conflicts, and (3) the effectiveness of conflict mediation.

## **Cardiac self-efficacy, self-management and health related quality of life of patients with coronary artery disease in regional, NSW**

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Coronary artery disease (CAD) is the leading cause of disease burden and mortality in Australia, with rural populations disproportionately affected due to higher hospitalisation rates and reduced access to specialist services. Cardiac self-efficacy (CSE) and self-management (SM) play a critical role in improving health behaviours and health-related quality of life (HRQoL) for people with CAD. This study aims to examine the association between CSE, SM, and HRQoL in patients with CAD in regional NSW, while also exploring patient experiences and needs during and following hospital discharge. An explanatory mixed-methods design will guide the study, with survey and semi structured interviews as methods. Multi-variate regression modelling will apply to explore associations, and thematic analysis will interpret qualitative findings. The study is expected to inform development of discharge care models incorporating CSE and SM strategies to enhance HRQoL for regional CAD patients.

## **Effects of a bacterial and enzymatic product on physical and chemical properties of bedding and cow behaviour in compost bedded pack barns**

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Compost bedded pack barns (CBPB) are loose housing facilities for dairy cows where composting principles assist in bedding management. A 5-week multisite replicated exposure study was conducted to assess the impacts of treatment with a biological and enzymatic product and management on pack characteristics and cow behaviour, on 5 commercial CBPBs in Australia from late autumn to early spring in 2023 and 2024.

Compost temperature (°C), stocking rate per study area (log m<sup>2</sup>/cow), and aerial ammonia concentrations (ppm) were assessed as outcome variables every 2 ± 1 d across all 5 farms. Three farms had compost moisture and carbon to nitrogen ratio (C:N) assessed weekly. Local weather conditions were measured daily for all 5 farms, while the cultivation rate of the pack (m<sup>2</sup>/min) was recorded for 3 farms. Multilevel mixed models were used to analyse the effects of treatment, covariables, and the interaction of treatment over time. There was no effect of treatment on the measured outcomes. Management factors that improved bedding quality included decreased stocking rates and cultivation rate.

## Session 3

### **Agricultural water governance in Bhutan: institutional analysis of water sharing and allocation**

**Kelly Tobden Dorji Tamang<sup>1\*</sup>, Bond, J.<sup>1</sup>, Pawsey, N.<sup>2</sup>, Connalin, J.<sup>1</sup> & Wangchuk, S.<sup>1</sup>**

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Access to water is crucial where 70% of the population is employed in agriculture, contributing 10.52% to GDP in Bhutan. Despite investments in irrigation and supply systems, water shortages persist, driven more by challenges of access, sharing, and allocation than by absolute scarcity. This study employs an exploratory sequential mixed-methods design to examine these dynamics. First, document analysis and semi-structured interviews trace the historical evolution of water governance institutions. These insights informed a household survey administered across four irrigation systems in two districts. Preliminary findings highlight the persistence of long-standing water allocation practices, while revealing contrasts between formal Water User Associations and informal farmer-managed systems. These differences have vital implications for equitable access to water, agricultural productivity, and the resilience of rural livelihoods.

### **Dietary human milk oligosaccharides intervention improves brain macrostructures in piglets: an MRI study**

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Human milk oligosaccharides (HMOs), the third most abundant biomolecules in breast milk, are the largest compositional difference from infant formula. This study examined how different HMOs, alone or with lactoferrin (Lf), affect brain macrostructure in piglets. Three-day-old male piglets ( $n = 80$ ) were fed methyl cellulose (control), sialylated HMOs (sHMOs), neutral HMOs (nHMOs), combined HMOs (cHMOs), or cHMOs + Lf diets for 35–36 days. At postnatal day 38/39, *in vivo* 3T MRI was performed to assess regional brain volumes. Absolute brain volume did not differ between groups ( $P > 0.05$ ), but sHMOs and cHMOs supplementation, with or without Lf, significantly increased relative volumes in cortex, hippocampus, corpus callosum, lateral ventricles, striatum, colliculi, and internal capsule ( $P < 0.05$ ). These region-specific adaptations suggest that HMOs, particularly sialylated forms, may accelerate maturation of cortical–subcortical and interhemispheric structures, potentially enhancing motor coordination, memory, and higher-order cognition in early life.

### Conservation status and threats to freshwater forested wetlands: a global systematic review

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Freshwater forested wetlands are biodiversity-rich ecosystems that regulate hydrology, store carbon, and provide vital services, yet they remain underrepresented in global conservation frameworks and face multifaceted threats. This review highlights altered hydrology as the most frequently reported threat, followed by agriculture expansion, climate change, logging, fire and infrastructure development. The most frequently studied regions were Southeast Asia, Europe, North America, and the Amazon Basin, yet substantial gaps persist, particularly in tropical and subtropical areas. Emerging approaches include remote sensing, ecological modelling, and socio-ecological methods, though long-term monitoring and interdisciplinary integration remain limited. Many keystone tree species lack updated conservation assessments, particularly in biodiverse but data-deficient regions. The review highlights a need for regionally tailored conservation strategies, improved wetland classification and mapping, and stronger inclusion of forested wetlands in policy and management agendas. Advancing these areas will contribute to safeguarding the ecological function, biodiversity value, and climate resilience of forested wetlands under accelerating environmental change.

### Preliminary evaluation of fungicide efficacy against key pathogens of persimmon dieback

**Taguam, John Darby<sup>1,2\*</sup>, Stodart, B.J.<sup>1,2</sup>, Steel, C.C.<sup>1,2</sup>, Fuss, A.M.<sup>3</sup> & Savocchia, S.<sup>1,2</sup>**

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Persimmon dieback is an emerging disease causing major losses in Australian orchards. Recent studies identified *Neofusicoccum* and *Neopestalotiopsis* species as the predominant pathogens, yet management options remain limited due to few registered fungicides and scarce efficacy data.

This study evaluated 17 fungicides representing different chemical groups, including products with single and dual modes of action. Fungicides were incorporated into potato dextrose broth at label rates and inoculated with actively growing cultures of the pathogens. Mycelial growth was assessed after two weeks of incubation, with untreated cultures serving as controls. Among single mode of action fungicides, difenoconazole and isopyrazam significantly reduced mycelial biomass ( $p < 0.01$ ) in both pathogen groups. Dual mode of action fungicides, particularly tebuconazole + fluopyram and pyraclostrobin + fluxapyroxad, also showed strong inhibitory effects. These results provide the first evidence of fungicide efficacy against persimmon dieback pathogens in Australia. Ongoing *in planta* trials will validate their potential for field application.

### **Evaluating step and gradient elution methods for the isolation of lactoferrin from bovine milk using a chromatographic process**

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Lactoferrin is an 80kDa iron-binding, sialylated glycoprotein with a broad range of biological functions. However, its isolation from bovine milk presents a significant challenge for the dairy industry. Increased global demand for lactoferrin fosters the need for efficient ion-exchange processes that can enhance yield without compromising purity. We investigated the impact of processing parameters, elution conditions and milk source on the yield and purity of lactoferrin using Sunresin SP Seplife®, an alternate commercial resin at the laboratory scale. Two gradient elution methods and an industry benchmark step elution method were evaluated with both raw and pasteurised milk using an AKTA Pure 25M Fast Protein Liquid Chromatography. Overall, the gradient elution methods provided a feasible alternative to step elution, offering improved yield while maintaining lactoferrin purity above 90% across the treatments. The lactoferrin yield from raw milk was more than 20% higher than that from pasteurised milk.

### **Structural and functional characterisation of the molecular interactions of non-structural proteins in Japanese encephalitis virus infection**

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Japanese encephalitis (JE) is a mosquito-borne viral disease that causes up to 68,000 clinical cases and 13,000–21,000 deaths each year, with a case fatality rate in symptomatic patients reaching 30%. The genomic landscape of the JE virus has shifted over time, with genotypes I, IV, and V emerging and spreading from East Asia westward and into Australia. Recurring outbreaks, including notable incursions into Australia in 2022 and 2025, have impacted both public health and the piggery industry. The JEV genome encodes seven non-structural (NS) proteins required for viral replication and the production of progeny virions. JEV NS3 and NS5 possess protease/helicase and methyltransferase/polymerase activities, respectively, and their molecular

interactions are essential for the viral lifecycle. This study focuses on the molecular interplay between JEV non-structural proteins—particularly NS3 and NS5—and host proteins, highlighting recent advances and current knowledge gaps to inform the development of next-generation antiviral therapeutic strategies.

### miRNA expression of bovine CD4+, CD8+ and $\gamma\delta$ T cells

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MicroRNA (miRNA) are an emerging class of molecules with potential as diagnostic biomarkers but are under-investigated in bovines. miRNA are small (20~ nt) nucleic acid molecules that regulate gene expression and are excreted from cells to facilitate cell-to-cell communication. Differentially expressed miRNA have been correlated with disease states in human studies. These miRNAs could have translational value as diagnostics – particularly for pathologies with limited or ineffective existing assays. To develop similar capabilities in livestock, our understanding of bovine miRNA needs to be expanded. We conducted a study to isolate specific T-cell subsets (CD4+, CD8+,  $\gamma\delta$ +) and characterise their miRNA expression. Analysis is currently being performed to identify differentially expressed miRNA between the cell types and what miRNA profiles may exist between cells and individuals.

### Enhancing nitrogen-use efficiency and yield in dryland wheat using *Methylobacterium symbioticum*: A field study in southeastern Australia

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Australian dryland wheat farming depends heavily on synthetic nitrogen (N) fertilizers, which are often inefficient and environmentally unsustainable due to various loss pathways demanding an alternative source of N. *Methylobacterium symbioticum* (MS), a foliar-applied microbial biostimulant, may offer a sustainable alternative; however, its effectiveness in improving N use efficiency in Australian dryland wheat are not well studied. A field experiment was conducted on a 24-hectare commercial farm at Englefield Plains, Junee, NSW, using a randomized complete block design with five replications to evaluate the effects of MS application on the growth and yield of dryland wheat. Recommended N (115 kg N/ha) and reduced N (85 kg N/ha), each with and without MS were examined. Application of MS under reduced N significantly improved leaf chlorophyll, above-ground biomass, and yield parameters. Notably, grain yield increased by 12%, and profitability improved by \$180/ha compared to the synthetic N-only treatment, supporting economic benefit.

## Japanese encephalitis virus genetic diversity in hosts and viral fitness

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Japanese encephalitis virus (JEV) is a mosquito transmitted virus of public and animal health significance. It is the causative agent of Japanese encephalitis (JE). In 2022, outbreaks of JE occurred in Australia impacting both animals and humans. These outbreaks were caused by a novel virus belonging to genotype (G) IV. The presence of GIV in Australia raised the need to understand the drivers of its spread into previously nonendemic areas and apparent displacement of the previous genotypes of JEV (GII and GI) detected in northern Australia. This requires studies into the genetic diversity of this novel Australian JEV GIV compared to Australian isolates of GII and GI, and also to earlier progenitor Indonesian isolates of GIV. This study aims to understand the genetic diversity of the Australian GIV through molecular characterization of quasispecies populations, to test the hypothesis that elevated levels of genetic diversity provide an improvement in viral fitness.

## Backyard poultry in Australia: safe practice or rising biosecurity challenge?

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Backyard poultry keeping is gaining popularity in Australia; however, systematic data on management, biosecurity, and antimicrobial use remain limited. To address this, an online survey of 683 backyard poultry owners was conducted. Chickens were the predominant species (99.7%, 95% CI: 98.9–99.9%), with a median flock size of 11 birds (IQR: 6–24). Poultry were mainly kept for eggs and as pets (68.3%, 95% CI: 64.7–71.8%). While 62.3% (95% CI: 58.6–66.0%) of respondents were aware of zoonotic diseases, only 34.1% (95% CI: 30.5–37.8%) expressed slightly concern regarding avian influenza. Antimicrobial use was low, with 77.6% (95% CI: 74.2–80.6%) reporting no use in the preceding 12 months. However, potential biosecurity risks were identified, particularly frequent contact with wild birds (69.4%, 95% CI: 65.8–72.8%). These findings highlight gaps in knowledge and management practices, emphasising the need for targeted education to strengthen biosecurity and safeguard both poultry and public health.

## The multisensory experience of European christmas markets: perceptions of sensory and multisensory heritage

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Christmas markets offer a wealth of sensory experience. Whilst this may be recognised as heritage, having social value and transmitted intergenerationally, no research has investigated such heritage perceptions, nor the sensory experience. Five European markets were thus examined using interviews/surveys, alongside field measurements.

Aurality dominated in Birmingham, while olfactory and visual components were primarily identified in Germany, which were also ascribed heritage importance. Visual icons included Christmas trees, carousels, and lighting displays, while soundmarks included Turmblasen and Stadtgeläut alongside traditional music. Crucial market odours and tastes included Glühwein, Kartoffelpuffer and other regional specialties, often considered unique and representative.

Whilst iconic sensory elements reveal ascribed heritage, combined sensory experience was considered essential, itself forming an inseparable culturally significant component. Furthermore, participant localness and child visitation were related to higher degrees of meaning and significance. These findings extend the debate of intangible heritage meaning, sensorial memory connections, and intergenerational heritage engagement.

## A bipartite, mutation-tolerant NLS regulates interaction of $\Delta$ Np63 $\alpha$ with importin alpha, nuclear transport and transcriptional activity

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The transcription factor  $\Delta$ Np63 $\alpha$ , a member of the p53 protein family, plays a key role in epithelial development and homeostasis by promoting the proliferation of basal progenitor cells. While  $\Delta$ Np63 $\alpha$  functions in the nucleus, the molecular mechanisms regulating its nuclear import are unclear.

In this study, we investigate the nuclear import of  $\Delta$ Np63 $\alpha$ , focusing on its interaction with the importin- $\alpha/\beta$ 1 (IMP $\alpha/\beta$ 1) transport machinery. Using X-ray crystallography, we define the structural basis for recognition of a bipartite nuclear localization signal (NLS) located between the DNA-

binding and oligomerization domains of  $\Delta$ Np63 $\alpha$ . Structural analysis reveals an atypical mode of IMP $\alpha$  engagement, whereby each basic cluster within the bipartite NLS can independently bind both major and minor sites of IMP $\alpha$  when  $\Delta$ Np63 $\alpha$  forms homodimers.

Mutational studies, coupled with biochemical assays and cell imaging, show that only simultaneous disruption of both basic motifs abolishes importin binding and nuclear localization, leading to a loss of transcriptional activity. Notably, our findings provide structural and functional insights into  $\Delta$ Np63 $\alpha$  nuclear import and reveal an evolutionary adaptation that safeguards its nuclear function against mutation.