V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Food Safety

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	100%	100%	100%	100%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Actual	8.0	1.5	5.0	1.5

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
329201	131608	276520	144222
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
329201	131608	276520	144222
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
658402	263216	540382	288444

V(D). Planned Program (Activity)

1. Brief description of the Activity

Food Safety for Everyone: UME Educators partnered with local churches, child care providers, agency food service staff, the Office on Aging, Southern Maryland Food Bank, assisted living personnel and Boards of Education to provide up-to-date food safety training during 2010. The program focuses on

foodborne illness, personal hygiene, cross-contamination, and temperature matters. In 2010, a fifth module focusing on Food Safety Updates was added. Participants received food safety certificates or 3 CEU's enabling them to meet job requirements. In addition, the program is delivered in a three-week online continuing education course for child care providers. The curriculum has also been made available to the public nationwide via eXtension.org and the Extension EDEN websites.

Animal Health and Biosecurity: UME provided small flock owners access to biosecurity training geared toward their needs, and supplied them with the tools and resources to help them prevent, control, or rapidly respond to any avian disease outbreak. Biosecurity workshops and educational material have led to better AI prevention and control measures. UMES research is focused on the study of molecular characterization and predictive modeling of Salmonella spp.

Food Safety Research: Research at UMES is addressing microbial contamination of fresh produce by pathogenic microorganisms by investigating efficacy of on-farm treatments for surface water sources, stability measures for manure-based products, and transport of E.coli and Salmonella by flying insects. Another research project involves integrating specialty crops in organic culture for safe production. The evaluation of practical post-harvest mitigation strategies to reduce the abundance of Vibrio bacteria in molluscan shellfish is being conducted by UMES.

Research at MAES has focused on:

- Developing, pilot-testing, and, evaluating an integrated multifunctional food safety training program targeting the continuum from food preparation to packaging to delivery of meals to the home to proper storage of food within the home.
- Developing of silver-food protein composites for antimicrobial packaging.
- Developing novel natural shelf-life enhancers for food utilization from the agricultural products and the by-products from agriculture and food processing.
- Reducing the cost and environmental impacts of chemical inputs to horticultural crops and increasing the safety of the food supply.
- Characterization of bacteriophage endolysins for antimicrobial use against pathogens.

2. Brief description of the target audience

Food Safety for Everyone: Churches, child-care providers, agency food-service staff, offices on aging, food banks, assisted living personnel, boards of education, Extension educators.

Animal Health and Biosecurity: Farmers; youth; MDA; Agricultural industry; Small and Beginning farmers; Backyard livestock owners; Extension faculty; Research faculty; and the Scientific Community. Students (undergraduate and graduate); stakeholder farmers; additional state and federal collaborators

Food Safety Research: Farmers; youth; MDA; Agricultural industry; Small and Beginning farmers; Backyard livestock owners; Extension faculty; Research faculty; and the Scientific Community. Students (undergraduate and graduate); stakeholder farmers; additional state and federal collaborators

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA	{NO DATA	{NO DATA	{NO DATA
Actual	1887	0	0	0

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

Patent Applications Submitted

Year: 2010

Plan:

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	2	25	27

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Factsheets & publications, curricula, partnerships, in-services, train-the-trainer sessions, workshops, grants, web sites, social media networks

Year	Target	Actual
2010	{No Data Entered}	200

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Food Safety is for Everyone: # following key recommendations of food safety--clean, separate, cook, and chill; # planning to thaw frozen foods in refrigerator instead of on kitchen counter; # planning to use food thermometer to monitor temperature of potentially hazardous foods; # planning to wash fruits and vegetables before eating or preparing them to serve.
2	Molecular Characterization and Predictive Modeling of Salmonella spp. Recovered From Processed Poultry. Immobilization of bioluminescent Escherichia coli cells using natural and artificial fibers treated with polyethyleneimine

Outcome #1

1. Outcome Measures

Food Safety is for Everyone: # following key recommendations of food safety--clean, separate, cook, and chill; # planning to thaw frozen foods in refrigerator instead of on kitchen counter; # planning to use food thermometer to monitor temperature of potentially hazardous foods; # planning to wash fruits and vegetables before eating or preparing them to serve.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	5000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
During the past 30 years, there has been an increased incidence of food borne illnesses. Currently, one in four Americans suffers from food borne illness each year. Some foods, such as fruits and vegetables, are often consumed raw or with limited preparation. It is important that producers and consumers practice safe food handling to decrease the burden of food borne illness.

What has been done
Food Safety Classes taught; Food Safety integrated into nutrition and food preparation classes; Food Preservation workshops conducted; online food safety course developed and implemented; Mass Media; newsletters; new partnerships developed; new farm to school initiative developed; fact sheet developed; exhibits and brochures developed; health fairs. Research on the pathogenic prevention, anti-aging, anti- colon cancer was conducted with excellent outcomes.

Results
Met the needs of residents requesting home preservation education and skills by offering training. 85% of participants understood food safety concerns for preserving foods at home (n=59). 35% intend to wash fruits and vegetables before eating and/or preparing them (n=107). 63% intend to cook and chill food to a safe temperature using a food thermometer (n=92).

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #2

1. Outcome Measures

Molecular Characterization and Predictive Modeling of Salmonella spp. Recovered From Processed Poultry. Immobilization of bioluminescent Escherichia coli cells using natural and artificial fibers treated with polyethyleneimine

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	150

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Food of animal origin, especially poultry and poultry products, has been implicated in outbreaks of human salmonellosis. Recently, a number of investigators have suggested that processing conditions may play a significant role in promoting/influencing the selection of antimicrobial resistant pathogens during processing. Little information is available about the association between the presence of virulence factors in Salmonella spp. and their potential for causing human illness. The main goal of this project is to characterize Salmonella spp. recovered from processed poultry.

What has been done
A total of 309 (146 pre- and 163 post-chill) isolates recovered from processed poultry were tested for the presence of Salmonella virulence genes invA, pagC, and spvC by PCR. Bioassays were used to evaluate aerobactin and colicin production. Artificial and natural fibers treated with polyethyleneimine were sucessful in immobilizing the bioluminescent E. Coli, which has a great value in food inspection.

Results
All isolates contained invA and pagC but only 1.3 percent contained spvC. All spvC positive isolates were S. Typhimurium--one of them was recovered from pre-chill and the other three were recovered from post-chill. There was no significant difference (P> 0.05) in the presence of virulence factors between pre- and post-chill isolates. The results suggest that Salmonella isolates recovered from pre- and post-chill whole broiler carcasses can possess virulence factors

and thus have the potential to cause salmonellosis. The research also indicates that chilling had no effect on virulence factors of Salmonella.

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Public Policy changes
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

Limited budgets have resulted in limitations in the laboratory equipment and hiring of graduate students to conduct further research in the overall food safety area at UMCP's College of Agriculture and Natural Resources.

UME continues to develop and deliver programs in this area, but continued capacity-building is needed to address this issue.

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

1. Evaluation Studies Planned

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}