2015 University of Maryland - Eastern Shore and University of Maryland Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

The 2015 Accomplishment Report consists of the University of Maryland Extension (UME) at University of Maryland College Park and University of Maryland Eastern Shore (UMES), Maryland Agricultural Experiment Station (MAES), and Agricultural Experiment Station (AES) results and accomplishments. UME and MAES at the University of Maryland College Park (UMCP) are in partnership with AES at the University of Maryland Eastern Shore, and, as such, they coordinate their research and extension activities to the maximum extent possible.
In 2013, a new strategic planning process was undertaken to develop a 2014-2019 UME Strategic Plan. Building on University of Maryland Extension's strong programmatic foundation, the UME Strategic Plan-ning Committee conducted extensive data collection in 2013 that reached out to all stakeholder groups: faculty and staff, clientele, and partnering organizations. Based on the data, specific goals, objectives, and strategies in four major areas were identified: Identity, Innovation, Infrastructure, Marketing & Visibility. The programmatic foundation for the 2014-2019 Strategic Plan builds on the four impact areas from the 2009-2014 Strategic Plan: Agriculture and Food Systems, Environment and Natural Resources, Healthy Living, and Resilient Communities and Youth Development. Programming to address these areas is developed in the traditional disciplines of 4-H Youth Development; Agriculture; Family and Consumer Sciences; and Natural Resources and Sea Grant.
Similarly, MAES and AES developed its POW for 2014-2018 using the framework identified by NIFA. In addition, the College of AGNR's strategic plan identifies four core research areas that MAES is leading and those are agriculture, natural resources and environment, human health and nutrition, and international engagement.

The plan for UME emphasizes key outcomes, impacts in critical areas, and "marshaling our intellectual resources" into non-formal 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, AES, 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. Focus Area 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. Focus Area leadership teams, across the major programmatic initiatives, develop signature programs that are replicable, measurable, and recognized at the state and national levels.
The MAES and AES coordinate research projects in the challenge areas identified by the USDA-NIFA. The 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 and graduate students 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 & 4-H Youth Development
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."
The 2014-2019 University of Maryland Extension Strategic Plan carries forward the land grant university mission; the goals of the University of Maryland, College Park, the College of Agriculture and Natural Resourc-es, and University of Maryland Eastern Shore; and the spirit of the Smith-Lever Act. Also, MAES carries forward the responsibilities of the Hatch Act in finding solutions posed to agricultural systems following USDA-NIFA's national priority areas and according to the research strategic plan of the College of AGNR.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	85.0	15.0	54.0	15.0
Actual	107.0	15.0	54.0	22.9

II. Merit Review Process

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

- Internal 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 processes did not change from 2014. On July 1 of each year, UME faculty and staff receive a memo from the Associate Dean/Associate Director of Extension outlining the process and requirements.
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 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, UMERS 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 specifically with non-traditional groups
- Survey of selected individuals from the general public

Brief explanation.

Stakeholder participation is encouraged through local Extension Advisory Councils, 4-H Club leaders (volunteers), and various surveys (including needs assessments) targeted to UME clients. Social media strategies are also now being used to solicit feedback (Facebook, web sites, blogs). Text messages are also being used to reach stakeholders. In 2013, feedback listening sessions were held throughout the State of Maryland to solicit feedback for the new 2015-19 strategic plan.

The administrative officers of the MAES, AES, 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.
In addition, UME administrative leaders connect with many other stakeholder groups outside of agriculture, such as with local departments of health, many nonprofit organizations that provide direct service to stakeholders, including public schools, and civic and community groups.

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
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys

Brief explanation.

End-of-class surveys are used to gather input from individuals attending UME workshops and other events. In addition, follow-up surveys are conducted with stakeholders across all of the major program areas who have attended programs. In 2015, a comprehensive agricultural needs assessments was conducted on the Eastern Shore of Maryland and will be implemented throughout the rest of the state. A needs assessment of participants in the UMES Small Farms program was conducted in 2013-14. Future plans include teaching Extension educators how to conduct focus groups in communities to reach out and engage in localized needs assessments.
The UME Facebook page is used as a method to solicit feedback from our stakeholders, as well as feedback from the UME and UMES web sites.

The administrative officers of the MAES, AES, 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 and 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. 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.
Plans are underway to establish a College-wide Advisory Council that will represent Research, Teaching, and Extension. Representatives of stakeholder groups will be identified to serve on this Council on a rotating basis.

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 of the general public
- Survey specifically with non-traditional groups
- Meeting specifically with non-traditional individuals
- Survey specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public

Brief explanation.

UME draws upon the expertise of approximately 145 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 the updated data from the 2010 U.S. Census, the new 2012 agricultural Census data, 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. In 2013-14, a national external environmental scan was undertaken by the UME strategic planning committee.

MAES and AES have 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 and AES scientists also have identified USDA-ARS scientists from Beltsville, Maryland, and State College, Pennsylvania 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 and AES scientists to respond to questions from the public across the state. Therefore, MAES and AES collect 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 2016 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.

Input from stakeholders was used to create the priorities for the UME strategic plan 2014-2019; 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 and AES 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

During the process of gathering input from Maryland residents for the 2014-2019 strategic plan, stakeholders helped to shape four strategic goals for UME:

1. Identity: Solidify UME's identity as the provider of excellent research-based educational programs in defined priority areas that meet the needs of Maryland's diverse population and are consistent with organizational capacity.
2. Innovation: Create and foster a culture of innovation that anticipates and responds to current and emerging needs of the organization and Maryland residents.
3. Infrastructure: Invest in human capital and organizational systems that foster a culture of inclusion, excellence, and engagement among faculty, staff, volunteers, and stakeholders.
4. Marketing and Visibility: Effectively communicate who we are; what we do; and the social, environmental, and economic importance of our work to clientele, volunteers, and stakeholders. As seen in many other states, Maryland's residents are concerned about the quality of their food, health, environment, families, and youth.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
3427839	1356558	3100591	1551667

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	3427839	969407	3100591	1622534
Actual Matching	3427839	969407	3100591	1551667
Actual All Other	5542468	0	270000	0
Total Actual Expended	12398146	1938814	6471182	3174201

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	0	0	0	1312965

V. Planned Program Table of Content

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Global Food Security and Hunger

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	10%	10%	15%	17%
205	Plant Management Systems	10%	10%	10%	17%
216	Integrated Pest Management Systems	15%	10%	10%	16%
301	Reproductive Performance of Animals	0%	0%	0%	17%
302	Nutrient Utilization in Animals	10%	0%	0%	0%
311	Animal Diseases	10%	10%	10%	0%
503	Quality Maintenance in Storing and Marketing Food Products	5%	10%	5%	0%
601	Economics of Agricultural Production and Farm Management	10%	10%	10%	0%
602	Business Management, Finance, and Taxation	10%	10%	10%	0%
604	Marketing and Distribution Practices	0%	10%	10%	0%
608	Community Resource Planning and Development	10%	10%	10%	0%
704	Nutrition and Hunger in the Population	10%	10%	10%	16%
723	Hazards to Human Health and Safety	0%	0%	0%	17%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	28.0	4.0	16.0	4.6
Actual Paid	28.0	4.0	16.0	9.3
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
1028351	290822	1550296	742129
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
1028351	290822	1550296	695264
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
1662741	0	135000	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

• UME, MAES, and AES will have a combined focus to ensure that Maryland agriculture and food production will be sustainable and profitable and produce a safe, abundant, affordable, and accessible food supply.

• Research coordinated through MAES and AES on crop and animal breeding, specialty crops, personal protective equipment, market analysis, green technologies, economic sustainability, and policy analysis will be performed, while UME will be involved in local and regional efforts to assist agricultural and natural resource entrepreneurs.

• Research conducted through MAES, AES, and UME will generate vital information to increase productivity using genomics, breeding, and adaptation of alternate crops with economic and environmental sustainability.

• Through UME's Impact Teams and MAES and AES research projects, the following planned program activities will be emphasized: IPM; Value Added & Specialty Crops; Grow It-Eat It; Annie's Project; Best Management Practices in Crop and Animal Agriculture; Technologies for the Genetic Improvement of Crops and Animals; Agronomic Fruit & Vegetable Production; Dairy Analysis; and Small/Beginning Farmers Program.

• On-line educational programs, field trials, twilight tours, seminars, workshops, on-farm research & demonstrations and individual farm consultations will be used to educate Maryland farmers, Agriculture industry professionals, Soil Conservation District personnel, USDA-NRCS conservationists and extension faculty.

• New research and technologies developed by the MAES and AES will be transferred via UME on-farm demonstrations and twilight tours.

• Training programs will be developed to improve nutrient management practices, IPM, diagnostic skills, identification and control of invasive species, water management practice improvements and reductions, biosecurity and animal health.

2. Brief description of the target audience

- Farmers, including new and beginning farmers
- Female farmers
- Producers
- Retailers
- Plan growers and breeders
- Socially disadvantaged farmers

- Small farm operators
- Pesticide operators
- Crop protection industry

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	20396	807862	6433	0

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

Patent Applications Submitted

Year: 2015

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	16	3	19

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational programs offered

Year	Actual
2015	579

Output #2

Output Measure

- Number of applied research projects

Year	Actual
2015	13

Output #3

Output Measure

- Acres of land exposed to educational programming efforts

Year	Actual
2015	308000

Output #4

Output Measure

- Number of newsletters distributed

Year	Actual
2015	10

Output #5

Output Measure

- Number of agronomic and fruit and vegetable winter meetings

Year	Actual
2015	15

Output #6

Output Measure

- Number of nutrient management plans written

Year	Actual
2015	549

Output #7

Output Measure

- Number of individuals reached through Extension programs

Year	Actual
2015	75

Output #8

Output Measure

- Number of information pieces developed

Year	Actual
2015	17

Output #9

Output Measure

- Number of databases developed

Year	Actual
2015	3

Output #10

Output Measure

- Number of international standards revised

Year	Actual
2015	3

Output #11

Output Measure

- Number of websites developed/updated

Year	Actual
2015	4

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increase in agricultural profitability attributable to extension efforts.
2	Increase in small, part-time, female, and limited resource farmers
3	Increase in the amount of agricultural land under best-management practices due to Extension programming efforts
4	Increase in the number of people growing food for health and economic reasons
5	Increase in research findings that help to ensure global food security.
6	Increase research findings and standards development that promote pesticide operator health and safety
7	Research: Porcine Reproductive and respiratory syndrome virus vaccine
8	Research: Genomic Data on Snail Target Genes in Chicken Embryos
9	Research: Integrated Pest Management Practices Using Cultural Practices
10	Research: Identification and Management of Herbicide Resistant Weeds

Outcome #1

1. Outcome Measures

Increase in agricultural profitability attributable to extension efforts.

2. Associated Institution Types

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

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Breeders - due to increase in production and decrease costs of labor and resources

What has been done
Research to synchronize estrus to increase pregnancy rate

Results
Increased survival rate and decrease labor costs because operators are better able to predict when their presence is needed.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
216	Integrated Pest Management Systems
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation

723	Hazards to Human Health and Safety

Outcome #2

1. Outcome Measures

Increase in small, part-time, female, and limited resource farmers

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The growth of the commercial grape and wine industry in the Mid-Atlantic has been exponential. There is an incredible demand for information on starting new vineyards in Maryland Local growers are looking more toward high value crops such as grapes to maximize profitability on small acreage.

What has been done
The New Grape Growers program addresses basic beginner production questions on economics, ground preparation, planting procedures, as well as pest management. The program has already attracted over 550 participants in the past five years.

Results
The number of commercial wineries has increased from 12 to 76 and wine production has also increased from 85,000 gallons in 2001 to 360,000 in 2015. UME Specialists and educators have interacted in the establishment of the new wineries and the new vineyards that satisfy the demands of increased production. The New Grape Growers program, from 2002-2015, has taught over 1,350 participants specific details of site evaluation, preparation, planting, and maintenance, resulting in new vineyard being installed with the best opportunity for success.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
216	Integrated Pest Management Systems

601 Economics of Agricultural Production and Farm Management

602 Business Management, Finance, and Taxation

Outcome #3

1. Outcome Measures

Increase in the amount of agricultural land under best-management practices due to Extension programming efforts

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
More than half of the livestock operations in the area are on less than 50 acres and even higher percentages have relatively small herds. This indicates that these are part-time operations and they may be less informed about grazing management best management practices for grazing such as stocking rates, mowing, weed control practices, fertility management, and rotational grazing.

What has been done
The Rotational Grazing Research and Demonstration project demonstrates and provide educational resources to livestock farm operators in the central Maryland region so that livestock operators can adopt BMPs for pastures to protect and improve water quality. A demonstration site was implemented with 13 paddocks demonstrating three different cool season grasses and one warm season grass.

Results
The first phase included initial site evaluation and preparation, which included evaluation of soil drainage, fertility amendments, perennial weed control and establishment of cover crops. This was completed in 2012. The second phase involved the establishment of grasses, installation of demonstration BMPs, and installation of the fencing. This was competed in 2015. The third phase is the introduction of animals and intensive, rotational grazing pasture demonstrations and education. This is planned for 2016.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #4

1. Outcome Measures

Increase in the number of people growing food for health and economic reasons

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
According to a National Gardening Association survey 35% of U.S. households (42 million) in 2013 were doing some type of food gardening. This represents a 17% increase from 2008. The rate of increase was 63% for millennials. Residents depend on UME for science-based, safe, and effective food gardening recommendations and practices.

What has been done
UME's Grow It Eat It program completed its 7th successful year in 2015. Master Gardeners (MGs), trained by UME field faculty, taught 112 classes to approximately 3,200 residents. Over 20,000 packets of organic GIEI lettuce seed was given out to youth and adult gardeners around the State to promote food gardening.

Results
The year 2015 was designated "The Year of Beans & Peas" with these crops featured in Master Gardener demonstration gardens and classes. Master Gardeners gave technical assistance and taught sustainable gardening practices to 25 community gardens and 39 school gardens, reaching hundreds of residents. The Home and Garden Information Center consultants and MGs answered 9,200 vegetable and fruit gardening questions by e-mail, and face-to-face. Master Gardener demonstration gardens produced and distributed 18,500 pounds of produce to food banks and pantries.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
704	Nutrition and Hunger in the Population

Outcome #5

1. Outcome Measures

Increase in research findings that help to ensure global food security.

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Producers and consumers of specialty food crops because of cultural and ethnic preferences, increased species and genetic diversity, and environmental and economic benefits

What has been done
Initial study on beneficial microorganisms on ethnic crops

Results
Two research studies have been initiated to identify elite biofertilizers to enhance the production of specialty vegetable crops.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
216	Integrated Pest Management Systems
301	Reproductive Performance of Animals

302	Nutrient Utilization in Animals
311	Animal Diseases
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
723	Hazards to Human Health and Safety

Outcome #6

1. Outcome Measures

Increase research findings and standards development that promote pesticide operator health and safety

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Producers applying pesticides because of the health and safety of the individuals ensuring global food security

What has been done
EN/ISO International standards are being developed to protect pesticide operators.

Results
Three standards are currently being balloted. These standards are 1) EN ISO/DIS 27065.2 Protective clothing ? Performance requirements for protective clothing worn by operators applying liquid pesticides and for re-entry workers, 2) EN ISO 19918 Protective clothing ? Protection against liquid chemicals ? Measurement of cumulative permeation of chemicals with low vapour pressure through protective clothing, footwear, and glove materials, and 3) EN ISO/DIS 18889 Protective gloves for pesticide operators ? Performance requirements.

4. Associated Knowledge Areas

KA Code	Knowledge Area
723	Hazards to Human Health and Safety

Outcome #7

1. Outcome Measures

Research: Porcine Reproductive and respiratory syndrome virus vaccine

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The goal of this project is to develop an improved vaccine against porcine reproductive and respiratory syndrome virus (PRRSV) infection by using a novel PRRSV isolate that can induce production of type I interferons, whereas most PRRSV isolates inhibit interferon production and its signaling. The novel PRRSV isolate is designated as A2MC2.

What has been done
Serial passaging and propagation in cultured cells, monitoring of interferon production and virus yield, and assessing the virulence and immunogenecity in pigs has been conducted. The virus was passaged over 90 times and interferon production sustained the passaging.

Results
This study showed that the passage 90 virus is attenuated. Two graduate students worked on this project, one paper has been published, and one manuscript is submitted. Accomplishment of this project will provide a vaccine candidate that may help swine producers reduce cost and increase profit margin.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases

Outcome #8

1. Outcome Measures

Research: Genomic Data on Snail Target Genes in Chicken Embryos

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Genomic level data on the snail target genes in chicken embryo is limited, thus obtaining such information is essential in order to allow us to address issues relating to chicken growth and development. The process of epithelial-to mesenchymal transition (EMP) is important for the formation of migratory neural crest cells during development and is co-opted in human diseases such as cancer metastasis.

What has been done
This research found that Cadherin-6B (Cad6B) is removed from migratory neural crest cells through cell surface internalization events that include clathrin-mediated endocytosis and micropinocytosis. Both of these processes are dependent upon the function of dynamin, and inhibition of Cad6B internalization abrogates neural crest cell ETM and migration.

Results
Overall, this research pointed out the significance of post-translational events in controlling cadherin during neural crest cell ETM and migration. Both of which play a central role not only during normal embryonic development and adult homeostasis, but also in pathological conditions such as cancer metastasis and fibrosis. This research has trained several Ph.D. and Post-doctoral students and resulted in several refereed publications to be shared by the scientific community.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
311	Animal Diseases

Outcome #9

1. Outcome Measures

Research: Integrated Pest Management Practices Using Cultural Practices

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The goal of the integrated pest management practice using cultural practices was to determine the effect of the addition of flowering borders on stink bug (Pentatomidae) susceptibility to parasitoid wasps in no-till soybean. Additionally, the project looked at the impact of flowering borders on natural enemy diversity within soybean fields.

What has been done
Soybean plots were flanked by two strips of Single Golden Marigold and Buckwheat with a buffer of bare ground and Sudan grass dividing treatment and control plots. There was no significant difference between flowering and non-flowering plots in terms of stink bug parasitism rates and natural enemy populations. However flower treatments did contain more parasitoid wasps. Sample sizes of stink bug egg masses may have been too low to detect treatment differences.

Results
This project provided training to undergraduates, grade school teachers, graduate students and Post-docs. The Ph.D. candidate assigned to this project is currently writing his dissertation and this work will serve as one of the chapters. Results have been disseminated via farm tours, extension articles, open house events, commodity meetings and national scientific conferences.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
216	Integrated Pest Management Systems

Outcome #10

1. Outcome Measures

Research: Identification and Management of Herbicide Resistant Weeds

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Glyphosate resistant palmer amaranth was confirmed in St. Mary's County in 2014 and in Charles and Calvert Counties in 2015, resulting in significant yield losses to isolated growers. Palmer amaranth is also present on the eastern Shore of Maryland, in areas such as Wicomico and Caroline Counties. The migration northward is expected to continue, with the potential to become established in all of Maryland.

What has been done
An on-farm replicated research trial was conducted in 2015 of six pre-emergent herbicide treatments in a field with a heavy past infestation of palmer amaranth. An evening twilight tour was organized at a farm with a palmer amaranth and trial information was shared with approximately 45 growers.

Results
The trial revealed significant differences in palmer amaranth control, with residual herbicides providing 14-35 days of control. This research indicates further measures will need to be implemented to adequately control palmer, including follow-up residual herbicides applied 4-5 weeks after planting and timely applications of post emergent herbicide treatments.

4. Associated Knowledge Areas

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

Sheep and goat gastrointestinal parasite burden was experienced which reduced the number of available test subjects for the study.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Beginning Farmers Program:
A three year follow up program evaluation was sent to 336 participants through email distribution and 27% responded. Participants were asked a four point scale to rate actions they have taken as a result of BFS. Participants have built their business by: Increasing my farm profitability (3.68), Growing products for market (3.62), Selling my product (3.55). Of those responding to the survey 18 have purchased or rented land, 24 have started a farm enterprise and 32 have started their business. In the area of farm management participants report: Researching agriculture crops and livestock in Maryland (3.48), Writing a Farm Business Plan (3.46), Contacting resources and agencies to start your farm business (3.39). In the area of crop production participants report: Practicing nutrient management on the farm (3.67), Increasing soil productivity and fertility (3.66), Practicing integrated pest management on the farm (3.65), Implementing good agricultural practices and food safety (3.63). In the area of livestock management: Implementing small ruminant management (4.25), Using a rotational grazing system (4.22), Using good pasture management techniques (4.20). When asked if what was learned in BFS has increased profitability 31% responded yes (53% were unsure). Those that responded yes estimated an increase profitability from $525 to $1,048 per participant.
Poultry Health Programs:
Over 500 attendees have taken part in the Poultry Growers Disease Control Workshop on the Eastern Shore of Maryland. Follow up surveys to determine what biosecurity practices were being used as a result of knowledge and skills gained at these workshops indicate:
99% of commercial growers are using farm dedicated footwear (an increase of 11%)
90% are using dedicated farm clothing (an increase of 23%)
93% are avoiding contact with backyard poultry (an increase of 2%)
100% require visitors to use biosecurity clothing prior to entering the farm (an increase of 39%)
69% use farm sign-in logs to track visitors
41% wash equipment entering the farm
93% use signage to alert visitors about biosecurity

56% have disposable clothing on farm for visitors
87% limit access to farm
46% use dedicated shoes in each house
67% Hand washing
91% have footbaths at each house
80% are closing end door between flocks - bird exclusion
56% are removing bird habitat from around the farm
Additionally follow up surveys were used to determine what biosecurity protocols growers where implementing:
89% visit farms only when necessary
86% park off site and walk onto the farm
96% use biosecurity clothing
64% wash equip/vehicles between farms
82% keep biosecurity clothing with them while working

Key Items of Evaluation

Farmers from Lower Eastern Shore to Western Maryland participated in annual winter agronomy meetings to increase crop production knowledge, meet regulatory requirements and improve production practices. In 2015, 513 farmers attended sessions. Of those attending over 60% have been farming more than 20 years with the average farmer tilling 704 acres. Over 90% of the participants report that the session will benefit their farming operation. Participants report information and production practices that will be implemented following the program. These include: Improved pest management practices (35%), improved fertility management (55%), Improved crop production practices (58%), Use of risk management tools (22%), Regulatory information (27%), a new product or practice (24%). Agronomy meeting participants were also asked the expected profitability increase per acre due to knowledge and skills gained from Extension programming. The average participant increases profitability between $16.27 and $25.27 per acre. Using the average acres farmed per person the overall average profitability is $14,270.08 per person.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Sustainable Energy

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	0%	100%	0%	23%
112	Watershed Protection and Management	0%	0%	0%	27%
302	Nutrient Utilization in Animals	0%	0%	0%	35%
403	Waste Disposal, Recycling, and Reuse	40%	0%	50%	0%
511	New and Improved Non-Food Products and Processes	0%	0%	40%	15%
601	Economics of Agricultural Production and Farm Management	60%	0%	0%	0%
801	Individual and Family Resource Management	0%	0%	10%	0%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	6.0	1.0	4.0	3.4
Actual Paid	5.0	1.0	4.0	4.4
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
171392	48470	248047	162711
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
171392	48470	248047	157409
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
277123	0	21600	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Short course and training seminars for industry personnel and growers, farmers, teachers, and faculty.
- Conduct basic and applied research in alternative fuel sources, energy saving techniques, recycling of green waste products, and precision agriculture.
- Contribute to trade and peer reviewed journal publications.
- Train graduate and undergraduate students

2. Brief description of the target audience

- Nursery, greenhouse, dairy farmers, poultry growers and managers
- In-state bioenergy industry.
- Research community at large.
- Farmers and producers.
- Fuel ethanol and distillers grain production industry, livestock feed industry, animal and poultry industry, meat industry, food ingredient industry, farmers
- Researchers in animal and poultry nutrition
- Students in agricultural and food sciences
- Middle and high school teachers
- Governmental agencies related to grain, fuel ethanol, and animal productions

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	782	45	226	0

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

Patent Applications Submitted

Year:	2015
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	0	1	1

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of Extension educational programs offered

Year	Actual
2015	18

Output #2

Output Measure

- Number of applied research projects

Year	Actual
2015	3

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increase in the number of educational programs offered to consumers.
2	Increase in the number of research projects on alternative energy sources and precision agriculture.

Outcome #1

1. Outcome Measures

Increase in the number of educational programs offered to consumers.

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Increase in the number of research projects on alternative energy sources and precision agriculture.

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Anaerobic digestion (AD) is a series of sequential microbial processes to transform organic material into methane-enriched biogas and has been shown to reduce greenhouse gas emissions, while providing renewable energy and a high-quality fertilizer. However, there are barriers facing widespread implementation of AD in the US, including marginal economics, high heating requirements, and the lack of an AD service sector. Improve the use of alternative energy sources and byproducts, and to improve efficiency and use of precision agriculture practices for farmers, particularly small and disadvantaged.

What has been done
With the help of students, the PI, designed innovative pilot-scale digesters, coordinated three AD workshops at USDA, and disseminated the knowledge gained via Fact Sheets aimed at farmers and policy makers on AD processes. Research was conducted regarding bioavailability of phenolic acids which could improve the long-term health, sustainability, efficiency, and profitability of farm animal production and on the synergistic benefits and optimization of inputs of the algal biorefinery.

Results

Our research has shown that small scale digesters are efficient in producing energy and could be financially viable. Results of this research have been highly cited (361 citations over 18 publications in high impact journals), and grant funding (> $2 million) over the past six years has supported six PhD students, four MS students, three post-docs, a visiting professor from Turkey, two research associates, two research technicians and more than 30 undergraduate students. Research indicated that the bioavailability of phytonutrients, such as phenolic acids, were not degraded but even increased during fuel ethanol production processing.
Potential biofuel for Unmanned Aerial Vehicles (UAVs) used in remote sensing for precision agriculture.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
302	Nutrient Utilization in Animals
511	New and Improved Non-Food Products and Processes

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 Programmatic Challenges

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Our research has shown that small scale digesters are efficient in producing energy and could be financially viable. This research has provided value-added benefits to agricultural communities, the sanitation sector, and developing countries while reducing greenhouse gas emissions, organic pollutants, pathogens, and nutrient runoff. With the help of students, the PI, designed innovative pilot-scale digesters, coordinated three AD workshops at USDA, and disseminated the knowledge gained via Fact Sheets aimed at farmers and policy makers on AD processes. Results of this research have been highly cited (361 citations over 18 publications in high impact journals), and grant funding (> $2 million) over the past six years has supported six PhD students, four MS students, three post-docs, a visiting professor from Turkey, two research associates, two research technicians and

more than 30 undergraduate students.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Climate Change

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	10%	10%	15%	72%
111	Conservation and Efficient Use of Water	10%	10%	5%	0%
112	Watershed Protection and Management	15%	20%	10%	10%
123	Management and Sustainability of Forest Resources	5%	5%	5%	0%
131	Alternative Uses of Land	10%	5%	5%	0%
132	Weather and Climate	0%	0%	0%	6%
133	Pollution Prevention and Mitigation	10%	10%	25%	12%
205	Plant Management Systems	15%	10%	10%	0%
216	Integrated Pest Management Systems	10%	10%	10%	0%
403	Waste Disposal, Recycling, and Reuse	5%	10%	15%	0%
608	Community Resource Planning and Development	10%	10%	0%	0%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	16.0	3.0	11.0	3.0
Actual Paid	16.0	1.0	11.0	3.1
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
685568	193881	372071	251037
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
685568	193881	372071	256208
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
1108493	0	32400	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

• UME, MAES, and AES will have a combined focus to help producers plan and make decisions in adapting to changing environments, sustaining economic vitality, and taking advantage of emerging economic opportunities offered by climate change mitigation technologies.
• UME, MAES, and AES will also develop research and education programs that generate knowledge to develop agriculture systems that maintain high productivity in the face of climate changes and reduce greenhouse gas emissions.
• In an effort to meet these objectives, UME, MAES, and AES will develop research and action teams that will focus on: Alternative energy and biofuels; Aquatic resources; Biodiversity/ecosystem services; Energy conservation; Forest resources; Integrated Pest Management; Invasive and exotic species; Land use; Nutrient management; Recreational resources; Waste management; Waste utilization and resource recovery; Watershed restoration; and Wildlife resources.
• UME, MAES, and AES will conduct workshops, demonstrations, symposia, twilight tours, forums and research to educate producers, farmers and citizens about adapting management practices to benefit the environment and minimize climate change impacts.
• MAES, AES, and UME will develop and expand collaborative research and education programs with partners and stakeholder and develop new web based and media educational materials.

2. Brief description of the target audience

- Maryland citizens;
- Master Gardeners and Naturalists;
- Land developer and owners;
- UME, MAES, and AES faculty;
- USDA-NRCS conservationists;
- Soil Conservation District personnel;
- EPA-Chesapeake Bay
- MDA program staff;
- MDE program staff;
- Producers;
- Farmers, large and small;
- Nursery and Greenhouse industry personnel;
- Forest landowners;
- 4-H youth;

- County planning and zoning program staff;
- AGNR industry;
- Animal manure producing industries;
- Nonprofits;
- Appropriate state and municipal government officials;
- Primary and Secondary Science Teachers;
- Recreational and commercial fisheries;
- Media; and
- Maryland homeowners.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	19974	77327	4516	0

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

Patent Applications Submitted

Year:	2015
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	5	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational programs (workshops, twilight tours, field days, courses) offered

Year **Actual**

2015	101

Output #2

Output Measure

- Number of applied research projects

Year	Actual
2015	4

Output #3

Output Measure

- Number of Master Gardeners, Naturalists, Bay-wise, Watershed stewards, and other trained volunteers to deliver educational programs

Year	Actual
2015	253

Output #4

Output Measure

- Number of newsletters (electronic and paper) to the public

Year	Actual
2015	4

Output #5

Output Measure

- Number of individuals reach through Extension programs

Year	Actual
2015	24490

Output #6

Output Measure

- Number of information pieces developed

Year	Actual
2015	12

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increased number of citizens and communities adopting practices of landscape ecology and understanding the relationship among pesticides, poor septic systems and environmental health.
2	Number of new crop varieties, animal breed, and genotypes with climate adaptive traits.
3	Increase in management and sustainability of forest and wildlife resources.
4	Increase in nutrient management planning, waste management systems, and use of composting technology.
5	Increase in research regarding agricultural waste management, composting, water quality, and environmental health.
6	Increased number of acres of best management practices (storm water, nutrient management) implemented
7	Increase in research regarding beneficial microorganisms

Outcome #1

1. Outcome Measures

Increased number of citizens and communities adopting practices of landscape ecology and understanding the relationship among pesticides, poor septic systems and environmental health.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Most Maryland residents live within a half-mile of a storm drain, stream or river. Most of those waterways eventually drain into the Chesapeake Bay. What we do to maintain our own landscapes can affect the health of our local waterways (drainage ditches, streams, and rivers), the Chesapeake Bay and our environment.

What has been done
The MD Bay-Wise Program focuses on water quality, hydrology, wells and septic systems, lawn fertilizers, critical areas and coastal zone management, soil compaction, stormwater management (including rain gardens), integrated pest management, native plants, riparian buffers, and ecologically sound landscape maintenance.

Results
Eighty-three (83) new Master Gardener volunteers were trained in Bay-Wise Landscape Management techniques. To date, 1184 Master Gardeners from 21 counties and Baltimore City have been trained in Bay-Wise techniques. Eighty-nine (89) additional Bay-Wise Master Gardeners had their personal landscapes certified as Bay-Wise demonstration sites by the Bay-Wise Landscape Management program, bringing the total to 565. To date, more than 1293 private properties (residential landscapes) have been certified as Bay-Wise by Master Gardeners in nineteen Maryland counties.

4. Associated Knowledge Areas

KA Code	Knowledge Area

102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
132	Weather and Climate
133	Pollution Prevention and Mitigation
216	Integrated Pest Management Systems
403	Waste Disposal, Recycling, and Reuse

Outcome #2

1. Outcome Measures

Number of new crop varieties, animal breed, and genotypes with climate adaptive traits.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Pumpkins are susceptible to many foliar and fruit diseases. The major foliar diseases are powdery mildew (caused by Podosphaera xanthii) and downy mildew (caused by Pseudoperonospora cubensis). However other diseases such as Plectosporium blight often occur. Designing fungicide programs for management of pumpkin foliar and fruit diseases is difficult because of the number of diseases that attack pumpkins and because of the varied environmental conditions that exist across the state

What has been done
A three-year study of pumpkin spray was conducted at two locations in Maryland. Sorcerer and Magic Lantern were seeded to plots and sprayed according to a weekly spray program, to an IPM program, or not sprayed with a fungicide. Our trials successfully compared conventional and IPM programs for pumpkin production. Disease pressure included powdery mildew and downy mildew at both sites.

Results

While there were some minor differences among research sites, similar trends indicate that broad recommendations apply across Maryland. Fungicides in FRAC group 11 (strobilurins), or FRAC 1 (benzimidazoles and thiophanates) had a high number of colonies form. That indicates that strobilurin and products like Topsin are ineffective for managing pumpkin powdery mildew. An intermediate group where a very low level of insensitivity occurred included FRAC 7 (carboxamides) and FRAC group 3 (DMI inhibitors). Fungicides in this group, which included Fontelis and Folicur, can still be used effectively in spray programs as long as they are used in few sprays and with excellent fungicide resistance management programs. A final group included the FRAC 13 (quinolones), where no insensitivity was observed. This group should also be used with excellent resistance management programs to safeguard their use for future years.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
132	Weather and Climate
205	Plant Management Systems
403	Waste Disposal, Recycling, and Reuse

Outcome #3

1. Outcome Measures

Increase in management and sustainability of forest and wildlife resources.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Maryland's woodlands cover 42% of the State, or 2.7 million acres. The disproportionately largest ownership of this forested landscape is comprised of private family landowners who make up 76%, or three-quarters, of all woodland management decisions and, therefore, have the most profound effect on the future of the State's forests.

What has been done
In 2015, UME began marketing the next Woodland Stewardship workshop and participant selection process began. In addition, a refresher course for current Woodland Stewards was held in western Maryland, and both a follow-up survey of past year's cooperators and a biannual survey of all MWS volunteers was conducted.

Results
Since its inception, more than 450 individuals have become Maryland Woodland Stewards by participating in an intensive four-day forestry and wildlife training workshop and committing to a minimum 40 hours of volunteer outreach advocating the benefits and sharing the strategies of sustainable forestry and wildlife management practices within their communities. Over the years, our Woodland Steward cooperators have consistently demonstrated that they are effective agents of change and are improving management on private forest land.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land
132	Weather and Climate
205	Plant Management Systems

Outcome #4

1. Outcome Measures

Increase in nutrient management planning, waste management systems, and use of composting technology.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Bedding is an important component used in the raising of poultry. It is important for several reasons including; insulating chicks from the ground, dilutes fecal material, absorbs excess moisture, promote drying (due to its increased surface area), and acts a cushion for their breast muscle and feet. While there has been some research on using switchgrass as bedding, no research has been implemented on looking at the long term viability in houses that go multiple grow-outs between cleanouts in commercial production houses.

What has been done
UME poultry specialists have developed best management practices on how to manage switchgrass bedding in the poultry houses

Results
There is currently about 1538 poultry farms with approximately 125 million sq feet of total production area in the Delmarva region. Every time houses are cleaned out they need to have bedding placed in them at an average depth of three inches. Pine shavings is the bedding that is most commonly used and as its availability decreases the cost increases. If Switchgrass is an acceptable alternative to pine shaving the savings to the Delmarva Poultry Industry would be significant. Currently it costs $0.125 per sq ft to bed this space with pine shaving. The cost of Switchgrass is $0.08125 per sq ft making it 35% cheaper to use than pine shavings. The total potential savings per clean out for the Delmarva area would be $5,468,750 or an average of $3,503 per farm.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
132	Weather and Climate
133	Pollution Prevention and Mitigation
403	Waste Disposal, Recycling, and Reuse

Outcome #5

1. Outcome Measures

Increase in research regarding agricultural waste management, composting, water quality, and environmental health.

2. Associated Institution Types

- 1862 Extension
- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Agriculture is the greatest consumptive user of water in the US, and in many regions agricultural water use cannot be sustained. Irrigation accounts for 62% of freshwater (surface and ground water) use in the United States. More than 55.4 million acres of land were irrigated in the United States in 2013, of which 72% was irrigated by sprinkler and micro-irrigation systems. Water moves fertilizer through the soil, so irrigation management is a key part of nutrient management. Also excessive nitrogen (urea) and phosphorus nutrients, including urea, can cause eutrophication and harmful algae blooms causing problems for industries that depend on heathy waters, i.e. fisheries and tourism.

What has been done
With funding from the USDA Specialty Crops Research Initiative (SCRI) the SCRI-MINDS project has developed advanced wireless sensor control technology and software to apply irrigation water based on daily plant requirements. This would result in efficient water use and water quality for ornamental Crop production and health.
A study was conducted to assess intermittent headwater sediments as a source of urea and another study investigated the different subsurface flow pathways that transports phosphorus from fields to drainage ditches.

Results
Using multi-disciplinary sources (Public Land grant, Private University, Private Industry, etc.) an advanced sensory wireless technology and software were developed to apply irrigation water efficiently, resulting in 40-70% reduction in water used and saving $151 dollars per Million gallons of water in just pumping costs. This technology also helped reduce fertilizer need by 50%, thus offering both economic and environmental benefits. This project has extended the application of sensor technology to Food crops (e.g., strawberries) for both water and nutrient management as well as frost control in places like Florida and California.
Research findings for the urea study show that sediment sources can explain the high concentrations found in drainage ditches and under warm summer conditions.
The phosphorus transport study is utilizing an emerging technology which combines near-surface geophysics with groundwater tracers to image the transport pathways and improve simulation models and risk assessment tools.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
131	Alternative Uses of Land

132	Weather and Climate
133	Pollution Prevention and Mitigation
205	Plant Management Systems
216	Integrated Pest Management Systems
403	Waste Disposal, Recycling, and Reuse

Outcome #6

1. Outcome Measures

Increased number of acres of best management practices (storm water, nutrient management) implemented

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Stormwater runoff from private properties remains one of the most difficult and expensive sources of Chesapeake Bay pollution to control. Small-scale, residential stormwater best management practices (BMPs) are most often voluntarily installed by property owners but are rarely effectively tracked at the local level by county and/or municipal agencies.

What has been done
The Chesapeake Bay Program's Urban Stormwater Work Group approved a streamlined verification procedure for non-permitted BMPs to simplify the property owner BMP reporting process while still retaining a high degree of quality assurance with the actual installation of each BMP being certified by a designated third party or a local government after installation.

Results
The Stormwater Management and Restoration Tracker (SMART), developed by the University of Maryland Sea Grant Extension Watershed Protection and Restoration Program provides the needed mechanisms to track, certify and report progress on these small-scale, non-permitted BMPs. The tool allows individuals to upload their BMP data to a local website, where the data are tracked, checked and certified by trained volunteers. SMART incorporates all approved nutrient and sediment reduction information provided by the Chesapeake Bay Program's Water Quality Goal Implementation Team to calculate and report out individual and aggregate reductions for each BMP tracked.

4. Associated Knowledge Areas

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

Outcome #7

1. Outcome Measures

Increase in research regarding beneficial microorganisms

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Increase the use of beneficial microorganism and biofertilizers by individuals in the green industries, nurseries, greenhouse growers, and small farmers on Delmarva. Biofertilizers are more cost effective relative to chemical fertilizers and can help reduce chemical fertilizer runoff. Uses of biofertilizers containing beneficial microorganisms instead of synthetic chemicals have been known to improve plant growth through the supply of plant nutrients and may help to sustain environmental health and soil productivity.

What has been done
Two greenhouse poinsettia studies were conducted. One study examined the application of a natural and a commercial microorganism product on the growth and development of poinsettias. The other study examined the application of seaweed extract on Poinsettia growth and development.

Results
The poinsettia beneficial microorganism study found that the natural product influenced plant growth and development. The seaweed study found no significant differences.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
132	Weather and Climate

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

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Maryland Woodland Stewards have contributed an average of 2,343 hours per year in education and outreach efforts, or a total of 39,830 hours during the life of the program. The average value of volunteer time over the 20 year period of 1990 - 2006 is $15.56 per hour.2 This means that average hours spent per year by volunteers who have participated in our follow-up surveys can be valued at $36,464. Put another way, a full-time person works 2080 hour in a year. The average volunteer time is equal to 1.1 full-time worker per year.
Maryland Woodland Stewards have averaged 12,739 hours per year in management efforts on their properties over the life of the program. Using the average volunteer time of $15.56 per hour described above, the average volunteer time can be valued at $198,218. This would amount to the time spent by 6.1 full-time workers per year.
The Master Naturalist Program had 153 new Master Naturalists volunteered at 16 sites in central Maryland and on the eastern Shore in 2014. Twenty new program facilitators (now 73 trained statewide) learned how to conduct volunteer training at their sites; with 180 certified Master Naturalists volunteering 8,230 hours, and having a value of $209,288.90. The 2014 Watershed Restoration Program had Watershed Stewards Academies and volunteers contributed 4,000 volunteer hours (valued at $90,200) and implemented stormwater management practices that treated 25,000 square feet of impervious surface. The Restoring the Environment and Developing Youth (READY) program that teaches high school and college students how to build rain gardens and other stormwater management systems. To date over 320 residents are certified as Master Watershed Stewards between 4 existing programs, over 100 summer green jobs have been created through the READY program and over 50 rain gardens have been installed treating over 500,000 sq. ft. of

impervious surface.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Childhood Obesity

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
703	Nutrition Education and Behavior	50%	100%	0%	0%
704	Nutrition and Hunger in the Population	5%	0%	0%	0%
724	Healthy Lifestyle	35%	0%	0%	100%
801	Individual and Family Resource Management	10%	0%	0%	0%
	Total	100%	100%	0%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	10.0	1.5	5.0	1.5
Actual Paid	10.0	1.5	0.0	0.4
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
342784	96941	0	82241
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
342784	96941	0	29180
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
554247	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Develop/implement training for cafeteria/food service workers using Walk the Line curriculum.
- Workshops and professional development for Growing Healthy Habits, Farm-2-School, and Walk the Line.
- Develop and implement training for School Wellness Champions in pilot test sites focusing on sustainable wellness policies that support healthy lifestyles.
- Create effective materials and programs that meet standards of health literacy.
- Investigate taste preference and trying new fruits and vegetable measures for statewide evaluation.
- Educational programs for cafeteria and food service workers and school administrators.
- Educational programs targeting pre-schoolers and their parents through train-the-trainer approach for child care and pre-school teachers.
- Up For the Challenge curriculum implemented for school-age youth in 3 sites targeted to geographically dispersed military families/youth.
- Contribute articles and expertise to eXtension.org Community of Practice for Food, Fun, and Fitness
- Develop Social Marketing and Social networking strategies to engage target audiences in Healthy Living dialogue
- Conduct applied research to inform educational program interventions.
- Promote lifelong healthy and active lifestyles by instilling beneficial habits in preschool children

2. Brief description of the target audience

- School-age and preschool youth
- Parents of school-age youth
- Children enrolled in childcare centers
- Parents of children enrolled in childcare centers
- Teachers
- Cafeteria/Food service workers
- School administration
- Providers of before and aftercare
- Limited Income Mothers and Children
- Food Stamp recipients
- Geographically dispersed military families
- Childcare providers

3. How was eXtension used?

- Contribute articles and expertise to eXtension.org Community of Practice for Food, Fun, and Fitness

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	4613	740000	17739	0

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

Patent Applications Submitted

Year:	2015
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational programs offered

Year	Actual
2015	24

Output #2

Output Measure

- Number of applied research projects

Year	Actual
2015	1

Output #3

Output Measure

- Number of schools and child-care partnerships in childhood obesity prevention programs

Year	Actual
2015	750

Output #4

Output Measure

- Number of school gardens developed

Year	Actual
2015	204

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increase in fruit and vegetable consumption among preschoolers and youth
2	Increase in school cafeteria workers' awareness, knowledge, and skills regarding healthy eating practices
3	Increase in preschoolers and youth who include physical activity in daily routine
4	Increase in preschoolers and youth who report eating more healthy foods
5	Market to Mealtime

Outcome #1

1. Outcome Measures

Increase in fruit and vegetable consumption among preschoolers and youth

2. Associated Institution Types

- 1862 Extension
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Recent studies have found that lifestyle choices and physical activity practices are established very early in life and have an impact on future health and well-being. Thus, preschool-age is a critical time for nutrition education intervention.

What has been done
When working with youth, FSNE educators introduce and repeatedly expose participants to healthy foods, with the goal of increasing taste preference and self-efficacy related to healthy eating. Programs include Growing Healthy Habits, Color Me Healthy, Feeding for Healthy Eating, Grow It, Try It, Like It, Nutrition Nuggets, and Read for Health.

Results
Parent participants in FSNE programming report that their kids are eating healthier, as determined by increases in daily fruit and vegetable consumption. Parents also report a significant increase in
their children's healthy snacking behaviors and a significant decrease in unhealthy snacking (candy, chips, and cookies) from before FSNE programming as compared to after. Youth participants in FSNE programming report increased taste preference for healthy foods, including foods from the vegetable and whole grain food groups. Youth also report increased confidence in their ability to choose and consume healthy foods.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

704	Nutrition and Hunger in the Population
724	Healthy Lifestyle

Outcome #2

1. Outcome Measures

Increase in school cafeteria workers' awareness, knowledge, and skills regarding healthy eating practices

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Increase in preschoolers and youth who include physical activity in daily routine

2. Associated Institution Types

- 1862 Extension
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	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
FSNE's nutrition education responds to and supports national recommendations for physical activity behaviors as highlighted by parent reports of their children's physical activity. Up for the Challenge is a - fitness, nutrition and health curriculum designed for school-aged, middle school and teen youth. The curriculum chapters contain multiple lessons on physical activity, nutrition and healthy decision making. Lessons focus on nutrition and/or physical activities and include essential information for instructors, food preparation instructions and supplies, and handouts.

Results

Parents in FSNE programming report a decrease in the amount of time their children spend watching TV each day. Specifically, the majority of parents report that their children are meeting or exceeding the American Academy of Pediatrics' recommendations for screen time. Youth participants also report significant increases in their physical activity. The greatest increase in physical activity occurred among those youth who report engaging in physically active behaviors at least 5 times per week.

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #4

1. Outcome Measures

Increase in preschoolers and youth who report eating more healthy foods

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Market to Mealtime

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
While farmers' markets are great places to buy local, healthy foods, markets could improve outreach and promotion efforts to increase patronage and federal nutrition program benefit redemption, including Supplemental Nutrition Assistance (SNAP). However, many SNAP recipients, and the general population, are unfamiliar with many healthy local fresh fruits and vegetables, including the nutritional benefits and how to prepare them.

What has been done

Farmers' markets provide an opportunity to influence market visitor knowledge and purchasing, preparation and consumption of fruits and vegetables through education and sampling of prepared simple and healthy recipes. The Market to Mealtime program provides demonstrations of how to prepare fresh fruits and vegetables and allows participants to try the food and take home the recipe.

Results

Sixty three percent of Market to Mealtime participants take home more fruits and vegetables than they typically do after Market to Mealtime education. Nine out of ten planned to buy or choose the fruit or vegetable they learned about that day and use it in meals and snacks during the week; half took home a new fruit or vegetable they never had before.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population
724	Healthy Lifestyle
801	Individual and Family Resource Management

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

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Adults who participate in FSNE programming that focuses on smart shopping strategies are equipped to improve their food resource management skills. These adults report plans to significantly increase the frequency with which they: · Compare prices when grocery shopping · Buy store brands instead of national brands · Use coupons · Eat a meal or snack before shopping to avoid impulse buys Additionally, adult participants in Cooking Matters at the Store tours conducted by FSNE educators, in partnership with Share our Strength, report strong plans to make healthier and less expensive food choices:
--80% planned to compare unit prices to find the best deal;
--83% planned to read ingredient lists to find whole grains;

--86% planned to compare food labels to make healthy choices.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Food Safety

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	10%	100%	100%	0%
205	Plant Management Systems	10%	0%	0%	50%
404	Instrumentation and Control Systems	10%	0%	0%	0%
501	New and Improved Food Processing Technologies	20%	0%	0%	0%
502	New and Improved Food Products	20%	0%	0%	0%
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	10%	0%	0%	25%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	20%	0%	0%	25%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	10.0	1.5	5.0	3.5
Actual Paid	10.0	1.5	5.0	5.7
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
342784	96941	930177	384416
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
342784	96941	930177	413606
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
554247	0	81000	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Develop technical assistance programs for UME
- Develop and/or adapt food safety materials and resources for UME Educators
- Collaborate with local, regional, and national partners
- Develop safe food educational materials/ resources and disseminate USDA food safety materials to consumers and producers
- Develop food preservation educational materials/resources and disseminate to consumers via workshops and media
- Conduct trainings and workshops, including train-the-trainer workshops
- Conduct evaluations
- Promote and support Maryland Farm to School and other agricultural literacy programs
- Conduct data analysis, needs assessments, environmental scans, and asset mapping
- Network internally and externally with collaborators, partners, and affiliates
- Raise community and stakeholder awareness of local food issues
- Contribute to relevant eXtension Communities of Practice
- Develop online food safety modules
- Conduct social marketing awareness education focusing on food safety
- Conduct basic and applied research to inform program development regarding food borne illnesses/pathogens, antibiotic residues, and beneficial and safe compounds in the food.
- Conduct basic and applied research for food safety and economic analyses of crops grown on conventional and organic sites.
- Conduct basic and applied research to test seafood samples for antibiotic resistance and to standardize methods for extraction of antibiotic residues.

2. Brief description of the target audience

- Consumers: Youth, adults, older adults
- Commercial: Fruit and vegetable producers and food processors
- Commercial: Seafood and meat producers and processors
- Food service workers, childcare workers, community-based organizations
- Service agencies related to food production, promotion, consumption, protection, education

3. How was eXtension used?

- Contribute to relevant eXtension Communities of Practice

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1296	600	0	0

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

Patent Applications Submitted

Year: 2015

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	0	1	1

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational programs offered

Year	Actual
2015	84

Output #2

Output Measure

- Number of applied research projects

Year	Actual
2015	9

Output #3

Output Measure

- Number of fruit and vegetable growers using good agricultural practices

Year	Actual
2015	65

Output #4

Output Measure

- Number of food processing operations using good manufacturing and sanitary practices

Year	Actual
2015	71

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increase in people who gain basic food safety knowledge and skills
2	Increase in fruit and vegetable farmers adopting good agricultural practices
3	Increase in applied research projects
4	Increase in processors using good practices

Outcome #1

1. Outcome Measures

Increase in people who gain basic food safety knowledge and skills

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	95

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Use and demand for organic produce is on the rise by consumers. Complicated certification requirements make it necessary to determine best management practices when using poultry litter.

What has been done
Research to produce selected organic crops in an environmentally responsible way while assessing the safety and economic viability of the practices. Additionally field tours were conducted to educate high school students and consumers about the potential for food borne pathogens on organic crops grown in poultry litter.

Results
Food borne pathogens were not detected on the selected organic crops.

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

Increase in fruit and vegetable farmers adopting good agricultural practices

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Several outbreaks of foodborne illness have been traced to contaminated fruits and vegetables that were either grown domestically or imported. The U.S. Food and Drug Administration (FDA) released new regulations associated with the Food Safety Modernization Act (FSMA) that govern the produce industry. Produce farms that have gross sales greater than $25,000 of fruits and vegetables may need to comply with the regulations. Therefore, it is evident that producers need to be more aware of GAPs and the changing regulatory environment which includes an emphasis on water quality.

What has been done
A series of GAP programs was offered in early 2015 that highlighted several topics prior to the November release of the new regulations. Secondly, faculty from the University of Maryland attended two training programs put on by the Produce Safety Alliance in preparation for the FSMA regulations and to be prepared to offer FDA approved training curriculum in late 2015 and early 2016.

Results
UME is educating growers about FSMA regulations. That knowledge enables them to evaluate how their operations can comply with the regulations and remain competitive and profitable.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
205	Plant Management Systems
404	Instrumentation and Control Systems

711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #3

1. Outcome Measures

Increase in applied research projects

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The United States is the third leading seafood consuming nation in the world. Currently, there is a lack of knowledge about the prevalence of food borne pathogens and antibiotic residues in imported and domestic seafood.

What has been done
Research was conducted to analyze imported and domestic seafood for the prevalence of food borne pathogens and antibiotic residues. Experiments were conducted to standardize methods for extraction of antibiotic residues from seafood.

Results
Valuable information is being obtained to determine the types and potential food safety hazards associated with domestic and imported seafood. The analysis of seafood for antibiotic residues provides increased data to support further risk assessment and food safety policy decisions.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
205	Plant Management Systems
404	Instrumentation and Control Systems

501	New and Improved Food Processing Technologies
502	New and Improved Food Products
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #4

1. Outcome Measures

Increase in processors using good practices

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The detection and enumeration of pathogens in food and on surfaces that come into contact with food is an important component of any integrated program to ensure the safety of food throughout the agricultural and food processing sectors.

What has been done
The goal of the MAES research biosensor project was to develop a nano-bio hybrid BioMEMS device that can recognize and capture a putative food born pathogen. Functionalized ferromagnetic nanoparticles (Fe3O4) were used to confer the magnetization of the BioMEMS device. Pathogens are detected by two entirely new sensing modalities: 1) detection of systems-level redox-activities by an electrochemical method; 2) detection of virulence-related quorum sensing activities by advanced biotechnological methods.

Results
Researchers have found that codeposition of chitosan and Fe3O4 nanoparticles and simultaneous imposition of a magnetic field during codeposition can (i) organize structure, (ii) confer magnetic properties, and (iii) yield magnetic films that can perform reversible collection/assembly functions. Researchers have fabricated a dual-functional electrodeposited magnetic chitosan film for magnetic capturing and bio-electric signal detection. It has spatially segregated functions within the film: magnetic property localized adjacent to solution (capturing

bacteria in the solution) and redox property localized adjacent to electrode (sensing bacteria).

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
501	New and Improved Food Processing Technologies
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Public Policy changes
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

V(I). Planned Program (Evaluation Studies)

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

Family & Consumer Sciences

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
504	Home and Commercial Food Service	10%	0%	0%	0%
607	Consumer Economics	30%	0%	0%	0%
723	Hazards to Human Health and Safety	10%	0%	0%	0%
724	Healthy Lifestyle	30%	25%	0%	0%
801	Individual and Family Resource Management	20%	25%	0%	0%
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	0%	50%	0%	0%
	Total	100%	100%	0%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	20.0	3.5	13.0	0.0
Actual Paid	20.0	3.0	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
411341	116329	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
411341	116329	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
665096	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

• Full development and implementation of Smart Choices Curriculum for Consumers focusing on making 'smart choices' related to health insurance; continue training Extension educators across the country to be certified to teach "Smart Choices."
• Develop, pre-test, pilot-test, and implement Smart Use Curriculum focusing on maximizing the use and understanding of health insurance.
• Conduct "Smart Choice" train the trainer and consumer workshops for targeted consumer groups (farm families, etc).
• Create and publish scholarly work in support of Smart Choice curriculum and associated health insurance literacy efforts.
• Conceptualize and initiate small working forum to explore the idea of developing a "Health Extension" program in collaboration with the UMD medical community.
• Piloting, testing, and implementation of Financial Nuggets Curriculum for parents and youth.
• Plan, organize, and conduct Personal Finance Seminar for Professionals (professional development for personal finance specialists, educators, and practitioners from across the country).
• Develop, pilot, and test adapted Small Steps to Health and Wealth in the Workplace; partner with Shore Health to implement SSHW on the Shore and beyond.
• Develop, review, test, and finalize on-line modules to support MD State Retirement Program participant education.
• Train Community Health Workers in MD and DC
• Promote green cleaning as a component of healthy homes
• Conduct healthy living programming at Senior Centers focusing on healthy eating and increased physical activity.
• Develop and implement educational programs focusing on safety on the farm and at home.
• Development of FCS Volunteer Program to support key programming outreach and education.

2. Brief description of the target audience

• Extension Educators
• People who need to purchase health insurance
• Professionals/Practitioners
• Childcare providers
• Youth/4-H
• Families with specific health hazards

- Older adults
- Military families
- General audiences
- Athletes, coaches, medical professionals
- University-wide faculty
- Community Partners
- Federal/State Partners
- Professionals/Practitioners

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	45078	14274	7163	845

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

Patent Applications Submitted

Year:	2015
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	11	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational workshops offered

Year	Actual
2015	1196

Output #2

Output Measure

- Number of adults and youth with increased financial literacy

Year	Actual
2015	1737

Output #3

Output Measure

- Number of adults and youth with increased health literacy

Year	Actual
2015	2242

Output #4

Output Measure

- Number of youth with increased safety awareness

Year	Actual
2015	38

Output #5

Output Measure

- Number of adults and youth with increased understanding of healthy and safe home environments

Year	Actual
2015	633

Output #6

Output Measure

- Number of youth and adults with increased nutrition/healthy eating understanding

Year	Actual
2015	12939

Output #7

Output Measure

- Number of applied research projects

Year	Actual

2015 9

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increase in children and youth who report eating more of healthy foods.
2	Individuals who report increased ability to set financial goals, make savings plans, establish emergency funds, and decrease debt
3	Increase in individuals who report the adoption of healthy eating practices (including eating more fruits and vegetables, choosing high fiber foods, choosing more whole grains)
4	Increase in people reporting the adoption of healthy home practices
5	Increase in reported confidence and capability to make smart health insurance decisions
6	Increased research findings that contribute to individuals and families well-being and quality of life.

Outcome #1

1. Outcome Measures

Increase in children and youth who report eating more of healthy foods.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The school environment directly impacts the health and wellness of children. School Local Wellness Policies (LWPs) has an opportunity to positively influence the school environment and student's health behaviors.

What has been done
The Maryland Department of Education is collaborating with University of Maryland Extension (UME), University of Maryland Baltimore (UMB) and Local Health Departments (LHDs) to provide training, technical assistance and resources to Local Education Agencies to support building a healthier school environment. This project will serve as a pilot effort, and will be implemented in five counties: Baltimore County, Frederick County, Somerset County, Washington County, and Worcester County. An average of twelve schools in each county were identified to participate.

Results
UME has evaluated and modified existing materials to create an eight hour training, Champions for Change, to provide Wellness Champions with the knowledge, skills and abilities to implement local wellness policy goals and activities at the school-level to enhance and improve the healthy eating and physical activity environment for students. The training teaches participants how to: 1) Establish a Wellness Champion 2) Build an effective school wellness team 3) Assess school wellness environment and 4) Develop action plans from LWP goals focused in nutrition promotion/food marketing, physical activity, nutrition education, school meals.

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #2

1. Outcome Measures

Individuals who report increased ability to set financial goals, make savings plans, establish emergency funds, and decrease debt

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Many economically vulnerable Maryland families face the realities of living in poverty such as being unbanked or underbanked, not having health insurance, being unbanked or underbanked, and filing bankruptcy (higher rates for minorities and single-parent headed households). In Maryland, the poverty rate among children exceeds adult incidence by 4%. The poverty and subsequent challenges that exist in every community can be helped by empowering children with early financial capabilities, trickling financial empowerment up through parents and caregivers, and spreading lessons and resources for extending basic financial management out to and through Maryland schools and afterschool programs.

What has been done
To actively engage youth participants in positive money management and financial capability lessons, financial simulations were embedded in financial programming called "The Reality Store." Over 1100 youth participated in the financial simulation, which increased their awareness of making smart financial decisions. The financial simulation included 8 stations: banking, housing, transportation, clothing, personal care, entertainment, food/groceries, and charity.

Results
The poverty and subsequent challenges that exist in every community can be helped by empowering children with early financial capabilities. The students enjoyed the financial simulations in The Reality Store and 92.2% planned to share what they learned with parents, teachers and/or friends.

4. Associated Knowledge Areas

KA Code	Knowledge Area
607	Consumer Economics

724	Healthy Lifestyle
801	Individual and Family Resource Management

Outcome #3

1. Outcome Measures

Increase in individuals who report the adoption of healthy eating practices (including eating more fruits and vegetables, choosing high fiber foods, choosing more whole grains)

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Marylanders still face a high proportion of adults who are overweight (65.4%) and obese (27.1%). Overweight/obesity may remain a perpetual chronic issue with adolescents who are overweight (15.6%) and obese (12.2%) in this state. Encouraging physical activity and healthy diet behaviors through outreach and education can ultimately reduce that state's current situation.

What has been done
The University of Maryland Extension Food Supplement Nutrition Education (FSNE) Program provides nutrition education to low-income Maryland residents. The goal of the educational programming is to improve the health and well-being of SNAP-eligible participants by encouraging healthy choices and active lifestyles.

Results
Adult participants in FSNE nutrition education classes increase their daily servings of fruits and vegetables by one whole serving, from a total of 3.5 servings before the program to 4.5 servings after the program. Following FSNE nutrition education programs, 26% more adult participants report consuming fruits and vegetables for snacks often or every day. Adults participating in FSNE nutrition education programs eat a daily variety of fruits and vegetables. More than 5 out of 10 adults (53%) eat more than one type of fruit and more than one type of vegetable often or every day

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #4

1. Outcome Measures

Increase in people reporting the adoption of healthy home practices

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
There has always been a link between the health of an individual and their dwelling. Ranging from the water quality and environmental contaminants to pests and allergens, the home environment can negatively impact people.

What has been done
The University of Maryland Extension Educators are one set of trainers to equip community health workers with the knowledge and ability to diagnose and treat these issues. Two full day trainings were held on the 7 steps to a healthy home and community health workers were given tools to practice identifying home problems and prescribing a treatment plan.

Results
Results of the pre/post-test indicate the participant leave with a greater knowledge to apply the 7 steps to a healthy home. In particular, they can identify and diagnose potential health issues, sources of the problem and methods to re-mediate. Potential health outcomes include lower incidence of asthma and allergies, lower incidence of home-based accidents, reduction in radon exposure, reduction in pest exposure and an overall income in health.

4. Associated Knowledge Areas

KA Code	Knowledge Area
723	Hazards to Human Health and Safety

724 Healthy Lifestyle

Outcome #5

1. Outcome Measures

Increase in reported confidence and capability to make smart health insurance decisions

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Consumers might make less than optimal health insurance choices for reasons such as low health insurance literacy, lack of information or misinformation, information overload, and time constraints. UME Educators believed that misunderstanding about how to use information could lead to a mismatch of insurance to needs.

What has been done
The primary delivery method for Smart Choice for Health Insurance is a two-hour consumer education workshop conducted by Extension Educators trained and certified to teach Smart Choice. Smart Choice Basics is a one-hour program. Consumers are able to determine which health insurance plan is best, based on needs, wants, costs, and coverage.

Results
Extension Educators in Family & Consumer Sciences have taught Smart Choice to over 500 individual consumers. However, through partnerships with multiple organizations, the reach of UME Smart Choice has been much more significant. A partnership was launched with Healthy Howard to promote Smart Choice workshops. A HILI team member worked with the Howard County Local Health Improvement Coalition (LHIC), a group made of 30 organizations and community groups with the goal to improve the health of all residents with particular attention to health disparities. The group learned about the programs UME has to offer on health insurance literacy to consumers and community assistance workers. In addition, HILI has conducted a professional development program in Howard County for 12 navigators from Door to Health Care.

4. Associated Knowledge Areas

KA Code	Knowledge Area

607	Consumer Economics
724	Healthy Lifestyle
801	Individual and Family Resource Management

Outcome #6

1. Outcome Measures

Increased research findings that contribute to individuals and families well-being and quality of life.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Senior centers are potential venue to develop a community- based hypertension management program for older adults to improve self-care
behaviors of chronic diseases.

What has been done
To address hypertension related issue and identify key aspects of hypertension management including eating behavior, gaps in hypertension knowledge and health literacy and sodium intake in older adults, a formative study was conducted and collaborative partnerships with state health departments were established.

Results
The findings of this formative study provide key information to develop a hypertension management program: 97.5% participants (n=79) take anti-hypertensive medication and about 40% of participants still had uncontrolled blood pressure (150/90). A majority of participants (82.9%) were overweight or obese. Based on the results of Block sodium screener, 46.5% consumed ≥ 2,300 mg/day. 79.7, 68.4 and 65.4 % eat less than 3 servings of whole grain, less than 3-4 servings of vegetables and 2-3 servings of fruit, respectively. This formative research will provide a base to develop an Extension program focused on preventing hypertension in older adults.

4. Associated Knowledge Areas

KA Code	Knowledge Area
607	Consumer Economics
723	Hazards to Human Health and Safety
724	Healthy Lifestyle
801	Individual and Family Resource Management
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

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

{No Data Entered}

V(I). Planned Program (Evaluation Studies)

Evaluation Results

The Reality Store:
Specifically, results from the post-test, administered immediately after simulation, indicate:
•61.9% of the students experienced an increased awareness of budgeting money
•51.8% of the students experienced an increased awareness of making wise financial choices
•51.76% of the students experienced an increased awareness of making career choices
•57.32% of the students experienced an increased awareness of the value of higher education
•32.6% of the students would set financial limits and stay within them
•53% of the students would create and follow a spending and savings plan once they were living on their own
•84.3% of the students consider insurance and savings as strategies to help plan for emergencies
•86.1% of the students believe the Reality Store financial simulation increased their awareness of making smart financial decisions

Key Items of Evaluation

Use of the Smart Choice Health Insurance© curriculum across the nation, provides an avenue for Cooperative Extension to mobilize, demonstrate nationally aggregated data, and to document behavior change. To date, 189 educators and specialists (and a few administrators) in 31 states are certified to teach Smart Choice; 30 to teach Smart Choice Basics. With the use of a standardized evaluation too, Cooperative Extension can demonstrate at the national, state and local levels the ability to mobilize the system to respond to a national need. Data will be shared with partner states and national decision makers. Smart Choice Health Insurance™ is robust enough to potentially touch every American.

Both through the creation of the curriculum and in teaching other Extension Educators to use the curriculum, it was evident that this curriculum can be used as personal and professional development for educators. Educators are consumers too, and find themselves faced with the same decisions our clientele and communities face. Educators also show increased confidence to teach workshops after participating in a consumer workshop. Through certification to become trainers for Smart Choice™, Extension Educators across the nation have been provided the opportunity to develop both personally and professionally. This curriculum has increased personal capacity and confidence of consumers and educators, alike, without political bias.

The Health Insurance Literacy Initiative (HILI) and Smart Choice™ are also being examined aspart of a national study to determine how non-agricultural program innovation and diffusion occur in CES. The findings from this study will help CES to understand how organizations can support the innovation development and implementation and what are innovation attributes that are important to Extension products.

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

4-H Youth Development

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
806	Youth Development	100%	100%	0%	0%
	Total	100%	100%	0%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	17.0	0.0	0.0	0.0
Actual Paid	17.0	3.0	0.0	0.0
Actual Volunteer	17.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
445619	126023	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
445619	126023	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
720521	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

1. 4-H community clubs will be conducted focusing on activities that support youth learning science and technology, healthy living, and citizenship

2. 4-H school enrichment programs
3. 4-H Operation Military Kids programs
4. Camping programs
5. State and county fairs
6. Demonstrations
7. Other special interest clubs and activities, such as Health Rocks!

2. Brief description of the target audience

- All youth in the State of Maryland
- All youth who are children of military parents
- All adults with an interest in becoming 4-H volunteers
- Businesses who would be interested in financially supporting 4-H programs
- Community partners

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	4046	148512	68315	54976

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

Patent Applications Submitted

Year:	2015
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of community club programs offered

Year	Actual
2015	380

Output #2

Output Measure

- Number of members enrolled in school-based clubs, community clubs, 4-H military programs, and camps

Year	Actual
2015	70351

Output #3

Output Measure

- Number of youth engaged in Science, Engineering, and Technology

Year	Actual
2015	66635

Output #4

Output Measure

- Number of youth engaged in building citizenship skills

Year	Actual
2015	12106

Output #5

Output Measure

- Number of youth involved in healthy lifestyles

Year	Actual
2015	20638

Output #6

Output Measure

- Number of adult 4-H leaders

Year	Actual

2015	4046

Output #7

Output Measure

- Number of youth enrolled through the Health Rocks program

Year	Actual
2015	20600

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increase in youth reporting adoption of healthy eating behaviors
2	Increase in youth who intend to engage in community projects and community leadership positions
3	Increase in the number of youth and adults adopting animal science practices that demonstrate increased knowledge of raising animals in a responsible, ethical, and ecologically viable manner
4	Increase in the number of youth who report aspirations to pursue science-related fields in college
5	Increase in youth who intend to pursue science-related careers
6	Increase in youth who practice environmentally responsible behaviors
7	Increase in youth and families who report becoming more literate in concerns surrounding global hunger and its relationship with agriculture, understanding of food systems, and the relationship of agriculture, food, nutrition, and the economy.

Outcome #1

1. Outcome Measures

Increase in youth reporting adoption of healthy eating behaviors

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The rate of childhood obesity has nearly tripled in the United States in the past 30 years. In Maryland, one out of every three children is overweight. Childhood and adult obesity rates in the U.S. have risen dramatically in the past three decades. The CDC reported in 2012 that only 20.8% of youth were active for a total of at least 60 minutes per day. Also, reports said that 64% of youth ate fruit less than two times a day and vegetables were under-consumed by 87% daily. Along with overweight and obesity comes physical health risks including diabetes, high cholesterol, heart disease, and several other concerns.

What has been done
A healthy living curriculum, Up for the Challenge, was implemented in the Carroll County Public Schools, Carroll County Public Library System, Westminster Boys and Girls Club, Westminster Girl Scout Troops, and 4-H clubs.

Results
Almost 800 youth and adults participated in Up for the Challenge healthy living program. Through hands-on activities, youth participated in physical activities, including hula hooping and dancing. Youth also participated in food demonstrations to encourage the adoption of healthy eating behaviors. Youth indicated they planned to try cooking and eating new vegetables.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #2

1. Outcome Measures

Increase in youth who intend to engage in community projects and community leadership positions

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Like many cities undergoing urban renewal initiatives, it is imperative that Baltimore City Extension, 4-H youth/adult leaders and community stakeholders assess community assets so that a clear strategy toward community revitalization can occur. The 4-H Teen Corps Leadership Program (Teen Corps) employs the best practices of youth and community development. It enables Extension to engage youth and adults in community development opportunities for the purpose of creating community change.

What has been done
Teen Corps began as a citywide collaborative between 4-H members and adult leaders, agencies, and community stakeholders who partner to strengthen communities, and increase leadership opportunities for youth from 12 to 18 year old. Teen Corps was developed to meet a need in youth development programming in Baltimore, Maryland.

Results
Twenty-two youth and adult 4-H members participated in monthly 4-H Teen Corps Leadership Development Program trainings to increase their skills in leadership development (private value). They returned to teach lessons to members of their clubs and communities and engaged an additional 1,000 participants in implementing STEM, workforce readiness, entrepreneurship, service-learning projects and initiatives in their communities, and the 13th Annual Baltimore City 4-H Youth Expo

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #3

1. Outcome Measures

Increase in the number of youth and adults adopting animal science practices that demonstrate increased knowledge of raising animals in a responsible, ethical, and ecologically viable manner

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
It is critically important that we teach 4-H youth in 4-H Animal Projects proper management practices to ensure not only the health and safety of their animals, but also to ensure the health and safety of the 4-H member and the general public. It is also important for 4-H members to learn to treat animals in an ethical manner, as they produce wholesome products and promote a positive image for animal industries. Youth must understand the visible and important roles they have as representatives of animal agriculture and the 4-H and FFA youth programs.

What has been done
To address the challenges associated with offering important livestock quality assurance training for thousands of 4-H animal science project members on a continual and widespread basis, a team from Maryland under the leadership of Anderson developed a new statewide on-line training program in 2010 called the Maryland 4-H Animal Husbandry and Quality Assurance Program (AH&QA). The online program is updated and offered annually between March and July.

Results
Presentations about the program has led to adoption of the West Virginia statewide 4-H and FFA programs for 2015. Approximately 7,700 youth have completed the program and acquired the knowledge to properly handle animals and animal medications, to act ethically in animal care, how to recognize common animal diseases, and proper animal nutrition.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #4

1. Outcome Measures

Increase in the number of youth who report aspirations to pursue science-related fields in college

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The 4-H youth development program historically has been
successful at utilizing teen?s members as teachers when the teens
are adequately trained. Some 4-H examples include using teens as counselors and teachers at camp, utilizing youth to serve as junior leaders in their 4-H club and the teens reaching youth peer model program.

What has been done
The AGsploration program strives to increase the amount of youth pursuing post-secondary degrees and careers in agriculture and science related fields. Furthermore, it also helps to develop leadership skills for life for the teen teachers. These "teen teachers" teach 30 hours of the Agsploration curriculum.

Results
A survey of Agsploration teen teachers found that 80% of the participants were currently enrolled in agricultural science degree-grant programs or had already graduated from a degree-granting program in agriculture. They also indicated that the experience had developed their relationship-building, leadership, communication, and teaching skills.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #5

1. Outcome Measures

Increase in youth who intend to pursue science-related careers

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Talbot County is a rural county with only 37,782 residents. Opportunities for students to participate in meaningful science learning experiences, particularly those related to science career education, during their out-of-school time are limited within Talbot County and other Mid-Shore counties.

What has been done
Health care is the number one employment sector in Talbot County and is a major employer in the Mid-Shore counties. Because health care is a STEM-based sector, Talbot 4-H developed the 4-H Health Science Adventures career exploration program for students from Talbot, Caroline, Queen Anne's, and Dorchester counties. The program is a partnership with Caroline 4-H, the local hospital, and the Eastern Shore Area Health Education Center and is now in its sixth year of serving local teens.

Results
As the largest employment sector in the area, health care offers the largest number of local science career opportunities. Youth who explore medical careers are more likely to identify careers that best match their job aspirations. A total of 66 diverse youth including males, females, whites, African Americans, Asians, and Hispanics from four counties participated in annual summer programs based at the hospital. A total of 94 diverse youth attended monthly Health Science Club meetings and explored numerous medical careers through interaction with medical professionals and tours of medical facilities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #6

1. Outcome Measures

Increase in youth who practice environmentally responsible behaviors

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Increase in youth and families who report becoming more literate in concerns surrounding global hunger and its relationship with agriculture, understanding of food systems, and the relationship of agriculture, food, nutrition, and the economy.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Sales of locally sourced food topped $11.7 billion dollars in 2014. A study by the Food Marketing Institute found that 58% of people want to know the source of their products. Additional, a survey conducted by U.S. Farmers & Ranchers Alliance (USFRA) revealed that 70% of consumers say their purchasing decisions are affected by how their food is raised. The residents of Maryland share many of these feelings and the local food movement is growing as more families are concerned about where, how and who is producing their food.

What has been done
The Montgomery County 4-H Market Animal Projects educate youth in raising meat animals for food production utilizing club meetings, weigh-ins, field days and educational programs. Youth are taught about animal selection, nutrition, animal husbandry, and annual complete a statewide quality assurance program. Raising and selling the highest quality, safe and nutritious protein source has always been the educational goal of the 4-H Market Livestock projects.

Results
In 2015 youth in the Montgomery county 4-H program raised 78 steers, 215 hogs, 75 sheep and

75 meat goats. 100% completed quality assurance training and documentation and followed the Maryland Code of Animal Science Ethics. At their annual 4-H livestock auction 182 buyers filled their freezers with a protein source that was locally produced, humanely treated and quality assured. Because of the value these buyers place on how these 4-Hers raise their animals they often paid premiums four times above market value and spent a total of $487,833.25to purchase these 4-H animals. This money will enable youth to save for college and reinvest in their future livestock projects and the agriculture industry and local economy.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth 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
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Agsploration:
In 2015 one hundred and ten individuals utilized the AGsploration curriculum in 17 states and territories. In Maryland 82 AGsploration lessons were taught to 4,600 program participants and 6 trainings were held to certify 161 new curriculum teachers and 20 new teen peer teachers were trained. On pre/post tests of students all indicated gaining more knowledge in the topics covered on agriculture and one in four participants indicated wanting to purse a degree or occupation in agriculture science. 82% of trained teachers on a follow up survey indicated the program improved their ability to teach about agriculture. 55% reported and increase in their attitudes towards using agriculture to teach STEM. 36% indicated an improvement in their students' knowledge of agriculture and their ability to understand the benefits of agriculture. Trained teen teachers where also surveyed after 3 years and found 80% of them were currently enrolled in college or working in the agriculture field. Therefore the AGsploration program has increased the knowledge and appreciation of agriculture in Maryland and created a network of trained individuals to more effectively continue the educational cycle.
4-H Animal Science:
In 2015 youth in the Montgomery county 4-H program raised 78 steers, 215 hogs, 75

sheep and 75 meat goats. 100% completed quality assurance training and documentation and followed the Maryland Code of Animal Science Ethics. At their annual 4-H livestock auction 182 buyers filled their freezers with a protein source that was locally produced, humanely treated and quality assured. Because of the value these buyers place on how these 4-Hers raise their animals they often paid premiums four times above market value and spent a total of $487,833.25to purchase these 4-H animals. This money will enable youth to save for college and reinvest in their future livestock projects and the agriculture industry and local economy.

Key Items of Evaluation

VI. National Outcomes and Indicators

1. NIFA Selected Outcomes and Indicators

Childhood Obesity (Outcome 1, Indicator 1.c)	
0	Number of children and youth who reported eating more of healthy foods.
Climate Change (Outcome 1, Indicator 4)	
0	Number of new crop varieties, animal breeds, and genotypes whit climate adaptive traits.
Global Food Security and Hunger (Outcome 1, Indicator 4.a)	
0	Number of participants adopting best practices and technologies resulting in increased yield, reduced inputs, increased efficiency, increased economic return, and/or conservation of resources.
Global Food Security and Hunger (Outcome 2, Indicator 1)	
0	Number of new or improved innovations developed for food enterprises.
Food Safety (Outcome 1, Indicator 1)	
0	Number of viable technologies developed or modified for the detection and
Sustainable Energy (Outcome 3, Indicator 2)	
0	Number of farmers who adopted a dedicated bioenergy crop
Sustainable Energy (Outcome 3, Indicator 4)	
0	Tons of feedstocks delivered.