

# 2010 University of Maryland and University of Maryland - Eastern Shore Combined Research and Extension Annual Report of Accomplishments and Results

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## I. Report Overview

### 1. Executive Summary

The 2010 Accomplishment Report consists of the University of Maryland Extension (UME) and Maryland Agricultural Experiment Station (MAES) results and accomplishments. UME and MAES at the University of Maryland College Park (UMCP) are in partnership with the University of Maryland Eastern Shore (UMES), and, as such, they coordinate their research and extension activities to the maximum extent possible.

In 2009, UME developed a new strategic plan to reflect the priorities of the University of Maryland and the National Institute of Food and Agriculture. The new strategic plan forms the framework for the 2012-2016 Plan of Work and annual Accomplishment Reports for those years. Similarly, MAES has developed its POW for 2012-2016 using the framework identified by NIFA.

The plan for UME emphasizes key outcomes, impacts in critical areas, and "marshaling our intellectual resources" into nonformal educational programs that work together to deliver measurable results for the economy, the environment, and the community. This approach parallels that of UMCP, UMES, MAES, and the College of Agriculture and Natural Resources to achieve impact on the big societal issues important to Maryland and, ultimately, to the global community.

The UME impact areas (referred to as Initiatives 1-4) represent major programmatic initiatives that UME directs resources to accomplish. These impact areas are a broad-based method of dividing the critical needs identified by the planning process into manageable units. Key outcomes are the goals within each impact area. Impact leadership teams consist of field-based Extension Educators, Extension Specialists, and Faculty Extension Assistants who work together to provide overall statewide leadership for programmatic efforts. These teams are responsible for collectively achieving the goals, measuring the impacts using suitable evaluation methods and tools, and reporting findings to stakeholders. Impact teams are linked to each other through common target and primary audiences served, the topics and subjects taught, and outcomes and impacts achieved. Impact leadership teams, across the major programmatic initiatives, develop signature programs that are replicable, measurable, and recognized at the state and national levels.

The MAES coordinates its research projects in the challenge areas identified by the USDA-NIFA. Its research focus ranges from plant and animal genomics to nutrients, health, environment, and economics of production systems. Both basic and applied research are conducted by the faculty to cover the topics of important value to animal and plant production systems with both environmental and economic sustainability.

The four major program areas in the UME and MAES strategic plans are:

#### **Initiative 1: LOCAL FOOD & AGRICULTURE SYSTEMS**

Key Outcome: Agriculture and food production will be sustainable and profitable and produce a safe, abundant, affordable, and accessible food supply.

This initiative is reported under Planned Program, "Global Food Security and Hunger."

#### **Initiative 2: ENVIRONMENT AND NATURAL RESOURCES**

Key Outcome: Individuals and communities will become stewards to manage the environment for the mutual benefit of people, ecosystems, wildlife, natural resources, and economic interests.

This initiative is reported under Planned Programs, "Climate Change" and "Sustainable Energy."

**Initiative 3: HEALTHY LIVING**

Key Outcome: Youth, individuals, and families will make informed decisions about their health, finances, food, housing, and overall well-being.

This initiative is reported under Planned Programs, "Childhood Obesity," "Food Safety," and "Family & Community Resiliency."

**Initiative 4: RESILIENT COMMUNITIES**

Key Outcome: Improve human capacity to achieve desired community outcomes and be prepared to respond to uncertainties of economics, health, climate, and security.

This initiative is reported under Planned Programs, "Childhood Obesity, Food Safety," and "Family & Community Resiliency."

**Total Actual Amount of professional FTEs/SYs for this State**

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	120.0	12.0	73.0	15.0
Actual	80.0	14.5	54.0	15.0

**II. Merit Review Process**

**1. The Merit Review Process that was Employed for this year**

- Internal University Panel
- External University Panel
- External Non-University Panel
- Combined External and Internal University Panel
- Combined External and Internal University External Non-University Panel
- Expert Peer Review

**2. Brief Explanation**

The merit review process for UME faculty occurs annually when the faculty member is formally evaluated by the Program Leader (Assistant Director). The AGNR Program Leader evaluates AGNR Educators and Specialists; FCS Program Leader, the FCS Educators and Specialists; and the 4-H Program Leader, the 4-H Educators and Specialists. Input is obtained from the County Extension Director (CED) or Area Extension Director (AED). Emphasis is placed on program impacts and the difference made to constituents and the residents of Maryland during the preceding 12 months. Each faculty member is evaluated on individual merit. Documents used for the merit review are approved Individual Extension Plan (IEP), Curriculum Vitae, MCERS reports, and Teaching Effectiveness Summary.

All research faculty have a departmental home, and while there are subtle differences between the departments, they all have a peer-review system wherein assigned faculty or a faculty committee review the annual performance criteria of each faculty member and assign a merit ranking. These criteria, from a research perspective are evaluated, in general, on grantsmanship, publications, the quality of the journal (based on a citation index), and invited and/or contributed scientific talks and seminars. These are also the

same criteria that are used to evaluate promotion and tenure decisions. The peer committee recommendations are reported to the respective department chair who provides his/her input and then provides a final ranking and conducts the annual review. This process is followed for tenured, tenure-track, and research faculty appointments.

### **III. Stakeholder Input**

#### **1. Actions taken to seek stakeholder input that encouraged their participation**

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of the general public
- Survey specifically with non-traditional groups
- Survey of selected individuals from the general public
- Other (Participate in workshop and conferences to obtain input from participating scientists and industry personnel on research projects with respect to soundness of methods and interpretation of data)

#### **Brief explanation.**

Stakeholder participation is encouraged through local Extension Advisory Councils, 4-H Club leaders (volunteers), and various surveys targeted to UME clients. The UME customer satisfaction survey is deployed in three-year cycles to insure that existing stakeholders are being heard. Social media strategies are also now being used to solicit feedback (Facebook, web sites, blogs).

The administrative officers of the Maryland Agricultural Experiment Station and UME sit on and attend a wide array of committees with the State's agricultural leaders. Such continuous contact with the agricultural leadership, including the Maryland Secretaries of Agriculture, Natural Resources and Environment, provides additional contact to keep current the research and education issues examined by research and extension in the State's two land-grant universities. The groups include the Maryland Agricultural Commission, the Maryland Grain Producers Association, the Delmarva Poultry Industry, the Southern Maryland Agriculture Commission, the Maryland Association of Soil Conservation Districts, Department of Housing and Community Development, Maryland Department of the Environment, and many other similar groups. Both research and extension faculty also seek stakeholder inputs through their participation and presentation of their projects to stakeholder audiences in state, regional, and national workshops and conferences.

**2(A). A brief statement of the process that was used by the recipient institution to identify individuals and groups stakeholders and to collect input from them**

**1. Method to identify individuals and groups**

- Use Advisory Committees
- Use Internal Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys
- Other (Participate in workshops and conferences)

**Brief explanation.**

The UME Customer Satisfaction Survey was a scientific sample of UME customers. The survey sample was drawn from the UME customer database--an aggregate of all county and city customer databases across all program areas.

End-of-class surveys are used to gather input from individuals attending UME workshops and other events.

The College of Agriculture and Natural Resources utilizes a Dean's Leadership Council consisting of a broad cross-section of agricultural industry leaders to provide input on major directions for the College's research, teaching and extension agenda. The Advisory Council meets periodically to discuss rising issues in the State.

The administrative officers of the Maryland Agricultural Experiment Station and UME sit on and attend a wide array of committees with the State's agricultural leaders. Such continuous contact with the agricultural leadership including the Maryland Secretaries of Agriculture, Natural Resources and Environment provides additional contact to keep research and education issues examined by the research and extension in the State's two land grant universities current. The groups include the Maryland Agricultural Commission, the Maryland Grain Producers Association, the Delmarva Poultry Industry, the Southern Maryland Agriculture Commission, the Maryland Association of Soil Conservation Districts, Rural Maryland Council, MARBIDCO, and many other similar groups.

**2(B). A brief statement of the process that was used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them**

**1. Methods for collecting Stakeholder Input**

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting with the general public (open meeting advertised to all)
- Survey specifically with non-traditional groups
- Meeting specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public

**Brief explanation.**

UME draws upon the expertise of approximately 125 UME Educators, Specialists, and administrators in ongoing, informal needs assessment. UME field-based educators solicit feedback

from local Extension Advisory Councils and other stakeholder groups. Survey work with all groups participating in programs is performed on a regular basis to assess needs. Analysis of secondary data for Maryland is also used, including data from the U.S. Census, USDA National Agricultural Statistics, Maryland Departments of Planning, Agriculture, Natural Resources, Economic Development, and Maryland Department of Health and Mental Hygiene (and many more) and environmental scanning at the national, regional, state, and local levels.

MAES has identified state agencies such as the Maryland Department of Agriculture, Maryland Department of Natural Resources, and Maryland Department of Environment as stakeholders for the important role that they play in economics, environmental, diseases, and public policies related to diverse land uses. MAES scientists also have identified USDA-ARS scientists from Beltsville, Maryland, as stakeholders due to their common research interests. In addition, our own UME educators are the best research stakeholders because they often use the results of research conducted by the MAES scientists to respond to questions from the public across the state. Therefore, MAES collects input from all these entities by participating in joint committee meetings and other related communication platforms (e.g., workshops, conferences, etc.). MAES has also formed a Faculty Research Council composed of both research and extension faculty that will serve as another body of stakeholder input to identify research needs in 2010 and beyond.

### **3. A statement of how the input will be considered**

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans
- To Set Priorities
- Other (Strategic Plan Development)

#### **Brief explanation.**

This information was used to: Set program priorities for our strategic plan 2006-2011; determine statewide staffing plans for UME; develop new job descriptions for county and regional extension positions; develop new initiatives for the College and UME; allocate financial resources, primarily operating expenses for program and curriculum development; and, to assist in revamping strategic initiatives as needed to deal with current budgetary shortfalls and staffing challenges.

MAES used the information obtained from the stakeholders to focus on research issues that are important to the state with respect to production, marketing, economics, public-economic-environmental policies, biotechnology, ecosystem services, animal and human health, energy issues, etc. This information, combined with the national priorities set by USDA-NIFA was used to set the research priorities and monitor progress.

#### **Brief Explanation of what you learned from your Stakeholders**

UME and MAES are still vital to the citizens of Maryland. The agriculture community requested that UME spend more time in community resource and economic development, primarily providing support for the small and beginning and young farmers. Topics included: Business and market plan development; Inter-generational transfer of assets; Niche markets; Home based businesses; Rural urban interface issues; and Agricultural awareness. In order to meet this need, there was support for the establishment of a Maryland Rural Enterprise Development Center (MREDC). In addition, there

is a need for enhanced support for the agriculture producers (broadly) of the State in the way of plant clinics and diagnostics. As a result, UME developed a new Plant Protection Center to include not only plant clinics and diagnostic support, but also academic programs and internships for students.

In 2010, the demand continued for agricultural literacy, including understanding the national, state, and local food systems. Maryland's citizens want to know where their food comes from and how to prepare it in ways that are healthy and affordable. In addition, customers continue to ask for information on growing home gardens and food preservation.

Stakeholders are also concerned about how to control chronic diseases that results from non-healthy lifestyles (for example, diabetes education). Family financial issues have dominated many stakeholders' lives in 2008-2010 and they are seeking financial management education.

MAES researchers in cooperation with the UME educators learned that their research should focus on issues needing answers through research; thus, they focused on topics of both state and national importance. Topics included the development of new BMPs to reduce negative agricultural impacts on water quality, especially the Chesapeake Bay; development of new varieties of crop seeds that are disease resistant; genomics on plants and animals for efficient storage of nutrients and reduction of such nutrients as phosphorus in the animal waste, thus helping to minimize nutrient loading to stream systems via runoff; study of the H1N1 virus and its vector of transmission; and alternate uses of tobacco such as pharmaceutical purposes.

#### IV. Expenditure Summary

<b>1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)</b>			
<b>Extension</b>		<b>Research</b>	
<b>Smith-Lever 3b &amp; 3c</b>	<b>1890 Extension</b>	<b>Hatch</b>	<b>Evans-Allen</b>
3292015	1316080	2765199	1442218

<b>2. Totaled Actual dollars from Planned Programs Inputs</b>				
<b>Extension</b>			<b>Research</b>	
	<b>Smith-Lever 3b &amp; 3c</b>	<b>1890 Extension</b>	<b>Hatch</b>	<b>Evans-Allen</b>
<b>Actual Formula</b>	3292015	1316080	2765199	1442218
<b>Actual Matching</b>	3292015	1316080	2765199	1442218
<b>Actual All Other</b>	6584030	2632160	5403826	2884437
<b>Total Actual Expended</b>	13168060	5264320	10934224	5768873

<b>3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous</b>				
<b>Carryover</b>	0	0	0	0

**V. Planned Program Table of Content**

<b>S. No.</b>	<b>PROGRAM NAME</b>
1	Global Food Security and Hunger
2	Climate Change
3	Family & Community Resiliency
4	Sustainable Energy
5	Childhood Obesity
6	Food Safety

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

**Program # 1**

**1. Name of the Planned Program**

Global Food Security and Hunger

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	10%	10%	15%	20%
205	Plant Management Systems	10%	10%	10%	20%
216	Integrated Pest Management Systems	15%	10%	10%	15%
311	Animal Diseases	10%	10%	10%	10%
503	Quality Maintenance in Storing and Marketing Food Products	5%	10%	5%	0%
601	Economics of Agricultural Production and Farm Management	10%	10%	10%	15%
602	Business Management, Finance, and Taxation	10%	10%	10%	0%
604	Marketing and Distribution Practices	10%	10%	10%	0%
608	Community Resource Planning and Development	10%	10%	10%	10%
704	Nutrition and Hunger in the Population	10%	10%	10%	10%
	<b>Total</b>	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
Plan	38.0	6.0	20.0	6.0
Actual	24.0	4.0	16.0	4.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
987605	394824	829559	432665
1862 Matching	1890 Matching	1862 Matching	1890 Matching
987605	394824	829559	432665
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1975210	789648	1621148	865331

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

### 1. Brief description of the Activity

**Integrated Pest Management (IPM):** Sixty two percent of the commercial MD greenhouses are actively participating in TPM/IPM programs with hired professional scouts or using Extension trained personnel to monitor their crops. UMES research is focused on protective clothing for pesticide applicators.

**Invasive species:** UME focused on control strategies for the brown marmorated stink bug to minimize crop losses. A field and laboratory study was conducted at UMES to: (i) Isolate indigenous spore-forming bacteria expressing delta-endotoxins with Bt comparable potential as bio-insecticides; (ii) Determine host plant interaction through foliage defoliation; and (iii) Assay the relative importance of genotype x insect interaction.

**Animal health and Biosecurity:** UME provided small flock owners biosecurity training and supplied them with tools to help prevent, control, or respond to avian disease outbreak. UMES research is examining the impact of possible natural anthelmintics on meat quality in sheep and goats. MAES research focused on investigating knowledge gaps in the pathogenesis and recurrence of infectious laryngotracheitis (ILT) on the Delmarva Peninsula; engineering a novel vaccine that protects both infectious laryngotracheitis and Newcastle disease.

**Rural Community Resource & Economic Development:** The Maryland Rural Enterprise Development Center (MREDC) provided programs in 1) Mastering Marketing and, 2) Curbside Consulting for business development and market planning.

**Small Farm Outreach:** The annual small farm conference was held to inform about new farming techniques, direct marketing opportunities, and strategies to increase profitability and sustainability. The Small Landowner Forestry and Conservation field tours on the Lower Eastern Shore educate farmers about forest resource management strategies and cost-share/conservation programs available.

**Alternative Agriculture Crops:** Approximately 2,360 producers attended educational workshops and twilight tours on alternative crops and 534 on organic crops.

**Urban Food Production:** The Grow it Eat it program has created GIEI teams in 15 counties and Baltimore City to help homeowners with backyard food production.

**Nutrient Management:** UME advisors have written 620 new traditional nutrient management plans and updated 4,190 plans along with 74 manure transport plans. Twenty-seven workshops were held and 545 nutrient management consultants were trained.

**Crop Production:** UMES research addressed the development and implementation of a multimicrobial and multifunctional inoculant for enhancing soybean productivity and environmental quality and introducing a cowpea as a crop to ensure food security, sustainable crop production, and water quality. MAES research focused on developing genomic and genetic resources for a diploid strawberry; identifying problem weeds, studying the biology of these weeds, and determining optimum way to manage weeds to reduce their impact on crop production; developing cost-effective sensor network tools that will

enable farmers to make better irrigation management decisions; assessing and identifying the diversity of specific groups of fungi associated with woody trees.

## 2. Brief description of the target audience

**Integrated Pest Management:** Crops: Crop scouts; Certified Crop Advisors; Chemical reps; Industry personnel; Extension faculty; Master Gardeners; Farmers. Green Industry: Arborist, landscape managers, professional ground managers, greenhouse growers, cut flower growers, homeowners, Master Gardeners; Agency personnel (MDA, UME, USDA); Certified pesticide applicators in categories III, IV, V; Private pesticide applicators; Technicians; Undergraduate and Graduate students; General public (e.g. Master-gardeners); IPM consultants; Landscape architects; Community Gardeners; Builders and Developers; Municipalities; Federal, state & local agencies; Scientific Community.

**Invasive species:** Crops: Crop scouts; Certified Crop Advisors; Chemical reps; Industry personnel; Extension faculty; Master Gardeners; Farmers. Green Industry: Arborist, landscape managers, professional ground managers, greenhouse growers, cut flower growers, homeowners, Master Gardeners; Agency personnel (MDA, MCE, USDA); Technicians; Undergraduate and Graduate students; General public (e.g. Master-gardeners); IPM consultants; Landscape architects; Community Gardeners; Builders and Developers; Municipalities; Federal, state & local agencies; Scientific Community.

**Rural Community Resource & Economic Development:** Southern Maryland Agricultural Development Commission; MARBIDCO; Chesapeake Fields; Garrett-Preston Rural Development Association; Rural Development Center at UMES; Local Agricultural Development Specialists; Planning and Zoning Boards; Farmers; Forest Landowners; General public; Food processors; Producers; Growers; Grain marketing clubs; Farmers markets; Local economic development offices; Mid-Atlantic Direct Marketing Association. Youth audiences and 4-H volunteers carry out entrepreneurship focused projects within urban agriculture. County agricultural marketing specialists; Farmer markets, Farmers; Maryland citizens; Local economic development offices.

**Small Farm Outreach:** Aspiring farmers, producers, landowners.

**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

**Alternative agriculture crops:** Producers; Transitional farmers; New &/or beginning farmers; Farmers markets; Local restaurants; MARBIDCO; County agricultural marketing specialists; Maryland Department of Agriculture; National Colonial Farms; and the Scientific Community. Commercial plant growers, plant breeders, retailers, and local home gardeners

**Urban food production--Grow It Eat It (GIEI) program:** General public; retailers; local home gardeners; schools and other K-12 educational programs; 4-H youth; Master Gardeners; local restaurants; community gardeners; local government officials interested in "greening" of urban areas; small farmers.

**Nutrient Management:** Individual landowners; agribusinesses; horse owners; dairy farmers; beef producers; sheep and goat producers; USDA conservationists.

**Crop Production:** Individual landowners, small and large agricultural operations, Extension faculty, and scientific community.

**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>	54000	100000	300	0
<b>Actual</b>	542427	1950300	392	0

**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>	6	40	
<b>Actual</b>	56	83	139

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

**Output Target**

**Output #1**

**Output Measure**

- 1. IPM: Fact sheets; short courses, field trials, curriculum, websites linked, grants awarded.

Year	Target	Actual
2010	35	22

**Output #2**

**Output Measure**

- 2. Community Resource & Economic Development: Publications; advisory committees, new enterprises, relationships, laws, programs, curriculum

Year	Target	Actual
2010	40	40

**Output #3**

**Output Measure**

- 3. Biosecurity and Animal Health: In-service training, seminars, publications, grants, presentations, websites linked.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	32	44

**Output #4**

**Output Measure**

- 4. Pasture Management: Pasture walks, variety trials, in-service training, grants, publications, budgets, practices implemented, websites & workshops

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	25	53

**Output #5**

**Output Measure**

- 5. Family Financial Management: Number Workshops, seminars, publications, in-service training, volunteers trained, partnerships, new enterprises, grants.  
Not reporting on this Output for this Annual Report

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

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

O. No.	OUTCOME NAME
1	1. IPM: Number of IPM scouts and producers that can identify threshold level; pest management programs; implementing research based recommendations; certification in Pesticide Safety; field trails.
2	2. Community Resource & Economic Development: Number of business people, advisory groups, development agencies, rural leaders interested in developing ANR businesses and having access to knowledge; Favorable policies created to encourage AGNR enterprises; New AGNR businesses established; Business and marketing plans developed; Number of Communities integrating MCE information for land use decisions and improved growth management concepts; Pubs developed and used to make land use decisions; and Regional collaborations
3	3. Bio-security and Animal Health: Number of: educational seminars held for producers, allied industry personnel and government workers; number of producers implementing biosecurity measures; new training curriculum developed.
4	4. Pasture Management: Number of: farmers adopting best management practices and increasing profitability; new variety trails; Extension, NRCS and SWCD personnel trained; new practices recommended
5	5. Family Financial Management: Number of: volunteers trained; new partnerships developed; new enterprises; Number who: comparison shop for best credit terms; pay more than minimum on credit cards; pay credit card bills on time; reduce their debt; develop/review estate plan; track family income and spending; develop a spending plan/budget.
6	6. Urban Agriculture: # of participants in urban gardening food production classes, seminars, programs, trainings; # of participants in urban forestry classes, seminars, programs, trainings,

## **Outcome #1**

### **1. Outcome Measures**

1. IPM: Number of IPM scouts and producers that can identify threshold level; pest management programs; implementing research based recommendations; certification in Pesticide Safety; field trails.

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

- 1862 Extension
- 1862 Research
- 1890 Research

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

Change in Knowledge Outcome Measure

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

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	1000	1320

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

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

Nursery, greenhouse and landscape management is Maryland's second largest agricultural industry (valued at \$1.96 billion in 2007). This industry requires cost-effective and environmentally safe materials and methods to control insects and diseases and to efficiently use water and nutrients. The IPM program was developed to help Maryland greenhouse and nursery managers stay on top of current insect, disease and fertility problems with greenhouse crops and to sustain and expand the use of IPM techniques.

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

UME faculty conducted over 150 educational programs reaching over 9,000 people. Sixty two percent of the commercial MD greenhouses are actively participating in TPM/IPM programs with hired professional scouts or using Extension trained in-house personnel to monitor their crops.

#### **Results**

Through educational efforts we have convinced 7 greenhouse operations to install microscreening on newly constructed greenhouse, which greatly reduces the outdoor inward migration of insect pests. As a result of participation in TPM/IPM programs we have reduced pesticide applications by 45 -50% compared to years previous to participation in the program.

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

<b>KA Code</b>	<b>Knowledge Area</b>
216	Integrated Pest Management Systems

**Outcome #2**

**1. Outcome Measures**

2. Community Resource & Economic Development: Number of business people, advisory groups, development agencies, rural leaders interested in developing ANR businesses and having access to knowledge; Favorable policies created to encourage AGNR enterprises; New AGNR businesses established; Business and marketing plans developed; Number of Communities integrating MCE information for land use decisions and improved growth management concepts; Pubs developed and used to make land use decisions; and Regional collaborations

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research
- 1890 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	290	1906

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

**Issue (Who cares and Why)**

Surveys of rural communities indicate an overwhelming need for education programs in financial issues, business planning, sustainable agriculture, entrepreneurship, value-added, alternative enterprises/crops, land use planning, farm profitability and support for small and beginning farmers, rural-urban interface conflicts and AGNR marketing.

**What has been done**

The Maryland Rural Enterprise Development Center (MREDC) is a new on-line Extension initiative providing farmers, agricultural entrepreneurs, and new and beginning farmers a much needed resource. The Curbside Consulting has provided one on one consultation for business development and market planning.

**Results**

Thirty-nine Curbside Consultations have been performed. As a result of direct marketing programs, attendees have increased understanding of the components of different direct markets outlets, the opportunities and threats involved in pursuing any of these outlets, contact information for different outlets, and the profit potential for each.

**4. Associated Knowledge Areas**

**KA Code    Knowledge Area**

503	Quality Maintenance in Storing and Marketing Food Products
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
608	Community Resource Planning and Development

### **Outcome #3**

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

3. Bio-security and Animal Health: Number of: educational seminars held for producers, allied industry personnel and government workers; number of producers implementing biosecurity measures; new training curriculum developed.

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

- 1862 Extension
- 1862 Research

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

Change in Action Outcome Measure

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

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	80	69

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

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

Poultry and egg production is Maryland's largest agricultural industries worth nearly \$1 billion in 2007. A disease outbreak such as Avian Influenza (AI) or exotic Newcastle disease in Maryland's poultry would economically impact poultry growers and processors, and in the case of H5 or H7 AI, would present potential human health risks. These diseases can cause epidemics on poultry farms, loss of export markets, and long expensive quarantines, resulting in large financial losses.

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

This work in biosecurity and animal health 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 responds to any avian disease outbreak. Approximately 41 publications were developed in disease identification, vaccine development and biosecurity.

##### **Results**

Biosecurity workshops, and educational material such as fact sheets and web-based materials, have led to better AI prevention and control measures. It is estimated these programs have saved the industry millions of dollars in losses.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases

#### Outcome #4

##### 1. Outcome Measures

4. Pasture Management: Number of farmers adopting best management practices and increasing profitability; new variety trails; Extension, NRCS and SWCD personnel trained; new practices recommended

##### 2. Associated Institution Types

- 1862 Extension
- 1890 Research

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	250	251

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

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

The dairy industry is important to Maryland agriculture because it produces about \$200 million in gross receipts for Maryland's economy. Urban sprawl leads to high land values, placing added pressures for decreasing farmland and increasing scrutiny on environmental issues such as water and air quality. Our farmers must become efficient in reduced labor cost, reduced feed cost, and increased revenues from value-added products to have profitability.

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

Utilized results of applied research and farm demonstrations to prepare teaching materials for seminars, pasture walks, farm consultations, newsletter articles, and newspaper column.

###### **Results**

Ninety-seven dairy and livestock producers from the Tri-State area participated in pasture walks through which they learned improved management techniques for selecting and implementing alternatives in forage production and feed management systems. Four farms have continued in a grant funded program to convert a total of 200 acres of crop land into pasture. In addition one-hundred sixty four small and part-time farmers learned new pasture management techniques.

#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
601	Economics of Agricultural Production and Farm Management

**Outcome #5**

**1. Outcome Measures**

5. Family Financial Management: Number of: volunteers trained; new partnerships developed; new enterprises; Number who: comparison shop for best credit terms; pay more than minimum on credit cards; pay credit card bills on time; reduce their debt; develop/review estate plan; track family income and spending; develop a spending plan/budget.

Not Reporting on this Outcome Measure

**Outcome #6**

**1. Outcome Measures**

6. Urban Agriculture: # of participants in urban gardening food production classes, seminars, programs, trainings; # of participants in urban forestry classes, seminars, programs, trainings,

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	{No Data Entered}	11920

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

**Issue (Who cares and Why)**

Interest in home and community food production has grown over the past two years in Maryland due to the 2008 recession, and a growing public desire for locally grown foods. Less than 30% of adult Marylanders consume five servings of fruits and vegetables each day. Many Marylanders desire fresh, locally grown vegetables, either to purchase or to grow themselves, but lack the space, time, or knowledge to create and maintain a garden of their own.

**What has been done**

UME Master Gardeners have taught 337 Grow It, Eat It classes and trained over 7,200 people. The GIEI program has developed the University of Maryland Salad Tables and Salad Boxes to help homeowners with backyard food production.

**Results**

The 4,719 residents who took vegetable gardening classes saved approximately \$290,000 on food because of their gardens. Training programs and participants estimated they have reached 14,000+ people with information on Salad Tables and Salad Boxes; 679 Salad Tables and 956 Salad Boxes had been constructed and used as a result.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
704	Nutrition and Hunger in the Population

**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
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

**Brief Explanation**

Overall, we have been able to meet our strategic goals through the use of Impact Teams and more focused programs. We are also doing a better job at reporting impacts.

A strategic staff plan has been developed for UME that focuses on providing adequate geographic and programmatic coverage of tenure-track educators and faculty educator assistants. On the producer side, input costs continue to rise, such as fuel, oil, seed, fertilizer and electricity. There is also the continuing unsteady commodity market and depressed economy in the nation and state that have made it difficult for the farming community to be profitable.

The interest in alternative energy sources has continued growing as the price of oil and gas goes up and disasters have occurred, such as the oil spill in the Gulf. Interest continues in alternative and high value crops.

Research related to food security in terms of efficient, economic, and environmentally sustainable production produced more than 100 refereed publications with novel outcomes related to crop and animal genomics, animal and plant diseases, value added nutritional crop products, vaccine development, and economic analysis of the production.

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

### **1. Evaluation Studies Planned**

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)

### **Evaluation Results**

Specific results are reported in the state defined outcomes. The key items section contains highlighted results.

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

**IPM:** As a result of participation in TPM/IPM programs we have reduced pesticide applications by 45 -50% compared to years previous to participation in the program. A written survey of the 59 growers showed that 86% felt they improved their understanding of diseases, insects and nutrient management monitoring techniques. Seventy nine percent felt they improved their ability to correctly select the least toxic fungicide or insecticide to control greenhouse insect and disease. Ninety-five percent felt they could now correctly calibrate a fertilizer injector and understood how to use a pH and soluble salt meter to monitor nutrient and pH levels in their greenhouse soils. Sixty two percent of the commercial MD greenhouses are actively participating in TPM/IPM programs with hired professional scouts or using Extension trained in-house personnel to monitor their crops.

**Alternative Agriculture Crops:** Approximately 2,360 producers attended educational workshops and twilight tours on alternative crops and 534 on organic crops. Surveys of organic crops events indicated 85% improved their knowledge on weed control options, 100% increased knowledge of tillage effects on weed species populations, 50% increased knowledge on using a commercial source of compost, 62% increased knowledge on using a flamer to control weeds and 62% increased knowledge on using biological control for insect management.

**Urban Food Production:** The 4,719 residents who took vegetable gardening classes saved approximately \$290,000 on food because of their gardens. The GIEI program has developed the University of Maryland Salad Tables™ and Salad Boxes™ to help homeowners with backyard food production. Training programs and participants estimated they have reached 14,000+ people with information on Salad Tables™ and Salad Boxes™; 679 Salad Tables™ and 956 Salad Boxes™ had been constructed and used as a result.

**Nutrient Management:** To help protect the Chesapeake Bay, UME advisors have written 620 new traditional nutrient management plans and updated 4,190 plans along with 74 manure transport plans. Twenty-seven workshops were held and 545 nutrient management consultants were trained and issued required continuing education credits. Eighty three farmers were trained to write their own plans.

**Environmental Stewardship:** Programming on well and septic maintenance led to

50% of participants saving money ranging from \$100 to \$15,000 with an average of \$4,700.

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

**Program # 2**

**1. Name of the Planned Program**

Climate Change

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	10%	10%	15%	0%
111	Conservation and Efficient Use of Water	10%	10%	5%	10%
112	Watershed Protection and Management	15%	20%	10%	20%
123	Management and Sustainability of Forest Resources	5%	5%	5%	5%
131	Alternative Uses of Land	10%	5%	5%	15%
133	Pollution Prevention and Mitigation	10%	10%	25%	10%
205	Plant Management Systems	15%	10%	10%	20%
216	Integrated Pest Management Systems	10%	10%	10%	20%
403	Waste Disposal, Recycling, and Reuse	5%	10%	15%	0%
608	Community Resource Planning and Development	10%	10%	0%	0%
	<b>Total</b>	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
Plan	39.0	1.0	20.0	6.0
Actual	16.0	3.0	11.0	3.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
658403	263216	553040	288444
1862 Matching	1890 Matching	1862 Matching	1890 Matching
658403	263216	553040	288444
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1316806	526432	1080766	576888

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

### 1. Brief description of the Activity

**Water and Nutrient Management (Green Industry) Nutrient and Water Management (Residential):** Programs assisted growers in writing plans through a training program. The following occurred: Applicator (voucher) training; Web-based and face-to-face courses for professionals; and publications. Research was conducted to find best fertilization patterns to help reduce losses to our water systems. MAES research focused on sensor networks will allow farmers to more accurately predict crop water requirements on a daily and seasonal basis.

**Nutrient and Water Management (Residential):** Developed curriculum and resources (fact sheets, print and on-line, and self-diagnostic web site); Conducted workshops, meetings, seminars, and classes such as: Weekly plant clinics, Master Gardener training, Bay-wise training for Master Gardeners and HGIC Phone Consultants.

**Nutrient Management (Commercial Agronomic):** To assist commercial producers, programs and resources were developed, such as: Farmer training and certification; Fundamentals of nutrient management; Publications on soils, soil fertility, nutrient management planning, record keeping, and annual compliance reporting; and updated NuManPro to reflect new recommendations. UMES research focused on determining the effect of increased use of urea and production of the biotoxin domoic acid. MAES research focused on developing a protocol for measuring the sorption of pesticides to thatch and has examined the feasibility of using the elemental content of thatch to predict pesticide sorption to thatch.

**Waste Management:** Conducted applied research and educational programs on using biosolids in deep row application to help grow rapidly growing trees. Field days held to showcase techniques with a focus on MDE, DNR and industry. Conducted applied research and educational programs on how to properly manage poultry litter stockpiles. Regional meetings conducted to help transfer the research findings and utilization of various types of pads beneath stockpiles. Conducted a "Better Composting School" to include both large and small animals.

**Coastal, Chesapeake Bay & Water Resources:** Conducted training programs for lawn companies and grounds managers on the proper application of fertilizers to residential areas. Conducted two half-day courses for lawn care technicians with one section in Spanish to assist the migrant workforce understand proper fertilizer application. Conducted a Master Well Owners Network program that produces a network of trained volunteers to promote proper construction and maintenance of private water systems.

**Management & Sustainability of Forest Resources Land Use:** Workshops, correspondence courses, seminars and field days are conducted to educate landowners and MD/DEL logger's management options. Research was conducted to evaluate the impact of different land use and cropping systems on water quality.

**Integrating Specialty Crops:** Studied various organic practices for safe production of specialty crops on

the Delmarva Peninsula. Surveyed stakeholders, established organic transition research site, assessed food quality and safety from food-borne microorganisms and heavy metals on plants.

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

**Water and Nutrient Management (Green Industry):** Field container nursery and greenhouse producers; Agency personnel (MDA, UME, NRCS, SCD); Certified nutrient management professionals and growers throughout the NE region; Irrigation, IPM and Interiorscapes professionals; General public; Master Gardeners; Other State and National agencies (MDE, EPA, USDA); Policy makers; and arborists, landscape managers, professional ground managers and homeowners. Scientific community was another pool of the target audience that our researchers reached via refereed publications and scientific conferences.

**Nutrient and Water Management (Residential):** Master Gardeners; Builders and developers; Real estate agents; Municipalities; Federal, state and local agencies; Private and non-profit organizations; Green industry; and Outdoor education centers; and the scientific community.

**Nutrient Management (Commercial Agronomic):** Farmers applying nutrients to soil; private consultants writing nutrient management plans; UME, NRCS, MDE, Soil Conservation District professionals, and scientific community.

**Waste Management:** State agencies (MDE, MDA, & DNR); Government officials; EPA; AGNR producers; the Poultry industry; and scientific Community.

**Coastal, Chesapeake Bay and Water Resources:** Homeowners; Master Gardeners; Elected officials; UME faculty; MDE; Farmers; EPA; MDA; Tributary Strategy Teams; and scientific community.

**Management and Sustainability of Forest Resources:** Foresters; Wildlife biologists; Forest landowners; Farmers; Forest industry; Forestry associations; Master Gardeners; UME faculty, Urban-Forest Group in Baltimore-Washington Corridor, and scientific community.

**Land Use:** Elected officials, community leaders, the general public, research community on the issues of land use impact on water quality.

**Integrating Specialty Crops:** Delmarva producers and consumers, scientists, and students.

**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>	12300	15000	3900	0
<b>Actual</b>	94732	15000	393	0

**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
Plan	5	30	
Actual	2	17	19

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

**Output Target**

**Output #1**

**Output Measure**

- 1. Nutrient & Waste Management (Commercial)-Programs, grants, in-service training, publications.

Year	Target	Actual
2010	85	74

**Output #2**

**Output Measure**

- 2. Coastal, Chesapeake Bay, Water Resources & Nutrient Management(Residential); Water Resources-Short courses, in-service, volunteers, relationships, policy & technology.

Year	Target	Actual
2010	470	348

**Output #3**

**Output Measure**

- 3. Management and Sustainability of Forest Resources-Publications, workshops, grants, plans

Year	Target	Actual
2010	61	84

**Output #4**

**Output Measure**

- 4. Water, Nutrient Management, Energy Efficiency & Composting (Green Industry)-Publications, short courses, in-service

2010 University of Maryland and University of Maryland - Eastern Shore Combined Research and Extension Annual Report of Accomplishments and Results

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	20	14

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

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

O. No.	OUTCOME NAME
1	4. Water, Nutrient Management, Energy Efficiency & Composting: Number of: Growers incorporating BMP's into management plans; Programs to improve water quality and nutrient management; Growers using information for changes; Horticulturists who understand energy saving and composting techniques; Homeowners and greenhouses adopting energy saving techniques; green methods; Businesses using energy efficient equipment
2	1. Nutrient & Waste Management (commercial): Number of: producers implementing nutrient management plans; plans written; producers relate nutrient management to water quality; advisors trained in plan writing; Policy makers and farmers understand the scientific issues of land applied poultry litter and poultry stockpiles; Policy makers access MCE information.
3	2. Coastal, Chesapeake Bay, Water Resources & Nutrient Management (Residential): Number of: Lawn care companies report fertilizer use and eliminate P from maintenance: Adoption of composting; water wells tested; septic tanks improved; Number of: Citizens adopt practices of landscape ecology and understand the relationship among pesticides, poor septic systems and environmental health.
4	3. Forest Resources: Number of forest landowners gain knowledge of forest stewardship and practices, join forests associations, understand wildlife damage control measures and implement in plans.

**Outcome #1**

**1. Outcome Measures**

4. Water, Nutrient Management, Energy Efficiency & Composting: Number of: Growers incorporating BMP's into management plans; Programs to improve water quality and nutrient management; Growers using information for changes; Horticulturists who understand energy saving and composting techniques; Homeowners and greenhouses adopting energy saving techniques; green methods; Businesses using energy efficient equipment

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research
- 1890 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	470	869

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

**Issue (Who cares and Why)**

Urban and suburban sprawl has led to the conversion of thousands of acres of native landscape into lawns and gardens. Most residents, planners, and developers do not recognize the urban landscape as part of the ecosystem, and they have failed to incorporate environmental and ecological concepts into their landscape plans. Studies have shown that both ground and surface waters contain high levels of the nutrients nitrogen and phosphorus (N and P), sediments and toxic contaminants, which adversely affect water quality.

**What has been done**

UME programs educate more than 100,000 people on a variety of environmental stewardship topics. Training programs, workshops, web sites and publications on well and septic system maintenance, composting, water conservation, rain garden and wise landscaping practices, have reached several thousand individuals from 2008-2010. Thousands of primary school students discovered the connections between water quality, agriculture and their environment during field days at Close Encounters with Agriculture.

**Results**

Programming on well and septic maintenance led to 50% of participants saving money ranging from \$100 to \$15,000 with an average of \$4,700. As a result of participation in TPM/IPM programs, pesticide applications have been reduced by 45 -50% compared to years previous to participation in the program.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
403	Waste Disposal, Recycling, and Reuse

**Outcome #2**

**1. Outcome Measures**

1. Nutrient & Waste Management (commercial): Number of: producers implementing nutrient management plans; plans written; producers relate nutrient management to water quality; advisors trained in plan writing; Policy makers and farmers understand the scientific issues of land applied poultry litter and poultry stockpiles; Policy makers access MCE information.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research
- 1890 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	5600	5109

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

**Issue (Who cares and Why)**

The Maryland Water Quality Improvement Act requires Maryland farmers as well as green industry businesses to develop and follow nutrient management plans that are approved by the State of Maryland.

**What has been done**

UME provides training for writing a nutrient management plan and updates to recently certified Nutrient Management Consultants on program and research components of a nutrient management plan. This is the only program of its kind in the State of Maryland. UME faculty developed an E-Learning Resource for Water and Nutrient Management & Conservation for the Nursery and Greenhouse Industries program.

**Results**

UME advisors have written 620 new traditional nutrient management plans and updated 4,190 plans along with 74 manure transport plans. Twenty-seven workshops were held and 545 nutrient

management consultants were trained and issued required continuing education credits. Eighty three farmers were trained to write their own plans. The E-Learning Resource Center has been accessed by thousands of individuals from 33 countries and 48 states in the US.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation
403	Waste Disposal, Recycling, and Reuse

### Outcome #3

#### 1. Outcome Measures

2. Coastal, Chesapeake Bay, Water Resources & Nutrient Management (Residential): Number of: Lawn care companies report fertilizer use and eliminate P from maintenance; Adoption of composting; water wells tested; septic tanks improved; Number of: Citizens adopt practices of landscape ecology and understand the relationship among pesticides, poor septic systems and environmental health.

#### 2. Associated Institution Types

- 1862 Extension
- 1862 Research
- 1890 Research

#### 3a. Outcome Type:

Change in Condition Outcome Measure

#### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	6250	85523

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

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

Urban and suburban sprawl has led to the conversion of thousands of acres of native landscape into home lawns and gardens. This growth and change in the Chesapeake Bay watershed is typically accomplished without an understanding of how these landscapes are a part of the greater ecosystem, and environmental and ecological concepts are essential to prevent continued degradation of soil and water quality.

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

The MD Bay-Wise Program is a homeowner education program conducted by UME Master Gardeners and focuses on teaching homeowners, Master Gardeners and students the importance of individual watershed and landscape practices and the impact on water quality. Training programs, workshops, web sites and publications on well and septic system maintenance, composting, water conservation, rain garden and wise landscaping practices, have reached several thousand individual

### Results

Programming on well and septic maintenance led to 50% of participants saving money ranging from \$100 to \$15,000 with an average of \$4,700. Thousands of primary school students discovered the connections between water quality, agriculture and their environment during field days at Close Encounters with Agriculture.

## 4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation
608	Community Resource Planning and Development

## Outcome #4

### 1. Outcome Measures

3. Forest Resources: Number of forest landowners gain knowledge of forest stewardship and practices, join forests associations, understand wildlife damage control measures and implement in plans.

### 2. Associated Institution Types

- 1862 Extension
- 1862 Research
- 1890 Research

### 3a. Outcome Type:

Change in Condition Outcome Measure

### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	400	240

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

There are 157,000 private forest landowners in Maryland who own 78% of the forest resources,

which provide forest products, wildlife habitat, recreation, open space and other benefits to all Maryland citizens. Only an estimated 6% have a written forest stewardship plan to guide their activities, and fewer than 10% seek the assistance of a professional forester before harvesting timber.

**What has been done**

UMES conducts small landowner forestry and conservation field tours on Maryland's Lower Eastern Shore to educate farmers about forest resource management strategies, various cost-share/conservation programs available from state and government (USDA) agencies, and way to manage their natural resources. The Maryland Woodland Stewards program educates forest landowners about forest stewardship, and the participants commit to 40 hours of extension work in the following year.

**Results**

The Maryland Master Naturalist program was developed that will provide training for Master Naturalists across Maryland. The Maryland Master Naturalist and Maryland Woodland Stewards programs, along with UMES field tours, provide a significant cadre of highly-trained people throughout the state to guide forest management.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
123	Management and Sustainability of Forest Resources
205	Plant Management Systems
608	Community Resource Planning and Development

**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
- Competing Public priorities
- Competing Programmatic Challenges

**Brief Explanation**

Overall, we have been able to meet our strategic goals through the use of Impact Teams and more focused programs. We are also doing a better job at reporting impacts. A strategic staff plan has been developed for UME that focuses on providing adequate geographic and programmatic coverage of tenure-track educators and faculty educator assistants. However, UME is still limited in climate change expertise and is working to develop that expertise among educators, specialists, and researchers.

The limitation for research has always been shortage of funds! Our faculty achieved excellent research findings in the area of climate variability and land use impacts on our water resources and the environment despite limited funds. Again, UME, MAES, and UMES need more positions and expertise in this area, which requires additional resources.

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

**1. Evaluation Studies Planned**

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Case Study

**Evaluation Results**

Specific results are reported in the state defined outcomes.

**Key Items of Evaluation**

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

**Program # 3**

**1. Name of the Planned Program**

Family & Community Resiliency

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
703	Nutrition Education and Behavior	10%	20%	30%	20%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	5%	5%	30%	70%
724	Healthy Lifestyle	10%	20%	20%	10%
801	Individual and Family Resource Management	10%	0%	0%	0%
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	5%	5%	0%	0%
806	Youth Development	60%	50%	20%	0%
	<b>Total</b>	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
Plan	15.0	5.0	10.0	3.0
Actual	20.0	3.5	13.0	4.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
823004	329020	691300	360554
1862 Matching	1890 Matching	1862 Matching	1890 Matching
823004	329020	691300	360554
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1646008	658040	1350956	721108

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

### 1. Brief description of the Activity

**Nutrition Behavior:** MAES research has focused on changing the health trajectory for older adults through effective diet and activity modifications to examine novel interventions to increase fruit, vegetable and whole grain intake and physical activity in older adults, and to identify effective biomarkers that reflect improvement in diet and physical activity and chronic disease risk in older adults.

**4-H Military Partnership:** 4-H programs are offered at five Maryland installations. UME provides support to one technology/youth development specialist in Korea and one youth development specialist in Europe to strengthen 4-H club programming in overseas Army 4-H clubs.

**4-H Afterschool:** A statewide 4-H Afterschool initiative provides extraordinary learning opportunities to school age youth in urban, suburban, and rural communities. This outreach to youth in afterschool and out of school time has resulted in increased participation by underserved and underrepresented youth in the Maryland 4-H program.

**4-H Adventure In Science (AIS) Program:** This program was targeted to inspire young students with an interest in science education and science related careers. It is a hands-on scientific program for youth, ages 8-14.

**Baltimore City 4-H Teen Corps Leadership Project:** This program provides training to youth 12-18, adult mentors, and partners from diverse communities during after-school hours to receive facilitation training on various youth development topics and then demonstrate those skills learned by facilitating the topics at their local after school site.

**4-H Science:** Launched the Robotics project clubs and brought in a significant number of children. Youth members begin with Lego Kits and through mastery of problem solving and skill enhancement, advance to build their own robots.

**Basic Financial Education for First-Term Soldiers:** This project provides instruction on financial management for service members assigned to Walter Reed Army Medical Center. Classes were provided for first term soldiers who are required to receive eight hours of training at their first duty station.

**Reading Makes Cents (RMC):** UME provides RMC, a financial literacy and reading curriculum for children in grades 3-5, to youth across the state.

**Dollars and Sense:** This is a three-hour basic financial education course taught to participants in the Workforce Opportunities Program at the local Department of Social Services requires mandatory participation as part of the Workforce program.

**Healthy Homes:** Partnerships were created with the Boys and Girls clubs, Dept. of Aging, WIC programs, child care providers and Head Start in order to deliver outreach education on healthy homes. Within Extension, Healthy Homes partnered with EFNEP and Urban IPM programs.

**Health Literacy & Rural Health:** UME partnered with the School of Public Health and the Center for Health Literacy, along with the University of Massachusetts-Amherst and 13 other states to develop health

messages for mothers in rural areas. Other program partners include the Maryland Rural Health Association and the Rural Maryland Council.

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

**Nutrition Behavior:** Scientific community, older adults.

**4-H Military Partnership:** Military youth families around the world.

**4-H Afterschool:** All youth in Maryland.

**4-H Adventure In Science (AIS) Program:** All youth in Maryland ages 8-14.

**Baltimore City 4-H Teen Corps Leadership Project:** Youth in Baltimore City between the ages of 12-18. All adults in the City of Baltimore.

**4-H Science:** All youth in Maryland.

**Basic Financial Education for First-Term Soldiers:** All first-time soldiers coming through Walter Reed Army Medical Center.

**Reading Makes Cents (RMC):** All youth in Maryland in grades 3-5.

**Dollars and Sense:** Participants in the Workforce Opportunities Program at local Departments of Social Services, all other individuals in the State of Maryland.

**Healthy Homes:** All homeowners and renters in the State of Maryland, real-estate owners and property managers, agencies and organizations.

**Health Literacy & Rural Health:** All residents in rural areas, particularly mothers.

**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>	175000	250000	12000	70000
<b>Actual</b>	196193	250000	83000	70000

**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**

<b>2010</b>	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Plan</b>	10	35	
<b>Actual</b>	47	3	50

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

**Output Target**

**Output #1**

**Output Measure**

- Factsheets & publications, curricula, meeting with partners, in-services, workshops

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	2900	5992

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

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

O. No.	OUTCOME NAME
1	1. Nutrition: The number of individuals who demonstrate adoption of healthy eating practices based on the 2005 MyPyramid and the 2005 Dietary Guidelines for Americans, including the number who adopt or plan to: Choose a variety of colors of fruits and vegetables; choose high fiber foods; choose lower fat dairy products; choose smaller portions of foods; choose whole grain foods; read food labels before making purchase; make foods at home instead of buying convenience foods; plan meals before shopping at grocery store.
2	2. Food Safety: The number of individuals that indicate change in behavior related to good personal hygiene including hand washing, cooking foods adequately, avoiding cross contamination, keeping foods at safe temperature
3	3. Volunteers: The number of MCE trained 4-H volunteers who provide leadership and guidance for 4-H youth development programs.
4	4. 4-H Clubs: The number of 4-H club leaders and volunteers who demonstrate an application of the essential elements of youth development and model experiential learning.
5	5. Youth Outreach: Teen and adult volunteers in after school and military partnership programs and youth enrolled.
6	6. Healthy Living: Read labels before using hazardous household chemicals; Identify potentially hazardous products that affect indoor quality; take steps to control humidity in homes; use safe practices with household products to improve indoor air quality. Health Literacy: increased awareness of how to access research-based health information; understand connection between health literacy and financial literacy.
7	Financial Literacy & Management: # of volunteers trained; new partnerships developed; new enterprises; # who comparison shop for best credit terms, pay more than minimum on credit cards, pay credit card bills on time, reduce their debt, develop/review estate plan, track family income and spending, develop a spending plan/budget.

**Outcome #1**

**1. Outcome Measures**

1. Nutrition: The number of individuals who demonstrate adoption of healthy eating practices based on the 2005 MyPyramid and the 2005 Dietary Guidelines for Americans, including the number who adopt or plan to: Choose a variety of colors of fruits and vegetables; choose high fiber foods; choose lower fat dairy products; choose smaller portions of foods; choose whole grain foods; read food labels before making purchase; make foods at home instead of buying convenience foods; plan meals before shopping at grocery store.

**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	13000	25000

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

**Issue (Who cares and Why)**

Healthy eating habits along with regular physical activity have an important role in weight control. Despite the proven benefits of these healthy habits, the CDC State Indicator Report for Maryland shows that less than 16% of adults report eating the recommended daily servings of both fruits and vegetables.

**What has been done**

Classes; workshops; train-the-trainer series; multi-session education; exhibits; social marketing messages; social media use to communicate recommended practices; Dietetic intern training; healthy food preparation workshops and demonstrations; child care provider training; after school sessions for 4-H Youth; summer day camps; in-school enrichment programs; systems environmental changes in schools; partnerships to develop educational programs.

**Results**

Examples of post/pre are:

- 60% intend to choose high fiber foods often (n=20)
- 54% intend to choose low fat foods when eating out (n=20)
- 35% intend to choose lower fat dairy products (n=23)
- 41% intend to choose lower fat (lean) meats (n=34)

UME and UMES developed and implement a research project on Family Influence on Fruit and Vegetable Consumption among Rural, Low-Income, and Preschool Children: A Preliminary Investigation of Factors Associated with Obesity. A new curriculum, Growing Healthy Habits (GHH), is a gardening and nutrition education curriculum providing easy-to-adopt lessons.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

**Outcome #2**

**1. Outcome Measures**

2. Food Safety: The number of individuals that indicate change in behavior related to good personal hygiene including hand washing, cooking foods adequately, avoiding cross contamination, keeping foods at safe temperature

Not Reporting on this Outcome Measure

**Outcome #3**

**1. Outcome Measures**

3. Volunteers: The number of MCE trained 4-H volunteers who provide leadership and guidance for 4-H youth development programs.

**2. Associated Institution Types**

- 1862 Extension
- 1890 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	3465	4339

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

**Issue (Who cares and Why)**

With the typical busy lifestyle of Americans, it is important that organizations effectively recruit volunteers to support their ability to deliver programs to the community. In order to maintain enough adult volunteers to meet the needs of the many young people across the state, UME

must continually recruit new individuals to serve as volunteers. Volunteer recruitment has become a necessary driving force behind all successful volunteer-based organizations and is thus being emphasized by UME leadership.

**What has been done**

The Maryland Volunteer Association provides training opportunities for Maryland 4-H volunteers. Members also serve as mentors to new 4-H volunteers and/or new clubs. The Maryland 4-H Volunteer and Teen Forum provides professional development opportunities for 4-H adult volunteer leaders. Online training for volunteers is also provided.

**Results**

Members of the Volunteer Association report contributing over 2360 hours of volunteer time to the Maryland 4-H program; this is valued at \$21.83 per hour for a total of \$51,518.80. Ninety-five percent of volunteers attending the Forum reported that they would take home new and innovative ideas and concepts to share with others. Eighty-six percent reported that their participation in the 4-H Maryland Volunteer Forum will make them a better volunteer.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
806	Youth Development

**Outcome #4**

**1. Outcome Measures**

4. 4-H Clubs: The number of 4-H club leaders and volunteers who demonstrate an application of the essential elements of youth development and model experiential learning.

**2. Associated Institution Types**

- 1862 Extension
- 1890 Extension

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	1600	1600

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

**Issue (Who cares and Why)**

The Maryland 4-H program's core mission is to help youth reach their fullest potential as individuals through the development of life skills. Studies indicated that participation in 4-H Clubs contributes to positive youth development and that youth who belong to 4-H clubs do better in school, are more motivated to help others, and are developing skills in leadership, public

speaking, self-esteem, communication and planning, and are making lasting friendships.

**What has been done**

Essential elements of 4-H youth development have been incorporated into the training programs for volunteers. 4-H educators have been provided with a tool for self assessment of 4-H clubs to determine how well the essential elements of 4-H are incorporated into 4-H club programs. The Maryland 4-H Volunteer Association provides multiple professional development training opportunities in a variety of formats.

**Results**

The Maryland 4-H Volunteer and Teen Forum is conducted every year to provide professional development opportunities for 4-H adult volunteer leaders. Three hundred twenty-five volunteers from all across Maryland networked with one another and shared their knowledge about the 4-H Youth Development program. Ninety-five percent of volunteers attending the forum reported that they would take home new and innovative ideas and concepts to share with others. Eighty-six percent reported that they feel as though participation in the 4-H Maryland Volunteer Forum will make them a better volunteer.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
806	Youth Development

**Outcome #5**

**1. Outcome Measures**

5. Youth Outreach: Teen and adult volunteers in after school and military partnership programs and youth enrolled.

**2. Associated Institution Types**

- 1862 Extension
- 1890 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	2200	3000

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

**Issue (Who cares and Why)**

Maryland's youth of today are Maryland's leaders of tomorrow. Youth need positive and caring relationships to build the knowledge, skills, self-esteem, and self-confidence they will need in the future.

**What has been done**

Maryland 4-H Youth Development has increased and strengthened after school programming efforts in partnership with other youth serving agencies, including military youth and family programs, to provide education, training, curricula resources, and 4-H club experiences that result in positive youth development outcomes for youth in after-school settings across the state, in local communities, and on military posts and bases.

**Results**

UME has almost 50,000 youth learning about science, engineering, and technology; 14,600 engaged in citizenship learning and activities; and, almost 45,000 participating in building healthy lifestyle programs.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
806	Youth Development

**Outcome #6**

**1. Outcome Measures**

6. Healthy Living: Read labels before using hazardous household chemicals; Identify potentially hazardous products that affect indoor quality; take steps to control humidity in homes; use safe practices with household products to improve indoor air quality. Health Literacy: increased awareness of how to access research-based health information; understand connection between health literacy and financial literacy.

**2. Associated Institution Types**

- 1862 Extension
- 1890 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	1000	5565

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

**Issue (Who cares and Why)**

Maryland residents face health hazards in the built environment including: toxic materials (lead, asbestos, pesticide and household products); dangerous gases (carbon monoxide and radon); hazards that cause and contribute to asthma (dust allergens, molds, and pests); and other safety and health concerns. Health literate people understand health information and have the skills to use that information in making health decisions and accessing health services.

**What has been done**

A Healthy Homes Web site was created to communicate the availability of educational resources, curricula and important public information related to Healthy Homes. A publication was developed and distributed in the state healthy homes project. A 5-hour forum focusing on health care reform was made available to the public and broadcast live as a web-based interactive forum. Five sites across Maryland participated with more than 150 participants.

**Results**

New partnerships were created with the Boys and Girls clubs, Dept. of Aging, WIC programs, child care providers and Head Start in order to deliver outreach education on healthy homes. This project trained 440 educators or professionals with healthy homes information. Four FCS educators are now trainers with the National Center for Healthy Housing. The UMES Human Ecology Health Fair is an annual event open to the campus and the local community at which community and campus health related agencies and organizations (including UME) set up educational exhibits/displays to help participants become more knowledgeable about health related issues.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
724	Healthy Lifestyle
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

**Outcome #7**

**1. Outcome Measures**

Financial Literacy & Management: # of volunteers trained; new partnerships developed; new enterprises; # who comparison shop for best credit terms, pay more than minimum on credit cards, pay credit card bills on time, reduce their debt, develop/review estate plan, track family income and spending, develop a spending plan/budget.

**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}	4500

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

**Issue (Who cares and Why)**

Low financial literacy, consumer indebtedness, low saving rate, low financial assets, expensive health care and long-term care, and insufficient retirement planning are all areas of concern for Maryland residents. Individuals and families need to be empowered with knowledge, attitudes, and skills to practice successful financial management, and eventually become financially secure in later life. Participation in personal finance education programs help individuals learn how to reduce debt and increase savings.

**What has been done**

Maryland has offered an annual financial education seminar to meet the professional development needs of educators employed in the financial industry, Land Grant Universities and the military. Dollars Makes Sense is a three-hour basic financial education course taught to participants in the Workforce Opportunities Program at the local Department of Social Services requires mandatory participation as part of the Workforce program.

**Results**

More than 4,500 Maryland citizens participated in 146 MoneySmart programs across the state

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
801	Individual and Family Resource Management

**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
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

**Brief Explanation**

Overall, we have been able to meet our strategic goals through the use of Impact Teams and more focused programs. We are also doing a better job at reporting impacts. A strategic staff plan has been developed for UME that focuses on providing adequate

geographic and programmatic coverage of tenure-track educators and faculty educator assistants.

However, it is still unclear how long this current financial crisis will last. While some indicators suggest that the recession is ending, it will likely be a year or more before the economy recovers. Almost all people are affected by the slowing economy, but the effects will be much harder for some groups to manage. Loss of income-- from effects such as job loss and furloughs-- continues to be a major problem. Maryland continues to face a budget shortfall (approximately 1.6 billion) with unknown potential funding reductions for all state agencies.

Another factor significantly impacting the makeup of our communities is the increasing cultural diversity in our area, as well as the BRAC Military actions, which both bring opportunities as well as challenges to communities.

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

### **1. Evaluation Studies Planned**

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)

## **Evaluation Results**

### **Key Items of Evaluation**

**Youth Development:** Over the past four years, over 60 intensively trained teen facilitators have delivered programs to hundreds of youth in after school settings in Baltimore City through the Baltimore City Teen Corps program. This program is helping to achieve a culture of entrepreneurship with urban youth. Military youth off-post are part of 4-H through the Operation Military Kids program and with partnerships with the National Guard and Reserves. Over 4,000 military children were involved in 4-H programs during 2010.

**Financial Security:** Dollars and Sense classes taught financial information to participants in the Workforce Opportunities Program at the local Department of Social Services. Pre/post-test evaluations revealed that 78% of participants intend to improve their money management more often (n=72), 69% of participants intend to develop a spending plan (budget) more often (n=123), 65% of participants intend to set financial goals more often (n=72), 68% of participants intend to track family income and spending (expenses) more often (n=71), and 86% of participants intend to request/review their credit report(s) annually more often (n=95).

**Healthy Homes:** In a partnership with EFNEP and IPM, the Healthy Homes program produced "Keeping a Healthy Home: Seven Tips Made Easy" and trained 440 educators or professionals with healthy homes information. Healthy Homes Toolkits were designed, developed, and provided to training participants in 2010 with results indicating that 94%

plan to use the toolkit received at the in-service in future educational programs.

**Food Security:** For every \$1 spent to implement EFNEP, \$2.48 is saved on food expenditures, reducing the need for emergency food assistance. In 2010, 2,352 families received over 8 contact hours in learning about food, nutrition, and food budgeting. These families represented 19,000 adults and 38,472 youth. The FSNE program reached out to 109,405 individuals and youth resulting in total program contacts of 411, 214. FY10 evaluation data indicated that 27 post/pre questions were statistically significant ( $p < .0001$ ) for a difference between behavior prior to FSNE participation and intent to change behavior following program participation. By the end of 2010, 849 persons were trained in Growing Healthy Habits, while a total of 3,425 contacts were made through this program.

**Health:** During the 2008-2010 time frame, 208 adults were trained to implement Up For the Challenge, while 4,299 participated in the program.

**Food Safety:** During 2010, 243 participants received food safety certificates or 3 CEU's enabling them to meet job requirements, and to remain in compliance with their funding sources as a result of these programs.

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

**Program # 4**

**1. Name of the Planned Program**

Sustainable Energy

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
403	Waste Disposal, Recycling, and Reuse	40%	30%	50%	20%
601	Economics of Agricultural Production and Farm Management	60%	70%	50%	80%
	<b>Total</b>	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	4.0	1.0	4.0	1.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
164601	65804	138260	72111
1862 Matching	1890 Matching	1862 Matching	1890 Matching
164601	65804	138260	72111
1862 All Other	1890 All Other	1862 All Other	1890 All Other
329202	131608	270192	144222

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

1. Brief description of the Activity

**Energy Efficiency & Composting (Green Industry & Poultry Growers):** Short course and training seminars for industry personnel and growers; Conduct field research in alternative fuel sources, energy saving techniques and recycling of green waste products; Trade and peer reviewed journal publications.

Also, conducted research in efficient digestion techniques for cellulosic material for conversion to biofuel.

**Biofuels & Alternative Energy Sources-Youth:** Conducted state wide 4-H science experiment day focused on biofuels and alternative energy sources. Twenty three counties and Baltimore City held the events involving 750 4-H members.

**Biofuels & Alternative Energy Sources-Research:** UMES research is focused on biofuels, sustainability, and geospatial information technologies to enhance experiential learning for precision agriculture projects and diverse grass species as potential sources of biofuel and the impact on soil organic matter dynamics. MAES research focused on:

- introducing switchgrass as a potential biofuel crop to the local agricultural and conservation communities in the Chester River Watershed.
- Investigating the early evolution of land plants and employing high-throughput DNA sequencing and computational analysis to understand evolutionary history that can help predict how changes in biodiversity impact the productivity of ecosystems.
- Discovery of an unusual bacterium that has the potential to produce 75 billion gallons a year of carbon-neutral ethanol. The bacterium *Saccharophagus degradans*, found in the Chesapeake Bay, is capable of breaking down biomass into sugars, which are then converted into ethanol and other biofuels.
- Integrating cation transport and pH across endomembranes with the secretory system.
- Controlling the pH and cation homeostasis of secretory compartments modulated membrane trafficking is critical for growth, tolerance to environmental stress, and synthesis of cell wall components.
- 

The regulation of rapid development in *Marsilea*.

## 2. Brief description of the target audience

**Energy Efficiency & Composting (Green Industry & Poultry Growers):** Nursery, greenhouse, poultry growers and managers. For Research, the target audience was industry and the scientific community.

**Biofuels & Alternative Energy Sources-Youth:** Youth 4-H members participating in Science, Engineering and Technology focused projects. Graduate students & undergraduate students.

**Biofuels & Alternative Energy Sources-Research:** Industry and the scientific community.

## 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>	{NO DATA}	{NO DATA}	{NO DATA}	{NO DATA}
<b>Actual</b>	882	0	750	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	0	21	21

**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}	85

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

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

### **Outcome #1**

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

{No Data Entered}

#### **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
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

##### **Brief Explanation**

UME has limited capacity to address this planned program. However, through the efforts of our Natural Resources Impact Team, it is planned to build capacity in this area and have an action team established within the next two years. The poultry, dairy, and green industry are very interested in alternative sources of energy and more energy savings techniques that make their operations more efficient and profitable. Research on the conversion of biomass to bioenergy was at its infancy, but it is envisioned that with more research funding Maryland scientists will move forward in developing economically and environmentally sound methods to convert biomass and waste into biofuels.

#### **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}

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

**Program # 5**

**1. Name of the Planned Program**

Childhood Obesity

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
703	Nutrition Education and Behavior	70%	50%	50%	50%
724	Healthy Lifestyle	30%	50%	50%	50%
	<b>Total</b>	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

**Nutrition Research:** MAES research has focused on the bioactive fibers including psyllium and chitosan for their health properties, and developing innovative technologies to improve their health properties and their physical-chemical properties.

**Expanded Food and Nutrition Education Program (EFNEP):** Provides nutrition education to low-

income families to prevent chronic disease through healthy eating and increased physical activity. EFNEP delivers behaviorally-focused, learner-centered, evidence-based nutrition education to food insecure Maryland families with young children and youth and facilitates behavior change for the prevention of chronic disease risk in youth and families with children through healthy lifestyle programming.

**No Child Left Inside: Reversing Our Children's Nature Deficit:** UME 4-H has been reconnecting youth to nature through environmental education within the past year through partnering with Maryland National Capital Park and Planning Commission to provide a weeklong residential camping program for over 150 "at-risk" youth from urban communities. A partnership was formed with Allegany County to offer outdoor school to over 1000 youth at the Western Maryland 4-H Center in Garrett County.

**Food Supplement Nutrition Education (FSNE):** Provides nutrition education to current or eligible Supplemental Nutrition Assistance Program (SNAP) recipients. The Growing Healthy Habits (GHH) is a gardening and nutrition education curriculum for youth to deliver nutrition messages to increase fruit and vegetable consumption.

**Up For the Challenge:** Up For the Challenge is a youth fitness and nutrition curriculum that was developed by a team of four UME FCS and 4-H educators for use by all domestic and international U.S Army after-school, youth-service facilities. It has been distributed to 100 Army installations worldwide. A two-day Up for the Challenge train-the-trainer session was conducted for 50 youth development and nutrition educators.

**Project Re-Fresh:** UME is facilitating the creation of ReFresh teams in 10 Local Education Agencies (LEA's) to conduct school food and nutrition services staff training and enhancements to "nudge" students toward healthier cafeteria choices, particularly fruits, vegetables and whole grains. Students in 4th and 5th grades receive nutrition education to lay foundation for making healthier choices.

**School Nutrition Programs -** A new program trains school health nurses to run after-school health/cooking clubs where pre-registered students receive nutrition education lessons on a weekly basis. The health clubs' focus is on encouraging children to try new foods, particularly fruits and vegetables and developing cooking skills.

**Centro Nia:** Teachers at Centro Nia were trained in and are incorporating Color Me Healthy and Healthy Steps lessons into daily activities. The Montgomery County FSNE program includes collaboration with Health Department nurses and dental hygienists who deliver Color Me Healthy and Healthy Steps lessons at multiple HeadStart locations. UMES research is focused on studying current influences on the dietary patterns and activity levels of children enrolled in childcare centers on the Lower Eastern Shore.

## 2. Brief description of the target audience

**Nutrition Research:** Scientific community.

**EFNEP:** Underserved populations who are underserved and at high risk for food insecurity, hunger, obesity and chronic disease.

**No Child Left Inside--Reversing Our Children's Nature Deficit:** At-risk youth from urban communities. Youth in Allegany County.

**Food Supplement Nutrition Education (FSNE):** Current or eligible Supplemental Nutrition Assistance Program (SNAP) recipients.

**Up For the Challenge:** All domestic and international U.S Army after-school youth.

**Project Re-Fresh:** School food and nutrition services staff.

**School Nutrition Programs:** School health nurses.

**Centro Nia:** Teachers at Centro Nia; Health Department nurses and dental hygienists who deliver Color Me Healthy and Healthy Steps lessons at multiple HeadStart locations.

**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>	{NO DATA}	{NO DATA}	{NO DATA}	{NO DATA}
<b>Actual</b>	45898	0	10866	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
<b>Actual</b>	0	8	8

**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	Choose a variety of fruits and vegetables more often.
2	# of individuals and families who gain awareness, knowledge, or skills regarding healthy eating and physical activity and the relationship between them.
3	# participants reducing dietary fat intake by using lower fat or nonfat dairy products, lower-fat meats, making wiser choices when eating out, and selecting lower-fat snacks more often.
4	Healthy eating and physical activity in child-care centers.

**Outcome #1**

**1. Outcome Measures**

Choose a variety of fruits and vegetables more often.

**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)**

According to the Maryland Behavioral Risk Factor Surveillance Survey, 36% of Maryland residents are overweight or obese and 45% participate in no vigorous physical activity. Overweight children are more likely to remain overweight as adults and are at increased risk for coronary heart disease, high blood pressure, Type II diabetes, gallbladder disease, and some cancers. This epidemic, which causes about 300,000 premature deaths each year nationally, also accounts for approximately 9 percent of national health care expenditures.

**What has been done**

Nutrition education programs in FSNE, EFNEP and FCS have focused efforts on increasing fruit and vegetable consumption in the diet. Educational sessions were conducted across Maryland with diverse audiences focusing on this program outcome. Additional indirect education was provided through PSAs, news articles, exhibits, and other social marketing efforts. UME and UMES developed and implemented a project on Family Influence on Fruit and Vegetable Consumption among Rural, Low-Income, and Preschool Children: A Preliminary Investigation of Factors Associated with Obesity.

**Results**

UME and UMES developed and implemented a research project on Family Influence on Fruit and Vegetable Consumption among Rural, Low-Income, and Preschool Children: A Preliminary Investigation of Factors Associated with Obesity. A new curriculum, Growing Healthy Habits (GHH), is a gardening and nutrition education curriculum providing easy-to-adopt lessons. The curriculum was developed by FSNE to (1) deliver nutrition messages in alignment with FSNE key

outcome to increase fruit and vegetable consumption, (2) creatively meet Maryland State Education curriculum objectives, and (3) correspond with Maryland growing season. GHH uses growing food as the teaching vehicle to link nutrition and gardening concepts in both in-school and out-of-school youth educational settings.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

**Outcome #2**

**1. Outcome Measures**

# of individuals and families who gain awareness, knowledge, or skills regarding healthy eating and physical activity and the relationship between them.

**2. Associated Institution Types**

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

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	{No Data Entered}	2000

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

**Issue (Who cares and Why)**

The Maryland Behavioral Risk Factor Surveillance Survey indicates that 36% of MD residents are overweight or obese and 45% participate in no vigorous physical activity. Overweight children are more likely to remain overweight as adults and are at increased risk for coronary heart disease, high blood pressure, Type II diabetes, gallbladder disease, and some cancers. This epidemic, which causes about 300,000 premature deaths each year nationally, also accounts for approximately 9 percent of national health care expenditures.

**What has been done**

During the 2008-2010 time frame, 208 adults were trained to implement Up For the Challenge program, while 4,299 participated in the program. Steps to a Healthier You is a 3-week, 6-hour online continuing education course for child care providers and was developed as a guided exploration of MyPyramid.gov. Programs were delivered in areas of choosing high-fiber, low-fat

foods, portion control, and making better food choices.

**Results**

The Up for the Challenge program is increasing the understanding of physical activity among youth and getting them to move more. A majority of participants in UME/UMES programs indicate on post/pre surveys that they intend to look for ways to eat more fruits and vegetables, choose low fat, high-fiber foods, use food labels to make healthy choices, and eat a variety of foods.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

**Outcome #3**

**1. Outcome Measures**

# participants reducing dietary fat intake by using lower fat or nonfat dairy products, lower-fat meats, making wiser choices when eating out, and selecting lower-fat snacks more often.

**2. Associated Institution Types**

- 1862 Extension
- 1890 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	{No Data Entered}	2000

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

**Issue (Who cares and Why)**

Healthy eating habits along with regular physical activity have an important role in weight control. Despite the proven benefits of these healthy habits, the CDC State Indicator Report for Maryland shows that less than 16% of adults report eating the recommended daily servings of both fruits and vegetables. Unfortunately, the statistics for adolescents are worse, with only 11% reporting daily consumption of the recommended amounts. Finding ways to increase fruit and vegetable consumption while reducing fat consumption is key to improving health and well-being. Since lifelong dietary patterns begin in childhood, focusing on children, and those who feed children, is a logical focus of nutrition education interventions.

**What has been done**

Classes; workshops; train-the-trainer series; multi-session education; exhibits; social marketing messages; social media use to communicate recommended practices; Dietetic intern training; healthy food preparation workshops and demonstrations; child care provider training; after school sessions for 4-H Youth; summer day camps; in-school enrichment programs; systems environmental changes in schools; partnerships to develop educational programs.

**Results**

Examples of post/pre are:

- 60% intend to choose high fiber foods often (n=20)
- 54% intend to choose low fat foods when eating out (n=20)
- 35% intend to choose lower fat dairy products (n=23)
- 41% intend to choose lower fat (lean) meats (n=34)

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
703	Nutrition Education and Behavior
724	Healthy Lifestyle

**Outcome #4**

**1. Outcome Measures**

Healthy eating and physical activity in child-care centers.

**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>
2010	{No Data Entered}	0

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

**Issue (Who cares and Why)**

Overweight and obesity have reached epidemic proportions nationwide and have become two of the most critical issues of our time. Over the years, environmental changes have resulted in trends toward inactivity and poor diets. It has been stated that children establish eating habits early in life and these are often the results of interactions with parents and caregivers.

**What has been done**

The pilot study (surveys, observations, logs) is currently underway. This project will provide parents and caregivers with best practices for healthy meal planning and physical activity. A workshop/summit is being planned for parents and providers.

**Results**

Results will not be available until next fiscal year.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
703	Nutrition Education and Behavior
724	Healthy Lifestyle

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

**External factors which affected outcomes**

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

**Brief Explanation**

There are more people in need of nutrition education than ever before, especially children, and the situation becomes even more critical. The number of families receiving food stamps is at an all time high in Maryland. Obesity rates for youth as well as adults are at an all-time high. In these difficult times, having food to eat becomes more important to parents and caregivers than worrying about healthy food to eat. However, UME's programs are addressing these challenges and the organization is building more capacity to address the issue.

The diversity of Maryland's population continues to grow and expand. While we do have three bi-lingual educators on staff to serve our Hispanic audience, it is quite insufficient with the growing number of Hispanics who reside especially near major metropolitan areas. In addition, there are indigenous people from many countries in great need of nutrition education, yet we do not have the capacity to fill that need.

More research efforts are underway. However, additional funding would help to employ more graduate students to continue and expand research efforts.

**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}

**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%
<b>Total</b>		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
<b>Plan</b>	{NO DATA}	{NO DATA}	{NO DATA}	{NO DATA}
<b>Actual</b>	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
<b>Actual</b>	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**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
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 successful 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}