

Resourcing an Area of Excellence in International Pregnancy & Developmental Programming

Department of Animal Science

animalscience.tamu.edu

DEPARTMENT OF ANIMAL SCIENCE MISSION

The mission of the Department of Animal Science is to improve lives through discovery, integration, dissemination and application of science-based knowledge of animals and animal products.

AREAS OF EXCELLENCE TO SUPPORT THE DEPARTMENT OF ANIMAL SCIENCE MISSION

To more effectively fulfill the mission of the Department of Animal Science, Areas of Excellence have been identified and developed. The goal for the Areas of Excellence are to provide focused areas of scholarship within the Department of Animal Science for which we may be or become a national and international leader. The Areas of Excellence align with the missions of both the Department and College, as well as the strategic pillars of the University: (1) Transformational Education for all students, (2) Discovery and Innovation for the world, (3) Impact on the state, the nation and the world.

DEPARTMENT OF ANIMAL SCIENCE AREAS OF EXCELLENCE

- Cattle Adapted to Tropical & Subtropical
- **Pregnancy & Developmental Programming**
- Safety, Quality, & Nutrition of Food Products
- Student & Stakeholder Engagement in Animal Science
- Quantifiable Animal Performance



TEXAS A&M UNIVERSITY
Animal Science

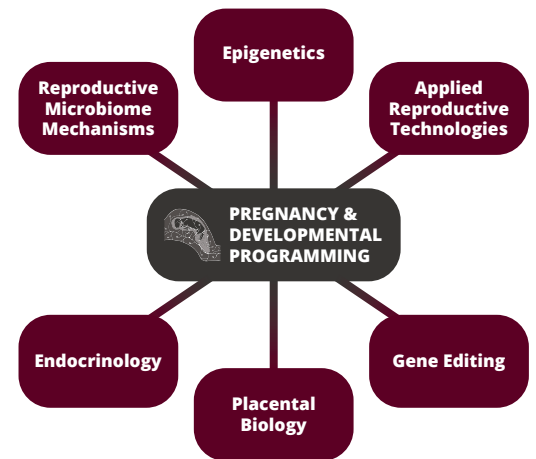


PREGNANCY & DEVELOPMENTAL PROGRAMMING

Increased understanding of animal reproduction at molecular, cellular, and whole animal levels is critical for improving production efficiency in animal agriculture as well as enhancing human health. Independent of the species, if a pregnancy doesn't establish and successfully result in live offspring, the species is not sustainable. Additionally, a broader understanding of the impact of suboptimal environmental exposure during pregnancy or early postnatal life suggests that reproductive success is a lifelong measurement of that animal's performance, in addition to historically calculated pre- and early postnatal morbidity and mortality. Developmental programming touches every aspect of physiology and therefore impacts all aspects of livestock production, including: 1) reproductive outcomes; 2) immune function; 3) growth, metabolism, and efficiency; 3) stress response; 4) behavior; and more. This concept is not new; however, the mechanistic basis of this process has recently come to the forefront.

Thus, pregnancy and developmental programming of both livestock and humans has taken on an increased level of importance. Nutrition, stress and environmental contaminants all play roles in programming the expression of genes in developing fetuses. Discovery and innovation in this Area of Excellence will allow for the generation of foundational knowledge and development of applied technologies and strategies that will positively impact the state, the nation, and the world.

Our **goal** is to be the world leader in pregnancy and developmental programming of livestock. Our **vision** is to enhance reproductive efficiencies and outcomes via increased understanding of mechanisms supporting embryonic survival, relationships between intra-uterine nutrition, immune function, neonatal survival, and improved utilization of nutrients in livestock species and laboratory animals, as well as pre- and post- pubertal development and functionality.



DEVELOPMENT PLAN TIMELINE

PHASE ONE: Immediate Initiative

Establish state of the art facility to recruit and retain exceptional faculty to advance research capabilities.

- Reproduction and Genetics Center: \$5 Million
- Assistant Professor Position in Reproductive Microbiome Mechanisms: \$750,000 start-up
- Endowed Chair for Epigenetics: \$2 million + \$750,000 start-up
- Graduate Student Fellowships: \$ 750,000 (\$250,000 per fellowship)
- Faculty Fellow for Reproductive Biology: \$250,000

PHASE TWO: Three Year Plan

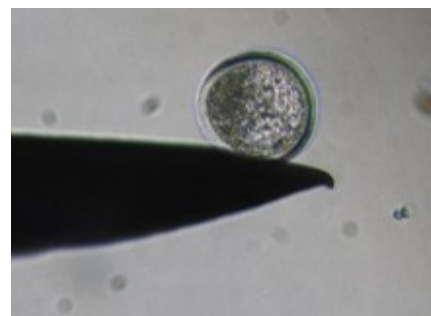
Reinvest in the department through faculty positions, key programs and facilities to grow the educational mission to youth and stakeholders of animal science and renovate laboratory spaces in the Kleberg Animal & Food Sciences Center.

- Named Department Head Position: \$5 Million
- Endowed Chair for Gene Editing: \$2 Million + \$750,000 start-up
- Endowed Chair in Placental Biology: \$2 Million + \$750,000 start-up
- Endowed Chair in Endocrinology: \$2 Million
- Endowed Chair for Applied Reproductive Technologies: \$2 Million
- Undergraduate Research Scholarships: \$250,000 (\$2,500 per scholarship)

PHASE THREE: Five Year Plan

Construct new state-of-the-art laboratories that have not been renovated since 1978 to accommodate cutting edge research.

- Kleberg Reproductive Biology Research Laboratories (\$1 million per laboratory): \$3 Million
- Kleberg Placental Biology Research Laboratories (\$1 million per laboratory): \$2 Million
- Kleberg Endocrinology Research Laboratories (\$1 million per laboratory): \$2 Million
- Kleberg Epigenetics Research Laboratory: \$2 Million
- Kleberg Gene Editing Laboratory: \$2 Million
- Kleberg shared space laboratories: \$2 Million





BUILDING BLOCKS OF OUR EFFORTS

Research: The Department of Animal Science is home to a critical mass of faculty with established records of collaboration and who have yielded significant extramural funding, publications, industry impacts, and global recognition. Their programs have been particularly effective at integration of scholarship in disciplines of agricultural sciences, biomedical sciences, veterinary sciences, engineering, bioinformatics, business, social sciences and the humanities.

Teaching: The opportunity for students to pursue graduate degrees in Physiology of Reproduction is an important recruiting tool. Faculty membership in the Interdisciplinary Faculty of Reproductive Biology (University Level) provides further opportunities for graduate students to engage with visitors to the seminar series as well as their peers from additional departments. Undergraduates have the opportunity to pursue training in reproductive biology courses with interactive laboratories as well as pursue laboratory research projects with faculty.

Extension: The dissemination of findings and translation of basic research into industry applications and protocols is a hallmark of this area. The involvement of research programs, as well as the level of engagement with stakeholders through events such as conferences and field days provide additional opportunities for stakeholder engagement.

For more information, please contact:

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