V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Global Food Security and Hunger: Animal Health, Production, and Products

☑ 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			15%	
302	Nutrient Utilization in Animals			12%	
303	Genetic Improvement of Animals			12%	
304	Animal Genome			12%	
305	Animal Physiological Processes			12%	
306	Environmental Stress in Animals			10%	
307	Animal Management Systems			12%	
308	Improved Animal Products (Before Harvest)			15%	
	Total			100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	63.0	0.0
Actual Paid Professional	0.0	0.0	12.7	0.0
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	164664	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	806521	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	157882	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conduct research regarding livestock reproduction and fertility rates and share results timely with producers
- Enhance the value of animal products, primarily sheep and beef cattle
- Explore the nutritional managements systems for livestock and winter grazing
- Continue advanced research for targeted grazing management
- Maintain research on residual feed intake and feed to grain conversion

2. Brief description of the target audience

- State agencies, animal health companies, and state commodity groups
- Ranchers, seedstock industry, colleagues, and related stakeholders
- Crop and livestock producers in Montana

3. How was eXtension used?

COA and MAES researchers worked closely with county extension agents and outreach coordinators to disseminate timely and accurate information about animal health, production and products.

V(E). Planned Program (Outputs)

1. Standard output measures

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

Patent Applications Submitted

Year:	2013
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	0	19	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of research citations

Year	Actual
2013	19

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of off-campus educational programs offered

Outcome #1

1. Outcome Measures

Number of off-campus educational programs offered

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Animal health, production and products are of significant concern to Montana producers, as animal health is a field that directly impacts the state's economy. Livestock production on Montana farms and ranches provided $ 1.6 billion of gross income to the United States Economy, and of that amount, $1.2 billion of the value-added was in beef. Montana producers rely heavily on current information and studies within the animal health field.

What has been done
Interactions between the levels of supplement consumption, supplement delivery methods, and forage intakes by beef and cows were evaluated. The intent of this research is to determine how the basic processes controlling forage intake and utilization by ruminants can be manipulated by supplementation.

Results
Sixty mature ewes were used to determine if a feeding method of pea-barely forage had an effect on individual ewe mineral consumption. In this study, both swath grazing ewes and ewes in confinement consumed more mineral than recommended by the mineral manufacturer and the NRC indicating that more research is needed to develop a better understanding of the factors that regulate and impact mineral intake. This data was presented at the 2012 Montana Nutrition Conference and the Western Section of the 2012 American Society of Animal Health. Additionally, two journal articles on the study were published.

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
306	Environmental Stress in Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)

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

Brief Explanation

MSU COA and MAES experienced significant faculty movement impacting this planned program. Previous projects highlighted in the 2013 Plan of Work included extensive research into brucellosis and prion diseases. The principal investigators in these projects were recruited to larger institutions with significant salary increases, and these projects were terminated.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Montana has 2.5 times more cattle than people providing the foundation for the number one industry in the State - agriculture. It is in this context that researchers design, implement, and conduct research projects within the COA/MAES. Research in the Animal Health Program is critical to the industry in Montana and producers and consumers alike who count on the investigators to promote a healthy industry through their consistent research. Highlights for 2013 were:

- Advancements in knowledge of Staphylococcus Aureus in humans and livestock
- Hired new faculty members, two of which are core users of new molecular tools
- Evaluated 256 animals through the GrowSafe system and added new equipment to MSU research center doubling the capacity of researchers to evaluate residual feed intake
- Conducted webinars, workshops, and seminars to share up-to-date information on animal health and quality assurance reaching audiences in excess of 1,500

Key Items of Evaluation

The Animal Bioscience Building combined with state-of-the-art laboratory equipment assisted in the successful recruitment and hiring of three new faculty members in the Animal and Range Sciences Department for the College of Agriculture. The new faculty include a beef geneticist, a range ecologist, and a rumen microbiologist. The College also purchased an Illumina MiSeq and is using it to help members of the Crow Indian

Reservation identify sources of antibacterial resistant E. Coli.