

ANIMAL TRACKS



A NEWSLETTER FROM THE DEPARTMENT OF ANIMAL BIOSCIENCES



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Aquaculture Prof**

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Our Vision

We are global leaders in innovative education, research and technology transfer in animal biosciences.



Our Mission

As scientists and educators, our mission is to generate and disseminate knowledge about the biology of animals in human care, including farm and companion animals and wildlife species. We focus on nutrition, breeding and

genomics, physiology, animal welfare and behaviour, and integrative modeling for viable production of high quality food, providing high quality animal care, and using animal models to improve human health and well-being.



A Message from the Chair

ANIMAL TRACKS



A Newsletter from the Department of Animal Biosciences

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Welcome to the Summer 2021 edition of 'Animal Tracks' – a newsletter dedicated to sharing news, awards and the many successes of the Department of Animal Biosciences.

We are now more than a year into the COVID-19 pandemic, and although it is not yet behind us, there is light at the end of the tunnel. The 2020-2021 academic year was certainly challenging and our students, faculty and staff should be proud of what they accomplished while faced with such uncertainty.

The Fall 2021 semester is expected to look very different with a dramatic return of campus life. For students, this means that a significant number of courses will be offered face-to-face; either fully or in a hybrid format of in-person and online learning. Our dedicated faculty and teaching staff worked extremely hard last Fall to bring courses online, with some even finding innovative ways to "bring the farm home". You can expect the same level of passion and dedication from them this year, whether learning online or in-person.

In alignment with other institutions across Ontario, U of G requires all students on campus to be fully vaccinated. With one of the largest undergraduate cohorts, I encourage students enrolled in ABSc programs to follow all University policies regarding health and safety. Not only does this keep you and those around you safe but adhering to safety measures on campus also allows you to make the most of your time here and enjoy the supportive and fun student experience that U of G has to offer.

For faculty and staff, there will be a gradual, phased-in return to campus. The workplace has undergone dramatic changes over the last year and has driven the need to consider expanded choices in the work environment. In recognition of this, the University has developed a Flexible Work Policy for non-academic staff that can be established upon request pending operational requirements. I understand that some of you have concerns regarding a return to the workplace and I want

to assure you that your well-being is our utmost priority.

Although COVID-19 has had a dramatic impact on research activities, our graduate students continue to shine and have been very successful in obtaining scholarships and awards and continuing to publish their work. Their incredible talents were on full display this past winter with the inaugural Creative Expressions of Research Contest held by the ABSc Graduate Student Council.

The past year has also seen several long-time members of the department retire including Prof. Rich Moccia, Wendy McGrattan, Brian McDougall and Linda Caston. I am sure that I speak for everyone when I say that they will be greatly missed and we wish them all the best on their new journeys.

With retirements come new hires and we have recently welcomed some new faces to the department. We believe these new team members fit in well with our department culture and hope to work with them for many years to come.

Speaking of department culture, an important new initiative in ABSc has been the formation of an equity, diversity and inclusion (EDI) committee. With excellent leadership from Dr. Jen Ellis and Prof. Rich Moccia, the committee is working diligently towards building a comprehensive and actionable strategy that seeks to ensure everyone is treated with fairness and respect and provided with equitable opportunities in the department. This is an opportunity for us all to learn from past experiences and become a stronger unit moving forward.

Stay safe and I hope you enjoy this issue of Animal Tracks.

Sincerely,
Jim Squires
Professor and Chair
Department of
Animal Biosciences



Photo: Merrin Schwalbe



ONTARIO AGRICULTURAL COLLEGE
DEPARTMENT OF ANIMAL BIOSCIENCES

ON THE COVER:
Salmon and rainbow trout—two key aquaculture species in Canada and a focus of agriculture policy and research in ABSc.

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BY THE NUMBERS | DEPT. OF ANIMAL BIOSCIENCES

28

Regular Faculty

13

Associate Faculty

19

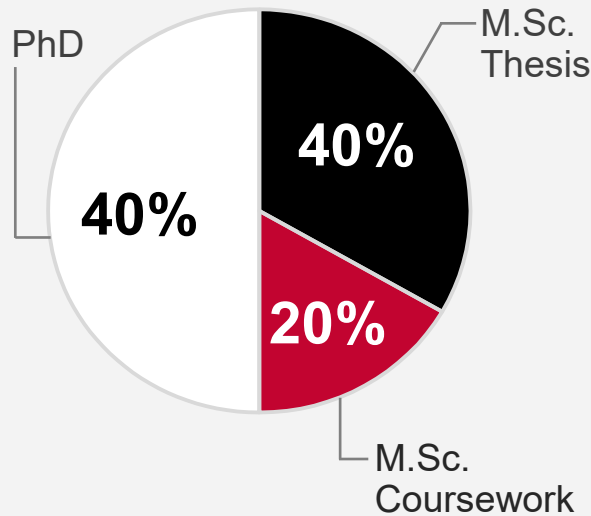
Postdocs and
Research Associates

4

Federal/Provincial/
Industry Co-Locations

150

Graduate Students



12

Staff

(excluding facility management)

6

Administrative

4

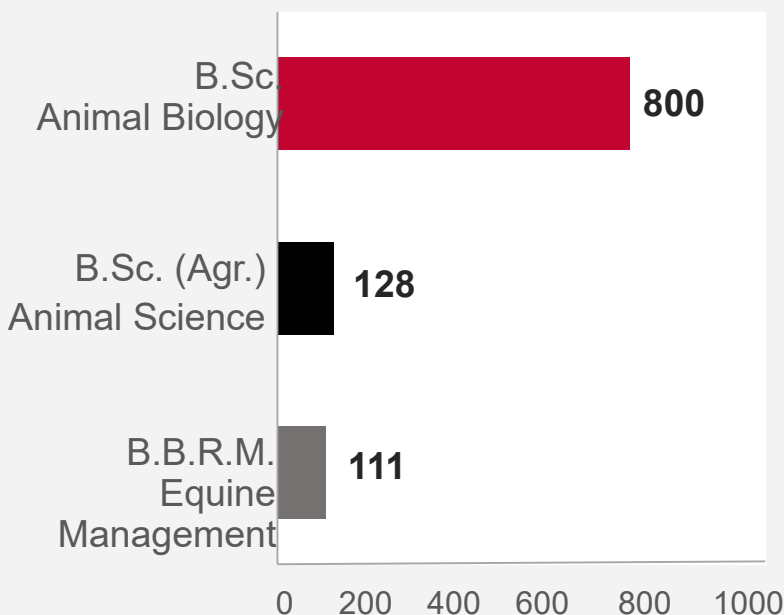
Teaching and
Research Support

2

IT and Computing



UNDERGRADUATE ENROLLEMENT



RESEARCH

\$6M+

in annual funding and a
high publication output



Equity, Diversity & Inclusion Committee



The Department of Animal Biosciences is committed to the fair and respectful treatment of all people. As part of our efforts towards strengthening equity, diversity and inclusion in ABSc we have formally established an EDI Committee. The nine member committee is comprised of faculty, staff and graduate students and Chaired by Dr. Jen Ellis with Prof. Rich Moccia as Co-Chair.

The mandate of the EDI Committee is,

“To increase the opportunity for qualified individuals from diverse backgrounds and identities to obtain high quality education, fair access to opportunities and positive life experience in the Animal Biosciences Department at the University of Guelph. This initiative spans recruitment, selection and retention of HQP, as well as helping to support teaching, research and outreach activities that embody the goals of equity, diversity and inclusion.”



A number of short, mid and long-term objectives have been developed including a gap survey analysis to find areas for improvement in how ABSc is addressing EDI. More information about the EDI initiative in ABSc be found on the Animal Biosciences website at: animalbiosciences.uoguelph.ca/about-us/equity-diversity-and-inclusion-committee

Retirements

The last year has seen many long-standing members of ABSc make the transition into retirement.

Wendy McGrattan retired in December 2020 after more than 30 years at U of G, all of them in ABSc.

Wendy joined the department in 1987 as a faculty secretary and then quickly rose to

Secretary to the Chair. During this time, she also held other duties including receptionist and Graduate Secretary. Following reorganization at OAC, she spent the latter part of her career as the Graduate Administration Assistant.

Wendy was always a bright light in the department with her cheerful smile and kind demeanor. While we are sad to see her go, we wish her all the best in retirement. In addition to spending time with family, Wendy is looking forward to volunteering with her church community, reading and learning to sew.



ABSc would also like to congratulate Linda Caston on her retirement this past Fall. Linda worked as a Research Assistant/ Associate in poultry nutrition with Professor Emeritus Dr. Steve Leeson from 1984-2011. During this time, she was responsible for ensuring research projects ran smoothly and helped pioneer the development of omega-3 fatty acid enriched eggs. Since 2011, Linda worked with renowned poultry welfare expert Dr. Tina Widowski.



Outside of ABSc, Linda is heavily involved with the Guelph Humane Society where she has sat on the board of directors and remains a dedicated foster volunteer. It is well known that many of those who come across Linda in ABSc have walked away with an extra pet!

Finally, we would also like to congratulate Brian McDougall on his retirement as Manager of the Meat Science Laboratory. Brian oversaw Canada's only federally licensed abattoir at a University and led a major \$2.5 million renovation of the space in 2018.

In retirement, Brian plans to spend time with family and work on the family farm just outside Guelph.

New Staff Members

Along with retirements, we are pleased to announce some new members to ABSc.

Jacob Harwood is our new Graduate Program Assistant. Jacob has a degree from U of G and has previously worked in administrative roles as the Booking Office Assistant in the

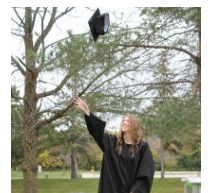


Athletics department, Accounts Clerk in Open Learning and the Graduate Program Assistant in Computer Science. With his education and experience, along with his strong work ethics and knowledge of the role and the university's various policies and procedures, Jacob will be a valuable addition to our team.

ABSc would also like to welcome Gino Giansante as the new manger of the Meat Science Laboratory. Gino's experience in the meat industry goes back to his days as a student working summers with his father in a small abattoir. He brings over 20 years of experience in the food processing industry, including plant management, operations, people leadership and financial expertise. Most recently, Gino was a Senior Processing Manager at Maple Lodge Farms, and before that he was a Production Manager and Logistics Manager at Olivieri Foods.



Another warm welcome to Stephanie Kears, a new member of the ABSc admin team.



Stephanie graduated from the University of Waterloo where she had several very successful co-op terms, including some in a university environment. With the experience and skills that she has accumulated in her previous roles, with her positive attitude, initiative and very good work ethics, she will be a great addition to our team.



CAREER SPOTLIGHT:
PROF. RICH MOCCIA



After a career that spanned 33-years at U of G, Prof. Rich Moccia retired in Fall 2020. In addition to his role as Professor of Aquaculture and Fisheries Science, Moccia also held positions as Associate Vice-President (Research) and Director of the Aquaculture Centre. He has been the recipient of numerous accolades including a Lifetime Achievement Award from the Aquaculture Association of Canada and a Distinguished Professorial Teaching Award from the University of Guelph Faculty Association and multiple awards honouring his strong track record of community engagement and volunteerism.

“Whatever you do, do something that matters”

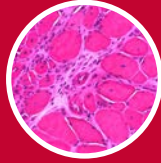
Moccia established a productive research program exploring the science and practice of aquatic food production as well as the impact of aquaculture on ecosystems and animal welfare. He has authored more than 200 peer-reviewed papers, technical reports and fact sheets and given hundreds of presentations to

government and industry. A respected researcher, coach and mentor, many of the nearly 100 graduate students he has supervised or co-supervised have gone on to successful careers in academia, government and the aquaculture industry.

Never one to sit back, Moccia has also obtained speciality certifications and training in a variety of areas including leadership skills development, conflict mediation, science diving and sports coaching.

Since retiring, Moccia remains a valuable member of ABSc and the broader U of G communities. While being active on several department and campus-wide initiatives, he has also recently been appointed to the Executive Boards of three different organizations: the Canadian Association for Underwater Science, the National Farm Animal Care Council and the Canadian Aquaculture Industry Alliance.

For more information on Prof. Moccia please visit his [ABSc profile page](#). You can also read more about his activities in this issue of Animal Tracks including his involvement with the development of Canada’s first-ever welfare code for farmed fish (p. 10) and his ongoing mentorship of former graduate student and new assistant professor Dr. David Huyben (p.8).



New Meat Science and Muscle Biology Professor



ABSc is pleased to announce Dr. Marcio Duarte as an assistant professor in meat science and muscle biology. Duarte comes to the University of Guelph from Universidade Federal de Viçosa in Brazil where he was an assistant professor in the animal science department. He is set to arrive late Fall 2021 following delays due to the COVID-19 pandemic.

His area of research focuses on maternal nutrition and its impact on fetal programming in meat animals. His aim is to better understand the gestational period to improve production efficiency and quality of meat in offspring animals.

Duarte will work with researchers across the University of Guelph to examine the relationships of genetics, nutrition, management, animal health and welfare, and other factors in meat product quality. His research team will also utilize the University’s recently remodeled Canadian Food Inspection Agency (CFIA) regulated abattoir/processing facility, sensory evaluation facilities, and the Elora Beef Research Centre.

A three-time grad of Universidade Federal de Viçosa, Duarte has published 65 peer-review papers within the meat science/muscle biology and/or livestock production fields.

The addition of Dr. Duarte represents another important milestone in the renewal of the department which saw the loss of 8 faculty members in 2008 due to OAC budget

“We are very happy to welcome Marcio to the department,” shares Prof. Jim Squires, department chair. “His experience in the molecular and cellular aspects of meat production, combined with his understanding of practical applications for industry, are a perfect fit for our department.”

NEW JOURNAL EDITOR APPOINTMENTS



Dr. Ming Fan, a Professor of Nutritional Ecology with expertise in gastrointestinal physiology and metabolism in pigs has been appointed as an Associate Editor for *Microbiome*, one of the world’s leading microbiology journals, and its sister journals *Animal Microbiome* and *Environmental Microbiome*.



Dr. Angela Canovas, an Associate Professor of Livestock Genomics and CGIL member with expertise in OMICS-technologies, has been appointed to the editorial boards of *BMC Genomics* and *Frontiers in Genetics*. Canovas also serves on the editorial boards of several other journals including *Canadian Journal of Animal Science*, *Livestock Genomics* and *Genome*.



Dr. Tina Widowski has been named one of seven Influential Women in Canadian Agriculture (IWCA) by AgAnnex, a media brand comprised of specialist print and online publications that provides

research and production news for North American farmers. The IWCA recognition program aims to honour the remarkable work women are doing across Canada's agriculture industry.

Dr. Widowski has been a professor in ABSc since 1990 and is also a core faculty member in the Campbell Centre for Animal Welfare (CCSAW). Since 2011 she has held the Egg Farmers of Canada Research Chair in Poultry Welfare and Director of CCSAW from 2007-2020.

The IWCA honour adds to a long list of awards for Widowski who has had a tremendous impact on the field of animal welfare. Over the course of her career she has advised over 100 graduate students and authored more than 230 peer-reviewed articles. The results of her research have led to great improvements in animal welfare that have strengthened farm practices.

You can listen to Widowski and the other recipients share their stories on the [IWCA podcast series](#). A virtual event will also be held in October to celebrate their accomplishments.

Dr. Trevor DeVries, a Canada Research Chair in Dairy Cattle Behaviour and Welfare, has been named the recipient of the 2021 'Nutrition Professionals Inc. Applied Dairy Nutrition Award'. The award recognizes outstanding achievement in

research, teaching and extension in the dairy industry and was presented during the virtual American Dairy Science Association (ADSA) Annual Meeting in July.

DeVries began his career in 2007 at U of G's Kemptville campus and moved to ABSc in 2015 where he runs a productive research program with more than 170 papers and 260 invited presentations. He is also a member of the cross-faculty group Dairy at Guelph, and coaches U of G's highly competitive Dairy Challenge team.



Dr. Anna-Kate Shoveller received the 'Excellence in Nutrition and Meat Sciences' at the 2021 ASAS-CSAS-SSASA Annual Meeting and Trade Show in July. The award recognizes excellence in teaching research, or

technology transfer in the area of animal nutrition or meat science and was sponsored by Trouw Nutrition.

Dr. Shoveller is a leading animal nutritionist, with a particular interest in companion animal and livestock nutrition. Prior to joining ABSc in 2015, she spent time in industry as a senior scientist at Procter & Gamble and Mars Pet Care in the USA. She runs a high-energy basic and applied research program with more than 160 papers and many students going on to positions in the animal nutrition industry.

Making Headlines



Dr. Anna-Kate Shoveller was interviewed by the [Toronto Star](#) where she provided insight on the growing trend of individualized diets and how owners can navigate the the complex world and sometimes polarizing world of pet nutrition.



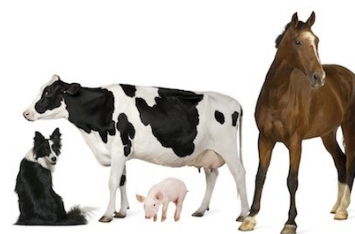
Dr. Andy Robinson was featured in a [story from the Globe and Mail](#) on how universities are adapting to online learning and teaching in the face of COVID-19. In the article, Robinson discussed some of the technical challenges that can arise when going remote and how quickly shift gears even if it means teaching from his miniature donkey hobby farm!



Robinson was also featured alongside Dr. Katrina Merkies and Dr. Michael Steele in a [U of G News article](#) on how faculty were working to "bring the farm home" to students learning remotely. Merkies discussed alternative ways in which students can gain practical horse handling skills while Steele described the use interactive case studies and virtual interviews with farmers for his dairy nutrition course.

Need an Expert?

ABSc faculty have expertise on a variety of topics related to livestock and companion animals including nutrition, breeding and genetics, behavior and welfare and physiology. [Get in touch!](#)





Q&A with Dr. David Huyben

From Guelph to Sweden to Scotland and back to Guelph, Dr. David Huyben's passion for aquaculture has taken him on a journey to some of the top research institutions around the world. After completing both a B.Sc. (Animal Biology, 2010) and M.Sc. (Aquaculture, 2012) at U of G, Huyben made the move to the Swedish University of Agricultural Sciences for doctoral studies. While at SLU, he explored the effects of sustainable fishmeal protein alternatives on the blood physiology and gut microbiota of rainbow trout. After obtaining his PhD in 2017, Huyben then crossed the North Sea to the University of Stirling for a postdoctoral fellowship before arriving back at U of G in 2020 as an Assistant Professor in Aquaculture. His current research focuses on the effects of feeding omega-3 fatty acids, single-cell proteins and probiotics on the growth, immune response and gut microbiome of salmonid fishes, especially rainbow trout and Atlantic salmon

In the following Q&A, we catch up with Dr. Huyben to find out how his first year as a Professor in ABSc went and what his goals are for the future.

You arrived in June 2020 just after the first wave of the COVID-19 pandemic. What was the journey like from Scotland to Guelph during this time?

It was a very challenging time since the UK was hit very hard by the first wave, while the situation in Ontario was not as intense. It was already going to be a challenging move flying across the pond with my wife, one-year old daughter, dog and cat as well as shipping our stuff via boat in a storage container. We tried to move in early June, but our flights were cancelled twice and we finally made the decision to rent a van and drive down to London, England to fly out since there were no trans-Atlantic flights out of Scotland. Our friends and family were amazing in providing food and supplies during our two-week quarantine until we could finally venture around Guelph, a city we love. We had several going away virtual drinks with friends in Scotland and we hope to one day return for a proper send off.

What has been the biggest challenge faced during the transition from postdoc to PI?

The opportunities have been endless in my new faculty position. The biggest challenge would be the steep learning curve to understand new funding, teaching, industry and research systems at U of G and in Canada since I am more familiar with these systems in Scotland and Sweden. It has helped me to fall back on my experiences as a B.Sc. and M.Sc. student at U of G, but life as a faculty member is very different. Other challenges include juggling several things at once, such as developing my own molecular lab, teaching, advising undergrad and grad students virtually, hosting other researchers and collaborating with industry, academic and government partners.

How have other faculty in the department, on-campus or outside U of G supported you during the transition?

I am so grateful for the support I have received and continue to receive from faculty at the department, U of G staff, Scottish/Swedish colleagues, research community and my family. Everyone has been very patient with my transition to this new faculty position. I want to especially thank Profs. Rich Moccia, Dom Bureau, Jim Squires and Eduardo Ribeiro as well as Dr. Marcia Chiasson for their advice on research, teaching and service while maintaining a work-life balance and planning for the future. There have been other faculty at the department that have assisted with teaching and grant writing, which I am very thankful for. Due to the pandemic, I have only met a few faculty members in person, but I look forward to meeting more in the future.

You have already had success with obtaining national and international funding from agencies such as OMAFRA and FORMAS. What does this mean to you as early-career researcher?

There is some relief in obtaining grants early on as well as validation since I have a degree of imposter syndrome. It is fantastic that research bodies in both Ontario and Sweden see the value in my research program and are supporting the sustainability, health and growth of the fish farming industry. I am thankful for the support of colleagues at U of G and in Sweden that add key pieces to these funded projects. I look forward to mentoring Canadian and Swedish students in these future projects and developing my career at U of G.



You can watch Dr. Huyben discuss his career and research program on the [Ontario Aquaculture Research Centre YouTube channel](#).

What has it been like to establish a lab during COVID-19?

Very strange! Out of the four students I have hired, I have only met one of them so far. I didn't meet my first student at U of G until 9 months after interviewing her on Skype when I was still living in Scotland. It has been challenging to connect at times and teach different aspects of aquaculture science in a virtual environment. I can't imagine what it's like for students to only take courses online for now over a year. However, things are beginning to open up and we all look forward to lab work, wet fish work and in-person discussions. In addition, it has been slow setting up my lab, especially ordering equipment and feeds, which will hopefully improve in the future as well.

Mentorship is essential for student success. Who were your mentors and how do you approach it with your students?

I have been privileged with a handful of mentors during my B.Sc., M.Sc., PhD and postdoc. I have also learned a lot from collaborating with other lab groups, feed companies and government partners. A few that have had the most impact on me include Profs. Rich Moccia (U of G), Torbjorn Lundh (SLU) and Brett Glencross (Stirling). I have picked up several strategies that I use with my students. Though I haven't had many yet at U of G, I have co-advised around a dozen students in Scotland. My main strategy is to keep an open door policy and have frequent update meetings to voice concerns and ideas in order to aim for equity, diversity and

inclusion in my lab group. I believe we can learn from each other; science is largely a constant problem solving exercise while navigating the rigors of the scientific method all in an effort to improve life for the future.

You jumped right into teaching for the Fall 2020 semester with the 3rd year undergraduate course Aquaculture: Advanced Issues (ANSC*3050). What was this experience like?

It was a mix of nostalgia from taking the course over a decade ago and merging aquaculture lectures I've given in Sweden and Scotland more recently. I really enjoyed interacting with the students and seeing their passion for aquaculture.

The most challenging part was the influx of info while teaching three days per week in addition to writing grant applications and attending meetings/seminars. Prof. Rich Moccia is a great mentor and gave me heaps of advice throughout the course. I was thankful to include several guest lecturers that took time to talk about their research, government work and industry experience to the students. I have lots of new ideas to add to the course and I am developing an undergrad and a grad course that is aquaculture related and hopefully will be offered next year.

Do you have any advice for students considering graduate work in Aquaculture?

Aquaculture is a very international field. My advice is to gain new experiences and pursue aquaculture programs in other provinces and countries, including my lab!

What are your future goals in terms of research and teaching?

My current goal is to build my lab group and establish my molecular and feed labs. I am also planning to collaborate with more ABSc faculty, industry and government partners as well as develop additional aquaculture courses at U of G.

As a new PI, free time is not always easy to find. What do you enjoy doing outside of academia?

I love playing hockey and I am also a huge hockey fan. Unfortunately I am with the wrong team (Leafs)! I enjoy spending time with my daughter, wife and big dog, especially on long hikes, walks and bike rides. It has been amazing returning to Guelph, reminiscing and making new memories with my family and friends. We do miss the castles in Scotland and the coffee breaks (fika) in Sweden, although Guelph has always been a place in our hearts.

How could someone connect with you and learn more about your research?

More info about my research including links to publications can be found on my [ABSc profile page](#).

If you are interested in my research and life as a grad student, please email me at huybend@uoguelph.ca. Students should also check my twitter [@DavidHuyben](#) and the [ABSc opportunities website](#) for updates on new positions.



Producing Better Fish

Researchers at the University of Guelph are among a group of national and international experts leading the charge on the development of Canada's first ever Code of Practice for the handling and care of farmed salmonids.

Aquaculture, or the farming of aquatic animals and plants, is one of the fastest growing food production sectors in the world. Globally, aquaculture now supplies more than **50% of consumed fish products**. In Canada, farm-raised fish make up **approximately 20%** of the total seafood supply, and the industry is a key contributor to economic wealth and employment in the agri-food sector.

The demand for seafood is expected to **double by 2050** and the aquaculture industry will play an increasingly important role in easing the pressure on wild fish stocks. Public and industry concern regarding the welfare of terrestrial food production animals has been a considerable focus over the past few decades, and that concern has recently been extended to fish. In Canada, the **National Farm Animal Care Council (NFACC)** facilitates the development of codes of practice for numerous livestock species. These Codes provide “nationally developed guidelines for the care and handling of farm animals and, “serve as our national understanding of animal care requirements and recommended production practices” (NFACC). In 2018, the NFACC was granted approval and received funding from AAFC for the development of a **code of practice for farmed salmonids** (these include salmon, trout and charr). This governing framework, the first of its kind for finfish in Canada, will provide clear and comprehensive guidance for the adoption of science-based practices that benefit farmed fish welfare.

U of G brings expertise in aquaculture and animal welfare

As Canada's “Food” University, U of G is renowned for bringing the newest developments in food production systems, safety as well as animal health and welfare to the agri-food sector. Researchers at U of G, particularly from the

Campbell Centre for the Study of Animal Welfare (CCSAW), have been involved in the development of a number of codes of practice for terrestrial livestock. This rich tradition at the University of Guelph continues for aquaculture, bringing together leadership and expertise from across the university.

Professor Rich Moccia, who recently retired after more than 33 years in the Department of Animal Biosciences (Ontario Agricultural College) serves on the Code Development Committee and also as Co-Chair of the Scientific Committee, which provided reviews of the scientific literature that informed recommendations made in the Code. At U of G, Moccia was instrumental in shaping aquaculture research as well as undergraduate and graduate education. In addition, he also held positions as Director of the **Aquaculture Centre**, Associate Vice President (Research) and currently serves on the NFACC Board of Directors along with Prof. Renee Bergeron, also from the Department of Animal Biosciences and CCSAW.

“I’ve spent most of my career helping the aquaculture industry find sustainable practices for farming fish, and I recognized early that we needed to confront the issues around fish welfare head on”, said Prof Moccia. “It was one of the benefits of being in this diverse department. It opened up my thinking to these issues well ahead of most people who worked in the fisheries sector. Other faculty, like Drs. Frank Hurnik and Ian Duncan, helped me frame my own views about where we needed to go to confront these challenges, and it led to a number of grad students pursuing fish welfare research in my lab. I was honoured to be invited by NFACC to participate in both the Code and Scientific Committees that would be responsible for developing Canada's very first welfare code of practice for the fish farming sector.”



Michelle Lavery, a PhD candidate supervised by Dr. Georgia Mason in the Department of Integrative Biology (College of Biological Sciences) and CCSAW, is another key member of the team. Lavery has a long standing interest in animal welfare and is currently exploring the impact of environmental enrichment on the welfare and cognition of zebrafish. A skilled science communicator, Lavery was initially recruited to the committee in the role of Research Writer; however, she was promoted to the Scientific Committee due to her broad knowledge and expertise in animal welfare.



"I'm really proud to be involved in the first Code of Practice for farmed fish in Canada" said Lavery. "Fish welfare is garnering increasing public attention and has needed to be formally addressed for a while now, so this is a step in the right direction. As a young fish welfare researcher, I was happy to see how evidence-based NFACC's Code of Practice process is, and participating as a Scientific Committee member has given me a great understanding of the issues that have yet to be addressed on-farm. I'm looking forward to being involved with future iterations of the Code as my career progresses and we continue to learn more about how to improve the welfare of fish in our care."

The Scientific Committee, under Professor Moccia's co-chairmanship, was responsible for conducting a thorough literature review of priority welfare issues for consideration by the Code Development Committee, which was published as a 100 page report on the current state of research pertaining to a variety of production practices. This was a significant undertaking, taking over a year to complete, including extensive peer-review which

was coordinated by Dr. Patricia Turner, Professor Emeritus in the Ontario Veterinary College and former Core Faculty member of CCSAW.

Why the wait?

Codes of Practice have already been developed or are under revision for the majority of livestock species in Canada including poultry, pigs, cattle, farmed rabbits, deer, fox and mink. So why has it taken so long to establish a code for fish? One issue that may have contributed to the delay, and which is highlighted in the report by the Scientific Committee, centers on the debate about fish sentience. Can fish feel a range of emotions associated with suffering such as pain, fear and stress?

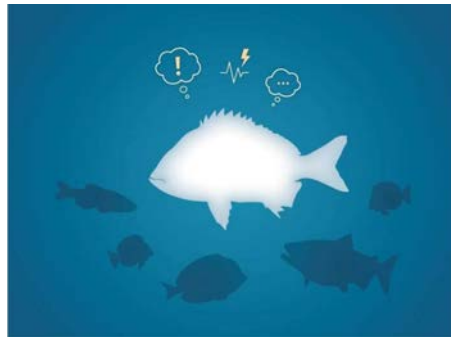


Illustration: Ines Bravo, IGCC.

This is a complex, controversial and often polarizing topic, but one that also carries significant welfare implications. Although new research supports arguments for the concept of fish sentience, conclusive evidence has been difficult to demonstrate.

The position of the Scientific Committee, articulated in their report, was to take a precautionary approach that ensures "producers employ sufficient measures to mitigate nocifensive and maladaptive stress responses that could result in conscious pain or other negative affective states". In other words, the aquaculture industry must work to implement appropriate practices for the

handling and care of salmonids that recognizes the potential for suffering, regardless of the state of the ongoing scientific debate.

Code development progress

The 'Review of Scientific Research on Priority Issues' was completed in September 2020 and it accompanied a draft Code of Practice for the Care and Handling of Farmed Salmonids that was made available for a 60-day public comment period starting November 2020.



Photo: Ontario Aquaculture Association

The code considers a variety of welfare issues including skills of hatchery, nursery, and farm personnel, husbandry practices and handling, feed and health management as well as euthanasia and transportation.

Input on the draft Code has now been received by NFACC and includes feedback from across Canada and internationally (US and UK). Additional meetings are scheduled for this spring with completion of the Code expected in Fall 2021. After publication, the critical steps of outreach and implementation begin, another process that Professor Moccia plans to undertake along with industry partners.

Although this first Code applies only to salmonids, the Code Development and Scientific Committees hopes that this is only the beginning and that additional Codes will be developed for the benefit of all farmed fish species.

Reference:

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RECENT PUBLICATIONS

The following is a sampling of recent publications from ABSc. For a more complete list, please visit the faculty member profile pages at: animalbiosciences.uoguelph.ca/abscfaculty.

POULTRY

Mindus C, Ellis J, van Staaveren N, Harlander-Matauschek A.

Lactobacillus-Based Probiotics Reduce the Adverse Effects of Stress in Rodents: A Meta-analysis. *Front Behav Neurosci.* 2021 Jun 16;15:642757. doi: 10.3389/fnbeh.2021.642757.

Leishman EM, van Staaveren N, Mohr J, Wood BJ, Freeman NE, Newman AEM, Harlander-Matauschek A, Baes CF. **The Effect of Egg Laying on Feather and Plasma Corticosterone Concentrations in Turkey (*Meleagris gallopavo*) Hens.** *Animals (Basel).* 2021 Jun 25;11(7):1892. doi: 10.3390/ani11071892.

Sanchez J, Barbut S, Patterson R, Kiarie EG. **Impact of fiber on growth, plasma gastrointestinal and excreta attributes in broiler chickens and turkey poults fed corn- or wheat-based diets with or without multienzyme supplement.** *Poult Sci.* 2021 Apr 28;100(8):101219. doi: 10.1016/j.psj.2021.101219.

Hanlon C, Takeshima K, Bédécarrats GY. **Changes in the Control of the Hypothalamic-Pituitary Gonadal Axis Across Three Differentially Selected Strains of Laying Hens (*Gallus gallus domesticus*).** *Front Physiol.* 2021 Mar 25;12:651491. doi: 10.3389/fphys.2021.651491.

Pufall A, Harlander-Matauschek A, Hunniford M, Widowski TM. **Effects of Rearing Aviary Style and Genetic Strain on the Locomotion and Musculoskeletal Characteristics of Layer Pullets.** *Animals (Basel).* 2021 Feb 27;11(3):634. doi: 10.3390/ani11030634.

Torrey S, Mohammadigheisar M, Nascimento Dos Santos M, Rothschild D, Dawson LC, Liu Z, Kiarie EG, Edwards AM, Mandell I, Karrow N, Tulpan D, Widowski TM. **In pursuit of a better broiler: growth, efficiency, and mortality of 16 strains of broiler chickens.** *Poult Sci.* 2021 Mar;100(3):100955. doi: 10.1016/j.psj.2020.12.052.

van Staaveren N, Ellis J, Baes CF, Harlander-Matauschek A. **A meta-analysis on the effect of environmental enrichment on feather pecking and feather damage in laying hens.** *Poult Sci.* 2021 Feb;100(2):397-411. doi: 10.1016/j.psj.2020.11.006.

Peixoto, M, Karrow, N, Newman, A, Head, J, Widowski, TM. **Effects of acute stressors experienced by five strains of layer breeders on measures of stress and fear in their offspring.** *Physiology & Behavior.* 2021. Jan; 228, 113185. doi.org/10.1016/j.physbeh.2020.113185.

Monckton V, Ellis JL, Harlander-Matauschek A. **Floor Substrate Preferences of Chickens: A Meta-Analysis.** *Front Vet Sci.* 2020 Dec 9;7:584162. doi: 10.3389/fvets.2020.584162.

SWINE

Crosbie M, Zhu C, Karrow NA, Huber LA. **The effects of partially replacing animal protein sources with full fat black soldier fly larvae meal (*Hermetia illucens*) in nursery diets on growth performance, gut morphology, and**

immune response of pigs. *Transl Anim Sci.* 2021 Mar 20;5(2):txab057. doi: 10.1093/tas/txab057.

Mwaniki AW, Buis QR, Trott D, Huber LA, Yang C, Kiarie EG. **Comparative efficacy of commercially available deoxynivalenol detoxifying feed additives on growth performance, total tract digestibility of components, and physiological responses in nursery pigs fed diets formulated with naturally contaminated corn.** *Transl Anim Sci.* 2021 Mar 10;5(2):txab050. doi: 10.1093/tas/txab050.

Bone C, Squires EJ. **The Binding of Free and Sulfated Androstenone in the Plasma of the Boar.** *Animals (Basel).* 2021 May 20;11(5):1464. doi: 10.3390/ani11051464.

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BEEF CATTLE

Williams MS, AlZahal, O, Mandell IB, McBride, B, and Wood, KM. **The impacts of a fibrolytic enzyme additive on digestibility and performance in the grower period, and supplemental *Saccharomyces cerevisiae* on performance and rumen health in the finisher period for feedlot steers.** *Canadian Journal of Animal Science.* 2021 Mar 12 JUST-IN. doi: 10.1139/CJAS-2020-0134

Oliveira HR, Miller SP, Brito LF, Schenkel FS. **Impact of Censored or Penalized Data in the Genetic Evaluation of Two Longevity Indicator Traits Using Random Regression Models in North American Angus Cattle.** *Animals (Basel).* 2021 Mar 12;11(3):800. doi: 10.3390/ani11030800.

Pereira MCS, Yang WZ, Beauchemin KA, McAllister TA, Wood KM, Penner GB. **Effect of silage source, physically effective neutral detergent fiber, and undigested neutral detergent fiber concentrations on performance and carcass characteristics of finishing steers.** *Transl Anim Sci.* 2021 Jan 4;5(1):txaa236. doi: 10.1093/tas/txaa236.

*ABSc faculty/emeriti in bold

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Livernois AM, Mallard BA, Cartwright SL, Cánovas A. **Heat stress and immune response phenotype affect DNA methylation in blood mononuclear cells from Holstein dairy cows.** *Sci Rep.* 2021 May 31;11(1):11371. doi: 10.1038/s41598-021-89951-5. PMID: 34059695; PMCID: PMC8166884.

van Niekerk JK, Fischer-Tlustos AJ, Wilms JN, Hare KS, Welboren AC, Lopez AJ, Yohe TT, Cangiano LR, Leal LN, Steele MA. **ADSA Foundation Scholar Award: New frontiers in calf and heifer nutrition—From conception to puberty.** *J Dairy Sci.* 2021 May 27;S0022-0302(21)00623-8. doi: 10.3168/jds.2020-20004.

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EQUINE

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COMPANION ANIMALS

Thornton E, Robinson E, Templeman JR, Bruggink L, Bower M, Cant JP, Holloway GP, Swanson KS, Squires EJ, Shoveller AK. **Supplemental Fiber Affects Body Temperature and Fecal Metabolites but Not Respiratory Rate or Body Composition in Mid-Distance Training Sled Dogs.** *Front Vet Sci.* 2021 Apr 29;8:639335. doi: 10.3389/fvets.2021.639335.

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Robinson E, Thornton E, Templeman JR, Croney CC, Niel L, Shoveller AK. **Changes in Behaviour and Voluntary Physical Activity Exhibited by Sled Dogs throughout Incremental Exercise Conditioning and Intermittent Rest Days.** *Animals (Basel).* 2021 Jan 8;11(1):118. doi: 10.3390/ani11010118.

GENERAL AGRICULTURE

Weersink A, von Massow M, Bannon N, Ifft J, Maples J, McEwan K, McKendree MGS, Nicholson C, Novakovic A, Rangarajan A, Richards T, Rickard B, Rude J, Schipanski M, Schnitkey G, Schulz L, Schuurman D, Schwartzkopf-Genswein K, Stephenson M, Thompson J, Wood K. **COVID-19 and the agri-food system in the United States and Canada.** *Agric Syst.* 2021 Mar;188:103039. doi: 10.1016/j.agsy.2020.103039.







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STUDENT & POSTDOC NEWS

Each year the Department of Animal Biosciences awards graduate students and post-doctoral fellows to recognize a variety of academic achievements.

	Outstanding Service	Teaching Award	Industry Outreach	Academic Mentorship	
					
	Erin Massender	Christine Bone	Amanda Fischer-Tlustos	Dr. Pablo Fonseca	Victoria Asselstine



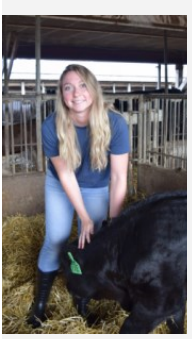
PhD candidates Brandon Van Soest and Colin Lynch have been awarded Dairy Farmers of Ontario (DFO) doctoral scholarships which are valued at \$105,000 over 3 years. Von Soest is carrying out research with supervisor Dr. Trever DeVries on the nutritional management of robot-milked cows. More information about Brandon and his research can be found on page 41 of the May 2021 issue of [Milk Producer](#).



Originally from Ireland, Colin Lynch came to ABSc in 2018 and completed an M.Sc. with Drs. Christine Baes and Flavio Schenkel looking at the effects of synchronized breeding on genetic evaluations of fertility traits in dairy cattle. He began his PhD with Baes and Schenkel in Fall 2020 and is involved with the Resilient Dairy Genome Project; a large research project funded by Genome Canada that aims to improve sustainability of the Canadian dairy industry.



Our students continue to be very successful in this years Animal Nutrition Association of Canada ANAC awards.



Melissa Williams, a 2nd year PhD candidate with Dr. Katie Wood was awarded the 2021 ANAC Graduate Scholarship. This is awarded to a Canadian university graduate student enrolled in animal science or related field of study, with a specific interest in animal nutrition. The award allowed Melissa the opportunity to share her research in a presentation at the Animal Nutrition Conference of Canada (ANCC) on May 14th.

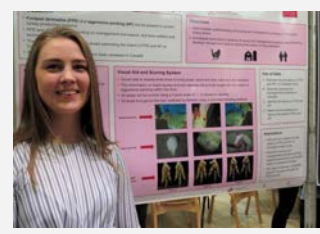
Dr. Wood's students were also very successful in the ANCC student poster competition. M.Sc. candidate Vanessa Rotondo won first place for her poster "*Predicting live weight using linear measurements in growing beef calves*" and Emily Conlin placed third for her poster "*Performance and Environmental Benefits from Biochar Supplementation in Beef Cattle Grazing Systems*".



Finally, Kortney Acton, a PhD candidate also with Dr. Wood and Élise Lafleur Larivière, an MSc candidate with Dr. Lee-Anne Huber, were selected to give an oral presentation of their work in the general session.



PhD candidate Emily Leishman received a scholarship from the European Federation of Animal Science (EAAP) to support her participation at the EAAP Annual meeting.



Leishman will be presenting her research in Dr. Christine Baes lab looking at risk factors for footpad dermatitis in Canadian turkey flocks. The research is part of the GAPP turkey project and includes Nienke van Staaveren, Vern Osborne, Ben Wood, Alexandra Harlander as co-authors.



Congratulations to M.Sc. and CCSAW student Renee Garant who placed 2nd out of 48 research talks at the 2021 Ontario Ecology, Ethology, and Evolution Colloquium (OE3C). Renee's presentation "*The role of flight feathers on the ability of egg-laying hens to access elevated resources in multi-tiered housing systems*" can be viewed at: https://www.youtube.com/watch?v=9I_JAhVyklg



ABSc Graduate Students were featured on OAC's new 'The Why and How Podcast', a series featuring interviews with graduate students, postdocs and professors that explores issues related to agriculture, food, and the environment.

In episode 17 'How might neuroscience shift animal welfare standards?', recent M.Sc. graduate Lindsey Kitchenham discussed her research in Dr. Georgia Mason's lab (now in the Department of Integrative Biology) examining the impact of housing environment on the welfare of laboratory mice. Through U of G's unique [Collaborative Specialization in Neuroscience](#) graduate program, Kitchenham was able to combine her interests in neuroscience and psychology with her passion for animals.

Mice are the most commonly used research animal in the world due to their small size, short reproductive cycles and well characterized genome that can be easily manipulated. However, stereotypic behaviors (abnormal behavior patterns) such as circling and back-flipping, are common in lab mice, particularly when housed in barren environments that lack enrichment materials. This not only impairs welfare but may also negatively impact the generation of reliable

research results.

To understand the neurobiological cause of environmentally induced stereotypic behaviors and which brain regions might be involved, Kitchenham measured the metabolic activity of 5 different areas of the brain (within the Basal Ganglia-the brain system that both activates and suppresses behavior) in mice housed under conventional or enriched conditions. Preliminary evidence suggests an area of the brain called the Nucleus Accumbens (also known as the 'reward centre') may be involved but more work is needed.

Kitchenham began her PhD this summer in the Mason lab and plans to dive deeper into the biology of stereotypic behaviours. Ultimately, her research may lead to better housing conditions for mice that also improve the reproducibility of scientific outcomes.

In addition to the podcast, you can [watch](#) Kitchenham present her work in Three Minute Thesis style (3MT) at the 2021 CCSAW Research Symposium.

In episode 20, 'How is cow health connected to farmer mental health?', former PhD student and postdoc Dr. Meagan King, now an

Assistant Professor at the University of Manitoba, sat down to discuss her research in Dr. Trevor DeVries' lab where she explored the connection between automation on dairy farms and farmer well-being.

In a study published in the journal *Animal Welfare*, Dr. King along with graduate student Robert Mattson (M.Sc. '20) analyzed data collected from 28 Ontario farms on management practices, cow welfare as well as milk production and quality. They also conducted an online survey designed to assess the farmers' levels of resilience, stress, anxiety, and depression. Interestingly, they found positive associations with farmer well-being and cow-lameness, udder health and milk yield. These findings suggest automated feeders and milking systems may have additional benefits that go beyond increasing profit by improving the quality of life for both farmers and the animals they care for.

To learn more about these and other projects being carried out at OAC you can find the Why and How Podcast at: uoguelph.ca/oac/research/why-how-podcast.



Research Associate Dr. Nienke Van Staaveren and PhD candidate Emily Leishman were featured in the June 2021 issue of Canadian Poultry magazine for a story on the housing and management of turkeys in Canada.

Van Staaveren and Leishman are part of a collaborative project between ABSc's Dr. Christine Baes and Hybrid Turkeys/Hendrix Genetics aiming to improve turkey health, welfare and productivity using genomic selection.

Focusing on the health and welfare aspect of the project, they surveyed Turkey farmers across Canada to get a more complete picture of on the housing and management practices of Turkeys. The results of the survey provide new insight into the health and welfare issues facing turkey production and have been published in *Frontiers in Veterinary Science*.

The next step for the team will be to incorporate their findings into genomic selection tools that will benefit turkey health and welfare and provide economic gains to the industry.

Journal Reference: van Staaveren N, Leishman EM, Wood BJ, Harlander-Matauschek A, Baes CF. Farmers' Perceptions About Health and Welfare Issues in Turkey Production. *Front Vet Sci*. 2020 Jun 12;7:332. doi: 10.3389/fvets.2020.00332.



“

My passion has always been communication and empathy.
—Lindsey Kitchenham

”

“

It's important that you take care of yourself in order to properly take care of your animals
-Dr. Meagan King

”



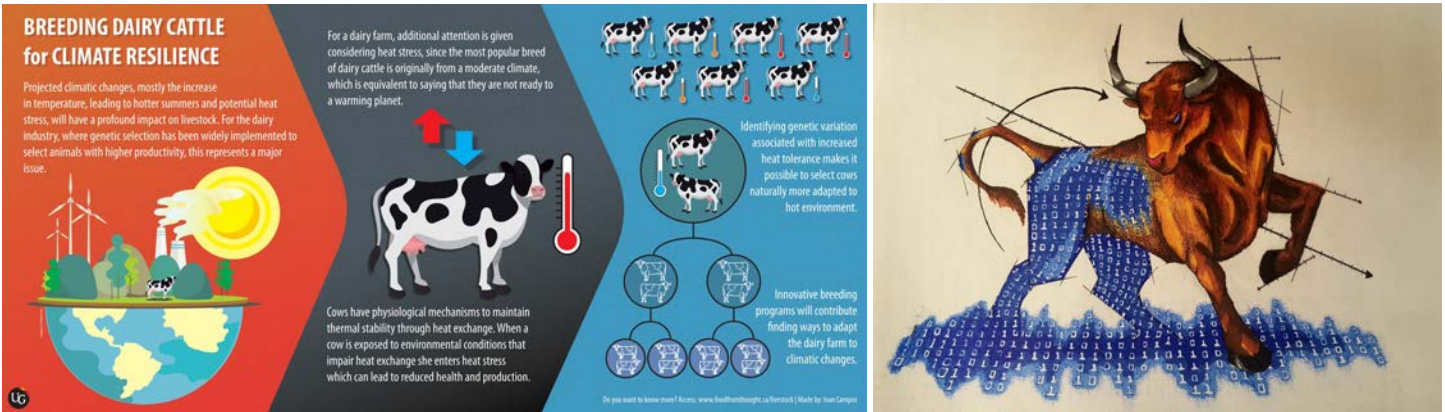
Creative Expression of Research Competition

In Winter 2021, the ABSc Graduate Student Council organized a virtual contest to recognize the amazing research being conducted in the department. There were 4 random weekly prize draws as well as a vote and prize for the overall winner and runner-up.

Dairy Cattle for Climate Resilience' (top, left). Esther Chan, an M.Sc. candidate working in Dr. Tulpan's lab, took home runner-up for illustration of 'Prediction of Beef Cattle Body Weight Based on Morphometric Measurements Extracted from 2D images' (top, right).

PhD candidate Ivan Campos won first prize for an infographic summarizing research in Dr. Flavio Schenkel's lab on 'Breeding

The ABSc GSC would like to thank everyone who participated and voted. We are certainly a creative department with lots of interesting research going being carried out.



To see ALL the amazing submissions please visit the [ABSc website](#) or [ABSc GSC Facebook Page](#)



**REFINE
DISTILL
SHOWCASE
NETWORK
GROW**

Congratulations to Claire Mindus, winner of the [2021 3MT® U of G Competition](#) and Community Choice Award at this year's event.

The Three Minute Thesis (3MT®) is an academic research communication competition developed by The University of Queensland (UQ), Australia. Graduate students from all seven University of Guelph colleges earned a chance to compete in the 3MT® campus final judged by a panel of government, community and industry professionals.

Mindus is a PhD candidate in [Dr. Alexandra Harlander's](#) lab where she is examining a potential link between gut microorganisms and feather pecking in poultry. You can view her 3MT presentation "[Don't be snappy, be happy-Preventing feather pecking in](#)

[chickens using probiotic bacteria](#)" and the other finalists on the [U of G Graduate Studies YouTube channel](#).

With the first place win, Claire was awarded \$1000 and will now go on to represent Guelph in a provincial showcase this summer.

Claire Mindus
PhD, Animal Biosciences



UNDERGRAD SUCCESS AT THE DAIRY CHALLENGE!



Congratulations to U of G's Dairy Challenge team that competed in the 2021 North American Intercollegiate Dairy Challenge (NAIDC), held remotely this past April.

The team of undergraduate students included Rebecca Barr, Brooke Boonstoppel, Clayton McWilliams and Tyrone Wagler who competed against three other schools to present the best dairy farm management recommendations.



"We were very proud to have been selected to represent U of G at the NAIDC and even more thrilled to have won the competition," said Barr. "I think we would all agree that it wouldn't have been possible without our dedicated mentors."

In addition to a team plaque, each student received an individual

plaque and \$200 scholarship

For this year's competition, students were given data and a series of videos from a working dairy farm. Teams evaluated the farm operations and provided comprehensive management recommendations to a panel of judges made up of industry professionals.

A total of 22 teams from across North America competed in the NAIDC. Teams were split into five farm groups and one team from each group was awarded first place. The other winning teams came from California Polytechnic State University, Michigan State University, Ohio State University and University of Idaho.

"I am very proud of our U of G team," said Dr. Trevor DeVries, team coach and professor in the Department of Animal Biosciences. "Despite the increased challenges associated with this remote competition, our students rose to those challenges and represented us well."

The U of G team prepared for a year for this competition. Members were selected from 27 students in DeVries's fourth-year course ANSC*4230 Challenges and Opportunities in Dairy Production.

In this course, students learn to critically assess dairy cattle operations, including analyzing four commercial dairy farms. Four students are chosen each year to compete in the NAIDC.

The news of U of G's big win was picked up by a variety of news outlets from across Ontario all the way out west to Alberta.

Parts of this story originally appeared in U of G News.



DID YOU KNOW?

Since the first Dairy Challenge in 2009, U of G has also had first place finishes in 2012, 2014 and 2015!

STUDENT AWARDS

Congratulations to all recipients of the 2020 OAC Scholarships and Awards including those from ABSc. We would also like to acknowledge the generous support of alumni, donors and industry partners.

UNDERGRADUATE

STUDENT	PROGRAM	AWARD	DONOR
Stephanie Rayner	BSCH.ABIO	DR. JACK BRITNEY SCHOLARSHIP	Friends and Associates of the late Jack Britney
Riley Bauman	BSAG.ANSC	NESTLÉ CANADA SCHOLARSHIP IN AGRICULTURE AND FOOD	Nestlé Canada Inc.
Oresta Hewryk	BSAG.ANSC	TILECROFT FARMS WOMEN IN AGRICULTURE SCHOLARSHIP	Jeff and Eleanor Robinson
Valerie Moore and Stacie Vandevelde	BBRM.EQM	OAC '49 BACHELOR OF BIO-RESOURCE MANAGEMENT-EQUINE ENTRANCE SCHOLARSHIPS	OAC Class of '49 and the OAC Alumni Foundation
Cristian Mastrangelo	BSCH.ABIO	NORMAN MCCOLLUM DAIRY SCHOLARSHIP	The late Norman E. McCollum and OAC Alumni Foundation
Rui Gao	BSCH.ABIO	OAC 1966 ENTRANCE SCHOLARSHIP	Class of OAC 1966
Carissa Chrysler	BSCH.ABIO	OAC 1968 SCHOLARSHIP	Class of OAC 1968
Derrick Knill	BSAG.ANSC	DAVID F. BOYES APICULTURE SCHOLARSHIP	The Apiculture Club
Riley Bauman	BSAG.ANSC	CLASS OF 1967 OAC CENTENNIAL SCHOLARSHIP	Class of OAC 1967
Mikayla Ringelberg	BSCH.ABIO	OAC'45 PUBLIC SPEAKING SCHOLARSHIP	The late Aubrey Hagar
Avery May	BSAG.ANSC	AMBER UNDERWOOD MEMORIAL COMMUNICATIONS	The Gibbons and Underwood Families and the
Taylor Flewwelling	BSAG.ANSC	R.W. (BOB) PAWLEY SCHOLARSHIP	The late Robert W. Pawley, OAC '39
Oresta Hewryk	BSAG.ANSC	CLAYTON AND DOROTHY SWITZER LEADERSHIP	OAC Class of '70 and the OAC Alumni Foundation
Sophie Tieu	BSCH.ABIO	TORONTO DISTRICT BEEKEEPERS' ASSOCIATION	Toronto District Beekeepers' Association
Cristian Mastrangelo	BSCH.ABIO	SHUR-GAIN, NUTRECO CANADA INC. SCHOLARSHIP	Nutreco Canada Inc.
Kathryn Kroeze	BSAG.ANSC	DOUG WAKELY MEMORIAL SCHOLARSHIP	Harriston Feed Dealers Association
Brooke Boonstoppel and Peter Gras	BSAG.ANSC	GLENN WEBB EDUCATION SCHOLARSHIP THE GROWMARK FOUNDATION	GROWMARK Inc.
Anastasia Tsementzis	BSAG.ANSC	DONALD I. BROADFOOT SCHOLARSHIP	Doug Broadfoot
Kyla Hartt	BSCH.ABIO	DEAN'S SCHOLARSHIPS	OAC
		CHRISTINA VICTORIA KENNY MEMORIAL SCHOLARSHIP	Clare and Stirling Kenny
Arayih Wildish	BBRM.EQM	MACSON SCHOLARSHIP	Maclaren Property
Laura Willis	BSCH.ABIO	DR. RALPH AND JOANNE WATT SCHOLARSHIP	Dr. Ralph and Joanne Watt Foundation
Isabelle Bates, Kyla Hartt, Alexandra Hume, Dakota Lee, Cristian Mastrangelo, Sophie Tieu, Natalia Savor*	BSCH.ABIO BSAG.ANSC*	DEAN'S SCHOLARSHIPS	OAC /U of G

Undergraduate: BSCH.ABIO (Bachelor of Science, Honours-Animal Biology), BSAG.ANSC (Bachelor of Science Agriculture-Animal Sciences), BBRM.EQM (Bachelor of Bio-Resource Management Equine Management).

STUDENT AWARDS

GRADUATE

STUDENT	PROGRAM	AWARD	DONOR
Emily Croft, Brooke McNeil, Siobhan Mellors	MSc	SODEN MEMORIAL SCHOLARSHIPS IN AGRICULTURE	The Estate of Edythe P. Soden
Erin Ross	MSc	CRAIG HUNTER POULTRY SCIENCE GRADUATE SCHOLARSHIP	Family and Friends of the Late Craig Hunter Sr.
Fiona Tansil	MSc	HALCHEMIX SCHOLARSHIP IN LIVESTOCK NUTRITION	Halchemix Canada Inc.
		KEES DE LANGE GRADUATE SCHOLARSHIP	Friends and Family of the late Dr. Kees de Lange
Juanita Echeverry Munera	MSc	ORVILLE E. SINCLAIR RESEARCH SCHOLARSHIP	School Milk Fund of London
Nadia Golestani	MSc	HERBS FOR HORSES GRADUATE SCHOLARSHIP IN EQUINE HEALTH	Herbs for Horses
Renee Garant	MSc	JOHN S. MARTIN MEMORIAL SCHOLARSHIP	The Estate of Lillian E. Martin
Siobhan Mellors	MSc	TORONTO MILK PRODUCERS SCHOLARSHIP FOR ABSC	TORONTO MILK PRODUCERS
Vicki Brisson, Emily Croft, Emma Hyland, Siobhan Mellors, Tianna Sullivan, Carissa White	MSc	CANADIAN DAIRY COMMISSION M.SC. SCHOLARSHIP	Canadian Dairy Commission
Aizwarya Thanabalan	PHD	KEYES FAMILY SCHOLARSHIP	The Keyes Family
Amanda Fischer-Tlustos	PHD	CLASS OF OAC 1958 ONTARIO GRADUATE SCHOLARSHIP	CLASS OF OAC 1958
		HAMILTON MILK PRODUCERS ASSOCIATION SCHOLARSHIP	Hamilton Milk Producers' Association
Anna Garland and Julia Guazzelli Pezzali	PHD	ANIMAL BIOSCIENCES ACADEMIC SCHOLARSHIP	ABSc
Colin Lynch	PHD	BRIAN W. KENNEDY MEMORIAL SCHOLARSHIP	Dr. Brian W. Kennedy
Emily Leishman	PHD	KING COLE DUCKS LTD. POULTRY SCHOLARSHIP	King Cole Ducks Ltd.
		W.R. GRAHAM MEMORIAL SCHOLARSHIP	W. R. Graham
Erin Massender	PHD	DR. G.W. FRIARS AWARD	Dr. Gerry W. Friars
		OAC 1964 ONTARIO GRADUATE SCHOLARSHIP	Class of OAC 1964
George Hall	PHD	EGG FARMERS OF ONTARIO	Egg Farmers of Ontario
Hannah Sweett	PHD	FRANK WALLACE COCKSHUTT SCHOLARSHIP	Frank Wallace Cockshutt
Jennifer MacNicol	PHD	SUE CHASE AND JOHN STECKLE FELLOWSHIP IN AGRICULTURE	Robert and Jean Steckle
Kerry Houlahan, Sarah, Parsons, Anna Schwanke, Hannah Sweett, Ran Xu	PHD	CANADIAN DAIRY COMMISSION DOCTORAL SCHOLARSHIP	Canadian Dairy Commission
Melissa Williams	PHD	JAMES HARRIS SCHOLARSHIP	James Harris Foundation
Midian Nascimento dos Santos	PHD	PAUL LEATHERBARROW MEMORIAL GRADUATE	The Clark Companies
Mohammad Bahry and Amanda Fischer-Tlustos	PHD	MARY EDMUNDS WILLIAMS SCHOLARSHIPS	The Estate of Mr. Edmund Cecil Williams
Reza Akbari Moghaddam Kakhki	PHD	DEBORAH WHALE / POULTRY COUNCIL INDUSTRY COUNCIL SCHOLARSHIP	Poultry Industry Council
		FRANK AND GERTRAUDE HURNIK SCHOLARSHIP	Dr. Frank and Gertraude Hurnik
		JAMES A. MCGRATH MEMORIAL SCHOLARSHIP	Family and Friends of James A. McGrath

Meet



Keerthehan Hector-Ratnanandan

Keerthehan recently completed his first year in the Bachelor of Bio-Resource Management (BBRM) – Equine Management program. He actually didn't know a lot about horses before entering the major, but pursued the program to support his hope of applying to the Ontario Veterinary College. Despite only being in his first year, he's already learned a lot about horses and the equine industry.

Why did you decide to study at the University of Guelph?

I decided to study at the University of Guelph for their exceptional Equine Management program.

What do you like best about your program?

Apart from working and learning about horses, interacting with a great group of people who share my passion and interest is the best part of the program.

What was your background in horses?

Before starting this program, I was a veterinary assistant working with only dogs and cats; my knowledge of horses was very limited. Starting my journey in the Equine Management program, I am starting to learn more and more. I had a vague idea of careers I can pursue relating to horses, but after the careers portion in my equine management course I have learned there are many career opportunities to work with animals.

Name something in your curriculum that you, at first, did not expect but appreciate now?

The horse breed and identification unit was particularly interesting and new to me, especially the horse colour topic. Before this course, I never knew that there were very unique names for the colours and patterns of a horse. Now I am well versed in that area

and appreciative of the work and effort put in by horse breeders to get a certain colour or pattern.

Any courses you've spotted that you're looking forward to?

I am very excited and looking forward to the Animal Care and Welfare course, as well as Equine Anatomy and Physiology. I have always been interested and wanted a career in veterinary medicine and both courses will be a great stepping-stone toward this goal.

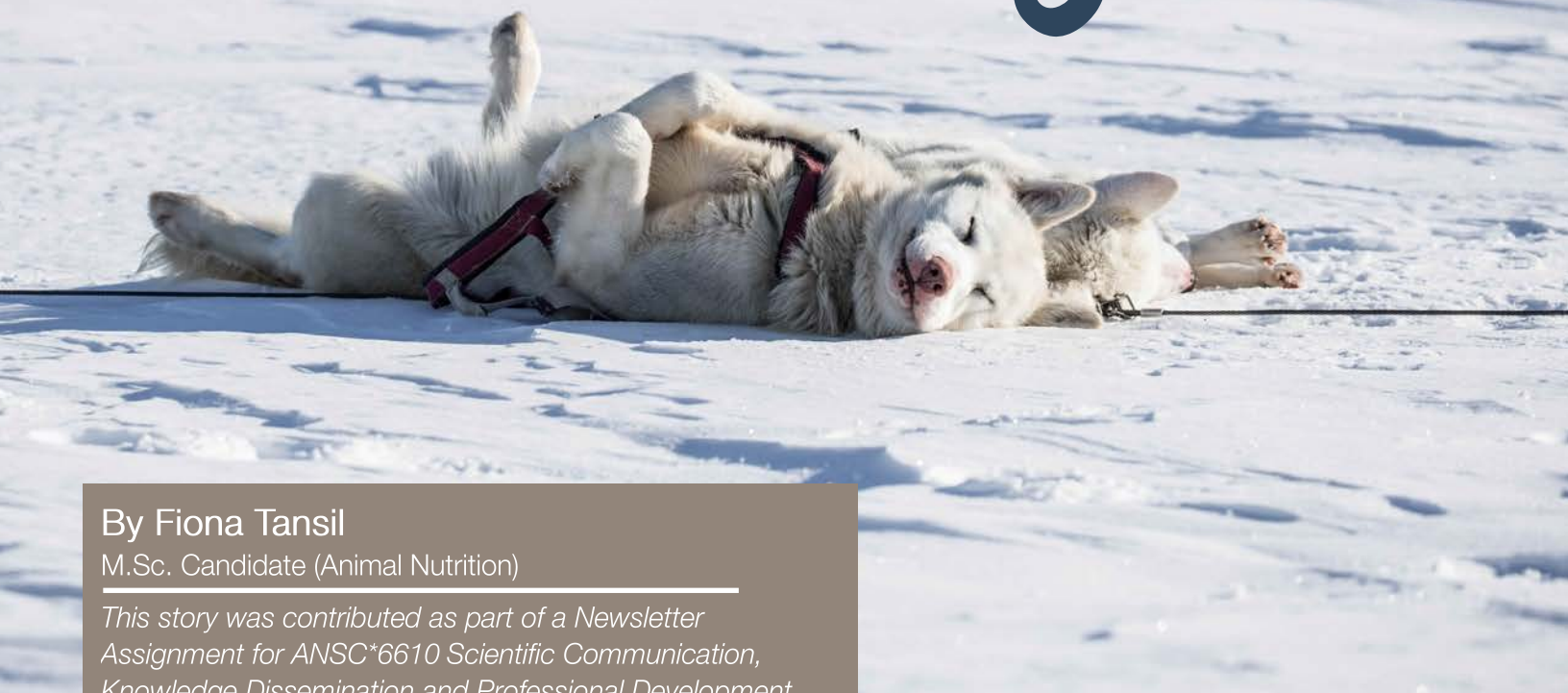
Do you have any favorite professors so far?

Dr. Katrina Merkies is an amazing professor. She is great at giving assignments that are detailed and simple to understand. The TA's [teaching assistants] are also amazing to work with. They are kind and supportive, especially when they are working with students who are new to the equine industry and have never touched a horse. They are always encouraging students to ask them questions and are willing to accommodate given the current COVID-19 barriers.

Any idea what you're interested in pursuing post-graduation?

My current goal is to apply to the Ontario Veterinary College in my third year of studies. After completing my Doctor of Veterinary degree, I would like to do a specialization in radiology. I want to be able to open my own veterinary diagnostic imaging hospital and help animals, big and small. 🐾

Snooze Time for Sled Dogs



By Fiona Tansil

M.Sc. Candidate (Animal Nutrition)

*This story was contributed as part of a Newsletter Assignment for ANSC*6610 Scientific Communication, Knowledge Dissemination and Professional Development*

Just like humans, working or sporting sled dogs can also experience tiredness and exercise-induced fatigue. Leading up to and during racing season, sled dogs are continuously training under strenuous conditioning exercise regimens, which consist of repetitive and increasing bouts of endurance exercises. Unfortunately, this could lead to overtraining or over-exercising, which can negatively impact their physiological health and well-being. Over-exercising can increase muscle damage, oxidative stress, and also lead to unfavorable behavioral changes. Thus, rest days in between bouts of exercise are perceived to be beneficial when incorporated into a conditioning regimen and allow sled dogs to recover.

A recent study from Dr. Kate Shoveller's lab looked at

behavioral changes in sled dogs as a visual marker for exercise recovery. The goal of their study was to investigate the effects of 10-week incremental endurance exercise on the locomotive behavior (e.g. digging, chewing, posture changing, and agonistic or fight behavior) and voluntary activity (any movements, e.g. play, walk, fight) of sled dogs. Additionally, they also looked at the change in time spent performing voluntary activity over two consecutive rest days. The researchers hypothesized that sled dogs would spend less time performing locomotive behavior pre-exercise and more rest behavior post-exercise as the training progressed. Further, they also hypothesized that sled dogs would spend more time doing voluntary activities during two rest consecutive days.

Continued on next page →



All About Fiona...



I am currently an M.Sc. by thesis student in animal nutrition under the supervision of Dr. Anna-Kate Shoveller. My passion in animal nutrition started when I took the ANSC*4560 Pet Nutrition class and participated in a Royal Canin tour early in my undergraduate career. After completing my B.Sc., I pursued a career as an animal feed formulator at a leading Asian agri-food company, JAPFA, in my home country, Indonesia. Through this role, I began to have a keen interest in investigating alternative protein ingredients that have desirable protein quality, and are sustainable and economically feasible to replace the commonly used soybean meal and fish meal in the animal feed industry. The quest for alternative protein in feed is of great importance to ensure food security to feed the projected 9 billion people by 2050. Motivated by the urgency for innovative protein ingredients and to further understand the protein quality concept, I decided to pursue a Master's in this field.

For my Master's project, I am evaluating the protein quality of black soldier fly larvae meal (BSFLM), a highly nutritious and sustainable alternative protein ingredient, by using the ileal digestibility and indicator amino acid oxidation (IAAO) techniques in swine. Assessment of protein quality, which technically refers to the amino acid (AA) bioavailability, is essential to successfully introduce a novel protein ingredient into the feed industry. For the ileal digestibility study, pigs were surgically-fitted with a T-cannula for digesta collection and were fed BSFLM-containing diet. The IAAO method measures CO₂ released from pigs as a result of AA oxidation, and has been demonstrated to be accurate in quantifying AA bioavailability. Results from my study will provide a more precise AA bioavailability data on BSFLM, an evaluation of different protein quality methods, and give insights to the feed industries and academic communities.

In the future, I hope to contribute my experience and knowledge to the animal feed industry or pursue further research in the same field. Aside from working in the lab or on my laptop, I enjoy swimming, hiking, and spending time with friends.

To test these hypotheses, 14 Siberian Huskies who had been actively participating in races were recruited for the study. All dogs participated in a distance run exercise regime, where the distance increased incrementally from 3 – 43 km over the study period. Five-minute video recordings were taken before and after one run per week to examine the time spent performing certain locomotive behaviors. Voluntary activities were measured using an accelerometer attached to the dog's collar.

Results from the study showed that dogs changed their posture and performed agonistic behavior much less prior to a run and spent more time lying down after a run as training progressed. Voluntary activities were reduced throughout the weeks, which could be an indication of exercise-induced fatigue. After just one rest day, dogs were more active, which confirms that rest is beneficial to provide much-needed recovery from increased heart and respiratory rate and internal temperature.

These findings provide applicable practice for mushers or working dog owners to incorporate at least one rest day during the training period or multiple rest days during repetitive training. Additionally, behavior display in dogs can be used as an indicator to determine whether rest and recovery are adequate for them. By ensuring sufficient recovery, dogs' exercise performance, health, and welfare are going to be improved. 🐾

This research was funded by MITACS Accelerate, grant number 460735, with equal contribution from Champion PetFoods (Morinville, AB, Canada).

Journal Reference:

Eve Robinson, Emma Thornton, James R. Templeman, Candace C. Croney, Lee Niel, Anna K. Shoveller. **Changes in Behaviour and Voluntary Physical Activity Exhibited by Sled Dogs throughout Incremental Exercise Conditioning and Intermittent Rest Days.** *Animals*, 2021, 11, 118. DOI: 10.3390/ani11010118.

Dr. Gordon James King



The Ontario Agricultural College and Department of Animal Biosciences would like to extend their sincere sympathies to the family, friends and

colleagues of Dr. Gordon James King, who passed away on January 7, 2021.

Dr. King was a faculty member at the University of Guelph from 1968-1998 and appointed University Professor Emeritus upon his retirement. Prior to his arrival at U of G, Dr. King held positions as a public school teacher, private and field veterinarian as well as technical manager at the Hamilton District Cattle Breeders.

Throughout his career, Dr. King made significant contributions to the field of animal reproduction having published over 150 scientific articles, 100

abstracts in scientific proceedings, authored multiple books and book chapters and designed material for numerous university courses. He was also involved with a variety of international development research projects focused on livestock production through consultation with numerous agencies including the FAO, IAEA, CIDA, SIDA, IFS, the Canadian Association of Animal Breeders and many others.

Dr. King's obituary can be found at: wallcunstance.com/acf-death-notice/gordon-james-king/

A BIT OF HISTORY



It was 50 years ago, in 1971, when two OAC Departments, Animal Science and Poultry Science, merged to form—you guessed it—the Department of Animal and Poultry Science (APS)! This designation held for more than four decades until being renamed Animal Biosciences (ABSc) in 2015.

Name changes linked to ABSc are not that unusual as the Department of Animal Science was known as the Department of Animal Husbandry until January 1965.

The department has been located in the Animal Science and Nutrition Building since 1969. A model depicting the future ANNU building was highlighted on the front cover of the Oct 31st, 1966 issue of the [U of G News Bulletin](#).

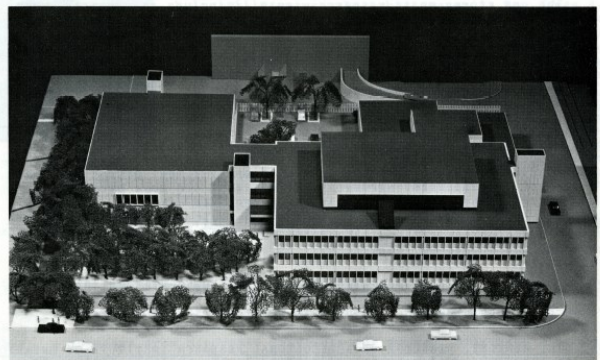
For more information about our most recent name change, please read Owen Robert's fantastic article in [Real Agriculture 'A Thanksgiving Tale: Why Guelph Retired "Poultry" and Added "Bio" to its Name'](#).

NEWS BULLETIN

UNIVERSITY OF GUELPH

Vol. 11. 23

31st October, 1966.



A model of the new eight and one half million dollar Animal Science-Nutrition building on which construction work is to start right away. The building will be located on the west side of Highway 6, south of the Dairy Science building.

ANIMAL SCIENCE AND NUTRITION BUILDING UNIQUE IN CONCEPTS

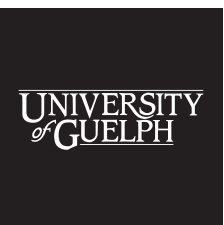
The new Animal Science and Nutrition building, for which the contract has just been signed with Robertson-Yates Corporation (1966) Limited of Hamilton, is unique in many of its concepts. It will provide some of the most modern and extensive facilities for research on small and large animals. Besides the Animal Science and Nutrition Departments the building will house the University's Data Processing Centre.

The building will have three separate wings which will enable the control of noise and odours.

continued.....



Have news or a story idea for *Animal Tracks* ?
Send a note to absccomm@uoguelph.ca



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