MEAT SCIENCE & MUSCLE BIOLOGY

Location: Columbus, OH

SUPERVISOR INFORMATION:

Dr. Benjamin M. Bohrer, Assistant Professor
Department of Animal Sciences
110 D Animal Science Building
2029 Fyffe Road
Columbus, OH 43210-1095

Phone: 614-247-4951
Email: bohrer.13@osu.edu

RESEARCH INTERESTS: Dr. Bohrer's research group focuses on several research themes within the meat science and muscle biology disciplines. Current and past research themes include live animal growth and development with an emphasis on muscle growth and fat deposition; carcass fabrication and fresh meat evaluation (including instrumental analysis and sensory analysis); manufacture and evaluation of further processed meat products; and evaluation of value-added protein foods.

DETAILED SUMMARY OF DUTIES & RESPONSIBILITIES: The below list is a tentative list of duties and responsibilities. You will meet with Dr. Bohrer on an ongoing basis during the work term in order to modify expectations, as needed.

- Assist in the execution of ongoing, and new, experiments and data collection (*this will include working in the university's federally inspected meat lab facility*).
- Assist with data entry, analysis of data, and interpretation of results.
- Preparation of results for publication in a scientific journal.
- Presentation of research findings at the CFAES Undergraduate Research Forum in the Spring Term.

KNOWLEDGE & EXPERIENCE STUDENT WILL GAIN: You will gain an understanding of basic laboratory techniques and applied meat processing techniques, including exposure to the university's federally inspected meat lab facility. You will work in a team environment and be provided with support from a team of graduate students. Additionally, you will gain exposure to research techniques and the value of communicating research findings.

MASTITIS & MAMMARY PHYSIOLOGY

Location: Wooster, OH

SUPERVISOR INFORMATION:

Dr. Benjamin Enger, Assistant Professor
Department of Animal Sciences
143 Gerlaugh Hall
1680 Madison Ave
Wooster, OH 44691
Phone: 330-263-3801
Email: enger.5@osu.edu

RESEARCH INTERESTS: Dr. Enger's laboratory investigates mammary growth and development and mastitis in dairy cows. Mammary growth and development is important as this directly affects milk production and mastitis is the most common and costly disease in the dairy industry.

DETAILED SUMMARY OF DUTIES & RESPONSIBILITIES:

- Assist with animal trials and general animal care.
- Assist with animal harvest along with tissue collection and processing for laboratory analysis.
- Attend lab meetings and present research progress while also participating in laboratory discussions.
- Become proficient in basic and advanced laboratory techniques, including but not limited to: microbiology, immunohistochemistry, Western blotting, and image analysis.
- Integrate research project results into established literature results.
- Present research results at the CFAES Undergraduate Research Forum in the Spring term.

KNOWLEDGE & EXPERIENCE STUDENT WILL GAIN: You will gain experience in working in mammary physiology and gain knowledge in mastitis' impacts in dairy cows. You will develop critical analysis/thinking skills and become proficient in general laboratory practices as well as specific laboratory techniques that will be assigned based on the laboratory's needs and your interest.

RUMINANT NUTRITION & MICROBIOLOGY

Location: Columbus, OH

SUPERVISOR INFORMATION:

Dr. Jeff Firkins, Professor
Department of Animal Sciences
223 Animal Sciences
2029 Fyffe Rd.
Columbus, OH 43210
Phone: 614-688-3089
Email: firkins.1@osu.edu

RESEARCH INTERESTS: Dr. Firkins conducts applied research to address concerns of the dairy industry with a focus on applied rumen microbiology and protein nutrition. His three main areas of study include: 1) the interface between nutrition and microbiology to enhance the conversion of dietary protein into microbial protein and reduce enteric methane production; 2) the interactions of physical, chemical, and microbiological processes related to fiber and starch degradation, passage, and biohydrogenation; and 3) improving the prediction of protein and carbohydrate digestion and microbial protein production in dairy cattle.

DETAILED SUMMARY OF DUTIES & RESPONSIBILITIES:

- General lab work in ruminant nutrition and microbiology
- Independent study on ruminal fermentation, protozoal culture, and microbial growth
- Data analysis and presentation at the CFAES Undergraduate Research Forum in the Spring term.

KNOWLEDGE & EXPERIENCE STUDENT WILL GAIN: You will gain critical thinking and interpretation skills as you integrate concepts of ruminal microbiology and nutrition. You learn how to work effectively in a team as you collaborate with graduate students. You will appreciate the scientific method, experimental design, and statistical analyses and develop your written and oral communication skills.

NUTRITIONAL IMMUNOLOGY & DEVELOPMENTAL NUTRITION

Location: Columbus, OH

SUPERVISOR INFORMATION:

Dr. Sheila Jacobi, Associate Professor
122 D Animal Science Bldg.
2029 Fyffe Ct.
Columbus, OH 43210
Phone: 614-247-7863
Email: Jacobi.1@osu.edu

RESEARCH INTERESTS: Research aims to identify nutritional programing of the piglet intestinal health and immune function, or nutritional regulation of metabolic disease and immune function in broilers.

DETAILED SUMMARY OF DUTIES & RESPONSIBILITIES:

- Assist in execution of experiment and data collection
- Analyze and interpret results involving swine or poultry nutrition and intestinal health for presentation of the results
- Present research findings at the CFAES Undergraduate Research Forum in the Spring Term.

KNOWLEDGE & EXPERIENCE STUDENT WILL GAIN: Basic techniques in molecular biology and immunology will be learned to evaluate the role bioactive nutrient's role in programing intestinal and metabolic health. You will gain experience in animal care, dietary treatments, laboratory techniques, statistical analysis, and interpretation of results.

MOLECULAR & CELLULAR BIOLOGY

Location: Columbus, OH

SUPERVISOR INFORMATION:

Dr. Kichoon Lee, Professor
Department of Animal Sciences
222F Animal Science Building
2029 Fyffe Court
Columbus, OH 43210-1095
Email: lee.2626@osu.edu

RESEARCH INTERESTS: Dr. Lee's research interests are to identify and define genetic and metabolic networks that regulate adipose and muscle development. His research interests focus on: 1) Discovery of genes or proteins that are involved in adipose and muscle development using RNAseq technologies, and 2) Functional genomics approaches to study the functions and roles of genes using in vitro and in vivo systems, including cell cultures and transgenic or CRISPR/Cas9-mediated gene-edited poultry. Dr. Lee has conducted numerous research trials in the area of adipocyte and muscle biology over the past 30 years. He values and recognizes the benefit of collaborative team efforts and will foster a team approach while leading research projects. Moreover, he is experienced in and enjoys training undergraduate and graduate students, and postdocs.

DETAILED SUMMARY OF DUTIES & RESPONSIBILITIES:

- Assist with execution of experiment and the collection of data during poultry research trials in the area of Molecular and Developmental Biology.
- Assist with data analysis and interpretation of results.
- Prepare a poster for the CFAES Undergraduate Research Forum during the Spring term.
- Prepare a manuscript for publication in high impact journals.

KNOWLEDGE & EXPERIENCE STUDENT WILL GAIN: You will gain an understanding of basic laboratory techniques, the research process, and the value of communicating research. A basic understanding of molecular genetics with regard to the developmental biology of adipose and muscle tissues will be a focus.

FETAL PROGRAMMING IN RUMINANTS

Location: Wooster, OH

SUPERVISOR INFORMATION:

Dr. Alejandro Relling, Associate Professor
114 Gerlaugh Hall
1680 Madison Avenue
Wooster, OH 44691
Phone: 330-263-3900
Email: relling.1@osu.edu

RESEARCH INTERESTS: RESEARCH INTERESTS:
Dr. Relling's research focuses on the effects of supplementation during gestation and its impact in growth, metabolism, and behavior of the offspring. The objectives of the studies are to evaluate fetal programming in sheep and beef. Specifically, the studies aim to improve animal performance in lambs and cattle by evaluating the effects of omega 3 fatty acid and fiber supplementation to the dams.

DETAILED SUMMARY OF DUTIES & RESPONSIBILITIES:

- Collecting, processing, and analyzing feed samples
- Assisting in weight and blood/plasma collections
- Performing metabolic assays to determine plasma glucose and free fatty acids
- Participating in and presenting to lab meetings
- Prepare a poster for the CFAES Undergraduate Research Forum during the Spring term.

KNOWLEDGE & EXPERIENCE STUDENT WILL GAIN:
You will be working on a finishing project of lambs or calves born from ewes or cows, respectively, supplemented with different diets during gestation. You will gain an appreciation for and understanding of the importance of the scientific method. The methods of determining feed quality and accuracy of laboratory analyses will be gained. You will gain an understanding of the physiology of fetal programming, metabolism, and the impact in production and health. By writing abstracts and participating in oral presentations, you will improve your communication skills.

POULTRY DISEASE & IMMUNOLOGY

Location: Wooster, OH

SUPERVISOR INFORMATION:

Ramon A. Zegpi Lagos, Assistant Professor
CFAH (FAHRP) building lab 161 and 177
1680 Madison Ave.
Wooster, OH 44691
Phone: 7542832909
Email: zegpilagos.1@osu.edu

RESEARCH INTERESTS: Virology, poultry diseases, viral evolution, mucosal immunology, host-pathogen interactions.

DETAILED SUMMARY OF DUTIES & RESPONSIBILITIES: participate in common lab procedures including RNA/DNA extraction, tests such as RT-qPCR and sequencing of RNA/DNA virus genomes that infect birds (no human pathogens will be involved in the student's work). Also, cell culture procedures will be performed and the student is expected to participate.

KNOWLEDGE & EXPERIENCE STUDENT WILL GAIN: the student is expected to gain understanding of how RNA/DNA extraction, PCR and sequencing works. Also, analyses of the data obtained will be performed with the involvement of the student.

ANIMAL GENETICS & MOLECULAR BIOLOGY

Location: Columbus, OH

SUPERVISOR INFORMATION:

Dr. Hui Yu, Assistant Professor
Department of Animal Science
221 Plumb Hall
2027 Coffey Rd
Columbus, OH, 43210-1095
Email: yu.3859@osu.edu

RESEARCH INTERESTS:

Dr. Yu's research group focuses on several research themes on genetics, genetic regulation and physiological function evaluation. Current research projects spans from identification of important genes that contributing to the central regulation of hunger and satiety, characterization important genes inducing Prader-Willi Syndrome and functional assessment of genes involving pathogenesis of Wooden Breast in broiler chickens. Employing an integrative approach, Dr. Yu's lab utilizes spatial, single-cell, and bulk RNA sequencing, computational analysis, *in vivo* animal tests, *in vitro* cell culture, stereotaxic surgeries, and biochemical assays to advance our understanding of these complex genetic phenomena.

DETAILED SUMMARY OF DUTIES & RESPONSIBILITIES:

- Manage and oversee the animal colony and genotype animals.
- Support animal experiments, including tissue collection, tissue preparation, tissue section, histology and images acquisition.
- Assist with *in vitro* cell culture experiments, including regents preparation, cell line maintenance, cell proliferation and differentiation.
- Assist with data analysis, interpretation, presentation and manuscript preparation.
- Presentation of research findings at the CFAES Undergraduate Research Forum in the Spring Term.

KNOWLEDGE & EXPERIENCE STUDENT WILL GAIN: You will gain hands-on experience on basic genetic, cell, and molecular biology laboratory techniques; a better understanding on the genetic networks and how genes are regulated in animal products and human health setting, developing of critical thinking and problem-solving skills, and improving communication skills by data presentation at the research forum.