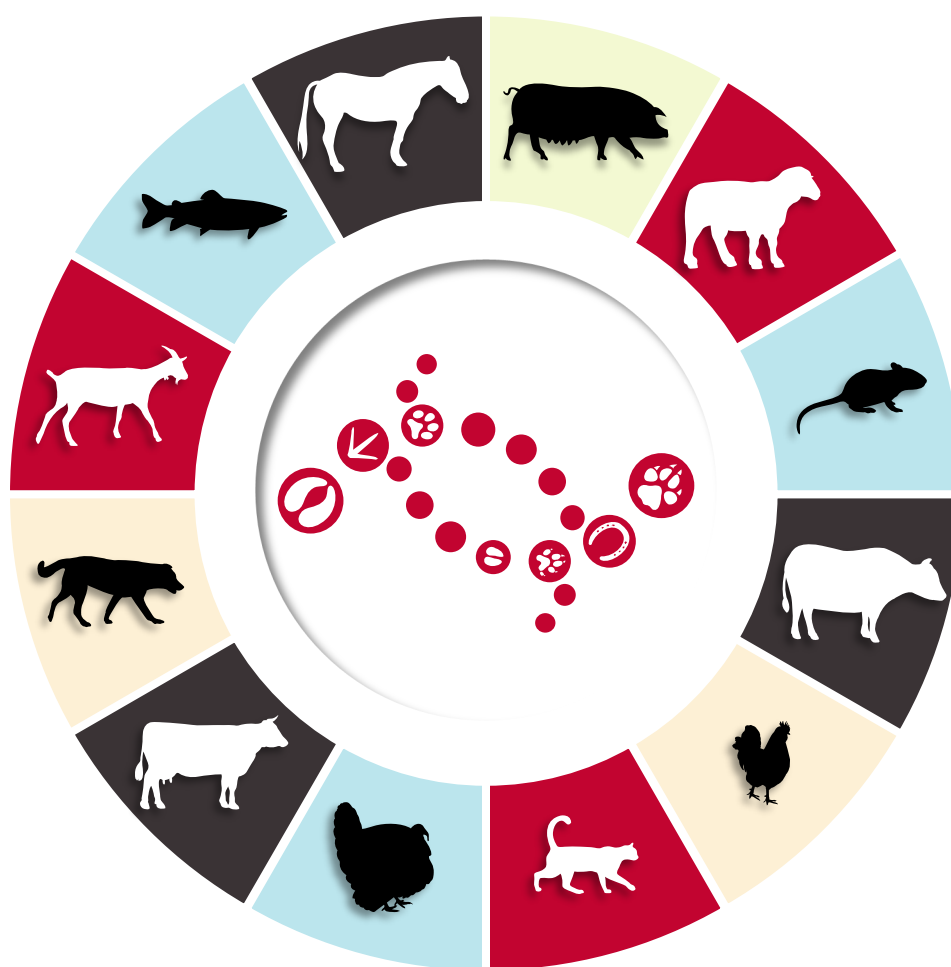


ANIMAL TRACKS

A Newsletter from the Department of Animal Biosciences



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Welcome from the Chair

Greetings friends, alumni, and industry members, and welcome to the inaugural edition of **'Animal Tracks'** – a newsletter dedicated to sharing news, awards and the many successes of the Department of Animal Biosciences.

Our department has undergone many exciting changes over the past few years. Most notably, we have undergone a name change (formerly Animal and Poultry Science), hired 13 new faculty members since 2015, increased our number of support staff and saw the completion of major renovations to our Meat Science Laboratory and Central Core lab space with more still to come. We also have enjoyed continued growth in our undergraduate and graduate programs and represent one of the most teaching and research intensive departments within the University of Guelph.

Among the many highlights in recent years was that the University of Guelph ranked third for Dairy and Animal Sciences in the Center for World University Rankings. This recognition clearly is a reflection of the caliber of our faculty, staff, and students within the department

and the outstanding level of support we receive from our partners and industry.

In this issue you will find a few highlights of the many exciting projects occurring within our department. We hope you enjoy reading the newsletter and we will continue to share ABSc news, research activities and faculty and student accomplishments.



Photo: Martin Schwalbe

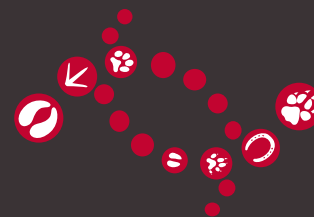
Jim Squires
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ANIMAL TRACKS

A Newsletter from the
Department of Animal Biosciences

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UNIVERSITY
of GUELPH

ONTARIO
AGRICULTURAL COLLEGE
DEPARTMENT OF ANIMAL BIOSCIENCES

OUR DEPARTMENT

Animal Biosciences at a Glance

The Department of Animal Biosciences (ABSc), became a part of the University of Guelph in 1964. Since then, ABSc has been the only one of its kind in Ontario offering three undergraduate programs, and numerous programs of study leading to MSc and PhD degrees.

The undergraduate programs include:

- Bachelor of Science-Animal Science
- Bachelor of Science-Animal Biology
- Bachelor of Science-Bio-Resource Management-Equine Management

Research Themes

Our faculty carry out fundamental and applied research in the following disciplines:

- Animal Behaviour and Welfare
- Animal Breeding and Genetics
- Animal Nutrition
- Animal Physiology

These disciplines operate under **three** research pillars:

1

Sustainable and ethical animal production, care, and use

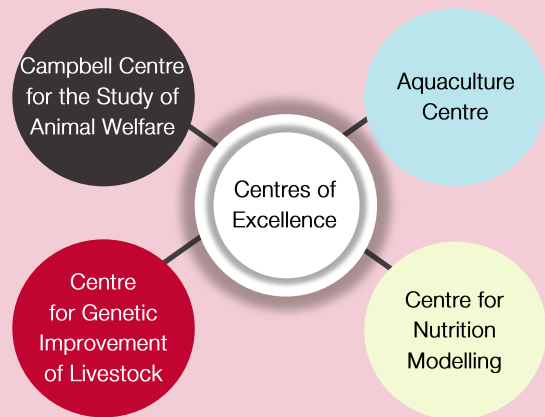
2

High-quality value-added animal products

3

Animal models for human metabolism, nutrition, and health

ABSc also houses four Centres of Excellence:



These affiliates provide opportunities for researchers across campus with shared interests to collaborate and carry out multidisciplinary research.



ABSc has 29 regular and adjunct faculty members, 160+ graduate students, as well as administrative, technical and research support staff



Faculty attract more than 6 million in external research funding annually



The department has strong partnerships with organizations representing all facets of the animal agriculture industry



Faculty with high publication output and average h-index factor of 21

Did you know?

While the core of ABSc research revolves around farm animal species, we also have faculty studying companion, zoo and laboratory animals.

NEW FACULTY

We would like to give a warm welcome to Jennifer Ellis, the newest faculty member in Animal Biosciences.

Prof. Ellis is a familiar face in the department as she received her BSc, MSc and PhD degrees from ABSc. Following her time at U of G she worked as a postdoctoral fellow with the world renowned Animal Nutrition Group at Wageningen University in the Netherlands. Most recently, Prof. Ellis was in industry as a research scientist at Trouw Nutrition Agresearch in Guelph.



Prof. Jennifer Ellis

In her new position as Assistant Professor in Animal Systems Modelling, Prof. Ellis will establish a research program that focuses on biological modelling that leverages 'Big Data' to improve animal performance, sustainability, health and welfare as well as animal product quality. Prof. Ellis will also play a key role in the Centre for Nutrition Modelling (CNM) where she will serve as associate director.

While her expertise lies primarily in dairy cattle and poultry nutrition modelling, Prof. Ellis has also worked on projects involving other livestock species as well as companion animals. In addition to her research activities, she will also be involved with teaching various courses at the undergraduate and graduate levels.

Faculty Q&A: Jennifer Ellis

Q: For the uninitiated, what exactly is 'animal systems modelling'?

'Models' of all sorts are essentially a simplified representation of a more complex system. So, animal systems modelling involves the use of an equation or series of equations to represent a complex system, in this case, some aspect of the animal. These models are used in practice for a variety of purposes such as nutrition programs, making recommendations to governing bodies on things such as sustainability, as well as academically to generate hypotheses around the mode-of-action of a complex system.

Q: How did you get interested in using math to understand biology? Did you excel in mathematics or start in biology and then moved into the field?

I excelled in math and physics in high school. I almost went into engineering, but my love of biology won out instead. It's interesting that I've found a niche where those two areas have come together nicely. John Cant's 4th year animal metabolism course introduced me to the 'systems' approach to examining biology which is really a problem solving exercise. From there I

carried out a MSc with John, which was my intro to applying this 'systems' model-based thinking to solve animal nutrition problems.

Q: You spent some time in the Netherlands for postdoctoral work. Does anything stand out from a science perspective? What about culturally?

WUR (Wageningen University and Research) is an amazingly prolific and international university and my time there was fruitful. What stood out is their collaborative approach to research and research excellence. They also have a yearly theatre show called 'Playback', which if you've never been privy to, is essentially the day you get to watch esteemed faculty lip-sync in costume. Of course there is also great beer!

Q: You are also the Associate Director for the Centre of Nutrition Modelling. What will this aspect of your job involve?

Raising our profile! We believe CNM is in a great position to be the go-to place for quantitative research on biological/agricultural problems. The group will be undergoing a bit of a brand re-fresh with a possible

name change to better capture the diverse modelling research being carried out by CNM faculty and associate members. A new website and social media presence are also planned as we move forward. Importantly, we will also be developing new course content at both the undergrad and grad level to supply the next generation of grads with the right skill-set for the workforce and looking to collaborate with industry closely to solve real-world problems.

Q: What do you like to do in your spare time (if you have any!) and how do you manage a work-life balance.

I like to really unplug. I love being outdoors and activities such as horseback riding. Before kids I was heavily involved in cycling and boxing and it would be great if I could resume those activities at some point! I have twin 5 year olds, and thus now they are essentially my 'hobby'! I also volunteer with Autism Ontario / Wellington Autism Connections whose aim is



Faculty, researchers and students gathered at a CNM "Think Tank"

to provide inclusion opportunities for children with ASD and support to families with children on the autism spectrum. One of my daughters is on the spectrum, thus it is a topic close to the heart of my family.

Prof. Ellis is one of many hires over the past five years. During this time, we have added 13 new faculty that complement and add to our existing group of strong professors and are helping to shape the future of ABSc.



Top: Alexandra Harlander (Poultry Behavior), Christine Baes (Dairy Genomics), Angela Cánovas (Beef Genomics), Anna-Kate Shoveller (Companion Animal Nutrition), Elijah Kiarie (Poultry Nutrition), Eduardo Ribeiro (Reproductive Physiology). *Bottom:* Abigail Carpenter (Dairy Nutrition Management), Katie Wood (Beef Nutrition), Wendy Pearson (Equine Physiology), Lee-Ann Huber (Swine Nutrition), Michael Steele (Animal Physiology), Dan Tulpan (Computational Biology)

Central Core Renovation

This past Spring, with the support of a generous gift from the estate of ABSc Professor Emeritus John Summers and his son Bill Summers, the Central Core lab space underwent much-needed renovations to improve research functionality and efficiency.

The updated lab space has been transformed with durable countertops, new flooring, ceiling tiles and paint finishes as well as plumbing and electrical upgrades. The rejuvenated space has also been equipped with a new muffler

furnace for ash analysis and a user-friendly benchtop autoclave.

Prof. Summers, who passed away in 2016, was a true leader in ABSc and a pioneer in the field of poultry nutrition. Over the course of his career, he was the recipient of numerous awards including the Order of OAC in 2013.

In honour of Summers legacy and generous gift, the Central Core lab space has been named the “J.D Summers Poultry/Mono-Gastric Metabolism and Feed Evaluation Laboratory”.



A Bit of History...



Funded through the Development Fund campaign, construction of the Animal Science and Nutrition (ANNU) building began in 1966 and was completed in early 1969. The official opening was the highlight of Alumni Weekend in the summer of 1969. The Summer 1969 issue of Guelph Alumnus Magazine wrote:

"...the modern glass and concrete structure consists of three wings separated for control of noise and odors. The largest wing, the centre block, contains laboratories, offices and is the temporary location of the Institute of Computer Science. A second wing houses research animals, while a third contains the meat science laboratory with slaughtering, processing, and basic research facilities. The meat laboratory, a facility which cannot be found elsewhere in Canada, provides for research in histology, biochemistry, and microbiology of meats as well as product assessment".

The total cost of the project was \$8.8 million dollars which corrected for inflation would approach \$68 million today!

Meat Science Laboratory Renovation

Did you know ABSc is home to the only federally licensed abattoir located within a Canadian University?

Operating under the Canadian Food Inspection Agency (CFIA), the Meat Science Laboratory provides opportunities for faculty and students from ABSc as well as the Department of Food Science to carry out research and training to improve animal welfare, productivity and food safety. In addition, the facility is also used to educate and engage in services for outside agencies including the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) and the local community.

After approximately a year of renovations the facility re-opened in July 2018. The laboratory meets today's industry standards and has allowed U of G to continue to play a vital role in AgFood research and training.

Highlights of the renovated facility include:

- new processing equipment, industrial smokehouse, freezer and spice room
- updated blast chiller and handling pens for large cattle
- CO2 stunning system for human euthanasia of pigs and sheep



Renovations to the 50-year-old Meat Science Laboratory were made possible with funding support from the U of G-led Food From Thought research program, the Strategic Investment Fund, the Agricultural Institute of Ontario (ARIO) and the OAC Class of 1978.



Elora Beef Research Centre Project

In 2017, the federal and provincial government along with the University of Guelph (U of G) finalized exciting plans for a leading-edge beef research facility. The \$15.5 million-dollar world-class Beef Research Centre is funded by U of G along with Agriculture and Agri-Food Canada, the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), the Agricultural Research Institute of Ontario (ARIO), and the Beef Farmers of Ontario.

Located at the Livestock Research and Innovation Centre (LRIC) 25 minutes north of Guelph in Elora, the facility will be operated by U of G under its partnership with OMAFRA to drive fundamental research that will help enhance livestock health and welfare to

strengthen Canada's economy. The training and education at the centre will address the needs of the beef industry in Ontario and will greatly facilitate multidisciplinary research in cow-calf nutrition, genetics, forage and feedlot research.

Highlights of the new 165,000 sq. ft. facility include:

- Two new cow-calf barns and joint handling facility to provide space for up to 288 cows
- Two new C-Lock Greenfeed Trailers that allow for accurate measurements of greenhouse gas emissions including CO₂ and methane
- > 100 automated Insentec and Calan Broadbent solar-powered

feeding head gates that permit monitoring and measurement of feed intake in individual animals

- Repurposing of 200 acres of land for accessible pasture

This state of the art centre is set to replace the original Elora Research Station, built in 1969, while complementing the \$25-million leading edge Livestock Research Innovation Centre – Dairy Facility that opened its doors in 2015.

Construction on the Beef Research Centre began in August 2017 with offices, labs and cow barns expected to be completed this Fall. The full beef research facility will be ready for operation in 2021. 🐮

AWARD WINNERS



Prof. Michael Steele has been named one of two recipients of the 2019 American Society of Animal Science (ASAS) Early Career Achievement Award. The award recognizes an individual who has shown outstanding achievement as a young scholar and will be presented during the 2019 ASAS-CSAS Annual Meeting held this July in Austin, Texas.

Prof. Steele completed his BSc, MSc and PhD degrees at U of G and then spent time in industry prior to returning to academia as an Assistant Professor and NSERC Industrial Research Chair at the University of Alberta. This past fall, Prof. Steele joined ABSc where his lab continues to carry out research in early life calf nutrition and the role of the microbiome in gastrointestinal tract health and development.



This past April, Professor Emeritus Ian Duncan was named the recipient of the 2019 Frederic A. McGrand Lifetime Achievement Award from Humane Canada, a federation that brings together SPCAs and humane societies from across the country. The award is given out every two years to an individual who has made outstanding contributions to animal welfare in Canada. Past winners of the award include Canadian icon Dr. David Suzuki in 2017.

Considered a top expert in farm animal welfare, especially poultry welfare, he has worked with organizations worldwide to develop animal welfare certification programs.

Prof. Duncan received the award during Humane Canada's sixth annual National Animal Welfare Conference in Montreal.



We are pleased to announce that retired ABSc faculty member Prof. James France has been granted the title of University Professor Emeritus by the Senate of the University of Guelph.

Prof. France, the former Director of the Centre for Nutrition Modelling and Canada Research Chair in Biomathematics in Animal Nutrition, is internationally recognized for his research on the development and application of mathematical models to better understand the complexities of various biological processes such as metabolism and digestion in livestock. The results of his work have led to the implementation of feed strategies that improve nutrient efficiency on farms while maintaining cost-effectiveness and environmental health.

Congratulations also go out to the following faculty who have recently been granted tenure: Christine Baes, Angela Cánovas, Alexandra Harlander, Anna-Kate Shoveller and Michael Steele. Effective July 1, 2019 they were promoted to the rank of Associate Professor.



GRANT SUCCESS!

ABSc faculty were once again very successful in recent grant competitions.

Natural Sciences and Engineering Council (NSERC)- 2019 Discovery Grants Awarded

- "Nutritional regulation of endoplasmic reticulum biogenesis in mammary epithelial cells" - J. Cant
- "Advancing knowledge of individual differences in feeding behaviour of dairy cattle" - T. DeVries
- "Methyl and methionine utilization in gestating sows" - LA. Huber
- "Neuroendocrine-immune (NEI) system programming of zebrafish embryos and larva: Implications for stress resilience, disease resistance, and longevity" - N. Karrow
- "Sulfur amino acid requirements and metabolism in cats" - AK. Shoveller
- "The integrated metabolism of boar taint - towards developing effective strategies to reduce taint" - J. Squires
- "Development of biomarkers for stress, boar taint and reproductive performance in pigs" - R. Bergeron, J. Squires, J. Li
- "A comparison of key methodologies used to quantify protein quality of insect protein, black soldier fly larvae, for human and farm animals" - AK. Shoveller, LA. Huber, E. Kiarie
- "Precision poultry management: combined approaches for enhancing layers health and welfare in the context of sustainable high egg production" - G. Bedecarrats, E. Kiarie, A. Harlander, T. Widowski
- "Mechanisms of long-term consequences of transition cow biology on production and reproduction traits" - E. Ribeiro
- "A comprehensive assessment of slow growing chickens: tackling sustainability issues for chicken strains of tomorrow" - T. Widowski, E. Kiarie, N. Karrow, D. Tulpan
- "Breeding Livestock for Climate Resilience" - F. Schenkel, A. Cánovas, N. Karrow, D. Tulpan

Food From Thought Funding Awarded

- "Precision cattle management" - J. Cant, T. DeVries, M. Steele

What is Food From Thought?

Agriculture and food production around the world has benefited from the rapid expansion of sensor technology that is helping us collect vast amounts of information and measure everything from global shifts in climate, to variations in food quality, to microscopic evolution of pests and pathogens.

The Food From Thought program at the University of Guelph is working on how to realize the full potential of all this data to understand the complex interplay between farming practices, the genetic potential of our livestock and crops, and the ecosystem. The \$76.7 million, 7 year research program started in 2016, and is funded by the Canada First Research Excellence Fund. This research will help us to understand how we can increase the capacity, sustainability and safety of our food production systems.

Faculty and graduate students from all seven colleges are tackling cross-disciplinary projects at three scales of research and innovation: the global scale (transforming agriculture's impact on biodiversity), the landscape scale (sustainably intensifying production), and the micro-scale (enhancing food and livestock health).



Genomic Selection in Dairy Cattle and Mitigating Climate Change

This past winter, ABSc Associate Professor and Tier 2 Canada Research Chair in Livestock Genomics Prof. Christine Baes was front and centre in the media with DAILY VICE and the CBC. Dr. Baes discussed how advanced genomic technologies are being used to help reduce methane emissions from ruminant livestock species such as dairy cattle.

Atmospheric levels of methane, a potent greenhouse gas, have risen sharply over the last decade. While the oil and gas industry are major offenders, the animal agriculture sector also produces its share of climate pollutants.

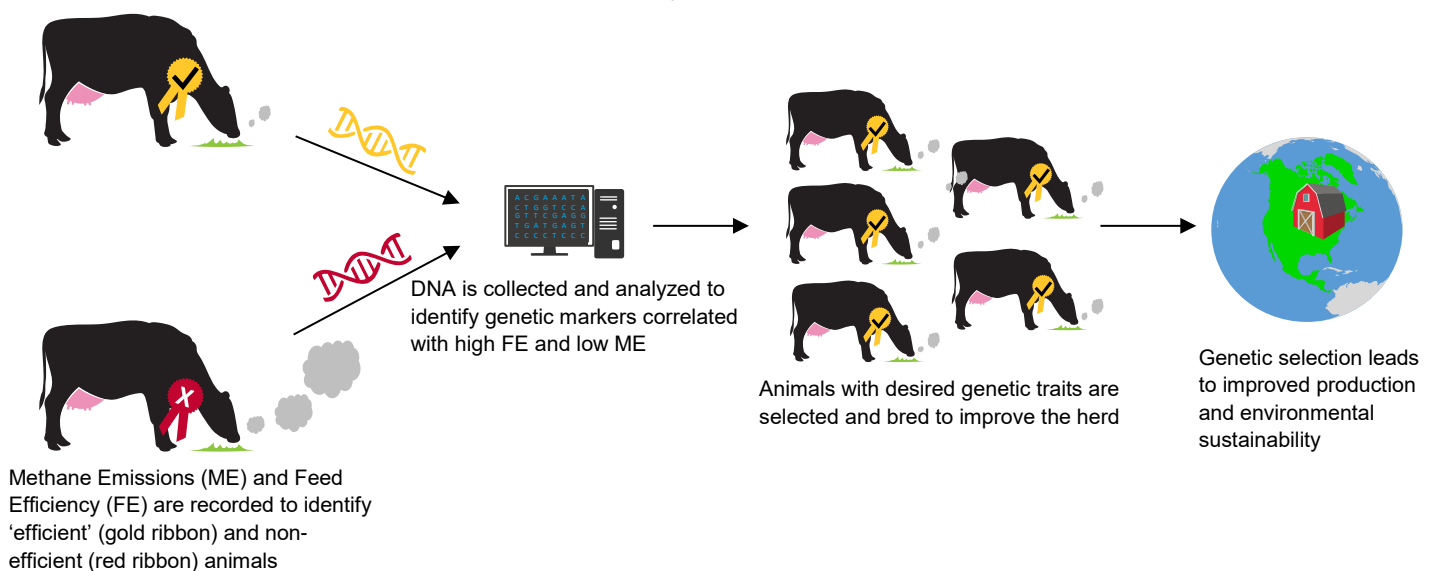
On farms, methane is generated

from two main sources: enteric fermentation and to a lesser extent manure storage sites. Enteric fermentation is a natural digestive process carried out by tiny microbes located in a unique stomach chamber of species such as cattle, goats and sheep called the rumen. While this process is essential for the breakdown of plant material into usable energy, methane is also generated as a by-product. Often linked to the *rear*-end, Prof. Baes clarified that it is in fact the *front*-end in the form of 'burps' that accounts for the release of methane gas.

Methane emissions are not only linked with climate change but are also used as an indicator of feed efficiency in ruminants. As

high levels of methane generation is a net loss of energy, the sub-optimal use of nutrients found in feed can negatively affect desired outputs such as milk production. Thus, the development and implementation of strategies that improve feed efficiency can also be used for mitigation of methane. This would result in increased profitability and lessen the environmental impacts of the industry.

One approach investigated to curb livestock methane emissions has been through dietary manipulation. This may involve improving forage quality, changing the proportion of concentrate or through supplementation of feed additives



▲ Process of genetic selection for increased feed efficiency and decreased methane emissions in dairy cattle. Adapted from Lam et al. OMAFRA Virtual Beef. 14 (57). April 2018.




that inhibit methane production. However, as Prof. Baes discussed, another strategy may lie within the animals DNA.

Recent studies suggest that methane production and feed efficiency are to some degree heritable traits. As part of The Efficient Dairy Genome Project

(EDGP), research groups from the University of Guelph, University of Alberta as well institutions in Australia, USA, United Kingdom and Switzerland are using advanced genomic technologies to identify DNA markers associated with feed efficiency and methane emissions in dairy cattle. Once genomic regions are

identified, animals with high feed efficiency and low methane emissions can be selected and used for genetic improvement of the herd as well as providing social and economic benefits.

 For more information on the EDGP please visit: genomedairy.ualberta.ca

Not Just Dairy!

The use of genomics to improve feed efficiency and reduce methane emissions isn't just limited to dairy cattle. ABSc researchers are also investigating the use of advanced genomic technologies in beef cattle. However, instead of DNA, Prof. Angela Cánovas and her team are focused on RNA.

Using RNA-sequencing (RNA-Seq), genes that are turned 'on or 'off' in beef cattle with different feed efficiencies and methane emissions can be identified. Their initial efforts have focused on exploring gene expression changes in muscle and liver; two highly metabolic tissues linked to feed efficiency.

The identification of genes and their associated molecular pathways will provide novel insight into the

underlying biological mechanisms that regulate feed efficiency and methane emissions in cattle.

More information on this project can be found at: <http://www.omafra.gov.on.ca/english/livestock/beef/news/vbn0418a3.htm>



▲ Prof. Angela Cánovas discusses RNA-Seq data analysis with her team.

Improving Health and Productivity of Turkeys Through Genomics


Selective breeding programs, in which animals with desirable traits are mated, are essential for sustainable animal food production. Prior to the genomic era, the genetic improvement of livestock relied not only on detailed phenotypic (i.e. observable characteristics) records for traits of interest but also lengthy progeny testing. However, with the development of advanced genomic technologies, the incorporation of DNA information into the animal selection process has revolutionized animal breeding programs.

Hybrid Turkeys is a Canadian company that operates in the global turkey breeding market and supplies parent stock toms and hens for commercial breeding use. The company provides the Canadian turkey industry with the majority of its genetic stock, meaning that most of the turkey consumed in Canada could be genetically traced back a few generations to a Hybrid Turkeys farm.

Researchers at the Centre for Genetic Improvement of Livestock (CGIL), a Centre of Excellence nestled within ABSc, are collaborating with Hybrid Turkeys to adapt advanced genomic selection methods used successfully in other livestock species to improve turkey health and production. By more accurately estimating the genetic potential of individual turkeys, the rate of genetic gain for some traits is expected to increase up to 60% and provide economic benefit for the turkey industry and consumers.

The effective application of these novel methods requires the availability of an enormous amount of data for analysis. Genomic information is obtained from SNP (single nucleotide polymorphism) arrays, a technology which allows for the detection of small changes in the DNA code of individual animals. Pedigree data (i.e. ancestry), high-quality records for traits of interest and an excellent computational infrastructure and database are also needed. While pedigree data and records for

interest are already available, data on health, behaviour and novel traits including meat quality (e.g. water holding capacity, pH, shear force and colour) and total carcass composition are also being collected. Integration of SNP array information with the pedigree and trait records will then allow for the identification of heritable traits and the most desirable animals for breeding.

The use of advanced genomic selection in turkeys for traits such as feed efficiency, bodyweight, breast meat yield, egg production and livability will lead to gains in industry efficiency over and above those delivered by traditional genetic improvement. These will have social benefits by improving animal health and welfare and also benefit the environment through increased feed efficiency and decreased manure and greenhouse gas emissions. 

Funding for this project is provided from the Genomic Applications Partnership Program (Genome Canada) and Hybrid Turkeys, a Hendrix Genetics company.

This project is co-led by Prof. Christine Baes (U of G) and geneticist Dr. Ben Wood (Hybrid Turkeys).

STUDENT AWARDS



Victoria Stewart with Prof. de Lange's family at the OAC Awards

This past Fall, MSc student Victoria Stewart was awarded the first CFM de Lange Scholarship in Swine Nutrition. This scholarship was created by friends, family and colleagues of Prof. Kees de Lange in memory and recognition of his outstanding research and contributions to ABSc, the swine industry and the broader U of G community. 68 donors stepped forward

to rapidly raise \$150,000 for the scholarship which will be presented annually to a student focused on swine nutrition research.

Victoria was also recently awarded 1st prize in the MSc category for her research talk at the 2019 University of Guelph Swine Research Day.

Working with Prof. Lee-Anne Huber, Victoria is evaluating the use of precision feeding strategies in sows to better optimize nutrient requirements needed for robust growth of sows and piglets. 🐷

Midian Nascimento Dos Santos, a PhD candidate under the co-supervision of Prof. Elijah Kiarie and senior research associate Dr. Stephanie Torrey, has been awarded the first Aviagen Poultry Genetics Scholarship.



The award was established in co-operation with the Canadian Poultry Research Council (CPRC) and provides support to an outstanding student whose research has great potential to benefit the poultry industry.

The focus of Midian's research is on evaluating the use of slower growing genetic lines of broiler chickens as a means to improve animal welfare and facilitate sustainable poultry production. 🐔



MSc student Madeline Collins won 1st place for her poster "Does Supplemental Methionine and Protein Improve Performance and Digestibility During Late Gestation in Beef Cows?" at the 2019 Animal Nutrition Conference of Canada (ANCC) in Niagara Falls.



At the 2019 Swine Research Day, Christine Bone, was awarded 1st place in the PhD category for her oral presentation on "The synthesis of sulfated 16-androstene steroids by porcine Leydig cells and their potential involvement in the development of boar taint" while



MSc student Michelina Crosbie garnered 1st place for her 2-minute oral pitch on her poster "Standardized ileal digestible amino acids in black soldier fly larvae meal (*Hermetia illucens*) fed to growing pigs".

Berry and Apple Skins in Poultry Production

Stellah Mbao, MSc student
Department of Animal Biosciences

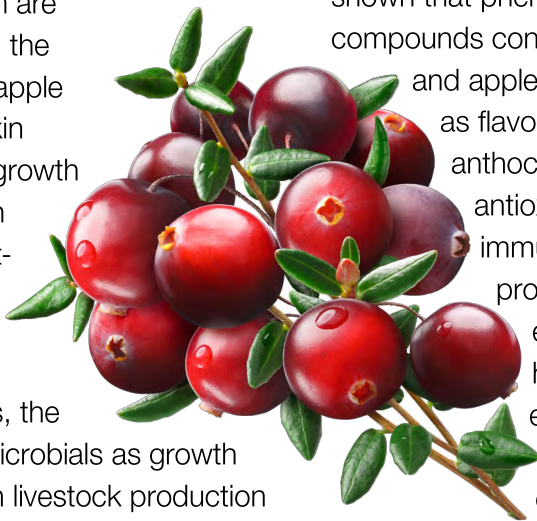
Have you ever wondered what happens to the skin of apples and berries after juice production? Normally it would be tossed away. But new research from ABSc is looking into a potentially new use for fruit waste.

In collaboration with Dr. Diarra Moussa (Agriculture and Agri- Food Canada), ABSc Assistant Professor and McIntosh Family Professor in Poultry Nutrition Dr. Elijah Kiarie and his team are investigating the potential of apple and berry skin extracts as growth promoters in broiler (meat-type) chickens.

For decades, the use of antimicrobials as growth promoters in livestock production has been common practice. However, the widespread use of antibiotics has led to a dramatic rise in antimicrobial resistant bacteria leading to food safety concerns and a potential threat to human health. Consequently, a ban

on the uncontrolled use of antimicrobials has been imposed in Canada and other countries. Given that poultry is one of the most consumed meats, the identification of non-antimicrobial alternatives has become an intense area of research.

The improved growth metrics and overall health performance observed with antimicrobial use may be due to direct antibacterial activity on the gut microbiota as well as anti-inflammatory actions¹. Previous studies have shown that phenolic compounds contained within berry

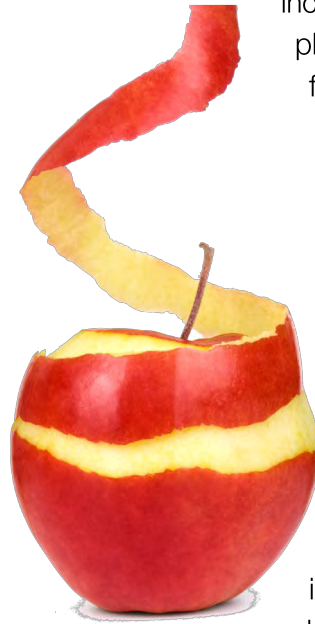


and apple skin extracts such as flavonoids and anthocyanins also have antioxidant and immunomodulatory properties that enhance overall gut health¹. Pomace extracts also have the potential to disrupt the growth of pathogenic bacteria such as *Listeria*, *Salmonella* and *Staphylococcus aureus*, all while showing comparable efficacy as antibiotic growth promoters².

To further investigate the potential

benefits of berry and apple waste in poultry production, our lab is collaborating with Canadian Bio-Systems, a Calgary based company to develop enzymes to

increase release of phenolic biomolecules from complex fruit skin matrix. In the first trial, different extract and enzyme concentrations will be administered to identify the optimal dosage for productivity and gut health development. This dosage will then be applied to sick birds in a second study to determine its efficacy in clearing disease.



Ultimately, this research aims to identify alternatives to antibiotics that will improve poultry health and performance, promote the organic production of animal food products and improve food safety. 🍏

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This article was contributed as part of a newsletter assignment for ANSC*6600/6610, a graduate-level course on Scientific Communication.

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*ABSc faculty/emeriti in bold

Staff Go Wild!

STAFF NEWS

This past June, ABSc staff members enjoyed a team outing to Wild Ontario at the University of Guelph Arboretum. Wild Ontario works with non-releasable birds native to Ontario including falcons, hawks and owls and provides environmental outreach and education programs. The organization has been based out of ABSc since 2010.

The Wild Ontario team were fantastic, from

Director Jennifer Bock to the many enthusiastic volunteers. ABSc staff were given a history of the program, a tour of the new aviary and the story behind the many birds in their care.

What a fantastic afternoon with great people and even better birds! 🦅

To learn more about programs, volunteering and sponsorship opportunities at Wild Ontario please visit wildontario.ca

Chinook, a beautiful peregrine falcon that has been with Wild Ontario since 2013.

Photos: Robert Jones



RECENT & UPCOMING EVENTS

Bowl for Kid's Sake Success!

Thank you to everyone who stepped up to the plate to donate and participate so enthusiastically for a great cause. In total, our teams the Alley Cats (grad students) and Animal

Crackers (faculty/staff) raised \$1600 towards Big Brothers Big Sisters of Guelph mentoring programs for children. With a two game split, it looks like we are headed for a rubber match!



CURRENT OPPORTUNITIES

Faculty Position-Aquaculture

The department invites applications for a tenure-track position at the Assistant or Associate Professor level in Aquaculture. Applicants must hold a Ph.D. with post-doctoral experience, and have a strong academic background and research track-record in one or more of the following areas:

- fish physiology/endocrinology
- environmental impact assessment
- genetics
- nutritional sciences
- animal welfare

The deadline for applications is July 31, 2019 or until a suitable candidate can be found. Full details can be found at: uoguelph.ca/facultyjobs/pos_ngs/ad19-34.shtml

M.Sc. Graduate Research Assistantship (Two) – Swine Nutrition

Expressions of interest and applications are invited from prospective M.Sc. students. These are full Graduate Research Assistantship positions and the successful candidates are anticipated to start either in September 2019 or January 2020.

The successful applicant will join our energetic and driven Swine Nutrition Research Team. The applicant's research will focus on

either: 1) examining the use of different management and feeding regimens (i.e. milk replacer) for piglets before and after weaning to optimize growth and gut development or 2) determining methionine requirements for reproductive sows. State of the art facilities for advanced animal nutrition and metabolism, spectrometry, chromatography, microscopy, and high-throughput genomics will be available for the execution of these research programs.

A minimum of 80% grade point average is required for combined

B.Sc./DVM transcripts. The candidates should have basic animal and laboratory research experiences. Skills in biochemical, microbiology, and molecular biology techniques will be an added advantage.

Consideration of applications will begin on August 1, 2019 and will continue until the positions are filled. Applicants should submit curriculum vitae, a statement of research interests, list of publications, B.Sc./DVM transcripts, and the names and email addresses of two persons who will serve as references to: huberl@uoguelph.ca

ISES 15th Equitation Science Conference



The International Society for Equitation Science (ISES) will be holding their annual conference at U of G August 19-21. Organized by ABSc Prof. Katrina Merckies, the theme for this year's conference is "Bringing Science to the Stable-Horse-human relationships: *Where have we come from? Where are we now? Where are we going?*".

The ISES 2019 blog can be found at : ises2019uofg.wordpress.com



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

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Photo: Robert Jones