

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Global Food Security and Hunger - Poultry

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 | 10% | | 8% | |
| 302 | Nutrient Utilization in Animals | 10% | | 68% | |
| 303 | Genetic Improvement of Animals | 0% | | 8% | |
| 305 | Animal Physiological Processes | 10% | | 5% | |
| 306 | Environmental Stress in Animals | 10% | | 0% | |
| 307 | Animal Management Systems | 10% | | 0% | |
| 308 | Improved Animal Products (Before Harvest) | 10% | | 0% | |
| 311 | Animal Diseases | 10% | | 11% | |
| 312 | External Parasites and Pests of Animals | 10% | | 0% | |
| 313 | Internal Parasites in Animals | 10% | | 0% | |
| 315 | Animal Welfare/Well-Being and Protection | 10% | | 0% | |
| | 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 | 1.0 | 0.0 | 2.0 | 0.0 |
| Actual Paid Professional | 1.3 | 0.0 | 1.7 | 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 |
| 33739 | 0 | 30567 | 0 |
| 1862 Matching | 1890 Matching | 1862 Matching | 1890 Matching |
| 33739 | 0 | 472069 | 0 |
| 1862 All Other | 1890 All Other | 1862 All Other | 1890 All Other |
| 0 | 0 | 651712 | 0 |

V(D). Planned Program (Activity)

1. Brief description of the Activity

Extension personnel will communicate with poultry producers and the general public through seminars, workshops, and extension bulletins and newsletters distributed in paper copy and electronically via the internet. Field demonstrations may also be required to encourage acceptance of new practices and methodologies. Results of research projects will also be published in peer-reviewed scientific journals. Research disseminated to the stakeholders will consist of, but is not limited to, the following:

- Flock hatchability and fertility
- Male broiler breeder viability measurements
- Dietary and managerial regimes to decrease layer Mycoplasma infections
- Optimizing early chick performance through: broiler and breeder nutrition, embryo physiological assessment, incubation management, and physiological assessment
 - Applied nutrition with feed additives and alternative feed ingredients
 - Ammonia management in broiler houses: minimization of nitrogen input, ammonia chemical modification and capture, and ammonia impacts on bird performance
 - Minimization of physiological stress in broilers and layers
 - Understanding broiler intestinal microorganisms and their role in nutrient utilization and disease
 - Identification of physiological responses associated with poultry welfare.

2. Brief description of the target audience

The target audience for this program consists of commercial poultry producers and related industry personnel.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

| 2012 | Direct Contacts Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---------------|------------------------|--------------------------|-----------------------|-------------------------|
| Actual | 1121 | 187 | 0 | 0 |

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

Patent Applications Submitted

Year: 2012

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

| 2012 | Extension | Research | Total |
|---------------|-----------|----------|-------|
| Actual | 1 | 55 | 0 |

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

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

| Year | Actual |
|------|--------|
| 2012 | 218 |

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 increasing production efficiency. |
| 3 | Number of producers reducing the environmental impact of production. |

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

| Year | Actual |
|-------------|---------------|
| 2012 | 44 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Meat and Poultry producers and processors as well as other food producers and processors must comply with various aspects of the new Food Safety and Modernization Act of 2011. USDA has similar programs that are currently voluntary. USDA is pushing for 90% of all plants to have an active and workable Food Defense Plan by Jan. 2015. If not, then it most likely will be mandatory and the southeast U. S. is behind by more than 20% compliance with this expectation.

What has been done

A program for meat and poultry processors was developed and offered in three different locations across Mississippi in September 2012. The USDA's Pathogen Reduction and Hazard Analysis Critical Control Point (HACCP) regulation states that certain functions in the processing plant be conducted by certified personnel and/or HACCP trained individuals. Trainers in the Department of Food Science, Nutrition, and Health Promotion put together a one day training program with training materials for producers and processors in the industry.

Results

Forty-one industry personnel from MS, TN, and AL attended the programs. Sixty-eight percent of participants showed improvement in post-test scores. For food processors to be eligible to bid on government food contracts (i.e., school lunch, military), they must have a workable Food Defense plan in place. For example, the pork, lamb, chicken and fish industries in August of 2012 were offered the opportunity to bid for \$170 million of these products through federal purchase programs. Without a food defense plan in place, the contracts would not be considered. These trainings will allow multiple businesses the opportunity to bid on various food contracts while increasing their profitability and enhancing overall food safety.

4. Associated Knowledge Areas

| KA Code | Knowledge Area |
|----------------|---|
| 301 | Reproductive Performance of Animals |
| 302 | Nutrient Utilization in Animals |
| 305 | Animal Physiological Processes |
| 306 | Environmental Stress in Animals |
| 307 | Animal Management Systems |
| 308 | Improved Animal Products (Before Harvest) |
| 311 | Animal Diseases |
| 312 | External Parasites and Pests of Animals |
| 313 | Internal Parasites in Animals |
| 315 | Animal Welfare/Well-Being and Protection |

Outcome #2

1. Outcome Measures

Number of producers increasing production efficiency.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

| Year | Actual |
|-------------|---------------|
| 2012 | 35 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In 2012, the Mississippi poultry industry produced 758,000,000 broilers with a farm gate value of \$2.32 billion on 1478 farms. Additionally, 288 farms produce 1.3 million eggs with a farm gate value of \$201 million. Two issues of economic importance to the poultry industry in Mississippi are Mycoplasma gallisepticum (MG) infection in laying hens and embryo development and hatchability of broilers. MAFES researchers are investigating ways to improve the nutrition and growth of the state's most profitable bird.

What has been done

Chicken embryos are made up of water, protein and fat. To get energy to hatch, protein and fat are converted into carbohydrates. So hatchlings can reserve fat and protein for growth, MSU scientists are injecting eggs (in ovo injection) with carbohydrates before they hatch. Poor hatchability can also occur due to eggshell bacterial contamination. While this can be decreased by UV light or hydrogen peroxide, the antimicrobial effects of these two treatments combined are unknown. MAFES scientists are testing these combined treatments.

Results

Research indicates that in ovo injection of carbohydrates can provide benefits to commercially grown poultry with an earlier increase in body weight and good hatching. Scientists are also experimenting with injection of vitamin supplements. Results of anti-microbial egg treatments have shown that the combined treatments further reduced bacterial contamination compared with each treatment individually, supporting greater hatchability of chicks.

4. Associated Knowledge Areas

| KA Code | Knowledge Area |
|----------------|--|
| 301 | Reproductive Performance of Animals |
| 302 | Nutrient Utilization in Animals |
| 305 | Animal Physiological Processes |
| 306 | Environmental Stress in Animals |
| 307 | Animal Management Systems |
| 311 | Animal Diseases |
| 312 | External Parasites and Pests of Animals |
| 313 | Internal Parasites in Animals |
| 315 | Animal Welfare/Well-Being and Protection |

Outcome #3

1. Outcome Measures

Number of producers reducing the environmental impact of production.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

| Year | Actual |
|-------------|---------------|
| 2012 | 17 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Maintaining a safe, nutritious, and environmentally sustainable food supply is of paramount importance, especially as the world population grows toward nine billion by 2050. Global food security is a MAFES, Extension, and university priority, and our scientists are in position to discover solutions for critical food supply issues. MAFES and Extension Station expertise in food safety and quality includes every aspect of production, harvesting, processing, packaging, and preparation.

What has been done

MSU scientists in Poultry Science and Agricultural and Biological Engineering develop poultry litter management systems that improve profitability, control harmful pathogens, and minimize environmental impacts. One study evaluates new methods of reducing poultry exposure to pathogenic bacteria which harm consumers and reduce broiler industry profits. The study examines how poultry house litter management can help prevent these problems, as well as offsite transmission of pathogens in poultry litter used for fertilizer.

Results

Scientists found that bacterial concentrations are reduced and other benefits are achieved when litter is treated using a process called "windrowing," in which litter is piled in rows down the length of a broiler house. Heat generated in the composting piles partially sterilizes the litter. Changes in other variables, such as pH, ammonia, and moisture, may also play a role in improving litter quality and need further study. MAFES scientists also studied the role of vertical transmission, the process by which adult chickens spread bacteria to their offspring.

4. Associated Knowledge Areas

| KA Code | Knowledge Area |
|---------|--|
| 302 | Nutrient Utilization in Animals |
| 307 | Animal Management Systems |
| 311 | Animal Diseases |
| 313 | Internal Parasites in Animals |
| 315 | Animal Welfare/Well-Being and Protection |

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Government Regulations
- Competing Programmatic Challenges

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