V(A). Planned Program (Summary)

Program # 6
1. Name of the Planned Program
Integrated Health Solutions
☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

<table>
<thead>
<tr>
<th>KA Code</th>
<th>Knowledge Area</th>
<th>%1862 Extension</th>
<th>%1890 Extension</th>
<th>%1862 Research</th>
<th>%1890 Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>301</td>
<td>Reproductive Performance of Animals</td>
<td>0%</td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>311</td>
<td>Animal Diseases</td>
<td>0%</td>
<td>15%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>503</td>
<td>Quality Maintenance in Storing and Marketing Food Products</td>
<td>20%</td>
<td>10%</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>701</td>
<td>Nutrient Composition of Food</td>
<td>0%</td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>702</td>
<td>Requirements and Function of Nutrients and Other Food Components</td>
<td>0%</td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>712</td>
<td>Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins</td>
<td>20%</td>
<td>15%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>723</td>
<td>Hazards to Human Health and Safety</td>
<td>40%</td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>724</td>
<td>Healthy Lifestyle</td>
<td>0%</td>
<td>20%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>903</td>
<td>Communication, Education, and Information Delivery</td>
<td>20%</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>100%</strong></td>
<td><strong>100%</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

<table>
<thead>
<tr>
<th>Year: 2017</th>
<th>Extension</th>
<th>Research</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1862 1890</td>
<td>1862 1890</td>
</tr>
<tr>
<td>Plan</td>
<td>8.7 0.0</td>
<td>14.1 0.0</td>
</tr>
<tr>
<td>Actual Paid</td>
<td>30.5 0.0</td>
<td>13.2 0.0</td>
</tr>
<tr>
<td>Actual Volunteer</td>
<td>15.5 0.0</td>
<td>0.0 0.0</td>
</tr>
</tbody>
</table>

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

1. Brief description of the Activity

The food processing industry is an important economic driver in Pennsylvania, and much of the research in this planned program contributes to improved and safer food. Food scientists examined the prevalence and phylogenetic characterization of Escherichia coli and hygiene indicator bacteria isolated from leafy green produce, beef, and pork obtained from farmers' markets in Pennsylvania. Another team is studying and attempting to control Listeria monocytogenes in fruit packing houses.

Diet-related research in the College includes the determinations that flavonoid intake is inversely associated with obesity in U.S. adults and that a whole food diet may help prevent colon cancer and other chronic diseases.

Other researchers explored salmonella; avian influenza; anemia; malaria, zika, and other tropical diseases; and selenium deficiency, among other diseases, disorders, and deficiencies.

Veterinary science researchers found that supplementing dairy cows with capsicum oleoresin before and after calving supports milk production and reduces clinical mastitis. The Veterinary Medicine extension team has a new USDA-NIFA-funded research and extension program to reduce the use of antibiotics on dairy farms. Dairy breeding and genetics are other areas of active research.

The state has seen decreasing incidences of pesticide exposure in conjunction with the Pest Management extension team's long-term education efforts.

The requirements of the Food Safety Modernization Act are driving much of our extension programming in this planned program. Farms with over $25,000 in sales growing fresh produce likely to be eaten raw are required under the Produce Safety Rule to meet farm food safety standards and keep certain records. Under the Preventive Controls Rules for Human or Animal Food, all FDA-registered facilities are required to develop and implement preventive control food safety systems. Faculty have developed trainings to meet these needs. These offerings are expanding and well received. Extension teams are also providing industry partners help in writing Preventive Controls plans. These partners value our ability to provide continuing unbiased support in helping them implement best practices learned in trainings.

The ServSafe and Retail Manager training curricula are frequently presented to meet regulatory requirements for commercial food service operations. We offer specialized food safety trainings for specific industries as requested.
Extension work in Consumer Food Safety includes frequent offerings of Cooking for Crowds, for volunteer organizations that prepare and serve food to the public, and workshops by Master Food Preserver volunteers, who teach home food preservation.

The Health and Wellness extension team offers Dining with Diabetes, Strong Women, Nutrition Links, Totally Veggies, Everybody Walks, Seniors Eating Well, and Mediterranean Cuisine Comes to You.

We continue to offer food safety and animal care trainings in Spanish to meet the growing need, and we are translating more materials into additional languages as well.

2. Brief description of the target audience

Agricultural Producers/Farmers/Landowners
Agriculture Services/Businesses
Business/Industry
Community Groups
Education
General Public
Government Personnel
Human Service Providers
Local, Regional, State, and Federal agencies
Nonprofit Associations/Organizations
Policymakers

3. How was eXtension used?

Extension associates are active participants on eXtension and regularly respond to questions. In 2016, the Food Safety and Quality team fielded over 150 questions.

One of the Veterinary Medicine extension team members serves on the dairy eXtension program team and on the webinar team as a moderator and solicited speakers for DAIReXNET.

Penn State Extension supports faculty and staff use of eXtension and promotes communities of practice as a way of broadening sources of information and outreach. We also support the professional development offered through eXtension.

V(E). Planned Program (Outputs)

1. Standard output measures

<table>
<thead>
<tr>
<th></th>
<th>2017 Direct Contacts Adults</th>
<th>2017 Indirect Contacts Adults</th>
<th>2017 Direct Contacts Youth</th>
<th>2017 Indirect Contacts Youth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual</td>
<td>53506</td>
<td>6440</td>
<td>8261</td>
<td>329</td>
</tr>
</tbody>
</table>

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

Patent Applications Submitted
2017 Pennsylvania State University Combined Research and Extension Annual Report of Accomplishments and Results - Integrated Health Solutions

**Year:** 2017  
**Actual:** 6

**Patents listed**  
Serial No. 15/336,917; Filed 10/28/2016; Title: Device for Obtaining Small Volumes of Fluid from Animals

Serial No. 15/343,810; Filed 11/4/2016; Title: Compounds, Compositions and Methods for Coloring Edible Materials

Serial No. 62/522,521; Filed 6/20/2017; Title: Stabilization of Carrageenan Free Chocolate Milk

Serial No. 15/371,032; Filed 12/6/2016; Title: Inhibitors of the Farnesoid X Receptor and Use Thereof in the Prevention of Weight Gain

Serial No. 15/383,324; Filed 12/19/2016; Title: Paramyxovirus Virus-Like Particles as Protein Delivery Vehicles

Serial No. 62/543,174; Filed 8/9/2017; Title: Low-Temperature Plasma Catheter for Less-Invasive, Localized Treatment of Endocarditis and Atherosclerosis

3. Publications (Standard General Output Measure)

**Number of Peer Reviewed Publications**

<table>
<thead>
<tr>
<th></th>
<th>Extension</th>
<th>Research</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>1</td>
<td>159</td>
<td>160</td>
</tr>
<tr>
<td>Actual</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

V(F). State Defined Outputs

**Output Target**

**Output #1**

**Output Measure**

● Number of participants in extension education classes and workshops.

<table>
<thead>
<tr>
<th>Year</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>10930</td>
</tr>
</tbody>
</table>

**Output #2**

**Output Measure**

● Number of technology disclosures involving college faculty, staff, extension educators, and students.

<table>
<thead>
<tr>
<th>Year</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>6</td>
</tr>
</tbody>
</table>
### V(G). State Defined Outcomes

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

<table>
<thead>
<tr>
<th>O. No.</th>
<th>OUTCOME NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Number of people trained in safe food handling techniques.</td>
</tr>
<tr>
<td>2</td>
<td>Change in knowledge related to humane or efficient livestock housing and handling.</td>
</tr>
<tr>
<td>3</td>
<td>Change in knowledge related to our understanding of a disease mechanism, diagnostic testing, prevention strategy, or treatment for a livestock and/or human disease.</td>
</tr>
<tr>
<td>4</td>
<td>Increased knowledge of livestock genomics to potentially enhance performance and increase efficiency.</td>
</tr>
<tr>
<td>5</td>
<td>Estimated value (in US$) of preventing 1% of new colorectal cancer cases/year in the United States via research and education about the value of a whole food diet.</td>
</tr>
<tr>
<td>6</td>
<td>Percentage decrease in reported pesticide exposure incidents in Pennsylvania from 2011 to 2016, coincident with pesticide safe handling and poison control education.</td>
</tr>
<tr>
<td>7</td>
<td>Potential estimated health cost savings by reducing U.S. obesity by 0.5% through research and education about the value of flavonoids in the diet.</td>
</tr>
<tr>
<td>8</td>
<td>Estimated annual cost savings (in US$) if research and education on prevalence and phylogenetic characterization of Escherichia coli and hygiene indicator bacteria isolated from leafy green produce, beef, and pork obtained from farmers' markets in Pennsylvania reduces foodborne illness in the state by 1%.</td>
</tr>
</tbody>
</table>
Outcome #1

1. Outcome Measures

Number of people trained in safe food handling techniques.

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Change in knowledge related to humane or efficient livestock housing and handling.

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Change in knowledge related to our understanding of a disease mechanism, diagnostic testing, prevention strategy, or treatment for a livestock and/or human disease.

2. Associated Institution Types

● 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

<table>
<thead>
<tr>
<th>Year</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>1</td>
</tr>
</tbody>
</table>

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The transition period of three weeks before and after calving is the most critical period in the life of a dairy cow, so anything that can decrease metabolic diseases then could be significant. During this "transition cow" period, diseases can result in milk yield decreases of 5-10 pounds per day at peak lactation, a considerable economic loss for the producer. So, dairy-nutrition researchers have been experimenting with dietary supplements to bolster the immune systems of transition cows.
What has been done
Researchers are using capsicum oleoresin to supplement the feed of transition dairy cows because this extract from chili peppers had the most pronounced effect on the animals' health of the phytonutrient compounds tested. The extract acts as an antimicrobial and antiseptic. Research indicates that the extract has positive physiological effects on the immune response in ruminants, and in lactating dairy cows in particular.

Results
The regulatory effects of phytonutrients seem to be beneficial for immune suppression of inflammation disease in dairy cows. Let's conservatively assume that 33% of transition dairy cows in the U.S. will experience one or more metabolic or infectious diseases following calving, and that clinical mastitis is the prevalent disease of transition cows. We'll also assume 1% adoption of capsicum use nationally, and that use of capsicum prevents clinical mastitis in 50% of cows receiving it. Bar et al. (2008) found that the average cost of a case of clinical mastitis was $179. Therefore, the savings in milk yield not lost, mortality not experienced, and treatment costs foregone would be more than $2.5 million per year. Follow-on studies are underway to develop a rumen-protected capsicum product to reliably deliver the benefits of phytonutrients to cows' immune systems.

4. Associated Knowledge Areas

<table>
<thead>
<tr>
<th>KA Code</th>
<th>Knowledge Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>301</td>
<td>Reproductive Performance of Animals</td>
</tr>
<tr>
<td>311</td>
<td>Animal Diseases</td>
</tr>
</tbody>
</table>

Outcome #4

1. Outcome Measures

Increased knowledge of livestock genomics to potentially enhance performance and increase efficiency.

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Estimated value (in US$) of preventing 1% of new colorectal cancer cases/year in the United States via research and education about the value of a whole food diet.

2. Associated Institution Types

- 1862 Research
3a. Outcome Type:
Change in Condition Outcome Measure

3b. Quantitative Outcome

<table>
<thead>
<tr>
<th>Year</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>140000000</td>
</tr>
</tbody>
</table>

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Colon cancer is the second leading cause of cancer-related deaths in the United States and a leading killer in many other Western countries, where diets tend to include more meat and less fruits and vegetables. We know that foods can contribute to chronic diseases such as colon cancer, but we are finding that some foods may also help prevent these diseases. We don't yet fully understand how these foods work on a molecular level.

What has been done
Pigs were fed a high-fat diet supplemented with purple-fleshed potatoes. Purple potatoes were used as a model of a food high in anti-inflammatory and anti-oxidant compounds. Pigs were used because their digestive system is very similar to the human digestive system, more so than mice. The level of colonic mucosal interleukin-6 (IL-6) was compared between the treatment pigs and a control group. IL-6 is a key regulator of chronic intestinal inflammation and colon carcinogenesis.

Results
Pigs fed a high-fat diet supplemented with purple-fleshed potatoes had six times less colonic mucosal IL-6 compared to a control group. Eating whole foods, including plenty of colorful vegetables and fruits that contain macronutrients, micronutrients, and phyttonutrients, such as vitamins, carotenoids, and flavonoids, may be effective in altering the IL-6 pathway. Understanding how these compounds work on a molecular level in pigs could be an initial step toward finding treatments for people with inflammation-promoted chronic diseases such as colorectal cancer.

The Centers for Disease Control and Prevention estimated the direct medical cost of colorectal cancer care in 2010 at $14 billion. If we assume that research and education about the value of a whole food diet, including colorful fruits and vegetables, could prevent even 1% of new colorectal cancer cases each year in the U.S., the cost savings would be about $140 million.

4. Associated Knowledge Areas

<table>
<thead>
<tr>
<th>KA Code</th>
<th>Knowledge Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>701</td>
<td>Nutrient Composition of Food</td>
</tr>
<tr>
<td>724</td>
<td>Healthy Lifestyle</td>
</tr>
</tbody>
</table>
Outcome #6

1. Outcome Measures

   Percentage decrease in reported pesticide exposure incidents in Pennsylvania from 2011 to 2016, coincident with pesticide safe handling and poison control education.

2. Associated Institution Types

   ● 1862 Extension

3a. Outcome Type:

   Change in Condition Outcome Measure

3b. Quantitative Outcome

<table>
<thead>
<tr>
<th>Year</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>12</td>
</tr>
</tbody>
</table>

3c. Qualitative Outcome or Impact Statement

   **Issue (Who cares and Why)**
   Correct use of pesticides is essential to protect human, animal, and plant health as well as the environment. Unsafe storage of pesticides can be costly or even fatal. Penn State's Pesticide Education program strives to educate pesticide applicators and users about pest management alternatives, including pesticides, to promote responsible decision-making.

   **What has been done**
   The Pesticide Education Program provides and supports educational opportunities to prevent pesticide exposures. Each year staff reach about 17,000 adults and youth with pesticide safety information and teach about 3,700 people at pesticide applicator recertification events. More than 28,000 pesticide applicators participate in the program's trainings each year. With cooperation from Master Gardeners the program expanded a statewide poison prevention classroom outreach for first-graders from 3,200 in 2011 to 17,350 in 2017.

   **Results**
   Since 2011, there has been a 12.3% drop in the number of reported pesticide exposures, intentional, unintentional, and of unknown origin, in Pennsylvania--from 3,321 in 2011 to 2,913 in 2016. Five of six years saw a decrease in number of incidents. There may be other factors at work here besides the Pesticide Education program, but no doubt their extensive, multi-front program plays an important role in reducing incidents.

4. Associated Knowledge Areas

<table>
<thead>
<tr>
<th>KA Code</th>
<th>Knowledge Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>723</td>
<td>Hazards to Human Health and Safety</td>
</tr>
</tbody>
</table>
Outcome #7

1. Outcome Measures

Potential estimated health cost savings by reducing U.S. obesity by 0.5% through research and education about the value of flavonoids in the diet.

2. Associated Institution Types

● 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

<table>
<thead>
<tr>
<th>Year</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>735000000</td>
</tr>
</tbody>
</table>

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Over the past few decades, the rates of obesity have risen markedly. Overweight and obesity are known risk factors for chronic diseases, including cardiovascular disease, diabetes, and cancer. Recent studies have demonstrated the importance of flavonoid intake and disease risk, but the association between total flavonoid intake (found in tea, citrus, berries, red wine, apples, legumes, and other plant foods) and obesity has not been evaluated in a nationally representative sample of U.S. adults.

What has been done

Food science researchers evaluated the association between flavonoid consumption and established risk factors for obesity and obesity-related inflammation. Data from a nationally representative sample of 9,551 adults who participated in the 2005-2008 National Health and Nutrition Examination Survey were analyzed.

Results

Flavonoid consumption was inversely associated with obesity in both men and women in multivariate models. Adults in the highest quartile of flavonoid intake had significantly lower body mass index and waist circumference than those in the lowest quartile of flavonoid intake. Flavonoid intake was inversely related to C-reactive protein levels, a marker of inflammation, in women. These findings support a growing body of laboratory evidence that flavonoid consumption may be beneficial for disease prevention.

The Centers for Disease Control and Prevention estimates that the annual medical care costs of obesity in the United States were about $147 billion (2008 dollars). So a reduction in obesity rates
by just 0.5% would be expected to bring savings of about $735 million per year.

4. Associated Knowledge Areas

<table>
<thead>
<tr>
<th>KA Code</th>
<th>Knowledge Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>702</td>
<td>Requirements and Function of Nutrients and Other Food Components</td>
</tr>
<tr>
<td>724</td>
<td>Healthy Lifestyle</td>
</tr>
</tbody>
</table>

Outcome #8

1. Outcome Measures

Estimated annual cost savings (in US$) if research and education on prevalence and phylogenetic characterization of Escherichia coli and hygiene indicator bacteria isolated from leafy green produce, beef, and pork obtained from farmers' markets in Pennsylvania reduces foodborne illness in the state by 1%.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

<table>
<thead>
<tr>
<th>Year</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>20167</td>
</tr>
</tbody>
</table>

3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**

More than 8,400 farmers' markets operated in the U.S. in 2015. As farmers' markets have increased in size and complexity in the kinds of foods sold, so have the potential food safety risks. Since 2008, seven major foodborne illness outbreaks and two recalls have occurred with food products from farmers' markets. Various researchers have observed vendors performing high-risk food safety retail behaviors, and others have identified microbiological hazards in foods sold at farmers' markets.

**What has been done**

The presence of hygiene indicators (coliforms, fecal coliforms, Listeria spp., and Escherichia coli) was assessed in select samples of leafy green produce and meat obtained from farmers' markets in Pennsylvania. E. coli isolates were further characterized by phylogenetic profile and virulence potential.
Results

E. coli was present in beef (40%) and pork (18%) samples, and in kale (28%), lettuce (29%), and spinach (17%) samples. Listeria spp. were found in beef (8%), kale (2%), lettuce (4%), and spinach (7%) samples. Among the 10 Listeria spp. isolates, 3 were L. monocytogenes. The E. coli isolates possessed the genes associated with extraintestinal pathogenic E. coli and enteropathogenic E. coli.

According to a 2015 report, in Pennsylvania the cost per foodborne illness case ranges from $1,190 to $1,960. The Centers for Disease Control and Prevention identified an average of 1,280 cases of foodborne illness yearly in Pennsylvania from 1998 to 2016. Using the average per case cost ($1,575), a reduction in these cases by 1% due to research and education could bring about $20,000 in health care cost savings yearly.

4. Associated Knowledge Areas

<table>
<thead>
<tr>
<th>KA Code</th>
<th>Knowledge Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>503</td>
<td>Quality Maintenance in Storing and Marketing Food Products</td>
</tr>
<tr>
<td>712</td>
<td>Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins</td>
</tr>
<tr>
<td>723</td>
<td>Hazards to Human Health and Safety</td>
</tr>
</tbody>
</table>

V(H). Planned Program (External Factors)

External factors which affected outcomes
- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Funding)

Brief Explanation

Natural Disasters
Many participants in Health and Wellness programs will not travel in bad weather.

Economy
Many potential participants in Health and Wellness programs live on a fixed income and paying for a class is prohibitive. Dining with Diabetes does not accept insurance reimbursement, which can also be a deterrent.

Government Regulations
The Food Safety Modernization Act (FSMA) continues to have a major impact on food processors and others in the food supply chain, increasing the need for training and support.
Although PA Department of Agriculture is the primary regulatory agency, many municipalities have their own enforcement entities, which can result in differences in regulations and certification.

**Competing Public priorities**
There is continued demand for other food industry technical programs, including those required by industry audit standards or sought by companies trying to improve their food safety and quality systems.

ServSafe and other certification programs are offered by other organizations and companies and tend to be more heavily marketed and lower cost. Extension educators believe that a two-day format is more conducive to a positive test result.

The team held a Master Food Preserver training. With the addition of new educators and volunteers, we greatly increased the number of workshops and outreach activities this year.

Some YMCAs, community centers, and senior centers offer for free a program similar to Strong Women, though lacking in nutrition education.

**Competing Programmatic Challenges**
Many educators in Health and Wellness programs are trying to juggle several major programs and supervise paraprofessionals over a large geographic area.

Loss of staff through retirements and attrition has left many counties without the oversight of Family and Consumer Sciences educators to administer Health and Wellness programs.

**Population changes**
More participants have English as a second language, and several curricula are available in other languages, but often the issue of literacy in any language arises. We have offered classes in Spanish, but we have had difficulty filling the class.

We have recently trained several educators to deliver the Dining with Diabetes program in Spanish in select counties in 2017-2018. We are hoping that the online course will help us reach those 40 years old and younger.

The only trained "Strong Women Ambassador" retired, so this limited having any new instructor training this year.

**Funding**
Some of our programs are affected by extramural funding, either by adding resources to promote them or by shaping the content of the product.

**V(I). Planned Program (Evaluation Studies)**

**Evaluation Results**

The strongest evaluation of our programs comes from gathering pre- and post-training responses and the use of retrospective evaluation to assess whether participants actually put into practice lessons learned through extension programs. More statewide extension programs are performing these kinds of meaningful evaluations, so our programs continue...
to grow stronger and our results continue to become more quantifiable and impactful. We are also finding greater willingness to estimate potential earnings or cost savings as a result of research outcomes.

A customer relationship management tool was implemented in September 2017. That will lead to more consistent implementation of post-event evaluations, which should allow for assessment of change in practice and possibly estimates of economic impacts. These post-event assessments will be used more broadly in 2018 as time passes from events held in late 2017 and beyond.

Key Items of Evaluation

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