URA and USRA positions for Summer 2021 in Animal Biosciences:

Important dates for students to know:

URA postings close on: Feb.15.2021

USRA postings close on: Feb.22.2021

See full details on how to submit your application on the experienceguelph.ca website.

Information received from the Office of Research on Feb.4.21 – indicates the following for USRA applicants requesting an official transcript:

"It seems the registrar's office will accept the transcript form on line with out payment for the next few days. The students can submit their transcript form as per the instructions and insert their U of G email to obtain your transcript digitally. No need to add 'require for NSERC Scholarship application'"

Supervisor		Title of Proposed Research Project
John Cant	URA	Insuln/glucose dynamics in dairy cows
David Huyben	URA	Improving fish feeds and microbiome lab work
Jennifer Ellis	URA	Data mining to support the research program entitled: Modelling performance, efficiency and environmental impact of monogastric and ruminant animals
Dan Tulpan	URA	Intelligent segmentation models of livestock animals from digital images for automatic monitoring and tracking of morphometric measurements
Tina Widowski	URA	Nutritional approaches for enhancing productivity and welfare in poultry: behavioural response to maternal feeding of omega-3 fatty acids (NSERC CRD 514936)
Christine Baes	USRA	Resilient Dairy Genome Project
Renee Bergeron	USRA	Feeding preferences and grazing behaviour in pastured dairy cows
Alexandra Harlander	USRA	The link between tryptophan metabolism and bird-to-bird pecking in laying hens
Lee-Anne Huber	USRA	Feeding strategies for lactating sows
Jim Squires	USRA	Development of a complete solution for boar taint
Katie Wood	USRA	Understanding the impact of uNDF in feedlot ration on gut health

Job Information – URA with John Cant

Title of Proposed Research Project: **Insuln/glucose dynamics in dairy cows**

Proposed Start Date: **May 1 2021**

Name and Title of Proposed Supervisor: **John Cant, Professor**

Department: **Animal Biosciences**

Type of position: ☒ **URA** ☐ **USRA**

Brief Outline of Proposed Research Project:

Insulin is a hormone produced by the pancreas in response to blood glucose levels, that directs muscle, adipose and mammary glands to take up blood glucose. At the onset of lactation, pancreatic responsiveness to glucose, and insulin sensitivities of tissues, appear to change to allow absorbed nutrients to partition into milk. The degree to which these parameters differ between early- and late-lactation cows will be evaluated by exposing cattle of both groups to hyperglycemic and hyperinsulinemic challenges. The challenges will be conducted by infusing glucose + amino acids, and insulin + glucose, into the jugular veins of cattle for 4-h periods. During infusions, blood and tissue samples will be collected for analysis of metabolite concentrations and gene expression levels, respectively.

Job description (task/responsibilities, relevant scheduling details, and required and/or preferred qualifications):

The summer student will be involved in infusate preparation, blood and tissue sample collection, lab analysis, and data entry into spreadsheets. A background in biology is required. The student will interact with a team of graduate students studying effects of diet on milk synthesis.

What are 2-5 specific things you feel a student will learn during this position?

physiology experiment design
animal care
blood sample analytical techniques
real-time qPCR
Excel spreadsheet proficiency

Which 2-5 knowledge, skills, or attitudes are most relevant to this position? *View definitions of common knowledge, skills, and attitudes*.

1. **Knowledge: Scientific**
2. **Skill: Critical and Analytical Thinking**
3. **Skill: Problem-Solving**
4. **Attitude: Responsibility**
5. **Choose an item.**

Hiring Contact

This is the person managing the application process and the person whose account the job is posted to in experienceguelph.ca. This is the person that will receive reminder e-mails about URA/USRA processes.

Printed Name and Title of Hiring Contact: John Cant, Professor

Hiring Contact E-mail: **jcant@uoguelph.ca** Hiring Contact Phone: **519-824-4120 ext 56222**

Job Information – URA with David Huyben

Title of Proposed Research Project: Improving fish feeds and microbiome lab work

Proposed Start Date: May 1, 2021

Name and Title of Proposed Supervisor: David Huyben, Assistant Professor

Department: Animal Biosciences

Type of position: ☒ **URA** ☐ **USRA**

Brief Outline of Proposed Research Project:

The research project involves feeding different levels of lipids, insects and yeast to Lake whitefish (Coregonus clupeaformis) at the Alma Aquaculture Research Station in order to improve health and sustainable production of this new farmed fish species. One major challenge is to make fish feeds with different levels of ingredients with the same level of energy. Secondly, the field of microbiome research is rapidly developing and we need adapt to new methods to extract DNA, PCR and sequence samples in a timely and cost-effective manner. This project involves producing fish feeds, assisting with a fish trial and reviewing the microbiome literature.

Job description (task/responsibilities, relevant scheduling details, and required and/or preferred qualifications):

The student will be responsible for organizing feed ingredients, using the feed processing facilities at the ABSc Dept (e.g. mixers) and steam pelleting feeds along with the assistance of an MSc student. They will assist a MSc student with their fish trial by organizing sampling materials, driving to the Alma research station and feeding whitefish (later in July and August). The student will use resources on the UOG campus in accordance with institutional COVID-19 precautions, but if access is not allowed then alternate remote research work will be provided.

Remotely, the student will be responsible to perform a short literature review of recent microbiome studies on fish and other animals to identify current lab methods. In addition, they will investigate nearby molecular and DNA sequencing services that are available and cost-effective.

Some knowledge on feed production and/or molecular lab work is preferred, but not required.

What are 2-5 specific things you feel a student will learn during this position?

The student will learn about the scientific method in preparing and starting a fish experiment. They will learn to communicate with grad students and research assistants in a team, extract knowledge from the scientific literature and form recommendations for future research in a cutting-edge field.

Which 2-5 knowledge, skills, or attitudes are most relevant to this position? *View definitions of common knowledge, skills, and attitudes.*

1. **Knowledge: Scientific**
2. **Skill: Oral Communication**
3. **Skill: Knowledge Integration**
4. **Skill: Teamwork and Collaboration**
5. **Skill: Information Management**

Hiring Contact

This is the person managing the application process and the person whose account the job is posted to in experienceguelph.ca. This is the person that will receive reminder e-mails about URA/USRA processes.

Printed Name and Title of Hiring Contact: **David Huyben, Assistant Professor**

Hiring Contact E-mail: **huybend@uoguelph.ca** Hiring Contact Phone: **+1-519-824-4120 x54923**

Job Information – URA with Jennifer Ellis

Title of Proposed Research Project: **Data mining to support the research program entitled: Modelling performance, efficiency and environmental impact of monogastric and ruminant animals**

Proposed Start Date: **May 3, 2021**

Name and Title of Proposed Supervisor: **Dr. Jennifer Ellis, Assistant Professor, Animal Systems Modelling**

Department: **Department of Animal Biosciences**

Type of position: ☒ **URA** ☐ **USRA**

Brief Outline of Proposed Research Project:

The focus of the research program to which this URA will support is 'The development of models to support the efficient and sustainable (economic and environmental) production of animal products (meat/milk/eggs)'. Specifically, this student will support the research projects 'Mechanistic modelling of sustainability metrics and performance in broilers' and 'Hybridization of artificial intelligence and mechanistic models to create 'intelligent' precision nutrition models for next generation dairy production'.

As the global population escalates towards an estimated 9.5 billion in 2050 (FAOSTAT, 2013), the need to efficiently produce animal protein (milk, meat, eggs) for human consumption whilst minimizing the impact on the environment (methane, nitrogen, phosphorous, water & land use) will only continue to increase. These animal production systems must also manage increasing societal pressures to reduce production intensity (e.g. pasture-based systems, slow-growing breeds) and remove antibiotics and hormones from animal feed – strategies that may directly counter efforts to improve efficiency, health and production. Such complexities are difficult to address within individual research trials or even to extract from whole bodies of scientific

research literature. With complex biological systems, such as the digestive and metabolic pathways that drive nutrient utilization and animal performance, models play a key role in distilling knowledge from information and identifying optimized feeding and mitigation strategies. The development of such models serve as valuable tools both within academia (knowledge synthesis) and industry (optimization of performance and minimize negative impacts on the environment).

In order to develop such models, these research projects will utilize the body of information and data available in the published literature and through project partners. Via conducting a systematic literature review, the successful URA candidate will be responsible for mining and extracting this data from the published literature and from data received from project partners, and develop a database to be used for model development and evaluation.

Job description (task/responsibilities, relevant scheduling details, and required and/or preferred qualifications):

Tasks/Responsibilities:

- Conduct a systematic review of the published literature and identify relevant publications in the defined research topic areas
- Extract data from the mined literature and develop a database of literature trial results
- Perform line audits of the developed databases to ensure accuracy of transcribed data
- Perform exploratory data visualization and statistics (with support)
- Develop model input files using the extracted literature data and data provided by project partners
- Run the extracted literature data through the broiler models and evaluate results (with support)

Preferred Qualifications:

- strong animal nutrition/physiology (animal science, animal biology) or data science background
- comfortable with math and numbers
- knowledge of excel, SAS or R
- self-motivated, independent, ability to problem-solve both biological and mathematical problems

What are 2-5 specific things you feel a student will learn during this position?

- Systematic review of the literature
- Meta-analysis
- Database development and management
- Intro to empirical and mechanistic modelling in animal science

Which 2-5 knowledge, skills, or attitudes are most relevant to this position? *View definitions of common knowledge, skills, and attitudes*

1. **Skill: Information Management**
2. **Knowledge: Scientific**
3. **Knowledge: Mathematical**
4. **Attitude: Persisitence**
5. **Attitude: Responsibility**

Hiring Contact

This is the person managing the application process and the person whose account the job is posted to in [experienceguelph.ca](). This is the person that will receive reminder e-mails about URA/USRA processes.

Printed Name and Title of Hiring Contact: **Dr. Jennifer Ellis, Assistant Professor**

Hiring Contact E-mail: **jellis@uoguelph.ca** Hiring Contact Phone: **519-824-4120 x 56522**

Job Information – URA with Dan Tulpan

Title of Proposed Research Project: **Intelligent segmentation models of livestock animals from digital images for automatic monitoring and tracking of morphometric measurements**

Proposed Start Date: **May 1, 2021**

Name and Title of Proposed Supervisor: **Dan Tulpan**

Department: **Animal Biosciences**

Type of position: ☒ **URA** ☐ **USRA**

Brief Outline of Proposed Research Project:

Developing simple but robust data collection protocols and accurate models able to predict the weight and morphometric dimensions of livestock from raw digital images will be of great use to producers. Tracking weight and dimensions of body parts is beneficial for monitoring livestock health, for genetic selection, and for identifying optimal slaughter times, nevertheless there is no viable and affordable technology that accomplishes these tasks due mostly to the difficulty of automatically identifying and extracting the exact morphometric characteristics and implicitly the weight of an animal from digital imagery. Producing a model that is able to achieve this from digital images rather than the currently used weighing cell and BCS equipment can help to avoid the constant maintenance of these devices, lowering the maintenance cost, saving time and, most importantly, reducing the animal stress associated with the weighing and measuring process.
Therefore, this project will focus on the comparison, testing, selection and improvement of automatic segmentation models for cattle and pigs from digital images using a combination of promising computer vision and machine/deep learning techniques.

Job description (task/responsibilities, relevant scheduling details, and required and/or preferred qualifications):

The successful candidate will have experience with programming in Python using OpenCV, scikit-learn and other related packages used for the development of machine learning (ML) and computer vision (CV) applications. The project will be developed in multiple phases. The first phase will consist in preparing a dataset with ground truth images via manual curation. The second phase will consist of

exploring and implementing in Python 3 popular CV approaches for segmentation using ML models for animal-specific model construction with the purpose of extracting the exact boundaries of an animal from a digital image. The third phase will consist in constructing animal-specific ML models using the dataset prepared in phase 1 and evaluating the models based on a test dataset. The last phase consists in selecting the best model and implementing a simple front end such that the model could be used by other students. The work on this project will be done in close collaboration between the candidate and an M.Sc. student with deep knowledge in biological and data collection aspects of this project. The successful candidate and the M.Sc. student will work in Dr. Tulpan's lab and will have access to super-computing resources. The project is scheduled to be executed between May 1st, 2021 and August 31, 2021. The successful candidate, depending on successful performance, will have the opportunity to continue working on the project after August 2021, either on a term contract or could be considered for an M.Sc. position.

What are 2-5 specific things you feel a student will learn during this position?

The student will have the opportunity to:
- sharpen their skills in solving real-life problems using computer programming and modelling,
- work as part of a cohesive team whose success depends on each individual member effort and skills,
- interact on a regular basis with experts in the field and acquire new knowledge,
- apply machine learning techniques and improve models based on real data, and
- getting immersed and getting a first-hand experience with working in a scientific academic environment.

Which 2-5 knowledge, skills, or attitudes are most relevant to this position? *View definitions of common knowledge, skills, and attitudes*.

1. **Knowledge: Digital and Technical**
2. **Attitude: Curiosity**
3. **Skill: Creativity and Innovation**
4. **Skill: Problem-Solving**
5. **Skill: Teamwork and Collaboration**

Hiring Contact

This is the person managing the application process and the person whose account the job is posted to in experienceguelph.ca. This is the person that will receive reminder e-mails about URA/USRA processes.

Printed Name and Title of Hiring Contact: **Dan Tulpan, Assistant Professor**

Hiring Contact E-mail: **dtulpan@uoguelph.ca** Hiring Contact Phone: **1-506-871-0882**

Job Information – URA with Tina Widowski

Title of Proposed Research Project: **Nutritional approaches for enhancing productivity and welfare in poultry: behavioural response to maternal feeding of omega-3 fatty acids (NSERC CRD 514936)**

Proposed Start Date: **May 1, 2021**

Name and Title of Proposed Supervisor: **Tina Widowski**

Department: **Animal Biosciences**

Type of position: ☒ **URA** ☐ **USRA**

Brief Outline of Proposed Research Project:

In commercial poultry production, formulated diets are necessary to ensure correct uptake of nutrients for growth and production; these include lc-PUFAs due to the chicken's inability to modify fatty acids internally. Adding lc-PUFA into an individual breeder hen's diet can subsequently alter the phospholipid content within eggs they produce, thus altering the nutrients available to the developing chick embryo. The brain has a high fatty acid content, 30% of which is made up of n-3 and -6s. In several mammalian models and some avian species, there is evidence of cognitive benefits of n-3 supplementation on animal behaviour, such as improved spatial and working memory. However, in birds, there is also evidence that maternal n-3 supplementation may impact progeny's fearfulness and emotional reactivity.

The aim of this research is to investigate the effects of maternal feeding of fatty acids on the behaviour and well-being of their progeny. Different levels of dietary fatty acids will be fed to parental layer breeder flocks during rearing and laying periods to assess the impact on their daughters. A series of behavioural tests to compare cognitive functioning, fearfulness and stress reactivity will be conducted on laying progeny. We will explore whether n-3s will alter cognitive performance, with emphasis on spatial memory and learning. We will also explore is whether n-3s alter fearfulness or emotional reactivity of laying hens chicks and pullets.

Job description (task/responsibilities, relevant scheduling details, and required and/or preferred qualifications):

The student will assist graduate student researchers in data collection and performing behavioural tests with layer hens, chicks and pullets at the Arkell Poultry Research Station. This will include handling birds, weighing and scoring for physical attributes and collecting behavioural data using data collection software from video, audio and live observations.

The students will require successful completion of UoG Animal Care training modules and Poultry A Animal Care Training before handling birds.

A background in poultry and/or animal behaviour and welfare is preferred.

Students must be reliable, task oriented and show good attention to detail. They must be able to work full days in farm conditions and must be available for some weekend scheduling.

A full G driver's license would be an asset.

Some of the tasks as outlined require the student use equipment and resources on the University of Guelph campus in accordance with institutional COVID-19 precautions. In the event of a change in

precautions that would no longer allow access to the campus lab facility, alternate remote research work will be provided.

What are 2-5 specific things you feel a student will learn during this position?

Procedures and process for conducting scientific research and its application

Students will develop close attention to detail and time management skills

Students will advance their interpersonal skills through teamwork and collaboration

Which 2-5 knowledge, skills, or attitudes are most relevant to this position? *View definitions of common knowledge, skills, and attitudes*.

1. **Knowledge: Scientific**
2. **Skill: Teamwork and Collaboration**
3. **Attitude: Adaptability**
4. **Skill: Information Management**
5. **Attitude: Responsibility**

Hiring Contact

This is the person managing the application process and the person whose account the job is posted to in experienceguelph.ca. This is the person that will receive reminder e-mails about URA/USRA processes.

Printed Name and Title of Hiring Contact: Tina Widowski

Hiring Contact E-mail: **twidowsk@uoguelph.ca** Hiring Contact Phone: **ext 52408**

Job Information – USRA with Christine Baes

Title of Proposed Research Project: **Resilient Dairy Genome Project**

Proposed Start Date: **May 1st 2021**

Name and Title of Proposed Supervisor: **Dr. Christine Baes, Associate Professor**

Department: **Animal Biosciences**

Type of position: ☐ **URA** ☒ **USRA**

Brief Outline of Proposed Research Project:

The demand for dairy products is set to expand with the need for safe, affordable, nutritious and high quality milk protein in emerging middle-class incomes. At the same time, the dairy industry is also facing a number of emerging issues important to governments and consumers, related to human and animal health, environmental impacts, sustainability and social acceptability.

To address these issues, we aim to develop datasets and genomic tools to breed for more 'resilient' cows by creating a novel selection index for resilience including novel traits related to fertility, health

and environmental efficiency. In particular, we will focus on aspects such as increased feed efficiency, reduced methane emissions, improved fertility and enhanced disease resistance. A more accurate selection for increased fertility, broader disease resistance and environmental efficiency will result in wider benefits to Canadian society, i.e. reduced reliance on pharmacological interventions (antibiotics and hormones), fewer animal welfare concerns, reduced animal wastage, reduced environmental impact (reduced methane emissions and reduced land required for feed production). The new index for resilience will allow farmers to reduce costs related to poor cow fertility, diseases and animal feed, which represent the largest expenses in milk production, resulting in an estimated annual net savings for the dairy industry of $200M.

The student working on this project will provide a valuable contribution to address these knowledge gaps by assisting MSc/PhD students in their area of research. There is flexibility for the student to work on a preferred area of research or assist in multiple areas of research depending on their interest and in collaboration with the team. The student will expected to perform in data management and analysis, with possible assistance in data collection as required.

Job description (task/responsibilities, relevant scheduling details, and required and/or preferred qualifications):

Responsibilities
1. Assisting MSc/PhD students with their experimental proceedings and data collection/analysis.
2. Conducting literature search and reviews for background information.
3. Weekly lab meetings to provide updates on current work and coordinate upcoming plans.

Scheduling details
- 35 hours per week
- Hours are generally completed between 9:00 AM and 4:30 PM, Monday to Friday, however, experimental scheduling and research activities may rarely require working earlier/later or on the weekend.

What are 2-5 specific things you feel a student will learn during this position?

1. Organize and manage datasets for statistical analysis.
2. Independently perform data analysis.
2. Concise reporting of methods, progress and research findings in written and oral form.
3. Increased understanding of dairy cow genetics and physiology.

Which 2-5 knowledge, skills, or attitudes are most relevant to this position? *View definitions of common knowledge, skills, and attitudes*.

1. **Skill: Information Management**
2. **Attitude: Responsibility**
3. **Skill: Problem-Solving**
4. **Knowledge: Scientific**
5. **Attitude: Initiative**

Hiring Contact

This is the person managing the application process and the person whose account the job is posted to in experienceguelph.ca. This is the person that will receive reminder e-mails about URA/USRA processes.

Printed Name and Title of Hiring Contact: Karina McKenzie, Undergraduate Program Assistant

Hiring Contact E-mail: **kmck@uoguelph.ca** Hiring Contact Phone: **(519) 824-4120 ext 56219**

Job Information – USRA with Renee Bergeron

Title of Proposed Research Project: **Feeding preferences and grazing behaviour in pastured dairy cows**

Proposed Start Date: **May 10th 2021**

Name and Title of Proposed Supervisor: **Renée Bergeron**

Department: **Animal Biosciences**

Type of position: ☐ **URA** ☒ **USRA**

Brief Outline of Proposed Research Project:

Grazed grass as the sole feed may be sufficient to meet the nutritional requirements of medium yielding dairy cows during most of the grazing season. However, the limitations of grazed grass in enabling high yielding cows to achieve their milk production potential have been highlighted in previous research. Inadequate nutrient intakes on pasture may result in cows entering negative energy balance, with subsequent loss of body condition, and ultimately, an increased likelihood of compromised health and fertility. Indeed, body condition scores are lower for cows on pasture, especially for the high-producing Holstein breed, indicating that some high producing cows do not fare as well on a pasture. Our previous observations of individual dairy cow behaviour have revealed considerable variation between animals in the performance of feeding behaviours as well as in their feeding preference. Some cows appear to be "better grazers" than others, either because they are more efficient at harvesting their feed, or better at selecting an optimal proportion of each plant species to fulfil their nutritional needs and improve their health status.

Some of these individual differences may be due to genetics, others to experience. On heterogeneous pastures, animals learn to graze selectively and choose a diet that exceeds in quality the average quality of pasture. If feeding preferences and grazing behaviour affect cattle health and milk production, the reverse is also true. For instance, lactating cows show a higher preference for protein rich clover compared to dry animals, and cows suffering from sub-acute ruminal acidosis, a metabolic disorder that may result from a large intake of grain, have been shown to select a feed with longer particles over shorter ones, in an attempt to attenuate the acidosis. Sheep offered a choice between a low and a high protein ration modified their diet selection to alleviate the higher nutritional requirements associated with a nematode infestation. Collectively, these results indicate that ruminants may have the ability to modulate their diet selection in a grazing environment to meet their nutritional requirements for

production and improve their health status, but there is little data on dairy cows to support this. Therefore, the objective of this research project is to determine how grazing behaviour in pastured dairy cows is related to health and productivity.

Thirty dairy cows will be studied over the grazing season on a mixed and diverse pasture. Individual cow posture (standing or lying) and behaviour (grazing, ruminating, idling) will be measured by visual observation using a scan sampling technique. Individual herbage intake will be estimated by the n-alkane technique. On observation days, cows will be equipped with GPS to measure distance travelled on pasture. Chemical (dry matter, protein, fibre, carbohydrates, ash, etc.) and botanical composition of pasture will be determined. Observations and measurements will be made at 3-week intervals throughout the summer. Milk production will be automatically recorded twice daily, cow body weight and body condition score will be assessed at 3-week intervals. Milk samples will be taken weekly to assess milk components. Health data will be obtained from the herd health records and visual assessment of lameness. Multivariate analysis will be done to link these grazing behaviour characteristics with individual cow productivity, body condition score, and health. We predict that cows that are more efficient grazers perform better on pasture and are healthier.

Job description (task/responsibilities, relevant scheduling details, and required and/or preferred qualifications):

-Assist graduate student with data collection
-Help look after experimental animals
-Flexible schedule
-Experience with large animal preferred
-Willingness to work out of town

What are 2-5 specific things you feel a student will learn during this position?

Student will learn to rigorously apply a research protocol
Student will learn to identify potential problems and find solutions in consultation with co-workers and supervisor
Student will learn to communicate with co-workers and work as a team

Which 2-5 knowledge, skills, or attitudes are most relevant to this position? *View definitions of common knowledge, skills, and attitudes.*

1. **Knowledge: Scientific**
2. **Skill: Problem-Solving**
3. **Skill: Teamwork and Collaboration**
4. **Attitude: Responsibility**
5. **Skill: Time Management**

Hiring Contact

This is the person managing the application process and the person whose account the job is posted to in experienceguelph.ca. This is the person that will receive reminder e-mails about URA/USRA processes.

Printed Name and Title of Hiring Contact: Karina McKenzie, Undergraduate Program Assistant

Hiring Contact E-mail: **kmck@uoguelph.ca** Hiring Contact Phone: **519-824-4120 x56219**

Job Information – USRA with Alexandra Harlander

Title of Proposed Research Project: **The link between tryptophan metabolism and bird-to-bird pecking in laying hens**

Proposed Start Date: **May 1st 2021**

Name and Title of Proposed Supervisor: **Dr. Alexandra Harlander, Associate Professor**

Department: **Animal Biosciences**

Type of position: ☐ **URA** ☒ **USRA**

Brief Outline of Proposed Research Project:

The USRA student will work together with MSc/PhD student(s) within the Harlander lab on the following project:

One challenge in laying hens is feather pecking (FP), in which individuals repetitively peck other birds leading to skin damage or mortality. FP has been linked to behavioural characteristics, physiology and the gut-brain axis. Our research indicates that suboptimal conditions can lead to motivational frustration which triggers FP, and that birds performing FP show signs of behavioural control deficits, different gut microbiota profiles, altered tryptophan (TRP) metabolism and gut dysmotility compared to non-FP birds. We intend to elucidate the importance of microbial influence on TRP metabolism and its link to FP. An experiment is to be performed to investigate the effect of providing birds with probiotics, and determine their effect on behaviour and physiology as a potential strategy to prevent/reduce FP in laying hens. Furthermore, we will perform behavioural testing to investigate birds' motivation for accessing these probiotics in an attempt to regulate their gut microbiota profile and FP behaviour.

Job description (task/responsibilities, relevant scheduling details, and required and/or preferred qualifications):

The student will be splitting time between working in the office, the lab and at the research facility.

Responsibilities

1. Assisting MSc/PhD students with their experimental proceedings and data collection. This includes
   - handling of hens, assist with blood and/or faeces collection
   - experimental/apparatus set-up, sample preparation, organization, data entry and analysis
2. Conducting literature search and reviews for background information.
3. Weekly lab meetings to provide updates on current work and coordinate upcoming plans.

Scheduling details
- 35 hours per week
- Hours are generally completed between 9:00 AM and 4:30 PM, Monday to Friday, however, experimental scheduling and research activities may require working earlier/later or on the weekend.

Required skills
- enthusiastic, self-motivating, hard worker with a positive attitude that enjoys working in a team
- ability to drive is an asset

What are 2-5 specific things you feel a student will learn during this position?

1. Animal handling and farm experience
2. Skills in laboratory procedures (e.g., processing blood/faeces samples) and behavioural analysis.
3. Understand experimental research design and organize/manage datasets for statistical analysis.
4. Concise reporting of methods, progress and research findings in written and oral form.
5. Increased understanding of poultry behaviour, physiology, and welfare.

Which 2-5 knowledge, skills, or attitudes are most relevant to this position? *View definitions of common knowledge, skills, and attitudes*.

1. **Attitude: Responsibility**
2. **Skill: Teamwork and Collaboration**
3. **Skill: Problem-Solving**
4. **Skill: Oral Communication**
5. **Knowledge: Scientific**

Hiring Contact

This is the person managing the application process and the person whose account the job is posted to in experienceguelph.ca. This is the person that will receive reminder e-mails about URA/USRA processes.

Printed Name and Title of Hiring Contact:

Hiring Contact E-mail: **kmck@uoguelph.ca;** Hiring Contact Phone: **(519) 824-4120 ext 56219**

Job Information – USRA with Lee-Anne Huber

Title of Proposed Research Project: **Feeding strategies for lactating sows**

Proposed Start Date: **May 1, 2021**

Name and Title of Proposed Supervisor: **Lee-Anne Huber; Assistant Professor**

Department: **Animal Biosciences**

Type of position: ☐ **URA** ☒ **USRA**

Brief Outline of Proposed Research Project:

Computerized feeding technologies are becoming more common and are being implemented by Ontario pork producers. These technologies provide the opportunity to closely match estimated (daily) nutrient requirements by blending diets that have differing nutrient densities. For sows, this is a very powerful tool, as nutrient requirements change considerably throughout the reproductive cycle. This research program will explore the use of computerized feeding technologies to generate and apply precision feeding programs for lactating sows, explore the effects of precision feeding on sow productivity, and will develop evidence-based recommendations for feeding sows during the pre-farrowing (transition) and lactation periods.

Job description (task/responsibilities, relevant scheduling details, and required and/or preferred qualifications):

Assist graduate students with animal procedures at the Arkell Swine Research Station (weighing sows and piglets, feeding pigs), sample collection (blood and other tissues), and simple tissue preparation (centrifuging whole blood to collect plasma, formalin fixing for histology etc). On-site job training provided. F/T, Mon-Fri. Some of the tasks as outlined require the student use equipment and resources on the University of Guelph campus in accordance with institutional COVID-19 precautions.

What are 2-5 specific things you feel a student will learn during this position?

Learn a wide range of techniques to evaluate aspects of sow and progeny growth performance and productivity. Work together with a highly motivated team to complete intensive tasks. Appreciation for the scientific method and the value of practical swine nutrition research.

Which 2-5 knowledge, skills, or attitudes are most relevant to this position? *View definitions of common knowledge, skills, and attitudes.*

1. **Knowledge: Scientific**
2. **Skill: Critical and Analytical Thinking**
3. **Skill: Teamwork and Collaboration**
4. **Attitude: Initiative**
5. **Attitude: Responsibility**

Hiring Contact

This is the person managing the application process and the person whose account the job is posted to in experienceguelph.ca. This is the person that will receive reminder e-mails about URA/USRA processes.

Printed Name and Title of Hiring Contact: Karina McKenzie, Undergraduate Program Assistant

Hiring Contact E-mail: **kmck@uoguelph.ca** Hiring Contact Phone: **519-824-4120 x56219**

Job Information – USRA with Jim Squires

Title of Proposed Research Project: **Development of a complete solution for boar taint**

Proposed Start Date: Click or tap here to enter text.

Name and Title of Proposed Supervisor: **E. James Squires, professor**

Department: **Animal Biosciences**

Type of position: ☐ **URA** ☒ **USRA**

Brief Outline of Proposed Research Project:

Boar taint, an off-odour and off-flavour in pork from boars, is currently prevented by castration of male pigs. However, castration raises serious animal welfare concerns and lowers profitability of pork production due to poor feed efficiency and lean gain of castrates. The objective of our research program is to find alternatives to castration for the prevention of boar taint. This project will be an opportunity for a student to part of an active research program involving metabolism and functional genomics in pigs. The work has the potential to dramatically improve the profitability and animal welfare in pork production systems worldwide.

Job description (task/responsibilities, relevant scheduling details, and required and/or preferred qualifications):

Various experimental approaches are underway in our lab to investigate the mechanisms controlling boar taint and to devise methods for control of boar taint. The student in this position will work with graduate students and research personnel to assist with a number of projects.

What are 2-5 specific things you feel a student will learn during this position?

The students will be exposed to a variety of animal and lab based experimental protocols and will have the opportunity of learning these techniques. This may include assisting with animal handling and blood sampling of boars and laboratory methods such as hormone assays, cell culture and gene expression analysis.

Which 2-5 knowledge, skills, or attitudes are most relevant to this position? *View definitions of common knowledge, skills, and attitudes.*

1. **Knowledge: Scientific**
2. **Skill: Problem-Solving**
3. **Skill: Knowledge Integration**
4. **Attitude: Responsibility**
5. **Attitude: Initiative**

Hiring Contact

This is the person managing the application process and the person whose account the job is posted to in experienceguelph.ca. This is the person that will receive reminder e-mails about URA/USRA processes.

Printed Name and Title of Hiring Contact: Karina McKenzie, Undergraduate Program Assistant

Hiring Contact E-mail: **kmck@uoguelph.ca** Hiring Contact Phone: **519-824-4120 x56219**

Job Information – USRA with Katie Wood

Title of Proposed Research Project: **Understanding the impact of uNDF in feedlot ration on gut health**

Proposed Start Date: **May 1, 2021**

Name and Title of Proposed Supervisor: **Katie M. Wood**

Department: **Animal Biosciences**

Type of position: ☐ **URA** ☒ **USRA**

Brief Outline of Proposed Research Project:

Feedlot cattle often have challenges with gut health and secondary metabolic disorders when fed high-grain finishing rations, impacting performance and wellbeing. Although dietary fibre inclusion reduces the incidence of metabolic disorders, however not all types and forms of fibre are equal. This study will investigate the integration between rumen fermentable starch and uNDF content in diets fed to feedlot steers. Steers will be fed rations for 100 d and steer growth, feed intake, carcass traits, rumen pH and gut health will be evaluated. This study is part of a national research effort to better establish minimum fibre requirements for feedlot cattle.

Job description (task/responsibilities, relevant scheduling details, and required and/or preferred qualifications):

The student will help the research team in data and sample collection and analysis over the summer and help with data analysis towards the end of the summer. Some on farm work to help with sample collection is required, therefore comfort working with large animals is a requirement. Travel to the research station is also required, so a valid driver's licence is also necessary. The student will also help with sample collection from the abattoir, so comfort with dissection is also an asset. Desire to learn more about livestock production, nutrition, and beef cattle also an asset.

What are 2-5 specific things you feel a student will learn during this position?

Ruminant digestive anatomy, feedlot production, team work, basic nutrition lab work,

Which 2-5 knowledge, skills, or attitudes are most relevant to this position? *View definitions of common knowledge, skills, and attitudes.*

1. **Knowledge: Scientific**
2. **Skill: Teamwork and Collaboration**
3. **Skill: Time Management**
4. **Attitude: Curiosity**
5. **Attitude: Adaptability**

Hiring Contact

This is the person managing the application process and the person whose account the job is posted to in experienceguelph.ca. This is the person that will receive reminder e-mails about URA/USRA processes.

Printed Name and Title of Hiring Contact: Karina McKenzie, Undergraduate Program Assistant

Hiring Contact E-mail: **kmck@uoguelph.ca** Hiring Contact Phone: **519-824-4120 x56219**