

**V(A). Planned Program (Summary)**

**Program # 3**

**1. Name of the Planned Program**

Global Food Security and Hunger - Animal Science/Forages

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
202	Plant Genetic Resources	0%		1%	
205	Plant Management Systems	0%		3%	
301	Reproductive Performance of Animals	14%		4%	
302	Nutrient Utilization in Animals	19%		11%	
303	Genetic Improvement of Animals	19%		2%	
304	Animal Genome	4%		27%	
305	Animal Physiological Processes	9%		15%	
306	Environmental Stress in Animals	9%		4%	
307	Animal Management Systems	14%		12%	
308	Improved Animal Products (Before Harvest)	4%		0%	
311	Animal Diseases	3%		3%	
312	External Parasites and Pests of Animals	1%		0%	
313	Internal Parasites in Animals	1%		0%	
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals	1%		0%	
315	Animal Welfare/Well-Being and Protection	2%		0%	
502	New and Improved Food Products	0%		4%	
511	New and Improved Non-Food Products and Processes	0%		14%	
	<b>Total</b>	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	14.0	0.0	5.0	0.0

Actual Paid Professional	13.3	0.0	8.6	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
357701	0	942737	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
357701	0	1132362	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	2519573	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

Research and Extension programs will be conducted in the following areas (and others as needed):

- MSUcares.com Livestock Web Site
- Beef Cattle Extension Publications
- Cattle Business in Mississippi magazine articles
- Mississippi Master Cattle Producer Program
- Beef Quality Assurance Program
- Beef Cattle Boot Camps
- Beef Cattle Workshops and Short Courses
- Heifer Development Program
- Farm-to-Feedlot Project
- Artificial Insemination School
- Beef Cattle Improvement Assn. sponsored sales
- Beef Cattle Improvement Assn. newsletter
- Feeder Calf Marketing
- Stocker Cattle Conference
- Enrollment on the Dairy Herd Improvement Assn.
- DHIA herd management screening
- Statewide Dairy Field Day
- Swine Producers Extension Program
- Swine Managers Training
- Environmental Continuing Education Classes
- Dietary analyses and consultation
- Pork Quality Assurance Program
- Swine Welfare and Assurance Program
- Forage Nutrient Analysis
- Grazing Schools
- Grazing Conference
- Cattle Transportation Stress Research
- Cattle Temperament Research
- Cattle Breeding and Genetics Research

- Cattle Disease Research
- Livestock Nutrition Research
- Livestock and Equine Reproduction Research
- End Product (Meats) Research
- Forage Production and Utilization Research

**2. Brief description of the target audience**

The target audience for this program includes beef, dairy, swine, equine, and forage producers (full- and part-time) and related industry personnel.

**3. How was eXtension used?**

The resources provided through eXtension were used to supplement and enhance our public learning experiences provided by MSU Extension agents and specialists. eXtension was also used as a resource in state-based planning processes. Overall, 212 MSU employees are eXtension users, with 15 new registrations during this reporting period. Further, MSU Extension has 64 employees that serve on one or more of the 72 Communities of Practice (COPs); MSU Extension employees are member of 33 COPs. Twelve MSU Extension employees serve as a leader for a COP, leading 9 COPs. MSU Extension personnel are members of the Beef Cattle COP and the Livestock and Poultry COP.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	61201	91705	0	0

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

**Patent Applications Submitted**

Year: 2012  
 Actual: 2

**Patents listed**

1. Patent Pending: Production of Xylo-oligosaccharides Using Autohydrolysis of Fiber Separated by Elusieve Processing of Animal Feeds, serial number 13/285,745
2. Provisional Patent: Generation of Imazapic resistant Switchgrass 61,690,458

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2012	Extension	Research	Total
<b>Actual</b>	16	48	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of producers attending seminars, workshops, short courses, and demonstrations.

<b>Year</b>	<b>Actual</b>
2012	25484

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of producers adopting new technologies, strategies, or systems.
2	Number of producers optimizing production levels.
3	Number of producers optimizing production inputs/expenses.
4	Number of producers improving their environmental stewardship.
5	Number of producers adding value and capturing added value to products through marketing.
6	Number of producers improving overall herd health, animal welfare, and/or protection.

## **Outcome #1**

### **1. Outcome Measures**

Number of producers adopting new technologies, strategies, or systems.

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Action Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2012	5097

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Processors, distribution chains, brokers, food service and retail segments from various venues want to enhance muscle foods through marination techniques to add value and quality. Many do not have the expertise and/or knowledge base of the proper techniques, ingredients or methodologies to accomplish proper marination.

#### **What has been done**

This workshop has been offered annually to the entire foods industry for the past 6 years and has seen continued growth with attendees from MS industries as well as major food processors across the US and several international companies. This intensive 2½ day workshop offers both technical information and hands-on exercises from some of the most recognized industry leaders in this field. Existing marination science as well as new technologies and ingredients are covered in this workshop.

#### **Results**

In 2012, 41 people attended the workshop. Numerous networking contacts among participants, MSU and various companies have established varying degrees of working relationships as a result of these workshops. This workshop facilitates recruitment of students, research contracts, and outreach partnerships. While a definite economic figure cannot be affixed directly to these educational events, consider the following as a very realistic hypothetical example, for each company represented last year (~35), if they were able to improve their yields by a mere 1% on a very conservative figure of 300 million pounds at an average of \$2.00/lb, that would equate to \$6 million for just these companies in one year. Several of the companies represented produce well over that amount of product a year each, much less collectively.

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
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)

## **Outcome #2**

### **1. Outcome Measures**

Number of producers optimizing production levels.

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Condition Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2012	2079

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

The MAFES White Sand Branch Unit station sits on 440 acres of forage. Currently 120 acres can be prepared and planted for grazing from January to May. On these 120 acres stocking rate is 600-700 lbs of cattle per acre, with historical daily gains of 3-3.5 lbs/day. More winter annuals could be drilled into summer pastures, but that would result in lower stocking rate and reduced grazing period. Summer grazing usually results in 1 lb or less daily gain from May until October without supplementation and 1.5-1.7 lbs daily gain with supplementation (usually 2-4 lbs of supplement per head daily).

#### **What has been done**

We conducted a SWOT analysis as part of proposing that MAFES White Sand Unit graze cattle belonging to individuals and get paid on a weight gain basis for income generation and as a source for cattle to be used in research. The research focus of the station is stocker cattle production. With the current cow herd size and composition, it is difficult to conduct any

publishable nutrition/reproduction/production studies. Additionally, industry funding is more available for stocker cattle studies.

### **Results**

Based upon gain data from last year, over 33,000 lb of gain were put on beef cattle used in studies at White Sand. This would result in a profit of over \$13,000.00 at \$0.40/lb (the current rate for stocker gains) This data were generated utilizing 130 animals throughout the whole year on various studies.

## **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
305	Animal Physiological Processes
306	Environmental Stress in Animals
307	Animal Management Systems

## **Outcome #3**

### **1. Outcome Measures**

Number of producers optimizing production inputs/expenses.

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Condition Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2012	2039

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Forage utilization has remained unchanged for long period of times in Mississippi leading to losses in forage quality and reducing stocking rates. Over 90% of the livestock producers use rotational grazing due to economic constrains and how their farm is set up for grazing management.

### **What has been done**

This pilot program looks at ways to extend the grazing season and reduce supplementation. It identifies 2-3 farms in each of district in collaboration with extension area agents. Farms participate for a minimum of two years. Part of the farm follows grazing and nutrient management guidelines established by the MSU Forage program to compare current management practices to alternatives. The program focuses on soil testing, rotational grazing, forage quality, animal performance, stockpiling, weed control and environmental stewardship.

### **Results**

Producers that participated in the first year have become more aware of the advantages rotational grazing can offer. They have developed skills to determine grazing capacity, rotation patterns, and the use of soil survey to determine species suitability and how to manage nutrient applications. Producers participating in the program have been able to increase stocking rates from 0.5 to 0.8 animal units per acre and extend the grazing season by an average of 47 days. Nutrient application has decreased by 60% when using soil test recommendations, forage utilization has increased from 35% to 57%, and forage quality has increased by 4%. The application of this program has reduced forage production cost by 20% saving producers an average of \$250.00 per acre. Full implementation in MS will save \$250M annually.

## **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
305	Animal Physiological Processes
306	Environmental Stress in Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)

## **Outcome #4**

### **1. Outcome Measures**

Number of producers improving their environmental stewardship.

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Condition Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2012	1875

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Many MSU Extension beef cattle educational programs focus on complex problems or topics, with the target audience being established beef cattle producers with experience in cattle production. Rather than focus on that target audience, the Beef Cattle Boot Camps offered a new approach. They focused on novice producers, who may not have the experience or knowledge of longer established producers. The goal of the Boot Camps was to provide basic information to producers in a hands-on, applicable manner.

#### What has been done

Boot Camp topics in 2012 included implants, heifer development, newborn calf feeding, vaccinations, fertilizer planning, making hay and baleage, troubleshooting reproduction, mycotoxin management, and input purchasing. Live animal demonstrations and interactive participant exercises were included. Both MSU Extension and MAFES personnel were involved in the Boot Camp planning and program implementation.

#### Results

Post-program evaluations demonstrated on a 1 to 5 scale, with 1="poor" and 5="excellent," the average rating for all Boot Camp presentations was 4.6. Hands-on learning experiences are considered valuable to beef cattle producers, especially novice producers who may require more hands-on experiences to understand basic practices. The Beef Cattle Boot Camps provide opportunities for these experiences while also highlighting MAFES beef cattle research activities. In addition, they facilitate MSU Extension and MAFES personnel interactions with beef cattle producers.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals
306	Environmental Stress in Animals
307	Animal Management Systems

### Outcome #5

#### 1. Outcome Measures

Number of producers adding value and capturing added value to products through marketing.

Not Reporting on this Outcome Measure

## **Outcome #6**

### **1. Outcome Measures**

Number of producers improving overall herd health, animal welfare, and/or protection.

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Action Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2012	122

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Many weeds are nonpalatable or toxic to livestock and compete with consumable forages to increase livestock production costs and lower profits for these producers.

#### **What has been done**

Research to determine effective management methods for weeds in forages combined with local outreach to deliver this information enables producers to make decisions that will improve weed control and forage quality.

#### **Results**

In 2012, 877 livestock producers, 38 county extension personnel, and 132 USDA NRCS employees were better prepared to make informed choices of weed control tactics to produce higher quality forages with fewer toxic weeds.

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
306	Environmental Stress in Animals
307	Animal Management Systems

## **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**

{No Data Entered}

## **V(I). Planned Program (Evaluation Studies)**

### **Evaluation Results**

MSU Extension agents and specialists, as well as MAFES faculty, used a variety of recommended methods to gather needed information. Specific strategies will be initiated and utilized for collecting evaluation information to determine program outputs and outcomes (see impact statements for examples).

In FY 2012, MSU Extension agents and specialists were required to submit four quarterly reports (January, April, July, and September). This quarterly report collects information about the number of contacts, types of contacts, and number of programs conducted in each Priority Planning Area. In addition, two narrative Accomplishment Reports are required from each MSU Extension employee each year. Finally, a specific request for impact statements is also made. The evaluation results are a combination of this quantitative and qualitative data.

MAFES scientists operate research programs under an approved Hatch or Hatch-Multistate CRIS project plan of work. Outputs, outcomes, target audiences, and impacts are reported annually through the CRIS (REEport) system. Annual and project termination reports are developed by scientists and reviewed by Department Heads and the Director's office before submission to USDA-NIFA through REEport.

### **Key Items of Evaluation**