

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Childhood Obesity, Chronic Health Issues, and Healthy Lifestyles

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
311	Animal Diseases	10%		0%	
501	New and Improved Food Processing Technologies	5%		10%	
602	Business Management, Finance, and Taxation	10%		0%	
607	Consumer Economics	5%		8%	
701	Nutrient Composition of Food	5%		2%	
702	Requirements and Function of Nutrients and Other Food Components	5%		20%	
703	Nutrition Education and Behavior	5%		10%	
721	Insects and Other Pests Affecting Humans	5%		10%	
722	Zoonotic Diseases and Parasites Affecting Humans	10%		0%	
723	Hazards to Human Health and Safety	10%		25%	
724	Healthy Lifestyle	10%		0%	
802	Human Development and Family Well-Being	10%		15%	
805	Community Institutions, Health, and Social Services	10%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	184.6	0.0	52.4	0.0
Actual Paid Professional	110.8	0.0	32.0	0.0
Actual Volunteer	28.0	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
768967	0	97927	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1850031	0	2366501	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
5530313	0	5356002	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Food and lifestyle choices are often inextricably linked to health issues that are costing our nation in terms of dollars, productivity, and quality of life. Research and extension programs that focus on these complex, interrelated issues are ongoing activities in this planned program area.

The problem of obesity, with its links to other health problems such as diabetes and early onset heart disease, must be addressed through a combination of approaches. An understanding of the underlying biological and sociological bases of health-related problems is needed to promote activities that lead to healthier lifestyles. Families are a crucial link in teaching healthy behaviors. It is important that those behaviors involve good nutrition and physical activity as the cornerstone of preventing obesity in children and adolescents.

Community health spans a broad range of issues with public health implications. The value-added aspects of commodities and availability of foods with improved nutritional values are important to the Pennsylvania agricultural industry and stakeholders. Pest control, especially of those pests that carry disease, and improper pesticide application can have public health risks. We continue to provide education to the general public and governmental agencies to reduce the risk of these pests and treatments.

Extension programs use innovative interdisciplinary approaches to discover, translate, and apply how nutrition and physical activity can prevent disease and promote good health and well-being. Programs use the socio-ecological model as a framework to address multiple factors that influence an individual's ability to change. Youth organizations, such as 4-H, offer programs that help young people increase their knowledge and offer opportunities to improve healthy eating and physical activity habits. Extension activities also focus on diverse programs that affect rural health and farm safety.

2. Brief description of the target audience

- Nonprofit Associations/Organizations
- Community Groups
- Education
- General Public
- Government Personnel
- Human Service Providers

- Military
- Special Populations (at-risk and underserved audiences)
- Students/Youth
- Volunteers/Extension Leaders

3. How was eXtension used?

Penn State is the lead institution for the Farm & Ranch in eXtension for Safety and Health (FReSH) Community of Practice (CoP). We have expanded the CoP to over 90 members who are actively involved in developing and reviewing content for the site. The FReSH site is the official ag safety and health website for the Agricultural Safety and Health Council of America (ASHCA), which is linked to industry. eXtension is used for information dissemination, webinars (Learn), mobile app promotion, and online courses (Moodle). Grant funding was obtained this fiscal year that will continue to enhance and expand the FReSH CoP.

Because the PROSPER team is working within state, they did not engage in eXtension as a group. However, the project PI attended and contributed to the eXtension CYFAR group by actively participating in the discussion about evidence-based programs and practices. Specifically, PROSPER was described in detail as an example of an evidence-based program.

eXtension's Extension Alliance for Better Child Care is cross-referenced on our website as a means of providing additional resources for early learning and school-age practitioners. Some educators on the team serve in the "ask the expert" role for eXtension.

One program used eXtension as an informational resource for content.

One program did not use eXtension this past year, but intends to use it in FY 2014.

V(E). Planned Program (Outputs)

1. Standard output measures

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

Patent Applications Submitted

Year: 2013
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	34	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of college-initiated technology disclosures.

Year	Actual
2013	2

Output #2

Output Measure

- Number of participants in extension education classes and workshops.

Year	Actual
2013	103522

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Percentage of extension class/workshop participants who expect to implement/adopt practices. (This is a short-term outcome measure.)
2	Percentage of extension class/workshop participants who respond to a follow-up survey with a self-report that they have implemented/adopted practices. (This is a medium-term outcome measure.)
3	Potential cost savings (in \$) to society from avoiding 5-10% of fatal farm accidents in PA by use of new Spanish-language farm safety materials.
4	Refinement of biobased pesticide effective against bed bugs.
5	Patent received for technique that boosts vitamin D in mushrooms using intense ultraviolet light flashes.
6	Number of tires collected for proper disposal, thereby reducing mosquito breeding habitat.

Outcome #1

1. Outcome Measures

Percentage of extension class/workshop participants who expect to implement/adopt practices. (This is a short-term outcome measure.)

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Percentage of extension class/workshop participants who respond to a follow-up survey with a self-report that they have implemented/adopted practices. (This is a medium-term outcome measure.)

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Potential cost savings (in \$) to society from avoiding 5-10% of fatal farm accidents in PA by use of new Spanish-language farm safety materials.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	2600000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Although agricultural safety and health training material and general information about getting started in various farm operations does exist, it is primarily available only in English. This is not very useful to Spanish-speakers, who represent a large portion of the nation's agricultural workforce.

What has been done

A Penn State program translated existing farm safety curricula into Spanish and included culturally appropriate examples and illustrations, an instructor manual, and video clips in Spanish

-- all available on hand-held electronic devices. The materials are online and available to instructors and extension agents across the country.

Results

Offering more extension information in Spanish helps to meet the changing demographics of the country and agriculture. Participants indicate that the sessions improve their work performance and on-the-job safety.

The National Safety Council estimates the costs of fatal work injuries per worker. Data from 2009 show that in that year fatal injury cost was \$1.3 million per worker. In 2012 Pennsylvania had 28 fatal farm and agricultural incidents. Therefore, we can estimate that fatal agricultural incidents in Pennsylvania in 2012 posed at least an estimated \$37 million burden on society. If we assume that use of these new materials could have prevented just 5-10% of the fatal incidents (say, 2 incidents), that's a cost savings to society of at least \$2.6 million.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
723	Hazards to Human Health and Safety

Outcome #4

1. Outcome Measures

Refinement of biobased pesticide effective against bed bugs.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The U.S. has recently seen a resurgence in bed bugs that may be linked to increased resistance to pesticides, more widespread travel, and the continuing reduction or elimination of pest control programs at public health agencies. Bed bugs seem not to transmit disease, but they are a significant and costly public health issue.

A 2006 Australian study estimated that bedbugs cost the Australian tourism industry \$75 million annually. The cost of treating one hotel room is estimated at \$6,000-7,000.

What has been done

Beginning with USDA appropriated support, Penn State researchers developed a biopesticide that exploits bed bugs' behavior of gathering in harborages. Studies show that the team's novel formulations of a fungal isolate (*Beauveria bassiana*) can be applied as a long-lasting barrier treatment. Bed bugs crossing the barrier acquire fungal spores and spread them among insects in the harborages, resulting in debilitating morbidity within 2 days and more than 95 percent mortality within a week.

Results

The research team has filed patent applications for the technology, which has garnered strong interest from the hotel industry. They have also secured a Penn State technology commercialization grant, which will support efforts to collect additional data needed to secure U.S. Environmental Protection Agency registration of the product for in-home use.

Use of a naturally occurring biopesticide addresses concerns about the safety of traditional chemicals in the home. The biopesticide is relatively easy to produce in the lab and is stable, so it can be used much like chemical pesticides. Indirect exposure of bedbugs that remain in harborages cannot be achieved with traditional chemicals.

4. Associated Knowledge Areas

KA Code	Knowledge Area
721	Insects and Other Pests Affecting Humans

Outcome #5

1. Outcome Measures

Patent received for technique that boosts vitamin D in mushrooms using intense ultraviolet light flashes.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Vitamin D has health benefits for bone health and regulating the immune system. It also improves the mobility of vitamin D-deficient elderly people who may be more at risk of falling. The human body naturally uses ultraviolet light from the sun to convert cholesterol in the skin into most of the vitamin D it needs. However, as more people work inside and use sunblock outside, they receive less sunlight and have more chance to be vitamin D-deficient.

What has been done

Penn State researchers focused an ultraviolet light that flashes high energy light waves several times a second onto the surface of mushrooms. A patent has been awarded for the method. The treatment converts ergosterol into vitamin D₂, raising the level in a serving of mushrooms from nearly 0 to more than 100% of the recommended dietary allowance. This method more efficiently boosts vitamin D than the previous method because it takes only a few seconds to significantly increase levels.

Results

Because this method is more efficient than previous treatments, and because it offers another selling point for mushrooms, profitability of the mushroom industry is increased.

Mushroom shipments set record levels in 2012, and they were up another 6% in early 2013. U.S. mushroom sales totaled 900 million pounds for the 2011-12 crop, at a value of \$1.10 billion.

This research applies technology to turn mushrooms into an even healthier food. Mushrooms are low in calories and considered a good source of vegetable proteins, potassium, fiber, and essential minerals, such as selenium. They are also the best dietary source of ergothioneine, an antioxidant that some researchers think is a potential new vitamin.

The high energy ultraviolet light wave treatment does not negatively affect the appearance or taste of the mushrooms, as previous treatments have. The vitamin D remains in the mushrooms even after a week in storage.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies

Outcome #6

1. Outcome Measures

Number of tires collected for proper disposal, thereby reducing mosquito breeding habitat.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	20139

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

West Nile encephalitis had never been documented in the Western Hemisphere before late summer 1999, when an outbreak occurred in the New York City area. In 1999, the Centers for Disease Control and Prevention confirmed 62 human cases of this encephalitis, including 7 deaths, although the actual infection rate was much higher. The best ways to fight this disease are to reduce the population of mosquitoes that carries it and to educate people about reducing their risk of being bitten.

What has been done

Penn State Extension performs mosquito surveillance following IPM and provides education by way of press releases, educational programs, displays, and phone and email contacts. Individuals create programs and carry out activities dependent upon additional local needs and funding.

In an effort to have residents reduce mosquito breeding habitat, Lebanon and York County programs coordinate tire collections. In 2013, they had 535 participants properly dispose of more than 20,000 tires.

Results

West Nile virus continues to affect human and animal health in Pennsylvania. Protecting the general public and agriculture from public health concerns such as vectored diseases and other pests is essential to maintaining stable social and economic systems that our communities depend on. Educating the general public is the best way to reduce health care costs.

Four percent of West Nile virus cases in the U.S. are fatal, according to the Centers for Disease Control and Prevention. The disease can also have major economic consequences, with the 2012 outbreak in Texas causing an estimated \$47 million in losses, largely due to lost workdays.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases
722	Zoonotic Diseases and Parasites Affecting Humans
805	Community Institutions, Health, and Social Services

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Appropriations changes
- Competing Public priorities
- Competing Programmatic Challenges
- Other (Extramural Funding)

Brief Explanation

Natural Disasters (drought, weather extremes, etc.)

- Circumstances resulting from natural disasters require more of our time to serve a limited amount of people.

Economy

- The down economy increases the demand for programs due to increased pest problems (i.e., abandoned properties from bank foreclosures).
- Most counties are providing some sort of financial scholarships, reduced fees for returning participants, and alternative payment models, such as installments.
- More participants are asking if insurance plans subsidize the program (a few do).
- Funding is limited to conduct agricultural safety and health trainings and for people (e.g., EMS, volunteer fire fighters, etc.) to participate in training.

Appropriations changes

- Appropriation Changes affected both the research and extension functions of the College of Agricultural Sciences and resulted in fewer faculty and staff across all areas of the college.

Public Policy changes

- Public Policy Changes require us to continually meet the public health need related to vectored diseases.

Government Regulations

- Government Regulations are counterintuitive to following IPM. An NPDES permit is now needed for mosquito control.

Competing Public priorities

- Competing Public Priorities force us to continually align our program priorities with budget realities.

Competing Programmatic Challenges

- The College of Agricultural Sciences' restructuring process allowed for continued focus on cost-effective program deliverables and strategic elimination of programs.

Populations changes (immigration, new cultural groupings, etc.)

- Population Changes continue to create new pest concerns, from bed bugs to dengue

fever.

Other - Extramural Funding

- Programs in this area rely heavily on extramural funding for program development and delivery, curriculum, etc. However, funding opportunities are highly competitive.
- Funding for many of our community partners was reduced or eliminated, making it challenging in some counties to reach our target audiences.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

The generation of outcomes from existing programs and the development of new programs require improved evaluation that identifies pre- and post- responses to information and monitoring for long-term behavioral changes that result in improved environmental outcomes. The evaluations conducted thus far provide initial measures of implementation, but long-term monitoring is needed to ensure that the practices are successfully managed over time. We are attempting to incorporate more economic valuations of the results of our research and extension work.

Key Items of Evaluation

See highlights of state-defined outcomes in this planned program.