

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

**Program # 11**

**1. Name of the Planned Program**

Show-Me-Select Replacement Heifer 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	60%			
303	Genetic Improvement of Animals	20%			
307	Animal Management Systems	10%			
308	Improved Animal Products (Before Harvest)	10%			
	<b>Total</b>	100%			

**V(C). Planned Program (Inputs)**

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	12.0	0.0	0.0	0.0
Actual	13.0	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
491451	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
510538	0	0	0
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

The learner-focused outcomes of this program will expand the scope of the Missouri Show-Me-Select Replacement Heifer Program. These outcomes include: 1) Regional Extension Livestock Specialists, veterinarians, farmers, and allied industry representatives will acquire knowledge and skills to aid in the successful adoption and implementation of existing management practices to improve beef heifer development; 2) Regional Extension Livestock Specialists, practicing veterinarians, producers, and future professionals will acquire new knowledge and skills to aid in the adoption of emerging biotechnologies in beef heifer development, including estrus synchronization and artificial insemination; 4) Regional Extension Livestock Specialists, practicing veterinarians and producers will be able to identify and discuss the economic implications of implementing production practices associated with the Show-Me-Select Replacement Heifer Program; and 5) Participating producers will develop a plan that establishes the Show-Me-Select Replacement Heifer Program as a producer owned and managed system.

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

The audiences targeted in this program are farmers across Missouri actively involved in cow-calf production and marketing. There are no limitations placed on the program in terms of farm or size of cow-herd. The program to date has involved herds as small as 8 cows and as large as 6,000 cows. Numerous sectors of the Missouri livestock industry come together as a result of this program, including University Extension, the Division of Animal Sciences, the University of Missouri College of Veterinary Medicine, the Commercial Agriculture Program, the Missouri Beef Cattle Improvement Association, the Missouri Cattlemen’s Association, the Missouri Department of Agriculture, and the Missouri Livestock Marketing Association.

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

**1. Standard output measures**

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Plan</b>	750	10000	100	450
<b>Actual</b>	995	1486	716	849

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

**Patent Applications Submitted**

Year: 2010  
 Plan: 0  
 Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2010	Extension	Research	Total
<b>Plan</b>	0	0	
<b>Actual</b>	0	0	0

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

**Output Target**

**Output #1**

**Output Measure**

- Provide in-service training session(s) for regional Extension specialists on an annual basis.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	2	3

**Output #2**

**Output Measure**

- Regional and state specialist will conduct demonstrations on an annual basis.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	6	9

**Output #3**

**Output Measure**

- Regional specialist will assist with producer sales.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	12	14

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

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

O. No.	OUTCOME NAME
1	Economic assessment of the program and impact based on surveys of participating farmers.
2	Increase in the number of animals (heifers) enrolled in the program.
3	Increase in the number of programmatic participating veterinarians on a region-to-region basis.
4	Annual economic impact of the Show-Me-Select heifer program on the state's economy.
5	Number of farmers participating in the SMS program and the % of producers adopting management protocol.

## **Outcome #1**

### **1. Outcome Measures**

Economic assessment of the program and impact based on surveys of participating farmers.

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

- 1862 Extension

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

Change in Knowledge Outcome Measure

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

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	0	0

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

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

The audiences targeted in this program include regional extension livestock specialists, veterinarians, and farmers across Missouri who are actively involved in cow-calf production and marketing. Technology transfer with respect to the management practices involved in the program is not dependent the size of a livestock operation but rather on individual farmers who may introduce a fundamental change in approach to management and marketing that affects the profitability of their particular operations.

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

The Missouri Show-Me-Select Replacement Heifer Program was designed to improve reproductive efficiency of beef herds in Missouri and increase individual farm income. The program objectives include (1) a total quality management approach for health and management of heifers from weaning to late gestation; (2) increased marketing opportunities for, and added value to, Missouri raised heifers; and (3) the creation of reliable sources of quality commercial and purebred replacement females.

#### **Results**

The Show-Me-Select Replacement Heifer Program is the first comprehensive, statewide, on-farm beef heifer development and marketing program in the United States. Participation in the program from 1997-2010 involved 91,776 heifers on 703 farms across Missouri, 205 veterinarians, 10 regional extension livestock coordinators, and 17 regional extension livestock specialists. The marketing component of the program over this period involved 105 sales at 12 locations. During this time, 22,807 heifers sold through the Show-Me-Select Replacement Heifer Program sales, with gross receipts of \$25,406,700. The total net impact on Missouri's economy from the 14 years of the Show-Me-Select Replacement Heifer Program and Sales exceeds \$50,000,000. Producers from 104 of Missouri's 114 counties (91%) have enrolled heifers in the program, and 64 counties in Missouri (56% of the total) list the Show-Me-Select Replacement Heifer Program as a priority

program for their county in the their current program of work.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
303	Genetic Improvement of Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)

#### Outcome #2

##### 1. Outcome Measures

Increase in the number of animals (heifers) enrolled in the program.

##### 2. Associated Institution Types

- 1862 Extension

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

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

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

Continuation of low adoption rates of best management practices in the United States will ultimately erode the competitive position of the U.S. cattle industry. Producers in other countries are adopting new technologies for animal production more rapidly than their U.S. counterparts. Unless owners of commercial and purebred cowherds aggressively implement reproductive and genetic improvement, the United States will lose its competitive advantage in production of high quality beef.

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

A number of management procedures have been cited to have a significant impact on beef herds and their resulting performance as measured by reproduction and productivity. Only a limited percentage of beef cattle operations use these management procedures. Best management practices for replacement beef heifers, when collectively viewed as a "program," can assist producers in more effectively managing reproduction, production and marketing.

###### **Results**

The Show-Me-Select Replacement Heifer Program is the first comprehensive, statewide, on-farm beef heifer development and marketing program in the United States. Participation in the program from 1997-2010 involved 91,776 heifers on 703 farms across Missouri, 205 veterinarians, 10 regional extension livestock coordinators and 17 regional extension livestock specialists. The marketing component of the program over this period involved 105 sales at 12 locations. During this time, 22,807 heifers sold through Show-Me-Select Replacement Heifer Program sales, with gross receipts of \$25,406,700. The total net impact on Missouri's economy from the 14 years of the Show-Me-Select Replacement Heifer Program and Sales exceeds \$50,000,000. Producers from 104 of Missouri's 114 counties (91%) have enrolled heifers in the program, and extension councils in 64 counties in Missouri (56% of the total) list the Show-Me-Select Replacement Heifer Program as a priority program for their county in their current program of work. Heifers from the program have now sold to farms in Arkansas, Arizona, Florida, Georgia, Iowa, Illinois, Indiana, Kentucky, Kansas, Missouri, Nebraska, Oklahoma, South Carolina, South Dakota, Tennessee and Texas.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
303	Genetic Improvement of Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)

#### Outcome #3

##### 1. Outcome Measures

Increase in the number of programmatic participating veterinarians on a region-to-region basis.

##### 2. Associated Institution Types

- 1862 Extension

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

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

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

Veterinarians provide expertise in herd health, assessment of reproductive potential, and pregnancy diagnosis. Veterinarians serve as key information sources for U.S. beef producers and are essential in facilitating the adoption of various reproductive procedures. Nearly two-thirds

(60.8%) of cow-calf producers cited their veterinarian as a "very important" source of information for their cow-calf operation including health, nutrition, or questions pertaining to production or management.

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

Implementation of the Show-Me-Select Replacement Heifer Program in Missouri involved University specialists working closely with producers, regional extension specialists, and veterinarians. On-farm development programs that involve local veterinarians, state, regional extension livestock specialists, and individual farm operators provide the structure through which change can occur.

#### **Results**

Veterinarians provide expertise in the areas of health, assessment of reproductive potential, fetal aging and pregnancy diagnosis. Veterinarians serve as key information sources for U.S. beef producers and are essential in facilitating the adoption of various reproductive procedures. Nearly two-thirds (60.8%) of cow-calf producers cited their veterinarian as a "very important" source of information for their cow-calf operation including health, nutrition, or questions pertaining to production or management. The success of this program over the past years was largely a function of being able to reach the target audience and the associated impact of that connection. Implementation involved University specialists working closely with producers, regional extension specialists, and veterinarians. On-farm development programs that involve local veterinarians, state and regional extension specialists, and individual farm operators provide the structure through which change can occur.

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

<b>KA Code</b>	<b>Knowledge Area</b>
301	Reproductive Performance of Animals
303	Genetic Improvement of Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)

#### **Outcome #4**

##### **1. Outcome Measures**

Annual economic impact of the Show-Me-Select heifer program on the state's economy.

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

- 1862 Extension

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

Change in Action Outcome Measure

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

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
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2010

3

0

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Missouri ranks third in the U.S. in number of beef cows in production, with > 2 million cows on 52,000 farms. Sales of cattle and calves contribute nearly 20% annually to Missouri's total farm cash receipts and generate in excess of one billion dollars annually. The definitive outcome of this program was intended in part to add value to beef heifers by expanding marketing opportunities as a result of technology adoption, production verification, collective action, and best management practices.

#### What has been done

An example of the economic impact stemming from an organized program that supports use of Best Management Practices is the Missouri Show-Me-Select Replacement Heifer Program. Heifers that sold (n=22,807) between the Fall of 1996 and 2010 at 105 Show-Me-Select Replacement Heifer Program Sales across Missouri sold for an average of \$1114 per heifer, which is nearly \$200/head greater than the price received per head for bred heifers at conventional livestock sales.

#### Results

Impact on Missouri's economy from the first 14 years of the Show-Me-Select Replacement Heifer Program now exceeds \$50,000,000. Producers from 104 (91%) of 114 counties have participated in the Show-Me-Select Replacement Heifer Program. Buyers from 112 of 114 counties (98%) registered to purchase heifers from 1997-2010 Show-Me-Select Replacement Heifer Sales. Buyers from 108 of the 114 counties (95%) purchased heifers from 1997-2010 Show-Me-Select Replacement Heifer sales. Show-Me-Select Replacement Heifers have now sold into 18 states including: AR, AZ, CO, FL, GA, IA, IL, IN, KY, KS, LA, MO, NE, OK, SC, SD, TN and TX.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
303	Genetic Improvement of Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)

### Outcome #5

#### 1. Outcome Measures

Number of farmers participating in the SMS program and the % of producers adopting management protocol.

#### 2. Associated Institution Types

- 1862 Extension

### 3a. Outcome Type:

Change in Knowledge Outcome Measure

### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Continuation of low adoption rates of best management practices in the U.S. will erode the competitive position of the U.S. cattle industry. Other countries are adopting new technologies more rapidly than the U.S. Unless owners of beef herds aggressively implement reproductive and genetic improvement, the U.S. will lose its competitive advantage in production of high quality beef. International players will position themselves to dominate the production and sale of high-quality beef worldwide.

#### What has been done

The Show-Me-Select Replacement Heifer Program draws on the fundamental basis upon which Extension and the Land Grant system was founded: The use and application of what we know to create knowledge. Meaningful assessment of this program began by building in evaluation as part of the design, which it did. Data collection is part of the delivery process and reinforces the development of sound management practices on individual farms that participate in the program regardless of their size.

#### Results

The marketing component of the program facilitated the sale of 22,807 heifers in 105 sales across Missouri from 1997 through the fall sales in 2010. These sales generated interest from over 7,500 prospective buyers that formally registered to buy heifers, and over 2,700 individuals that purchased heifers from the various sales. Heifers from the program have now sold to farms in AR, AZ, CO, FL, GA, IA, IL, IN, KY, KS, LA, MO, NE, OK, SC, SD, TN and TX. Collectively, 105 sales have generated \$25,406,700 in gross sales. The Missouri Show-Me-Select Replacement Heifer Program is the first statewide on-farm development and marketing program of its kind in the U.S. Economic impact of the Show-Me-Select Replacement Heifer Program on an annual basis is estimated at \$3.5 million. Impact on Missouri's economy from the past 14 years of the Show-Me-Select program exceeds \$50,000,000.

## 4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
303	Genetic Improvement of Animals
307	Animal Management Systems

308 Improved Animal Products (Before Harvest)

**V(H). Planned Program (External Factors)**

**External factors which affected outcomes**

- Economy
- Other (Marketing Fluctuations)

**Brief Explanation**

The audiences targeted in this program include Regional Extension Livestock Specialists, veterinarians, and farmers across Missouri that are actively involved in cow-calf production and marketing. There are no limitations placed on the program in terms of farm or size of cowherd. The pilot programs involved herds as small as 15 cows and as large as 800 cows. Technology transfer with respect to the management practices involved is not size dependent but rather producer dependent in terms of introducing a fundamental change in approach to management and marketing that impacts the profitability profile of a particular farm or ranch. The success of this program over the past 14 years relied largely in reaching this target audience and the associated impact of that connection. Numerous sectors of the Missouri livestock industry came together as a result of this program, including University of Missouri Extension, the College of Agriculture Food and Natural Resources, the College of Veterinary Medicine, the Division of Animal Sciences, the Commercial Agriculture Program, the Missouri Beef Cattle Improvement Association, the Missouri Cattlemen's Association, the Missouri Department of Agriculture, and the Missouri Livestock Marketing Association. Since the program began in 1997, 703 farms in Missouri have enrolled 91,776 heifers in the Show-Me-Select Replacement Heifer Program. The program has been led by 10 Regional Extension Livestock Specialists that serve as Coordinators of the Program in their respective regions, and 17 additional Specialists across the state that support efforts in these regions. In addition, 205 veterinarians in Missouri have participated in the Program since its inception. The Show-Me-Select Replacement Heifer Program draws on the fundamental basis upon which Extension and the Land Grant System was founded: The use and application of what we know to create knowledge. Hence, evaluation has an impact in the program itself. Meaningful assessment of this program began with building in evaluation as part of the design. Data collection was part of the delivery process and reinforced the development of sound management practices through on-farm, individualized result demonstrations conducted on farms that participated in the Program. Farmers used data generated on their own farms with the focus of the program centered on action alternatives based on data generated, methods flowed from issues. The end result was that a negotiated participatory process that evolved among the Regional Extension Livestock Specialist, the veterinarian, and the farmer with support from State specialists. The existing database from the Show-Me-Select Replacement Heifer Program serves as a conduit in the development of new educational programming areas.

**V(I). Planned Program (Evaluation Studies and Data Collection)**

## 1. Evaluation Studies Planned

- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.

## Evaluation Results

The Missouri Show-Me-Select Replacement Heifer Program was designed to improve reproductive efficiency of beef herds in Missouri and increase individual farm income. The program objectives include: 1) a total quality management approach for health and management of heifers from weaning to late gestation; 2) increased marketing opportunities for, and added value to, Missouri raised heifers; and 3) the creation of reliable sources of quality commercial and purebred replacement females. The program was initiated as a pilot project in two regions of Missouri in 1997 with 33 farms and 1,873 heifers. During the past 14 years, 703 farms enrolled 91,776 heifers in the program. Regional extension livestock specialists serve as coordinators of the program locally and work closely with the 196 veterinarians involved with the program state wide. State specialists provide program support to regional extension field staff and participating veterinarians. The reproductive goals for heifers enrolled in the program are aimed at improving breeding performance during the heifers' first breeding period, minimizing the incidence and severity of dystocia, with the resulting delivery of healthy vigorous calves, and successful rebreeding of heifers during the subsequent breeding season. The marketing component of the program facilitated the sale of 22,807 heifers in 105 sales across Missouri from 1997 through the fall sales in 2010. These sales generated interest from over 7,500 prospective buyers that formally registered to buy heifers, and over 2,700 individuals that purchased heifers from the various sales. Heifers from the program have now sold to farms in AR, AZ, CO, FL, GA, IA, IL, IN, KY, KS, LA, MO, NE, OK, SC, SD, TN and TX. Collectively, 105 sales have generated \$25,406,700 in gross sales. Producers from 104 (91%) of 114 counties have participated in the Show-Me-Select Replacement Heifer Program. Buyers from 112 of 114 counties (98%) registered to purchase heifers from 1997-2010 Show-Me-Select Replacement Heifer Sales. Buyers from 108 of the 114 counties (95%) purchased heifers from 1997-2010 Show-Me-Select Replacement Heifer sales. The Missouri Show-Me-Select Replacement Heifer Program is the first statewide on-farm development and marketing program of its kind in the U.S. Economic impact of the Show-Me-Select Replacement Heifer Program on an annual basis is estimated at \$3.5 million. Impact on Missouri's economy from the first 14 years of the Show-Me-Select program exceeds \$50,000,000.

## Key Items of Evaluation

The Missouri Show-Me-Select Replacement Heifer Program was designed to improve reproductive efficiency of beef herds in Missouri and increase individual farm income. The program objectives include: 1) a total quality management approach for health and management of heifers from weaning to late gestation; 2) increased marketing opportunities for, and added value to, Missouri raised heifers; and 3) the creation of reliable

sources of quality commercial and purebred replacement females. During the past 14 years, 703 farms enrolled 91,776 heifers in the program. Regional extension livestock specialists serve as coordinators of the program locally and work closely with the 205 veterinarians involved with the program state wide. State specialists provide program support to regional extension field staff and participating veterinarians. The reproductive goals for heifers enrolled in the program are aimed at improving breeding performance during the heifers' first breeding period, minimizing the incidence and severity of dystocia, with the resulting delivery of healthy vigorous calves, and successful rebreeding of heifers during the subsequent breeding season. The marketing component of the program facilitated the sale of 22,807 heifers in 105 sales across Missouri from 1997 through the fall sales in 2010. These sales generated interest from over 7,500 prospective buyers that formally registered to buy heifers, and over 2,700 individuals that purchased heifers from the various sales. Heifers from the program have now sold to farms in AR, AZ, CO, FL, GA, IA, IL, IN, KY, KS, LA, MO, NE, OK, SC, SD, TN and TX. Collectively, 105 sales have generated \$25,406,700 in gross sales. Producers from 104 (91%) of 114 counties have participated in the Show-Me-Select Replacement Heifer Program. Buyers from 112 of 114 counties (98%) registered to purchase heifers from 1997-2010 Show-Me-Select Replacement Heifer Sales. Buyers from 108 of the 114 counties (95%) purchased heifers from 1997-2010 Show-Me-Select Replacement Heifer sales. The program fosters the adoption of reproductive technologies focused on expanded use of artificial insemination (AI), use of high accuracy AI sires, and provides the infrastructure for effective implementation of new reproductive technologies and economic feedback regarding their use. By-products of adoption of reproductive technologies in beef cattle include enhanced genetic merit of heifers and steers, and improvements in whole herd reproductive management. The Missouri Show-Me-Select Replacement Heifer Program recently created a Tier 2 classification that distinguishes heifers from high accuracy sires. Sales results from this past fall's sales show an average premium of \$155 per heifer that were distinguished as Tier 2 replacements compared with other heifers in the program. The Missouri Show-Me-Select Replacement Heifer Program is the first statewide on-farm development and marketing program of its kind in the U.S. Economic impact stemming from the program on an annual basis is estimated at \$3.5 million. Impact on Missouri's economy from the first 14 years of the Show-Me-Select program exceeds \$50,000,000.