

FOOD SYSTEMS
FELLOWSHIP PROGRAM

2026 Position Descriptions

MICHIGAN STATE UNIVERSITY | College of Veterinary Medicine

MICHIGAN MILK PRODUCERS ASSOCIATION
41310 Bridge Street / P.O. Box 8002, Novi, MI 48376-8002
p 248-474-6672 » f 248-474-0924 » mimilk.com

Duration: Summer 2026

Supervisors: Ben Chapin, Deb Gingrich

Location: MMPA is located in Novi, MI. Student can work from East Lansing.

Requirements: This position requires daily travel throughout the state. A reliable vehicle is required. All related expenses (mileage, meal(s) during work hours) are covered by MMPA.

Scholarship: The MSU student selected for this opportunity will qualify to receive the Gary and Carolyn Trimner Scholarship.

Description:

The student (intern) selected to participate in the MMPA Food Systems Fellowship will work closely with MMPA Field Staff. The fellowship will be structured so that the student is exposed to all facets of the cooperative culture and dairy industry, giving the student insight into how customer and industry needs will be directly linked to their role as a large animal vet. The student will be able to participate in the following:

- Day to Day responsibilities of MMPA Member Representatives
  - On-farm dairy inspections
  - Milk quality troubleshooting
  - Dairy product processing
  - Cooperative structure and marketing
  - Environmental Stewardship and Sustainability
  - Exposure to MMPA laboratory testing
  - Participation in Milking Systems Performance Analysis with MMPA Milking Systems Specialists
  - Herd health and pathogen control
  - FARM (Farmers Assuring Responsible Management) Program

- *FARM (Farmers Assuring Responsible Management) Program*
  - Shadow members of the animal care team while conducting FARM program evaluations on member farms. The intern will have the opportunity to help producers meet FARM program requirements by assisting them with the completion of Herd Health Plan documents and Standard Operating Procedures for their farm.

- *On-farm milker training*
  - Work closely with MMPA mastitis management specialists on member farms to demonstrate and reinforce proper udder prep techniques and procedures. Proper practices are important to obtain teat sanitation while optimizing the cows' natural oxytocin release to harvest milk.
  - Perform udder prep evaluations
  - Assist with milking equipment evaluation following NMC (National Mastitis Council) guidelines

MICHIGAN DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT (MDARD)

The Michigan Department of Agriculture and Rural Development's (MDARD) Animal Industry Division (AID) is committed to protect, regulate, and promote animal health. This fellowship will provide an opportunity to better understand regulatory medicine and the One Health concept of medicine. The AID has over 20 different programs and positions based in Lansing or in the field, and we are able to tailor students' experiences to their specific area of interest. In previous years, students have worked on projects focusing on avian health which involved testing birds for avian influenza. Other students have worked with the privately-owned cervid program and others have assisted with bovine tuberculosis testing. Students will not only work with AID staff but also with state and federal partners. This position will be based out of the Lansing, MI office with travel throughout Michigan possible.

Objectives

- Assist with animal health programs in AID.
- Gain hands-on experience under the supervision of a field veterinarian.
- Under the direction of a Program Manager, complete an independent project.
- Support emergency disease response planning.
- Become familiar with the species area and industry in which the independent project focuses on.
- Become familiar with reportable animal diseases.

Activities

- Complete an independent project that can be shared with MDARD staff, fellow interns within the department, and Michigan State University College of Veterinary Medicine.
- Assist with disease testing, depending on the species of interest.
- Participate in emergency planning and stakeholder meetings in order to gain an understanding of the role of regulatory veterinarians in Michigan.
- Maintain data bases and write reports.
- Assist with animal health programs in AID through attending meetings, conducting research, and preparing reports and presentations.
- Participate in the MDARD Internship Program.

Desired Outcomes

- Develop best practice protocols for exhibitors, animal owners, and those working with animals for various diseases.
- Assist with development of education and outreach materials for animal owners and the public.
- Gain knowledge of animal health programs and the One Health approach at MDARD AID.
- Provide assistance to enhance animal health activities at MDARD AID.
- Learn about the MDARD programs and career opportunities.
- Network with other MDARD interns.

CentralStar

Through this internship, an FSF intern will join the **CentralStar Molecular Diagnostic Research & Development** Team investigating novel biomarkers within DHI milk samples. It is the intent and expectation of the FSF intern to aid in the discovery and development of relevant findings with the potential of validating commercial applications and creating diagnostic tools. The selected FSF summer intern will have the opportunity to work on federally funded research projects with focus on the use of common diagnostic tools such as qPCR and ELISA to develop new diagnostic tests in order to provide information on disease in the context of reproductive efficiency and milk production.

More specifically the student will:

- Gain an understanding of how biotechnology and information management can be integrated into cost effective strategies facilitating management through Dairy Herd Improvement (DHI)
- Organize and process commercial samples for research sample sets
- Receive training in modern molecular biology techniques
- Interrogate specific biomarkers within various biological matrices
- Develop custom diagnostic assays
- Evaluate research findings, perform iterative assessments in order to optimize assay performance
- Collaborate with industry and academic institutions including data presentation, study design, and data dissemination.

This project will include but is not limited to farm visits for sample collection, working closely with CentralStar's commercial diagnostic team, training on DHI and dairy management software, development of molecular biology skills, and an experience within the interface between applied research and commercial diagnostics within production agriculture

Duration: Summer 2026 Supervisor: Casey Droscha, Ph.D.
Location: East Lansing
Requirements: Basic understanding of PCR and ELISA methodology, general knowledge of dairy cattle, good organizational and project management skills.

ABUELO LAB
dairy health | immunology | epidemiology

1.- Type of experience: ☐ Research ☐ Extension/Outreach ☒ Research & Extension

2.- Advisor:

Name: **Dr. Angel Abuelo**
Department: **Large Animal Clinical Sciences**
E-mail address: abuelo@msu.edu
Website: www.abuelolab.com

Other co-advisors (if applicable): N/A

3.- Target species (if relevant)**:**
Bovine – Dairy Cattle

4.- Brief description of the project:
The objective of this summer internship is to compare the immune response to vaccination against BRD between dairy calves that receive a homologous booster (intranasal prime - intranasal booster) and those that receive a heterologous booster (intranasal prime - injectable booster). Through this internship, the student will be involved in all aspects of the project, including sample collection, sample analysis, and data analysis and interpretation. The student will also be involved in the lab's outreach efforts, communicating the research results to the end-users (veterinarians & producers). It is anticipated that the project results will allow the student to present them at the 2027 Annual Meeting of the American Association of Bovine Practitioners (If so, funding will be provided for the student to attend the meeting).

5.- Summary of activities and/or skills that the student will develop during the internship:
This internship focuses on population medicine aspects. These skills are critical for dairy production medicine. Additionally, the student will learn laboratory techniques to evaluate the immune response in cattle (e.g., flow cytometry, qPCR, ELISA, etc.).

6.- Other information relevant to the student:
This project will include, but is not limited to, farm visits for sample collection, development of laboratory and epidemiological skills, learning about calf management in dairy operations, and participating in the outreach efforts of the MSU Extension Dairy Team. This internship will occur primarily between MSU College of Veterinary Medicine (Abuelo Lab) and commercial dairy farms (transportation will be provided). Additionally, there will be opportunities to assist with other team projects and to participate in training (lab meetings, journal clubs, etc.) and social events.

CONTRERAS LAB – MSU

1.- Type of experience: Research Extension/Outreach ☒ Research & Extension

2.- Advisor:

Name: Andres Contreras
Department: Large Animal Clinical Sciences
E-mail address: contre28@msu.edu

Other co-advisors (if applicable):

3.- Target species (if relevant)**:**
Cattle

4.- Brief description of project:
Excessive fat mobilization during the periparturient period predisposes cows to disease, reduced productivity, and poor reproductive performance. Dietary interventions used in the periparturient period significantly influence fat mobilization postpartum by altering blood and systemic pH. Pre-calving negative dietary cation-anion difference (nDCAD) diets lower blood pH, promoting calcium mobilization and reducing the risk of milk fever. Postpartum supplementation with sodium bicarbonate or other buffers reduces ruminal acidity and raises blood pH, mitigating the risk of ruminal acidosis. Although blood pH manipulation benefits calcium mobilization, it may negatively impact unexplored aspects of periparturient cow health and productivity. Research in monogastrics shows that drastic blood pH changes affect fat tissue function -an area not yet explored in dairy cows. Our preliminary data indicate that nDCAD diets lower blood pH to ~7.35, while postpartum bicarbonate diets increase it to ~7.50. Culturing fat explants at low pH reduced their fat mobilization response, while fat mobilization increased considerably at pH 7.50. Furthermore, insulin's ability to suppress fat mobilization was drastically reduced at both acidic and basic pH levels. This is concerning because many Michigan herds report excessive blood acidification in closeup cows (urine pH below 6). Recent findings also link acute and prolonged nDCAD use pre-calving with increased fat mobilization post-calving. These results underscore the need to understand how systemic blood pH changes affect fat tissue function and dairy cow productivity and health. This study will investigate the effects of systemic pH alterations on fat mobilization, adipose tissue function, and production efficiency in dairy cows.

5.- Summary of activities and/or skills that the student will develop during the internship:
Dairy cow handling, physical exams, tissue culture. The student will become familiar with running ELISAs, and other fluorometric and colorimetric assays.

6.- Other information relevant to the student:
This project will include work at a dairy and in the lab.

GORGOGLIONE LAB – MSU

1.- Type of experience: ☒ Research ☐ Extension/Outreach ☐ Research & Extension

2.- Advisor:

Name: **Dr. Bartolomeo Gorgoglione**
Department: **Pathobiology and Diagnostic Investigation (CVM)**
E-mail address: **BartGorg@msu.edu**

Other co-advisors:

Project title: **Studying emerging fish pathogens in Great Lakes fishes**

3.- Target species: Fish

4.- Brief description of project:
The student will take part in laboratory and field work aimed at detecting emerging fish pathogens in the Great Lakes watershed.
The student will be working at the **Fish Pathobiology & Immunology Laboratory**, supervised by Dr. Bart, to process fish tissue samples obtained from opportunistic field sampling in collaboration with governmental agencies (such as cyprinid species from the Illinois River; Fig. A). *Cyvirus cyprinidallo3* (aka KHV) and Carp edema virus (CEV) are notifiable and emerging pathogens threatening cyprinid fish populations worldwide, and we have recently demonstrated their presence in the Great Lakes area. Organs sampled from invasive Asian carp and from native fish species (Fig. B) are screened for infection with KHV and CEV. In addition, the student will focus on the identification of parasites that are also found on these fishes (such as leech *Actinobdella* or *Myzobdella* spp.; Fig C and D), aiming at publishing a comprehensive study to describe their occurrence and characterize the pathobiology during infestation.

5.- Summary of activities and/or skills that the student will develop during the internship:
Participation in field sampling and necropsy of fishes (Fig. A and B); nucleic acids extraction and quality check; several types of PCR; *in vitro* studies with cell lines for virus detection; sequencing and sequence analysis; histopathology; lab maintenance, including samples archiving and data collection.

6.- Other information relevant to the student:
The selected student will work closely with the international team at the Fish Pathobiology & Immunology Laboratory. The student will interact with the PI and will be guided to develop laboratory skills, attend and prepare scientific presentations, both for lab meetings and conferences (e.g., Phi Zeta Research Day at CVM). Desired skills: basic lab techniques, critical thinking, interest in aquatics.

TRINDADE LAB – MSU

1.- Type of experience: ☒ **Research** **Extension/Outreach** **Research & Extension**

2.- Advisor:

Name: Pedro Henrique Esteves Trindade
Department: Large Animal Clinical Sciences
E-mail address: trindad4@msu.edu

Other co-advisors (if applicable): N/A

3.- Target species (if relevant):
Bovine – Dairy calves

4.- Brief description of project:
A major welfare issue in the dairy industry is acute pain and inflammation mitigating following hot-iron disbudding in calves. Most the U.S. dairy farmers conduct this procedure to inhibit the growth of horns and prevent the risk of injuries to workers and other cattle. Given the growing concerns about the use of antibiotics and synthetic compounds in livestock production, there is increasing interest in identifying natural bioactive compounds from plants that can enhance animal health and resilience. In 2023, Michigan produced approximately 66% of all tart cherries in the U.S., and most of these cherries are processed, leaving the pits as by-products that are typically discarded in landfills. An extract from tart cherry pits is rich in micronutrients and has anti-inflammatory, antioxidant, and anti-microbial activities. We hypothesize that the bioactive properties of tart cherry pit extract may accelerate wound healing and alleviate pain in calves following hot-iron disbudding. Therefore, we aim to evaluate the analgesic and healing effects of tart cherry pit extract for relief of hot-iron disbudding acute pain in dairy calves. Definitively, this unique research line merging animal physiology and behavior to change how we mitigate pain and enhance farm animal's quality-of-life.

5.- Summary of activities and/or skills that the student will develop during the internship:
The summer student will work closely with the advisor and the research team, assisting in the collection of behavioral (body language video recording, mechanical nociceptive threshold, and ear-tag sensor data), physiological (blood cell counts, Substance P, haptoglobin, prostaglandin E2, and infrared thermography of the eyes and horn areas), and visual wound-healing score parameters at the MSU Dairy Cattle Teaching and Research Center. In addition, this internship will allow the summer student to prepare an abstract under the advisors' guidance using one or a small set of biomarkers to be presented at the Phi Zeta Research Day at MSU CVM.

6.- Other information relevant to the student:
The student will be welcome to engage in other research projects related to animal welfare and data science, as well as interact with graduate students and other interns. The student involvement will provide a well-rounded research experience. Be welcome on-boarding of Trindade Lab.

CHENG LAB – MSU

1.- Type of experience: Research Extension/Outreach Research & Extension

2.- Advisor:

Name: Ting-Yu Cheng
Department: Large Animal Clinical Sciences
E-mail address: chengti9@msu.edu

Other co-advisors (if applicable): Chun-Hua Tsai, Department of Information Systems and Quantitative Analysis, University of Nebraska Omaha

3.- Target species (if relevant)**:**
Swine

4.- Brief description of project:
Livestock production facilities generate a significant amount of animal health-related data through daily practices. Such data (i.e., the farm records), including room temperature, animal appearance, and treatment history, are valuable in farm management and disease prevention practices. However, due to the harsh conditions for electronics on farms (e.g., dust, humidity, and temperature), producers typically record data on paper sheets. Manual extraction of data from handwritten sheets is time-consuming and labor-intensive, making it impractical for routine implementation, especially for small, short-staffed farms.

Thus, a summer collaborative project between MSU and University of Nebraska Omaha aims to develop an artificial intelligence (AI)-based handwritten recognition system for real-time data integration, efficient farm management, and enhanced disease surveillance. We will first design and train the system specifically for recognizing and digitizing scanned images of handwritten swine farm records from the MSU Swine Teaching and Research Center (MSU-STRC). The system will then be implemented at the MSU-STRC to assess its field feasibility. The association between the digitized data and farm health-related incidences such as growth performance, disease outbreak, animal transportation.

5.- Summary of activities and/or skills that the student will develop during the internship:
The student will help collect historical hand-written farm records from MSU-STRC and use them to train the AI system developed by Dr. Tsai's research team. You will also help communicate with farm personnel in validating AI-digitized records to improve the system's accuracy. Thereafter, we will cross-validate digitized data based on health-related events. For example, frequent treatments and sudden temperature changes can be observed before/during respiratory disease outbreaks.

Through this project, the student will have an opportunity to work with professionals in designing cutting-edge AI models within a livestock production context. You will gain hands-on experience in data collection, digitization, and validation, and learn how to prepare and structure data for AI model training. By collaborating with MSU-STRC, the student will strengthen communication and engagement abilities with swine producers, particularly in translating technical outputs into practical insights. Finally, you will build data analytical skills such as statistical testing and epidemiological modeling through health event investigation.

6.- Other information relevant to the student:
The student will work closely with Dr. Tsai and his research team in the University of Nebraska Omaha. You will be guided to develop skills in the swine farm, attend and prepare presentations for team meetings and scientific conferences. Besides the Phi Zeta Research Day, the student is encouraged to submit abstracts to the 2026 Leman Swine Conference and/or the 2027 Annual Meeting of American Association of Swine Veterinarians.

Preferred skills: interest in livestock, eager to learn, critical thinking, basic data handling skills (e.g., Excel). Lab skill/work not expected.

MADUREIRA LAB – MSU

1.- Type of experience: Research Extension/Outreach Research & Extension

2.- Advisor:

Name: Augusto Madureira
Department: Animal Science
E-mail address: madurei2@msu.edu

3.- Target species (if relevant)**:**
Bos Taurus – dairy cattle

4.- Brief description of project:
Heat generated by metabolic processes such as tissue synthesis, lactogenesis, and milk secretion contributes to the thermal load of dairy cows. High-producing cows generate more metabolic heat, making them more vulnerable to heat stress, which can impair physiological functions, reduce milk yield, and compromise fertility. Economic losses due to heat stress in the dairy industry are estimated at nearly $900 million annually in the United States, and are likely higher in tropical regions where environmental temperatures and humidity are elevated.
The Temperature-Humidity Index (THI) is commonly used to assess environmental heat stress, as increases in THI are associated with reduced feed intake, milk production, and fertility. For instance, conception and pregnancy maintenance rates decline when body temperature exceeds 39.1°C during breeding. However, some cows maintain fertility even under high THI, suggesting that individual physiological and physical characteristics influence heat tolerance.
Recent studies indicate that coat color and skin thickness may affect thermoregulation. Lighter-colored cows often exhibit lower body temperatures, improved heat dissipation, and greater productivity compared to darker-coated cows. Similarly, skin thickness has been associated with heat tolerance, immune response, and milk yield, suggesting its potential as an indicator of adaptability to thermal stress.
This project aims to evaluate the relationship between vaginal temperature, production, feed intake, and individual physical characteristics in lactating dairy cows housed in a tunnel-ventilated barn. We hypothesize that, even under similar environmental conditions, cows exhibit individual variation in vaginal temperature patterns that influence their productive performance.

5.- Summary of activities and/or skills that the student will develop during the internship:
During the internship, the student will engage in activities related to the collection, analysis, and interpretation of physiological and productive data from dairy cows exposed to varying levels of heat stress. The student will learn how to measure and record physiological indicators such as vaginal temperature, body condition, and skin thickness, as well as monitor production performance. The internship will also provide hands-on experience with precision livestock technologies and environmental sensors to evaluate animal responses to thermal stress. In addition, the student will develop skills in managing and organizing large datasets and performing statistical analyses using software such as SAS, R, or Excel. Through data interpretation and discussion of research outcomes, the student will strengthen their understanding of the relationship between environmental factors, animal physiology, and productivity. Finally, this experience will foster critical thinking, problem-solving, and scientific communication skills, preparing the student for future work in dairy cattle physiology, management, and research.

6.- Other information relevant to the student:
This internship will provide the student with an opportunity to apply classroom knowledge to real-world dairy research and management settings. By working closely with faculty, graduate students, and farm personnel, the student will gain a comprehensive understanding of how environmental factors influence dairy cow physiology and performance. The project environment will encourage initiative, collaboration, and attention to animal welfare and data quality. Overall, the experience will enhance the student's technical, analytical, and

professional development, preparing them for future careers in animal science, dairy production, or graduate-level research.

BENJAMIN LAB – MSU

1.- Type of experience: Research X Extension/Outreach Research & Extension

2.- Advisor:

Name: Madonna Benjamin
Department: Large Animal Clinical Sciences
E-mail address: gemus@msu.edu

Other co-advisors (if applicable):

3.- Target species (if relevant)**:**
Livestock and Poultry – both commercial and lifestyle farming

4.- Brief description of project:
Generally Accepted Agricultural and Management Practices (GAAMPs) for the Care of Farm Animals were first adopted in 1995 and include 19 species of animals raised on Michigan farms. Animal care includes nutrition, manure management and sanitation, animal handling and restraint, transportation, facilities and equipment, health care and medical procedures, and recommendations. Domestication of livestock has made farm animals dependent on humans. Humans have responded to this dependence with a commitment to practice humane conduct toward domestic animals and to prevent avoidable suffering at all stages of their lives. This role would involve revising the GAAMPS Care of Animals document to include recommendations that can be used to address conformance.

5.- Summary of activities and/or skills that the student will develop during the internship:
OBJ
You will review the 2026 Care of Animals and collaborate with Dr. Benjamin, GAAMPS committee members, and MDARD representatives to develop language that provides a quantitative assessment using animal-based measures and environmental metrics related to the 5 Freedoms of Animal Welfare. This project will begin with an in-person review of the current document and committee input, followed by remote work. You would report weekly to both establish and report on deliverables.

6.- Other information relevant to the student:
This opportunity is recent, and I thought it would be a cool project for someone interested in helping establish reasonable animal care metrics for all Michigan farmers.