V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Global Food Security and Hunger - Animal Enterprises

☑ 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
121	Management of Range Resources	15%		15%	
302	Nutrient Utilization in Animals	12%		20%	
303	Genetic Improvement of Animals	8%		10%	
304	Animal Genome	0%		10%	
305	Animal Physiological Processes	0%		10%	
306	Environmental Stress in Animals	12%		10%	
307	Animal Management Systems	30%		10%	
308	Improved Animal Products (Before Harvest)	8%		5%	
311	Animal Diseases	6%		5%	
315	Animal Welfare/Well-Being and Protection	9%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2012	Extension		Research	
	1862	1890	1862	1890
Plan	20.0	0.0	4.0	0.0
Actual Paid Professional	20.0	0.0	16.0	0.0
Actual Volunteer	3.4	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**
555000	0	656554	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
555000	0	656554	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
2000000	0	3631747	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Develop research-based information and disseminate through peer reviewed journal articles, scientific reviews, and abstracts.

Develop decision aids and management programs that assist cattle and forage managers in making better informed decisions.

Conduct educational programs to improve the management skills, profitability and other success factors of people managing cattle and forages. Outputs for these activities will include fact sheets, books, and other extension publications, conference proceedings, web sites and conferences, and cattle enrolled in value-enhancement programs.

In animals exposed to BVDV, BRD, or both, identify biological links that exist between the bacteria and/or virus, reduced animal performance, and meat quality.

Provide meat goat workshops, boot camps, and keep meat goat manual up to date.

2. Brief description of the target audience

Managers, owners and employees of farms, ranches and agribusinesses, research scientists, extension personnel, beef cattle producers, meat goat producers, and the general public.

3. How was eXtension used?

Active participation in the Horse CoP.

V(E). Planned Program (Outputs)

1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	101902	8085628	4010	700000

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

Patent Applications Submitted

Year: 2012

Actual: 1

Patents listed

Methods of feeding ruminants.

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2012	Extension	Research	Total
Actual	9	12	21

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Conferences, symposiums, and meetings

Year	Actual
2012	405

Output #2

Output Measure

- Peered reviewed journal articles

Year	Actual
2012	12

Output #3

Output Measure

- Extension publications: fact sheets, proceedings, books, manuals, bulletins

Year	Actual
2012	166

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Total number of producers certified as Master Cattlemen
2	Number of producers implementing improved management, grazing systems and beef production systems resulting in improved sustainability.
3	Number of producers implementing management programs to decrease the incidence and economic impact of BVDV and BRD
4	Number of producers certified in the Beef Quality Assurance program
5	Number of cattle enrolled in value enhancement programs
6	Oklahoma Animal Genetics Initiative
7	2012 Cow/Calf Boot Camp
8	2012 Meat Goat Boot Camp
9	Psture recovery following drought

Outcome #1

1. Outcome Measures

Total number of producers certified as Master Cattlemen

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	75

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Beef production accounts for approximately one-third of Oklahoma's agricultural production in most years. Moreover, seventy percent of the state's 86,000 farms have some cattle and over fifty percent of the land area in Oklahoma is pasture or rangeland. Most of the cattle operations are small in size, with seventy-eight percent of the beef cow inventory in herds of fifty head or less. Smaller cattle operations have higher cost of production and are less likely to incorporate best management practices.

What has been done
The Master Cattleman Program is conducted by an interdisciplinary team resulting in a variety of educational products and programs, including the Beef Cattle Manual, benchmarking of cow/calf and stocker producer practices, Master Cattleman programs delivered at the local level and in-service training for Extension educators. An interdisciplinary Beef Cattle Manual was updated and published. The manual contains 41 chapters addressing various business, production, and natural resource topics. Approximately 462 manuals were distributed in 2012 and a total of about 9,400 have been distributed since program inception through local Extension offices, area and state meetings and from the Master Cattleman website. Requests have been filled to 25 states and 5 foreign countries. The manual is being used as a textbook in 8 universities and community colleges.

Results
To become a Master Cattleman, a producer completes twenty eight hours of instruction from the Beef Cattle Manual and associated quizzes. The program has enjoyed wide adoption in the state and it continues to be a popular staple in educational programming. Approximately 730 students have graduated with 75 having graduated during 2012. Currently, 133 students are enrolled from 17 Oklahoma Counties. Graduates average response to their estimate of annual improvement in their cattle operation's profitability is $3,500 for a total annual impact of $2.5 million. On average,

graduates indicate that they use the Beef Cattle Manual at least once monthly and that they have referred 5 additional people to the Beef Cattle Manual and three people to the Master Cattleman program.

4. Associated Knowledge Areas

KA Code	Knowledge Area
121	Management of Range Resources
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
306	Environmental Stress in Animals
307	Animal Management Systems
315	Animal Welfare/Well-Being and Protection

Outcome #2

1. Outcome Measures

Number of producers implementing improved management, grazing systems and beef production systems resulting in improved sustainability.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	250

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Hay ranks as the second largest crop grown and harvested in Oklahoma. Tremendous effort and expense goes into growing, cutting, baling, storing, transporting, and feeding hay in cow/calf enterprises across the state. In fact, recent data surveying 729 Oklahoma producers (Vestal et al., 2007) indicates that only 10% of cow/calf operations have a hay feeding season of 60 days or less. Most rely on harvested forages as the primary source of dietary nutrients for the majority of the winter (90 to 150 days).

What has been done
Our group had previously discovered that 16% less hay would be needed for beef cow operations if a better hay feeder were used. In a follow-up experiment, we discovered that hay needed for

wintering cows could be reduced by 18% by combining three technologies: using a better hay feeder, feeding a specific feed additive in the supplement and limiting access to hay on a daily basis. The amazing thing about this 18% savings in hay is that there was NO DIFFERENCE in performance of the cows regardless if they received the standard management program or the "three technology" program.

Results
With extreme cost of hay in 2012 due to the continued drought, the economic impact to the state is estimated to be $3.5 million dollars per year. This assumes that only 5% of the 86,000 beef cattle operations adopt the use of one or more of these three technologies.

4. Associated Knowledge Areas

KA Code	Knowledge Area
121	Management of Range Resources
302	Nutrient Utilization in Animals
306	Environmental Stress in Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
311	Animal Diseases
315	Animal Welfare/Well-Being and Protection

Outcome #3

1. Outcome Measures

Number of producers implementing management programs to decrease the incidence and economic impact of BVDV and BRD

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	125

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Bovine respiratory disease (BRD) is the most significant production problem for the feedlot

industry, accounting for the majority of morbidity, mortality, and decreased production in feedlots with estimated annual economic losses in excess of $1 billion. The standard protocol when treating for BRD or undifferentiated fever in feedlot cattle is to administer some class of injectable antimicrobial. However, it is also common to provide additional treatment, or ancillary therapy, along with the antimicrobial. The goal of ancillary therapy is to improve the response to a BRD challenge in calves treated with antimicrobials, not to replace antimicrobial treatment. This can be accomplished by relieving the harmful effects of inflammation, blocking histamine activity, or boosting immune system function to aid in the defense of infectious pathogens. In 1999, USDA NAHMS surveyed feedlots in the top 12 cattle feeding states and noted that only 12.8% of these feedlots used a single antimicrobial for the treatment of BRD (USDA APHIS, 2001). A more recent survey reported that 48% of veterinarians recommended some form of ancillary therapy for the treatment of BRD. The most common forms of ancillary therapy listed in the surveys included: vitamin C, non-steroidal-anti-inflammatory drugs (NSAID), antihistamines, direct-fed microbials (DFM), B vitamins, viral vaccines, and corticosteroids.

What has been done
While surveys provide evidence as to the scope of ancillary therapy use, there is limited published research on the efficacy of these ancillary therapies. Animal enterprises evaluated the effects of 3 ancillary therapies utilized in combination with an antimicrobial on performance and health variables of newly received high-risk calves treated for BRD.

Results
Calves receiving an intranasal viral vaccine tended to be treated a second time for BRD less frequently, and calves receiving NSAID or vitamin C tended to require a third BRD treatment less often when compared to calves receiving no ancillary therapy. Although the responses observed to the 3 ancillary therapies used were largely negligible, increased days on feed, lower final body weight and lower carcass value results in an $11.36 loss in income for every time an animal gets treated for BRD. Decreasing the average number of times an animal is treated for BRD by one treatment would result in a nearly $9 million savings to Oklahoma feedlot cattle producers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
311	Animal Diseases
315	Animal Welfare/Well-Being and Protection

Outcome #4

1. Outcome Measures

Number of producers certified in the Beef Quality Assurance program

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	300

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Cattle sickness costs the industry millions of dollars each year. These losses negatively impact producer profitability and they impact each and every level of the beef production chain.

What has been done
In order to facilitate the adoption of best management practices that should result in reduced sickness and associated adverse effects, the Oklahoma Quality Beef Network (OQBN) was initially developed in 2001. The objective is to add value to Oklahoma's calf crop and empower cattle producers to capture at least part of the added value.

Results
In 2012, 85 Oklahoma beef producers enrolled 3,496 calves in the OQBN program. Nine regional OQBN Vac-45 calf sales were conducted in six livestock markets. OQBN cattle received a premium of $9.23/cwt, based on the weighted average price of all lots, over non-preconditioned cattle. The average price premium is an additional $55.38 per head, while the added value of weight gain during the preconditioning period averaged $76.50 per head for a gross increase in revenue of $131.88 per calf. Average cost to participate in the program was about $80 per head, resulting in a net increase in income of about $52 per head or total net increase in income of $182,000 for the calves enrolled in the program in 2012. The extreme drought has reduced cow numbers drastically in the state and forced producers to sell calves early and directly off of the cow. We expect participation in this program and ones like it to climb dramatically again once forage production returns to normal. However, the educational program and example given by the OQBN is stimulating growth in adoption of these management, certification and marketing practices throughout the state. Therefore, the impact is much higher than can be measured by direct participation in the program.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
315	Animal Welfare/Well-Being and Protection

Outcome #5

1. Outcome Measures

Number of cattle enrolled in value enhancement programs

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	3496

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
See qualitative outcome for Oklahoma Beef Quality Network.

What has been done

Results
Involvement in this program was again reduced in 2012 due to the drought.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
315	Animal Welfare/Well-Being and Protection

Outcome #6

1. Outcome Measures

Oklahoma Animal Genetics Initiative

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Improper management of genetic resources and failure to use appropriate mating systems negatively impact beef cattle operations by reducing profit. Failure to follow basic guidelines regarding genetics and mating systems can impact all levels of the production chain by negatively impacting overall beef demand due to failure to provide a product that is acceptable from a consumer standpoint. Appropriate use of mating systems allows the selection of animals that fit the production environment and increase cowherd efficiency while still producing a product that is acceptable for beef consumers. Research studies, many of which stem from long-term research conducted at the US Meat Animal Research Center, have consistently highlighted the production advantages achieved from using appropriate crossbreeding systems to capitalize on maternal heterosis. Dramatic improvements in longevity, fertility, and lifetime productivity have been well documented in crossbred beef females. Other genetic tools such as EPDs and genomics can also be used to manage production levels to fit the environment while using terminal crosses to produce high-output animals with good carcass traits.

What has been done
The Oklahoma Animal Genetics Initiative began with the launching of a new web portal focused towards producer education on genetics and genomics topics (www.beefextension.com/genetics). This web portal is the gateway to integration of a variety of educational tools, programs, and topics that are of interest to Oklahoma cattlemen. The site is designed to be continually evolving and adding new materials and tools. It has been focused more towards beef cattle to date, but can also be expanded to other species as materials become available. This website is also serving as the primary informational delivery system for the upcoming Beef Improvement Federation Research Symposium and Annual Meeting. The schedule, registration links, and hotel information have all been posted and linked both from our site and the Beef Improvement Federation website.

Results
The genetics webpage has been completely re-designed and five previously authored fact sheets have been included within their appropriate sections. New content in 2012 consists of 1 fact sheet concerning use of genomics, an across-breed EPD calculator, a video episode of SUNUP TV that talks about the bovine genome, links to pertinent news articles, and links to outside websites and sources of genetics and genomics information. Additional web content is planned for development in 2013.

4. Associated Knowledge Areas

KA Code	Knowledge Area
303	Genetic Improvement of Animals
304	Animal Genome
308	Improved Animal Products (Before Harvest)

Outcome #7

1. Outcome Measures

2012 Cow/Calf Boot Camp

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	42

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Forty two producers from 5 states (Arkansas, Florida, Kansas, Oklahoma, and Texas) attended the 2012 Cow/Calf Boot Camp near Kellyville, OK.

What has been done
The effectiveness and impact of the program was evaluated using pre and post tests along with an overall evaluation.

Results
Twenty eight % of the participants considered themselves full time cattle producers while 70% had 100 cows or fewer. When asked to rate the individual classes on a scale of 1 to 5, the average score was 4.47. In particular, producers rated the following sessions very high: Livestock Mortality Disposal - 4.77; Calving Season & Cow Efficiency - 4.75; Reproduction - 4.71; and Cow Nutrition Exercise - 4.69. When asked what the value of the workshop was to their operation the answers ranged from $10/head to $1,000/head. Eighty three % of the participants plan to adopt 1 or more of the production practices discussed at the workshop. Eighty % of the participants said they would recommend this class to other producers. One participant remarked that "Any rancher should be required to attend this type of class as a minimum to try to be a responsible operator." Another comment stated that "The program is awesome and has information to help any beginning or mature farmer." Pre-test scores averaged 12.5 with a standard deviation of 2.98 and

a range from 8-20 correct. Post test scores averaged 16.3 with a standard deviation of 2.47 and a range from 11-22 correct. This test shows a 30.40% increase in knowledge gained from the workshop. There were four questions that showed an increase in knowledge of over 100%. The overall value of this program is best determined by using the producer's own estimation of the average value ($/head) gained from the workshop, the average number of cattle per participant and the total number of participants. By this estimation the value of the OSU Cow/Calf Camp was $899,264.

4. Associated Knowledge Areas

KA Code	Knowledge Area
121	Management of Range Resources
303	Genetic Improvement of Animals
305	Animal Physiological Processes
306	Environmental Stress in Animals
307	Animal Management Systems
311	Animal Diseases

Outcome #8

1. Outcome Measures

2012 Meat Goat Boot Camp

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	49

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Forty nine producers attended the 2012 Meat Goat Boot Camp.

What has been done
The effectiveness and impact of the program was evaluated using pre and post tests and an overall evaluation.

Results

Of the 49 participants, this was the first extension program that 37 had attended. When asked to rank the topics that were the greatest of value to them the top five sessions were FAMACHA Eye Scores and Fecal Egg Counts, Parasite Life Cycle Management, Goat Nutrition, Hay Evaluation, and Birthing and Neonatal Care. Eighty three % of the participants plan to adopt 1 or more of the production practices discussed at the workshop. Pre-test scores averaged 17.0 with a standard deviation of 3.84 and a range from 2-25 correct. Post test scores averaged 23.3 with a standard deviation of 3.25 and a range from 14-29 correct. This test shows a 37.1% increase in knowledge gained from the workshop. There were five questions that showed an increase in knowledge of over 100%. When the pre and post test questions are grouped by subject matter there are seven subject matter groups. Following are those subject matter groups and the change in knowledge gained for each group. Marketing - 114.55%; Nutrition - 83.61%; Forages - 49.18%; Parasite Control - 37.8%; General Herd Management - 24.57%; Business Planning - 18.52%; Record Keeping - 10.59%. The overall value of this program is best determined by using the producer's own estimation of the average value ($/head) gained from the workshop, the average number of goats per participant and the total number of participants. By this estimation the value of the OSU Meat Goat Boot Camp was $689,430.

4. Associated Knowledge Areas

KA Code	Knowledge Area
121	Management of Range Resources
302	Nutrient Utilization in Animals
306	Environmental Stress in Animals
307	Animal Management Systems
311	Animal Diseases
315	Animal Welfare/Well-Being and Protection

Outcome #9

1. Outcome Measures

Psture recovery following drought

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	22

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Oklahoma has experienced severe drought during the past two years which will have long-term negative effects on forage production for livestock producers.

What has been done
Ottawa County: This educational program was initiated in March of 2012.

Results
Sixty four surveys were distributed with 22 returned (34%). The total number of acres managed by those responding to the survey was over 23,000 acres, with approximately 60% of the reported acres having moderate to severe drought damage. The average value of pasture and forage losses due to drought was estimated at nearly $130/acre. All respondents reported plans to use information they learned at the meeting. Approximately 30% indicated using weed control only, with 65% planning to use both weed control and fertilization, with 100% indicating plans to either decrease or maintain herd size. The estimated value of the information was approximately $65/acre or greater than $1.5 million.

4. Associated Knowledge Areas

KA Code	Knowledge Area
121	Management of Range Resources

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.)

Brief Explanation

Extreme drought caused a reduction in several on-going programs. However, educational efforts in cattle management under such conditions, tax management, culling options, altenative feeds, cattle stress, etc. were increased.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

For the Master Cattleman, program, graduates estimate of annual improvement in their cattle operation's profitability was $3,500 for a total annual impact of $2.5 million. On

average, graduates indicate that they use the Beef Cattle Manual at least once monthly and that they have referred 5 additional people to the Beef Cattle Manual and 3 people to the Master Cattleman program.

The estimated value of the OSU Cow/Calf Boot Camp to producers was $899,264.

The estimated value of the OSU Meat Goat Boot Camp to producers was $689,430.

With extreme cost of hay in 2012 due to the continued drought, the economic impact of minimizing hay waste to the state is estimated to be $3.5 million dollars per year. This assumes that only 5% of the 86,000 beef cattle operations adopt the use of one or more of these three technologies.

The estimated value of the Pasture Recovery Following Drought program to producers was approximately $65/acre or greater than $1.5 million.

Key Items of Evaluation