V(A). Planned Program (Summary)

Program # 11

1. Name of the Planned Program

Food Safety/Global Food Security - Animal Systems - Research

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
301	Reproductive Performance of Animals		0%		10%
302	Nutrient Utilization in Animals		0%		20%
303	Genetic Improvement of Animals		0%		10%
304	Animal Genome		0%		10%
305	Animal Physiological Processes		0%		10%
307	Animal Management Systems		0%		10%
308	Improved Animal Products (Before Harvest)		0%		10%
313	Internal Parasites in Animals		0%		20%
	Total		**0%**		**100%**

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2012	Extension		Research	
	1862	**1890**	**1862**	**1890**
Plan	0.0	0.0	0.0	22.0
Actual Paid Professional	0.0	0.0	0.0	12.5
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
0	0	0	1433220
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	0	671134
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Applied and basic scientific research goals are as follows:

1. Determine the efficiency of farm animal production systems through a combination of best management practices and genetic enhancement.
a. Analyze the usefulness of various forage based production systems and management practices for the Texas Gulf Coast. Maximize livestock productivity on small acreage using forage based nutrient systems for livestock production.
2. Develop methods to improve reproductive efficiency of farm animals and improved conditions for growth and well-being.
a. Define endocrine and paracrine mechanisms which regulate early embryonic growth, uterine receptivity and support conceptus growth, endometrial attachment and placentation.
b. Investigate factors involved in regulation of male fertility levels.
c. Utilize functional genomic approaches to understand the physiological mechanisms that influence reproduction, growth and efficiency of food producing animals.
d. Identify molecular markers for desirable traits, including milk production, disease and stress resistance.

2. Brief description of the target audience

While the University's service area extends throughout Texas and the world, the University's target service area includes the Texas Gulf Coast Region. This includes the surrounding counties and includes the rapidly growing residential and commercial area known as the Northwest Houston Corridor as noted in the original Texas Plan. Therefore, problems associated with agricultural production systems, including those that exist at urban-agricultural interfaces and impact stakeholders will be addressed.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	373	500	100	200

2. Number of Patent Applications Submitted (Standard Research Output)
Patent Applications Submitted

Year: 2012

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2012	Extension	Research	Total
Actual	0	2	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Increase in peer reviewed publications. Increase in competitive grants received by researchers in the Animal Systems Group. Increase in graduate student enrollment and matriculation in the Animal Science Program. We anticipate a 5% increase over the previous 5-year base line in each of these categories.

Year	Actual
2012	2

V(G). State Defined Outcomes

	V. State Defined Outcomes Table of Content
O. No.	**OUTCOME NAME**
1	Improved reproduction efficiency and improved conditions for optimal growth and well-being of farm animals. Availability of resources (demonstration/test plots, hay and pastures, co-grazing site, etc.) for use by research scientists, graduate students and Extension personnel for research and teaching purposes. Availability of demonstrations using latest technology for research, demonstrations and teaching purposes for herd/farm record systems, animal identification, etc. applicable to small scale producers. A greater public understanding of the principles of animal behavior, animal responses to their environment, and the biology of reproduction and growth. Increased farm income and profitability by understanding production economics, profit margins and clarifying marketing channels and timing. A more competitive livestock industry in Texas.

Outcome #1

1. Outcome Measures

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2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	10

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Farmers and ranchers that raise livestock for a profit. Breed organizations. Wildlife management organizations.

What has been done
1) Male sub-fertility and inadequate fertility in artificial insemination programs are serious problems in goat species. Our goal is to use a multidisciplinary approach to identify factors influencing the outcomes of artificial insemination programs in dairy and meat goats.

2) For all mammalian pregnancies the first 30 days is the most critical stage for survival of the conceptus (i.e. the early embryo and associated fetal membranes). Of all human and domestic animal pregnancies that fail, the largest proportion is lost during the earliest stages of conceptus - uterine interactions. We study the molecular mechanisms maternal and fetal tissues use to communicate with each other when they come into contact during the first 30 days of pregnancy. This type of cell recognition is important for events leading to establishment of pregnancy and formation of the placenta. Understanding these developmentally regulated events may lead to better treatment and diagnostic strategies for infertility, novel approaches to contraception and better methods for controlled breeding in livestock.

Results

1) We studied follicle growth and development in response to common estrus synchronization schemes. Small, medium or large follicle populations were not influenced by treatment. The number of small and medium follicles varied over the sampling interval, independent of synchronization protocol. The number of small follicles peaked three days after CIDR insertion (4.8±0.42) and medium follicles peaked (3.57±0.48) during early diestrus of the subsequent luteal phase. Therefore, short-term progesterone treatment in conjunction with PGF and GnRH treatments can modify small and medium follicle populations.

2) Another aspect of our current research plan is expected to provide a better understand of the mechanisms maternal and fetal tissues use to communicate with each other when they come into contact during the first 30 days of pregnancy. Using proteomic approaches we identified proteins that are the first to come into contact with the developing embryo. Results may lead to an increase in the efficiency of embryo transfer and genetic improvement.

3) This research plan also provides the foundation needed to develop critical University research infrastructure and provide students with inquiry based research the cellular and molecular aspects of animal reproduction. An African American male and a female graduate student received their advanced degrees using these data for their thesis/dissertation projects.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
304	Animal Genome
305	Animal Physiological Processes
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
313	Internal Parasites in Animals

V(H). Planned Program (External Factors)

External factors which affected outcomes
- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (CARC staff changes)

Brief Explanation

Staffing at the IGRC continues to decline. Three new scientist positions will soon be listed with the intent to fill. Lack of animal care and laboratory research support staff continues to negatively impact the program. Purchasing difficulties and deferred maintenance hinder progress.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Specific goals with measurable objectives were established. External factors influenced full achievement of the goals.

Key Items of Evaluation

Student experiential learning. Number of students graduating with advanced degrees. Referred abstracts and journal articles.Small farmers adopting new production practices.