

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

**Program # 1**

**1. Name of the Planned Program**

Global Food Security and Hunger - Milk and Meat Production Systems

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			9%	
205	Plant Management Systems			9%	
213	Weeds Affecting Plants			9%	
301	Reproductive Performance of Animals			3%	
302	Nutrient Utilization in Animals			9%	
303	Genetic Improvement of Animals			24%	
306	Environmental Stress in Animals			5%	
308	Improved Animal Products (Before Harvest)			14%	
311	Animal Diseases			5%	
313	Internal Parasites in Animals			5%	
401	Structures, Facilities, and General Purpose Farm Supplies			3%	
503	Quality Maintenance in Storing and Marketing Food Products			5%	
	<b>Total</b>			100%	

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

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

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	0.0	0.0	4.0	0.0
<b>Actual Paid</b>	0.0	0.0	4.2	0.0
<b>Actual Volunteer</b>	0.0	0.0	0.7	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	986048	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	671636	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	51962	0

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

### 1. Brief description of the Activity

Of 14 articles based on our research results accepted by peer-review journals (8 published during 2014 and 6 in press at year's end), 10 involved different aspects of production and utilization of forages as silage, hay and grazed herbage, 3 were on the quality of locally produced meats and 1 on swine reproduction. The topics of 25 presentations at meetings of international or local scientific societies were distributed as follows: short-haired, heat tolerant Holstein cattle (3); mitigation of thermal stress in dairy cattle (2); animal diseases and parasitism (4); forage production and utilization (3); weed control in pastures (4); and poultry production (1). In most cases the first authors of these presentations were graduate students. There were also two publications in non-technical language on beef cattle topics. Extension efforts to educate producers about topics relevant to their operations, using a variety of methods of communication, were very active during the year. A number of field day and training sessions were well attended. Consulting services were provided for the benefit of both government officials and private sector parties.

### 2. Brief description of the target audience

1. Producers of the following classes of livestock and related products: bovines for milk and meat, sheep and goats for meat, goats for milk, swine and rabbits for meat, poultry for meat and eggs, and forages for sale
2. People working in services and sales in businesses related to livestock production, including producers of concentrate feeds, feed additives or supplements; semen and embryo transfer services; agricultural and veterinary supplies and equipment; milking equipment and agricultural machinery; and computer software
3. Self-employed professional consultants
4. Personnel of financial institutions, including banks and cooperatives and the Farm Credit Service
5. Officials of the insular and federal Department of Agriculture and other interested government agencies
6. Extension Service agents
7. Members of the teaching faculty
8. Graduate and undergraduate students
9. High school students with interest in livestock production

10. Members of the general public

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	0	0	0	0

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

Year: 2014  
 Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2014	Extension	Research	Total
<b>Actual</b>	0	8	8

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

**Output Target**

**Output #1**

**Output Measure**

- Number of meetings held with stakeholders to discuss the situation of each relevant industry and corresponding research priorities  
 Not reporting on this Output for this Annual Report

**Output #2**

**Output Measure**

- Number of popular (non-refereed) publications to report research results and other pertinent information for the benefit of producers and other interested parties

<b>Year</b>	<b>Actual</b>
2014	2

**Output #3**

**Output Measure**

- Number of field days, training sessions and other types of educational services provided for producers

<b>Year</b>	<b>Actual</b>
2014	9

**Output #4**

**Output Measure**

- Number of publications in refereed scientific journals.

<b>Year</b>	<b>Actual</b>
2014	8

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

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

O. No.	OUTCOME NAME
1	Number of producers participating in field days or training sessions who express willingness to adopt demonstrated management practices on their farms
2	Yearly percentage increase or decrease of on farm income from sale of livestock and related products in Puerto Rico
3	Number of animals of genetically improved breeding stock, from the University of Puerto Rico herd, sold to local beef producers to improve the genetic quality of their herds.

## **Outcome #1**

### **1. Outcome Measures**

Number of producers participating in field days or training sessions who express willingness to adopt demonstrated management practices on their farms

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

- 1862 Research

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

Change in Knowledge Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2014	0

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

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

To be profitable, livestock production increasingly needs pertinent information about up-to-date management practices. Profit margins are narrow, thus efficiency is required; this efficiency depends on organization and supervision of day-to-day operations combined with sound business administration, which in turn makes continuing education and acquisition of the underlying knowledge extremely important. Extension activities provided by university personnel are an outstanding resource in this regard.

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

As indicated in output #3, in 2014, a total of 9 field days and training sessions were conducted by the combined efforts of Extension Service and Experiment Station personnel. Attendance and interest of participants were high at these events.

#### **Results**

Undoubtedly considerable progress was made in furthering knowledge about recent developments in science and technology related to livestock production, as well as more traditional information about management practices that need to be repeatedly reemphasized. It was not possible to capture the attention and gain the cooperation of all producers attending educational events to obtain their expressed degree of willingness to implement the recommended practices. However, in all cases some producers showed genuine interest and presumably an inclination to take action.

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

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

202	Plant Genetic Resources
205	Plant Management Systems
213	Weeds Affecting Plants
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
306	Environmental Stress in Animals

## **Outcome #2**

### **1. Outcome Measures**

Yearly percentage increase or decrease of on farm income from sale of livestock and related products in Puerto Rico

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

- 1862 Research

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

Change in Action Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2014	1

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

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

The agricultural sector of the Puerto Rican economy now contributes far less than it did historically and far less than it could if adequately attended to. Total income from livestock and related products has shown only modest ups and downs over the past five fiscal years, rather than the sustained progress needed to achieve a reasonable level of food security and revitalize the agricultural economy. If the contribution made by research and extension efforts is not reflected in increased on-farm income, their main goal will not have been achieved and the justification for continued investment of resources in them may be questioned.

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

Extension and research activities have provided important knowledge that livestock producers need to improve efficiency and profitability of their operations. Such results can be achieved, in the case of producers with operations of fixed size, either by obtaining an increase in production with the same inputs or by maintaining the same production with lower inputs. For other producers who are either entering the livestock sector or expanding the size of existing operations, consulting services are provided upon request to verify the economic feasibility of the

proposed expansion and ensure wise initial investment and a cost efficient operation.

### Results

Between fiscal years 2012 and 2014, total on-farm income from livestock and related products (including forages for sale) increased from \$425.7 to \$439.9 millions. The increase represented a relative change of 1.03%. Milk income of \$214 millions represented 48.6% of the total, but showed a relative decline of nearly 1% from the previous year. In second place was poultry meat with \$81.9 millions, which represented a 1.08% increase over the year before. Similar slight relative increases were registered by the pork and beef sectors, whereas income from eggs showed a strong improvement of 25% reaching \$19.3 millions.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
308	Improved Animal Products (Before Harvest)
401	Structures, Facilities, and General Purpose Farm Supplies

### Outcome #3

#### 1. Outcome Measures

Number of animals of genetically improved breeding stock, from the University of Puerto Rico herd, sold to local beef producers to improve the genetic quality of their herds.

#### 2. Associated Institution Types

- 1862 Research

#### 3a. Outcome Type:

Change in Action Outcome Measure

#### 3b. Quantitative Outcome

Year	Actual
2014	136

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

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

Of Puerto Rico's livestock sector, beef producers find it most difficult to operate profitably. Unregulated beef imports make for an unlevel playing field as local producers have higher production costs and have to comply with more stringent sanitation and environmental protection regulations than those of exporting countries. In addition, Puerto Rico lacks a beef classification system; price discrimination is common against female animals and generally low prices paid for animals sold for slaughter. A number of these problems are beyond the scope of scientific research and extension, but one important contribution that our institution can make is to provide

breeding stock to genetically improve commercial beef cattle herds, thus helping to make them more profitable.

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

The beef cattle research project at Mountain Farm in north-western Puerto Rico has developed an excellent herd of the Senepol breed and crossbred animals of Senepol with several other well-known beef breeds. For more than 25 years, surplus animals beyond those needed for herd development or use in specific experiments, have been sold to be incorporated into commercial beef cattle herds.

#### **Results**

In the annual sale of 2014, a total of 136 animals were sold, including 40 bulls, 40 adult cows, 27 heifers, 18 male and 11 female young animals. The buyers were owners of 17 different commercial herds located in the west (83), north (43), south (7) and east (3) regions of the island (in parenthesis, number of animals acquired in each case). The addition of these genetically superior animals to the commercial herds, which in many cases were previously composed of unselected animals, has raised the average level of genetic potential for productive performance, and carcass and meat quality. Furthermore, it has made beef producers more aware of the need for genetic improvement of their herds.

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

<b>KA Code</b>	<b>Knowledge Area</b>
303	Genetic Improvement of Animals
308	Improved Animal Products (Before Harvest)

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

##### **External factors which affected outcomes**

- Economy
- Appropriations changes
- Public Policy changes
- Other ((see below))

##### **Brief Explanation**

- Continued long-term economic recession in Puerto Rico with effects on consumer purchasing power and food selection
- Lack of long-term government planning for the agricultural sector, no continuity, subject to changes in focus and the government incentives accompanying every 4-year electoral cycle
- Insufficient private sector investment in agricultural enterprises
- Continued conversion of land from agriculture to other uses and under-utilization of the agricultural lands still remaining
- Unpredictability of future costs of petroleum and its derived products needed for on-farm production and processing and distribution of local food; also costs of imported feed grains
- Lack of a sufficient number of young people, well prepared, willing and financially able

to engage in productive agriculture with successful results

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

#### **Evaluation Results**

Satisfactory progress is observable in the gradual integration of scientific personnel of the two agencies, Agricultural Experiment Station and Agricultural Extension Service, in planning and carrying out research pertinent to the needs of the local livestock industries, and dissemination to stakeholders of the knowledge gained from such research.

Key Items used for judging the progress of the program:

1. Attendance of producers at educational activities and their level of interest in acquiring useful knowledge with possible applicability on their farms, and the dialogue in which producers make known to university personnel the problems that they face that might be amenable to further scientific research.
2. Willingness of some producers to have research under UPRM auspices carried out at their private farms.

#### **Key Items of Evaluation**