

2015 University of Kentucky and Kentucky State University Combined Research and Extension Annual Report of Accomplishments and Results

Status: Accepted

Date Accepted: 06/07/2016

I. Report Overview

1. Executive Summary

The Kentucky Accomplishment report presents an integration of Research and Extension efforts of the Kentucky Cooperative Extension system. Moreover, the document reveals the collaborative efforts of county and state level personnel working together to benefit millions of Kentuckians across the state. Some of our 2015 accomplishments include: Promotion of Woodlands and Wildlife workshops, Educational 4-H programs that relate to Robotics programs aimed at extending its reach in science, engineering and technology (4-H SET) by providing opportunities for hands-on scientific learning and discovery in club settings; the disaster relief taskforce created to support an emergency notification system, and; continued focus on Kentucky Beef IRM is to increase the profitability of beef operations in Kentucky by using intense educational programming that will result in producers' adopting proven money-making practices. UK specialists have been engaged in a bed bug genome consortium, thus contributing to addressing the pest epidemic. Water quality programming investigated issues on the perils associated with storm water runoff. Local foods initiatives have become a movement to advocate for fresher, healthier eating habits; the Management in Tough Times initiative produced numerous publications and online resources; High impact educational programs resulted in significant improvements in consumer and commercial horticulture, animal health, farm income, natural resources and the environment. Fatherhood remains an avenue for parenting skills with the purpose of equipping men with the necessary tools needed to be available to their children.

In 2015, we continued our routine follow up to assess our issues discovery process, which served as a facilitation tool for county Plan of Work discussions. This included leaders and agents talking about what is needed at the county level. The issues discovery process is a dialogue made possible by our presence in all 120 counties. Throughout the year, agents and volunteer leaders came together to discuss the progress of how programs were addressing the needs of local communities. The data remains useful in assessing and maintaining programs that address pertinent issues. Several programs are being evaluated for impact and may be utilized in the new plan of work cycle beginning in 2016.

With the emphasis on accountability, we also continue to make strides in highlighting specific programs that are addressing traditional and non-traditional needs through public value materials. To date, a significant number of public value materials have been created and are now being showcased on the UK Extension homepage. Videos are now in the process of being developed to highlight these programs. Agricultural research through Kentucky's land grant programs has been providing new opportunities to farmers and residents for more than 130 years. With external grants and contracts now reaching over \$30 million a year, agriculture researchers address problems of agribusiness, consumers, international trade, food processing, nutrition, community development, animal health and development, soil and water resources, and the environment with over 300 externally funded projects. The research continuum reaches from basic to applied science, with new fundamental knowledge as well as applied knowledge that has impacts on the lives of Kentuckians and people across the world.

As a result of interaction with volunteers, council members and other stakeholders, the 2015 program year emphasis as defined by the number of contacts, was as follows:

31% Global Food Security and Hunger
5% Social and Economic Opportunity
25% Life Skill Development

2015 University of Kentucky and Kentucky State University Combined Research and Extension Annual Report of Accomplishments and Results

- 3% Childhood Obesity
- 12% Leadership and Volunteerism
- 2% Food Safety
- 15% Diet, Nutrition and Healthy Lifestyles
- 1% Sustainable energy
- 5% Agricultural and Environmental Quality
- 1% Climate Change

Kentucky State University and the University of Kentucky share adjunct faculty with at least three positions in entomology, three positions in horticulture, three positions in animal sciences, and one position in agricultural economics. Extension agents from both UK and KSU are co-located to maximize effectiveness to stakeholders.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	470.0	48.0	200.0	40.0
Actual	508.0	43.0	175.5	40.0

II. Merit Review Process

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

- Internal University Panel
- External University Panel
- External Non-University Panel
- Combined External and Internal University Panel
- Combined External and Internal University External Non-University Panel
- Expert Peer Review
- Other (State Extension Advisory Committee)

2. Brief Explanation

Kentucky Cooperative Extension continues to define merit review as a process used to judge the degree to which a planned program (1) is relevant to needs expressed by stakeholder groups, (2) draws upon current research and knowledge, (3) is congruent with quality standards and best practice, and (4) is likely to produce anticipated outcomes. Merit review for research is similar in that it uses the criteria of (1) consideration for potential impact, (2) relevance to the needs of stakeholders, and (3) appropriateness within the mission and priorities of the experiment station, USDA, and the land grant mission.

The Plan of Work has been built on program goals that the Cooperative Extension Service identified through Extension advisory committees, developed through logic model program committees and reviewed through program area committees made up of Extension assistant directors, extension agents, department chairs, and specialists. The program area assistant directors select, refine and replace featured programs based on identified needs in the greatest number of counties, current and planned research and educational resources, and the ability to effectively deal with the issues. Over 40 non-

university individuals who comprise the State Extension Council representing both the University of Kentucky and Kentucky State University, all geographic regions of Kentucky as well as agriculture, youth, families, business, industry, and public education served as reviewers of the Plan of Work using the criteria identified above.

The University of Kentucky Agricultural Experiment Station focuses on scientific peer review and merit review on individual research projects. Scientific review is evaluation by other researchers who possess the expertise to conduct the same or similar research. Such review includes technical feasibility, originality and scientific/disciplinary significance of the research. Project proposals go through an initial anonymous departmental peer review. If satisfactory expertise is not available within the department or on campus, external reviews are solicited. After multiple reviews (usually three) a project committee recommends approval, rejection or revision. Only approved projects move forward for review at the college level. The college review committee conducts further scientific peer review by highly qualified individuals as well as a designated statistician and other appropriate faculty. Outside expertise, including researchers around the nation and stakeholder review, are also used.

Kentucky State University requires all project-based proposals to be peer-reviewed based on scientific merit and relevance to state, national and regional USDA priorities and the KSU mission. All Evans -Allen supported proposals are first sent for external peer-review by at least two scientists outside KSU to ensure the relevance and quality of the science. University of Kentucky faculty are often included on the proposal review panels in addition to peer reviews via, regional, national, and professional association colleagues.

III. Stakeholder Input

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

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of the general public
- Survey specifically with non-traditional groups
- Survey specifically with non-traditional individuals
- Survey of selected individuals from the general public
- Other (Training stakeholders in expectations relative to program needs)

Brief explanation.

The Kentucky Extension Advisory Council System has served as a primary mechanism for gaining input into program direction and development. For programs to meet the needs of the audiences they intend to serve, county level councils are to be diverse enough to represent the various constituencies within the counties including under-served and underrepresented audiences. Their purpose on the council is to express their own needs as well as to gain additional resident perspectives through traditional and non-traditional means in order to provide input into development of local extension programs. These representatives of the various audiences are not only involved in planning but also implementation and evaluation of those programs. In addition to a county extension council, each county also has an agricultural advisory council, homemaker's council, home economics advisory council, and 4-H council. They communicate research and

resource needs to the universities. Through an Issues gathering process, topics of greatest importance are brought forward through district and state meetings attended by program leaders, extension agents and district directors. The issues identified are then presented to state program leaders, extension specialists, and department chairs for response.

Each county also has a district board that manages the fiscal affairs of the Extension office. The board is comprised of citizens in the county that represent the various program areas, plus the county judge executive.

As full partners, the Cooperative Extension Service and Kentucky Agricultural Experiment Station set priorities for research activities with information from the county extension councils, district issues and program committees, and the University of Kentucky Council for Agricultural Research, Extension and Teaching (UK-CARET). UK-CARET functions as an advisory and advocacy group for the College of Agriculture. KSU-CARET functions in the same manner. Members have an opportunity to advise in the development of college priorities and assist in generating public support for those priorities at state and national levels. UK-CARET and KSU-CARET are representative of the full scope of the land-grant mission:

Extension, research, instruction, and service. Membership is comprised of active and progressive leaders in agricultural and natural resource enterprises. UK-CARET provides a direct link to the national CARET organization. Two members of UK-CARET are designated as national CARET representatives. KSU's CARET representatives work closely with the University and are engaged in advising and representing the interests of its programs. KSU-CARET representatives also participate in national and state policy discussions and assist in the formation of partnerships that will generate programs and resources for KSU's expanded mission with its new college.

In addition, the experiment station meets formally with other entities: quarterly with the Equine Initiative advisory committee; quarterly with the Livestock Disease Diagnostic Center Advisory committee; bi-annually with the board of the Gluck Equine Research Center to discuss priorities for the equine industry; and regularly with the Tracy Farmer Center for the Environment on conservation-based research. Stakeholders were invited to be part of the interviews for the Kentucky Agricultural Experiment Station. UK's College of Agriculture, Food and Environment encouraged significant stakeholder involvement in their 2015-2020 strategic planning process. The strategic plan covers all missions of the college, including research and extension. Listening sessions were held in 7 different locations across the state to garner as much stakeholder participation as possible.

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
- Use Surveys
- Other (Program participants; Project Collaborators)

Brief explanation.

The Kentucky Cooperative Extension program development process is based on a grassroots, six-stage model that begins with the engagement of local advisory councils for agriculture, 4-H, Family and Consumer Sciences and Extension Homemakers. All program committees used a variety of methods for developing linkages with the public to capture input, including council dialogue and discussion, focus groups, surveys, program evaluations, and working with other local agencies and

organizations. Information from program committees are then shared with the total county Extension councils. Membership on these councils includes a broad cross-section of the people in the county representing all demographic and economic segments as well as government, business, education, and community organizations in addition to those identified as under-represented and under-served audiences in extension programs. County Extension Councils assist Extension personnel in identifying program opportunities through which extension and local community organizations could effectively bring about positive change. Councils also help establish program priorities for which county program plans and outcome goals are written. Counties also utilize a process for examining their council makeup and utilize membership committees and a rotation system to ensure new individuals have an opportunity to serve.

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
- Survey of the general public
- Meeting specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public
- Other (Serving on advisory groups/councils for organizations)

Brief explanation.

Even when Extension advisory councils appear to be broadly representative of the local population, it is possible that established program priorities fail to target important issues. Agents count heavily on their council members to identify program needs but recognize it is a mistake to think that the personal experiences of 15-40 individuals serving on the local Extension council can adequately identify the needs of the total population. Agents are trained to broaden that expression by involving members of the council in conducting a 'situation analysis.'

Councils use three major sources of information useful in conducting a situation analysis. (1) The first is data that have been collected by other individuals, agencies and/or organizations. This is typically called secondary or existing data. (2) The second is resident perspectives about issues, problems, resources and opportunities. (3) The third information source is current research and knowledge which may have implications for county programming. Extension Councils began the program development process by collecting situational data from these three sources. Council members and Extension staff together or independently pull this information together. Additional meetings of councils are held to review the data and discuss the implications of the findings. The product of this discussion is a list of program opportunities which may merit Extension's involvement. While existing data and current research and knowledge are as close as a computer and the internet, the council delegates themselves must be diligent in capturing local resident perspectives through one or more of several methods. Agents and local leaders were trained in the following methods:

Community Forums - Community forums are public meetings in which individuals are invited to share and discuss their perspectives on issues facing the community.

Focus Group Interviews - A focus group interview is a structured discussion with a small group of eight to twelve individuals on a clearly defined topic.

Key Informant Interviews - In any community, there is a number of individuals who, because of their

unique position within the community, can provide important information about local issues and needs.

Surveys - Surveys are a cost effective way of gathering data from a large number of people.

Media Scan - A systematic review of the content of news articles and editorials appearing in local newspapers and on local radio and television stations provides more information about the community.

UK College of Agriculture, Food and Environment's strategic planning process utilized community forums, focus groups and surveys to gather stakeholder input.

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

Brief explanation.

Information from stakeholders drives research and extension agendas including our pursuit of resources to conduct research and educational programs. In addition, stakeholder input has been utilized across the board for hiring, budget development, resource acquisition, program implementation, and evaluation. Our stakeholders have also provided a voice in communicating the successes of the organization to campus administrators as well as to outside and nontraditional groups and decision makers.

Brief Explanation of what you learned from your Stakeholders

Some of the issues that were identified and/or were under discussion in FY15 included:

Water Quality - educating Kentucky landowners and farmers on preventing water pollution; there has also been discussion about clean drinking water being an issue

Bedbugs -Helping residents in combatting an infestation

Food Security- Engaging communities in conversations around effective ways to address hunger

Financial Management- Assisting families during these tough economic times remains a priority. Our stakeholders have indicated that families are in need of Extension's up-to-date information regarding financial decisions. Families have also emphasized the need for Extension to continue focusing on educating youth about managing financial resources.

Concern over Zika Virus - UK Entomologists are working on international teams to better understand the health consequences and economic impact of the virus; Veterinary Science experts in viral transmission are collaborating with entomologists and medical researchers to better understand all transmission pathways

Accessing Healthy Foods - many Kentucky communities are dealing with a shortage of healthy food options. With assistance from stakeholders, Extension has been pivotal in training consumers and producers to maximize local access to farm-to-table food products

Health Disparities/Weight Management - Obesity continues to be a problem in Kentucky and local residents are very concerned. The epidemic contributes to a host of illnesses, including diabetes. Stakeholders want more current materials that are easily accessible either in the local office or as

web-based resources.

Disaster Education Program - Extension is working on programming that provides expert advice and assistance to communities during the times of natural disasters. Stakeholders see this as a priority and resources are being developed and committees have formed. A full-time staff person has also been hired.

Industrial Hemp-Despite the controversy, there is a keen interest in understanding any benefits help can provide as an alternative crop. Field days have been held to highlight the ongoing university projects.

Grain Crops- Kentucky wheat, corn, and soybean producers envisioned a Grain Crops Center of Excellence to facilitate research and extension programs to serve Kentucky and the region in addressing productivity, disease management, irrigation and environmental sustainability.

Camp Improvement Initiative - Kentucky 4H heard the voice of stakeholders and have completed a multi-million dollar renovation project at several camps with several revisions on the way.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
9367720	3228344	6479100	3662194

2. Totalled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	8704921	1460537	6840523	1448095
Actual Matching	9367720	693269	27632020	585252
Actual All Other	0	169330	0	148387
Total Actual Expended	18072641	2323136	34472543	2181734

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

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Life Skill Development
2	Leadership and Volunteerism
3	Diet, Nutrition and Healthy Lifestyles
4	Social and Economic Opportunity
5	Global Food Security and Hunger
6	Agricultural and Environmental Quality
7	Food Safety
8	Climate Change
9	Sustainable Energy
10	Childhood Obesity

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Life Skill 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
801	Individual and Family Resource Management	2%	7%	0%	100%
802	Human Development and Family Well-Being	52%	84%	0%	0%
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	0%	0%	75%	0%
806	Youth Development	46%	9%	0%	0%
903	Communication, Education, and Information Delivery	0%	0%	25%	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	120.0	16.0	2.5	0.0
Actual Paid	128.0	16.0	4.4	0.1
Actual Volunteer	136594.0	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
2176230	472647	50450	4987
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2341930	272478	380160	2533
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Through Extension specialists, agents, project coordinators, and program assistants, CES will partner with schools, businesses, and local agencies to present programs designed to build life skill opportunities and improve quality of life in adults and youth. Examples include:

- In-service training for extension agents on planning and retirement
- Agents and specialists conducting estate planning and retirement workshops and meetings for adult citizens of Kentucky
- Agents providing extension homemaker lessons on wills and retirement
- Small Steps to Health and Wealth and GPS Programming have become life skills featured programs
- Managing in Tough Times (MITT) Initiative
- Estate planning and retirement publications will be made available to the public through the web, meetings and activities and county extension offices
- Agents and community collaborators training parents, grandparents and community partners in attachment and literacy building, child development, and preventive and non-violent discipline
- 4-H project groups with six hours or more of teaching time
- One-day 4-H project groups
- Camp classes
- Senior conference track: Child Care-Beyond Babysitting
- Middle school career classes - in school and on Web
- Alternative school day calendar programs
- School-sponsored day care centers for faculty and students
- Family Development and Management program for limited resource families,
- Entrepreneurship Camp for High School Students
- * STEM-focused enrichment programs for youth

Through research, UK faculty develop methods and tools for teaching STEM skills through secondary agriscience education.

KSU provided educational opportunities to children and parents through the Rosenwald Center for Families and Children. Topics offered included educational programming include parenting, family economics, nutrition and health, agriculture/aquaculture, and child development. At KSU, research examined factors that influenced the adoption of computer-based technology in agricultural farm management.

2. Brief description of the target audience

- Agents, community collaborators, and adults interested in financial management and retirement
- Adults with low financial literacy
- Parents with children and grandparents
- 4-H youth from 9 - 19 for project work
- 4-H youth 11 and up for Babysitting and Beyond Youth entrepreneurs
- Secondary school teachers

3. How was eXtension used?

Extension staff participated in online trainings; networking and collaborating with colleagues

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	923290	3983494	1150895	4868715

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	6	3	9

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- na
Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of youth and adults who demonstrate increased practical living skills (learned through Extension programming)
2	Number of youth reporting the acquisition of one or more life skills as a result of participation in non-formal youth development programs conducted by Extension.
3	Number of youth and adults who demonstrate informed and effective decision-making.
4	Number of individuals who implemented at least one financial management strategy (e.g., checking credit report, developing a spending plan, etc.)
5	Number of individuals reporting changes in knowledge, skills, opinions or aspirations related to parenting or personal relationships.

Outcome #1

1. Outcome Measures

Number of youth and adults who demonstrate increased practical living skills (learned through Extension programming)

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	152721

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Since many middle and high schools have dropped family and consumer science classes, Extension is among only a few sources that provide youth with practical living skills. These skills include cooking and sewing.

KY does not currently produce enough qualified workers to meet the demand for STEM employees and the need is even more heightened when it comes to low-income and minority students pursuing careers in STEM.

Online access from smartphones and tablets continues to increase, and the older population adopts the use of these devices. There is a struggle for some consumers to keep up to date and manage these devices with new and emerging technology playing larger roles in consumers everyday lives.

Residents of housing developments governed by Metro Louisville Housing Authority, who were low-income, seniors, and disabled individuals, were mandated to attend educational programs in order to maintain their residency.

Preparing children for kindergarten is a critical step that is often neglected because the families do not have the skills nor can they afford traditional pre-school.

What has been done

Statewide Extension reports indicate that in the current program year, 2,338 youth were involved in sewing projects. UK Extension has offered programs that incorporate cooking instruction to youth while practicing mathematics in the kitchen.

KSU 4-H Youth Development offered STEM-based programs throughout the year, including

year-round Tech Wizards, AgDiscovery with USDA, and Summer Transportation Institute with the Federal Hwy Admin and KY Dept of Transportation.

KSU in Kenton Co conducted hands-on workshops for individuals with limited or no previous computer experience, including word processing, spreadsheet tools, and sending e-mail for individuals of all age groups.

KSU in Jefferson Co presented "Cleaning on a Shoestring" for two housing developments governed by Metro Louisville Housing Authority.

The Rosenwald Center for Families and Children staff implemented daily practices that support life skill development of the preschool age. Special emphasis is placed in building self-esteem, social skills, self-help skills, critical thinking, healthy living, healthy eating, and problem-solving skills.

Results

Development of leadership skills is another important part of a member's 4-H experience. In June 2014, Kentucky 4-H launched the Kentucky 4-H Fashion Leadership Board. Throughout the coming year, board members, selected from across the state, will put their leadership skills into action by teaching middle-school youth a fashion-related workshop at Teen Summit and by planning/conducting the 2015 State 4-H Fashion Revue held during Teen Conference. The Superstar Chef curriculum was beneficial in helping youth developing cooking skills and make healthier choices when selecting/preparing meals.

250 students increased their knowledge and abilities in the areas of animal science, transportation, engineering, environmental science, and technology through these initiatives.

This was a successful new venture for Extension as most participants were first-time users of Extension. Most followed up with requests for additional assistance and interest in more classes.

40 residents participated and stated that they will change their cleaning habits. The program also brought the living community together; some of the disabled individuals were able to exchange numbers with counterparts to assist them with their home cleaning needs.

Youth enrolled demonstrated increased abilities to perform daily life skills. The skills are assessed and documented through direct interactions, anecdotal notes from parents and staff and measured by the objectives and dimension of the curriculum utilized.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
806	Youth Development

Outcome #2

1. Outcome Measures

Number of youth reporting the acquisition of one or more life skills as a result of participation in non-formal youth development programs conducted by Extension.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	89761

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many of today's youth lack the guidance needed to make wise decisions, choose positive paths, and grow up competent, caring and responsible.

Nutrition and wellness are not easily attainable. Some may have a physically hard time with lifting and walking. Some may have a hard time eating properly due to texture issues. Persons with special needs are sometimes slow to change their eating habits.

Parents of children in Fayette Co. were ordered to attend parenting programs due to abuse or neglect.

What has been done

UK Extension formed a partnership with Jefferson County (Louisville) schools to implement a program that has a concentrated focus on positive behaviors for 11 and 12 year old girls who are starting their first year in middle school.

In Jefferson County, KSU facilitated "Brown Bag Series: Eating to Live" for PEAK, an agency provides one-on-one services to individuals that have developmental and/or intellectual disabilities, along with the South Louisville Community Center.

KSU conducted the SKY Families Parenting Program, which promoted individual and family self-sufficiency for parents assigned to attend a court-approved parenting program. Parent training sessions included effective family communication, traditional vs. non-traditional discipline, and how to navigate the child welfare system.

Results

More than half of the 87 Jefferson County participants reported that the workshops presented encouraged them to do their best in school, both academically and behaviorally and felt that they now could identify a caring adult to serve as their mentor through their middle school education. Due to the success of the program, one school worked with a 4-H Agent to create a plan to offer enrichment life skills education for the students and families in the community surrounding the school

Post-surveys from th Brown Bag series reported that all changed their eating habits and tried new snacks that were made in the class. It is expected the series will help individuals with special needs to make small adjustments to their eating habits and to increase their physical activity.

While the exact numbers are not available, many families were reunited and more parents are requesting the SKY Families Parenting Program's assistance.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
806	Youth Development

Outcome #3

1. Outcome Measures

Number of youth and adults who demonstrate informed and effective decision-making.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	88496

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Several counties in Kentucky have lost jobs due to the closing of coal mines; some have unemployment rates approaching 10%.

Getting back into the workforce after a period of not working is a challenge for most individuals. Many jobs may have changed focus or added new technology.

The Univ. of KY anticipates several retirements in the next few years and wanted to help their employees prepare for this transition.

What has been done

The KY Cooperative Extension Service has recommended the acquisition of business skills for citizens. The American Private Enterprise (APES) is a Program lead by local business leaders with a goal to help youth acquire skills to become business owners.

KSU in Kenton Co offered classes with an emphasis on researching job opportunities, networking, resume writing, interviewing, highlighting skills related to the job description, increasing marketability, and explaining any gaps in employment.

KSU developed an educational series on retirement planning for 75 Univ. of KY Extension personnel. Series addressed social, emotional, and economic well-being prior to and during

retirement. The information was presented to participants at a Research to Practice roundtable during the annual meeting of the American Assn. of Family and Consumer Sciences.

Results

The APES program has encouraged youth to pursue business degrees and be inspired to become entrepreneurs.

Participants in the Kenton County program were excited for the opportunity to return to work shared experiences with interviewing and locating available positions in an effort to help others.

Participants of the UK retirement seminar indicated that they would begin making retirement plans to: transition into retirement; better maintain health; create connections with other people; establish and maintain friend networks; have purpose; continue to grow through lifelong learning; and find ways to have fun.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
806	Youth Development

Outcome #4

1. Outcome Measures

Number of individuals who implemented at least one financial management strategy (e.g., checking credit report, developing a spending plan, etc.)

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	16643

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Current economic conditions facing recent college graduates include wage stagnation, rising levels of student loan debt, and high rates of unemployment and underemployment, which highlight the need to provide financial education in the college and university setting. Seventy-one percent of graduating seniors in the Class of 2012 carried student loan debt, with an average balance of \$29,400.

Northern KY has experienced major companies leaving or relocating their plants to other areas thus impacting the economy negatively, especially many families' buying power.

Social Security is the main source of retirement security for many workers and their families; for more than two decades it has provided more than half of the total income for nearly two-thirds of its elderly beneficiaries. As the "baby boomers" reach the retirement age minimum of 62, many have questions concerning their Social Security benefits.

Many low and moderate income families lack the knowledge or understanding of how to apply for and receive larger refunds when filing their federal income tax returns. Thousands of dollars go unclaimed that could help families in financially difficult situations.

Many families spend too much during the holidays and find themselves in financial distress. Learning how to plan and budget for these occasions is critical to preserving resources.

High school students often feel the brunt of economic downturns when their parents lose employment and local businesses are not hiring teens to fill part-time jobs.

What has been done

It's Your Reality (IYR) is a financial life skills simulation developed to promote financial capability among college students to help them understand how the financial decisions made today, or shortly after graduation, will impact their life course.

KSU in Kenton County developed a 5-week series, "Money Talk: A Financial Guide for Women." Networking with local industry experts enhanced the program by providing real world examples and up-to-date information.

KSU FCS in Kenton County offered a class with a Social Security Office specialist: "Have Questions about Social Security?"

KSU provided Earned Income Tax Credit (EITC) packets, newsletter articles, and information on Volunteer Income Tax Assistance and it is estimated that over 1,000 people received information.

KSU developed a teaching program, "Stretching Your Holiday Dollar" that was presented to 17 persons representing 13 states at the Natl. Assn. of Family and Consumer Sciences; and 30 persons attending the KY Assn. of Family and Consumer Sciences, and reaching over 500 people in KY and other states.

KSU presented a workshop to 14 Family and Consumer Sciences Teachers during the summer meeting of KY Career and Technical Education teachers. Materials for high school students from the Natl Endowment for Financial Education, and Real Skills for Everyday Life: Get More Bang for Your Buck.

Results

Out of the 700 It's Your Reality Participants, a majority reported a better understanding of the costs to maintain a household followed by costs to raise a child participants overwhelmingly reported positive changes in intended behaviors; most notably 97% reported the intention of thinking more about the impact of a purchase decision on finances.

The program proved to be a great tool in getting individuals to think about their financial goals. One participant, while taking care of ill parents and falling behind was struggling to obtain credit and filed bankruptcy. She was able to rebuild her credit and planned for long-term goals.

As a result of the class on Social Security, attendees learned how to use the Internet to locate answers, obtain benefits for their spouse and themselves, and the amount they would receive. In addition there was a request for a follow-up class on Medicare.

Conservatively, more than 200 people applied for EITC as result of receiving the information and these receipts helped pay bills, buy used appliances, make home repairs, purchase furniture,

and purchase clothing for their children. Money spent in local communities stimulated the economy.

One agent indicated that 95% of participants gained knowledge about: making a budget; use of cash and credit; money saving tips for decorations, food, travel, and gift giving; ideas for reducing, reusing, and recycling; and conserving energy. All participants stated that they would practice what they learned.

Teachers expressed great satisfaction with the Holiday Dollar workshops and materials, which she did not know existed before and was elated to know that there were materials to use with clientele. One teacher in Muhlenberg County expressed a desperate need for these materials in her county due to the economic conditions, layoffs, and other disparities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
806	Youth Development

Outcome #5

1. Outcome Measures

Number of individuals reporting changes in knowledge, skills, opinions or aspirations related to parenting or personal relationships.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	15301

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

According to U.S. Census figures, from 2000 to 2010 the number of Kentucky children living with someone other than their parents increased by more than 200 percent in some counties. That

shift in parenting responsibilities can often bring its own set of challenges, and those who find themselves caring for grandchildren often lack support. There is also a low level of fathers being involved in the lives of their children.

Grandparents are taking on more responsibility for raising grandchildren and many parents are not prepared for the demands of parenting. These skills are essential for all families, and especially for limited resource families with other stressors and demands.

Well-trained professionals are key in providing high quality early childhood care and education for children.

What has been done

Conferences, workshops and trainings have been held to promote awareness, foster support groups and enhance parenting skills. Fatherhood program were also utilized

KSU and Jefferson County Public School System's Early Head Start Program presented a series of life skill programs. Parents learned about the developmental stages of development for children ranging from ages 3-5 years. Also, they learned about the different parenting styles.

KSU's Rosenwald Center for Families and Children provided training to child development and family relation majors. Each student was paired with a teacher who focused on providing opportunities that allowed students to take the classroom learning experience into real life situations.

Results

Programs for grandparents have made a positive change in grandparents' confidence. Over 60 fathers in a program in Todd and Wolfe counties has encouraged fathers to be more involved not only in the lives of their children but to be more active in the Extension program (as volunteers).

In post-surveys, 9 of 25 parents agreed that they were going to change their parenting style and 6 parents reported they better understood their parenting skills. All parents reported they would attend more sessions.

By the end of the semester, students in Rosenwald Center program demonstrated improved confidence and competence. As a result of increased abilities and skills, three of the participating students gained employment before graduation dates.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
806	Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Increase in skill development, raised awareness; more positive life experiences for children and families

Key Items of Evaluation

Focus groups, surveys, follow up calls, secondary data

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Leadership and Volunteerism

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
802	Human Development and Family Well-Being	0%	9%	0%	0%
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	100%	14%	0%	0%
902	Administration of Projects and Programs	0%	20%	0%	32%
903	Communication, Education, and Information Delivery	0%	57%	0%	68%
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	77.0	10.0	0.0	6.0
Actual Paid	58.0	8.5	0.0	7.0
Actual Volunteer	75323.0	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
1044590	308823	0	227161
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1124126	167865	0	114042
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	13197	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Community leadership development programs will be conducted for the general public as well as training for those serving in leadership roles in extension councils and district boards, extension homemaker organizations and 4-H programs. •Extension will continue to utilize SEAL (Strengthening Extension Advisory Leadership) materials with extension leaders and in training facilitators to conduct local community programs. •Counties will identify volunteers and send them to certification workshops, thereby reaching more 4-H members across Kentucky. •Kentucky 4-H members will receive consistent, uniform education through school enrichment programs, after-school programs, day and /or summer camps and through communications events in the 4-H "Step Up to Leadership" and 4-H Communications - Speeches and Demonstrations projects and programs. Title VI and diversity workshops including True Colors training will be offered to program and county councils. KSU research explored farm, geographic, and market attributes to develop optimum land management models.

2. Brief description of the target audience

- General public as well as those serving in leadership roles in extension councils and district boards, extension homemaker organizations and 4-H programs •Volunteers from Kentucky counties with appropriate background and experience in subject matter that we can build on for 4-H subject matter and leadership training •"Step up to Leadership" curriculum and activities are designed for youth in grades K-12 Community-based non-profit organizations

3. How was eXtension used?

Printed materials, webinars

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	420262	960421	181467	411609

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	2	0	2
---------------	---	---	---

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- na
Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of people who are involved in addressing significant community issues.
2	Number of people who increase their knowledge of governmental process
3	Number of youth who held leadership and/or advisory positions on community boards
4	Number of youth indicating increased leadership skills, knowledge or confidence through participation in Extension-related leadership programs
5	Number of adults indicating increased leadership skills, knowledge, and/or confidence through participation in volunteer programs related to youth development

Outcome #1

1. Outcome Measures

Number of people who are involved in addressing significant community issues.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	34356

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Although Extension has a strong volunteer base, there is a need to equip these individuals with the skills to make a difference and address local and state issues.

Disaster preparedness is an ongoing concern in many rural communities. The tornadoes that touched Kentucky on March of 2012 took 24 lives. There is a need for clientele to be better prepared as instances of severe weather and community emergencies increase.

Parents in Fayette Co whose children (633) were diverted into relatives' homes due to abuse or neglect, and were receiving financial assistance from the Kinship Care Program until funding cuts were implemented.

What has been done

For the first time in years, the Kentucky Extension Homemakers Association celebrated a statewide increase in membership. Leaders in the organization have worked diligently to build enthusiasm, and members across the state are producing positive impacts for families and communities through volunteer outreach efforts.

KSU presented a homemaker leader lesson "Are You Ready for a Disaster?" in Carroll and Kenton counties. Many indicated this was the first time they had really thought about being isolated for 72 hours and what would they do during that time, including plans for the care of pets and evacuation.

KSU's SKY Families Program partnered with KY Youth Advocates and recruited relative caregivers to seek change of state policy reducing the number of children placed in foster care instead of with other family members.

Results

More than 15,300 members across the state have implemented changes as a result of programs offered. Members volunteered more than 59,000 hours for youth activities and offered 4-H camp scholarships totaling \$14,000. Across Kentucky, 5,573 youth received weekend food backpacks through programs supported by homemaker members. Through international programs, \$3,700 was collected to support programs through the Associated Country Women of the World and \$3,900 was contributed to supply safe drinking water through a special project of the National Volunteer Outreach Network.

As a result of the disaster lesson, most indicated increased awareness and knowledge, received a first-aid kit, first-aid manual, and food safety information, and each affirmed they would share this information with others.

As a result of efforts put forth by the SKY Family program, the KY General Assembly unanimously passed a bill allowing relative caregivers access educational services and health care for the child.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
903	Communication, Education, and Information Delivery

Outcome #2

1. Outcome Measures

Number of people who increase their knowledge of governmental process

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	22628

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Building the capacity of volunteer leaders within counties is critical for the sustainability of a community infrastructure. Leadership empowers local people to take ownership of community problems and possibilities. Volunteer leadership is critical to the success of any Extension

program.

What has been done

UK Ag Programs assisted counties in the Shaping Our Appalachian Region (SOAR) project in eastern Kentucky. One agent served as chair of the Agriculture, Community and Regional Foods, Natural Resources working group. Several counties in Kentucky have established leadership programs with a mission to develop leadership and acquaint both natives and new comers with the reality of living in Kentucky.

Results

In Henry County Kentucky, there has been over 110 citizens who have participated in their leadership course since its inception. The Chamber of Commerce recognized the Extension Service at a local event for providing scholarships, sponsorships, facility usage, educational programming and guest speakers from the University.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
903	Communication, Education, and Information Delivery

Outcome #3

1. Outcome Measures

Number of youth who held leadership and/or advisory positions on community boards

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	768

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Strong leaders are vital to the future of our communities, and to the organizations with whom Cooperative Extension works. Youth are the future leaders of our communities, country and our

world, thus the importance of leadership training is critical. With tight budget times it is now more important than ever to recruit, train and retain high quality adult and youth volunteer leaders.

What has been done

CES, through the 4-H program planned and implemented various leadership activities and councils for teens to serve on and work with to help offer opportunities for teens that will engage them within communities to enhance leadership skills.

Results

Youth across the state have developed leadership skills through 4-H, with several serving on teen councils. Several county based teen councils reported taking a leadership role in other school organizations after participation in 4-H leadership. All participants stated they felt better prepared to be a leader in school and the community.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
903	Communication, Education, and Information Delivery

Outcome #4

1. Outcome Measures

Number of youth indicating increased leadership skills, knowledge or confidence through participation in Extension-related leadership programs

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	59717

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Strong leaders are vital to the future of our communities, and to the organizations with whom Cooperative Extension works. Youth are the future leaders of our communities, country and our world, thus the importance of leadership training is critical. With tight budget times it is now very

important to recruit, train and retain high quality adult and youth volunteer leaders.

Middle school girls struggle with peer pressure, family issues, body image, and other matters associated with puberty. Many do not know how to successfully navigate these changes.

What has been done

4-H youth have been involved in community service and civic projects to help promote citizenship.

KSU FCS and UK 4-H agents partnered with two Jefferson County middle schools to mentor 6th grade girls through the 8th grade in a program called "Wonder Girls." Each week a different subject matter was covered and the girls had an opportunity to ask questions in a safe and secure environment as well as learn about themselves.

Results

Kentucky teen clubs have assisted with numerous project clubs this year. They adopted Angel Tree Children providing the funding and time to insure these children would have gifts during the Holiday season. In December, Oldham County club members sorted and prepared over 200 food baskets for families in need.

Teachers and Family Support counselors reported improved behaviors in the Wonder Girl program participants due to at-risk social/emotional behavior.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
903	Communication, Education, and Information Delivery

Outcome #5

1. Outcome Measures

Number of adults indicating increased leadership skills, knowledge, and/or confidence through participation in volunteer programs related to youth development

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	12083

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Identifying an adequate number of high quality volunteers is always a challenge. Volunteers serve as an important element of the youth development program. Attaining a diverse community representation of volunteers and allowing them to have ownership of the program will ensure community youth development needs can be addressed.

What has been done

Several county 4-H programs have been successful in including a teen voting member on boards and councils in order for youth to learn from adults how to become effective leaders.

Results

Perry county schools worked with Extension to organize a leadership retreat for all 8th grade students. Several have indicated how much the experience benefitted them and that they intend on stepping into more leadership roles.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
903	Communication, Education, and Information Delivery

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Increase in leadership capacity; knowledge gained; citizens utilizing the skills attained

Key Items of Evaluation

Pre-post surveys, one-on-one interviews, follow up calls

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Diet, Nutrition 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
312	External Parasites and Pests of Animals	0%	0%	5%	0%
502	New and Improved Food Products	0%	0%	21%	0%
503	Quality Maintenance in Storing and Marketing Food Products	0%	0%	7%	0%
701	Nutrient Composition of Food	0%	0%	14%	100%
703	Nutrition Education and Behavior	98%	0%	0%	0%
721	Insects and Other Pests Affecting Humans	0%	0%	29%	0%
722	Zoonotic Diseases and Parasites Affecting Humans	0%	0%	10%	0%
723	Hazards to Human Health and Safety	1%	0%	14%	0%
724	Healthy Lifestyle	1%	100%	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	95.0	2.0	3.0	2.0
Actual Paid	75.0	0.5	9.2	1.4
Actual Volunteer	42485.0	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
1305738	24145	245098	48300
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1405158	13919	1813266	24834
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Contacts with clientele related to diet and health will include volunteer training, health fairs, Extension Homemaker leader lessons, safe night programs, healthy homes programs, and more.
- Multidisciplinary programs aimed at strengthening local food systems. Examples of programs to be offered will include: 4-H school enrichment, after-school programs and dayand/or summer camp programs on 4-H Jump into Foods and Fitness. Weight--the Reality Series - Body Image and Get Moving Kentucky physical activity and weight management programs, LEAP-Literacy, Eating and Activity for Preschool Program and Exploring MyPyramid with Professor Popcorn for elementary school age children. •EFNEP - Expanded Food and Nutrition Educational Program for low income families with children. •Multi-agency activities related to diet and health. •Continued research in the areas of nutrient effects on high-fat diets, antioxidant effects on cancer prevention, environmental effects on nutrient requirements and more.

Major research efforts in this program area include: • Inclusion of healthy fats in processed meats •The biology, ecology and control of disease vectors and other insects of importance to public health. • Understanding confined space hazards for agricultural workers. • Bioprotective effects of phytochemicals to mediate immunity and antigenotoxic potential

2. Brief description of the target audience

- Extension agents •Community agencies •Volunteer leaders •Parents •Grandparents
 - General public •Public housing residents •Scientific community •Jump into Food and Fitness
- participants: curriculum designed for youth ages 8-11

3. How was eXtension used?

Extension agents and specialist participated in webinars and accessed publications

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	676736	3846193	345629	1981372

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	3	29	32

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- na
Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of individuals who experienced an increase in knowledge, opinions, skills or aspirations regarding lifestyle changes (diet, exercise, healthy home practices, managing stress, etc.) that improve personal health
2	Number of individuals who made lifestyle changes (diet, exercise, healthy home practices, managing stress, etc.) for the purpose of improving their health
3	Number of individuals implementing personal health protection practices (screening, immunizations, well-baby care, preventive health practices, etc.)
4	Number of individuals who reported practice changes related to safety (use of bicycle helmets, fire extinguishers, tractor roll bars, radon testing, smoke detectors, proper ATV operation, etc.).

Outcome #1

1. Outcome Measures

Number of individuals who experienced an increase in knowledge, opinions, skills or aspirations regarding lifestyle changes (diet, exercise, healthy home practices, managing stress, etc.) that improve personal 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	145317

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Lifestyle and behavioral risk factors contribute greatly to the onset of the chronic diseases that are the leading causes of death for Kentuckians. Kentucky is now the ninth most obese state in the nation.

Students do not realize the importance of maintaining proper nutrition and often are unable to while they are not in school during the summer break. Jefferson County's Louisville Metro government challenged the Parks and Recreation Program to emphasize health and wellness summer camps.

What has been done

Healthy Living Programs such as Get Fit Challenge along with Weight the Reality Series has helped participants meet outcomes of increased physical activity and reducing risk factors of chronic diseases through reduction of weight. The Plate it Up program also educated residences on ways to prepare fresh vegetables.

KSU partnered with the South Louisville Community Center to provide health and wellness education and physical activities for students 12-16 years of age. KSU also provided the different activities in the sports field.

Results

Statewide efforts from the Plate It Up program revealed that over 15,000 residents had more of an interest to purchase and try more vegetables. Over 13,000 noted that they will try some of the recipes recommended by Extension.

All participants of the Louisville health and wellness program reported that they were able to

read food labels, tried new foods and snacks as part of the food demonstrations, and would challenge their parents to eat healthier.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
723	Hazards to Human Health and Safety
724	Healthy Lifestyle

Outcome #2

1. Outcome Measures

Number of individuals who made lifestyle changes (diet, exercise, healthy home practices, managing stress, etc.) for the purpose of improving their health

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	46164

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Lifestyle and behavioral risk factors contribute greatly to the onset of the chronic diseases that are the leading causes of death for Kentuckians. Kentucky is now the ninth most obese state in the nation.

Jefferson County residents who were transitional from homelessness to having their own apartments were in need of nutrition education to support their independent living.

What has been done

Multiple program have been implemented including Plate It Up and Small Steps to Health and Wealth

KSU EFNEP partnered with St. Vincent DePaul Transitional Housing Program in Jefferson Co to offer hands-on experience and activities dealing with food purchases, preparation, and food demonstrations. On average 15 individuals participated in each session.

Results

This year a group of Family and Consumer Sciences (FCS) agents from each of the seven Districts issued a 12-week Wellness Challenge. Work site initiatives produce benefits both for individuals, their families, and the organization. A total of 350 individuals made changes to improve their food choices and physical activity. Several reported maintaining a healthy weight, taking less medication, and having fewer hospital visits.

Each participant reported that they would incorporate the "MyPlate" and 75-80% changed their eating habits. One stated "I learned so much about my own eating habits and will continue to use the healthier recipes that you shared with us. . . Thank you so much for coming to share the information with us."

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
723	Hazards to Human Health and Safety
724	Healthy Lifestyle

Outcome #3

1. Outcome Measures

Number of individuals implementing personal health protection practices (screening, immunizations, well-baby care, preventive health practices, etc.)

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	17927

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Two-thirds of Americans have a BMI that puts them in the obese category. Research has shown that losing as little as 10% of body weight may mitigate some of the health risks associated with obesity.

Breast cancer is the most common form of cancer among all American women and death by breast cancer is of greater prevalence among African American women.

What has been done

A Kentucky Extension grant team provided county coalitions with a menu of evidence-based options aimed to reduce obesity prevalence. A new social marketing campaign was put in place to promote healthy, home-cooked family meals. The Small Steps to Health and Wealth program is being utilized as well

KSU led a campus-wide social media campaign for breast cancer awareness month and prevention. #GetTheWordOut collaborated with KSU's Office of Student Life and Health Center. KSU's Student Body and Campus Community posted weekly facts about breast cancer on social media.

Results

Several participants of a Wellness challenge have reported less frequent doctor visits. Over 500 residents have participated in Small Steps to Health and Wealth programming, in which they walked over 25,000 miles (in steps)

The breast cancer program assist KSU in improving its social media campaign for future programming and opened up additional opportunities to partner with the Athletic Department and promote breast cancer awareness in the African American population.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
723	Hazards to Human Health and Safety
724	Healthy Lifestyle

Outcome #4

1. Outcome Measures

Number of individuals who reported practice changes related to safety (use of bicycle helmets, fire extinguishers, tractor roll bars, radon testing, smoke detectors, proper ATV operation, etc.).

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	20375

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Each year 1 out of 3 adults age 65 and older experiences a fall which leads to a fear of falling, moderate to severe injury, and even death. In addition to the physical and psychological impact, falls are associated with severe economic consequences for individuals, their families, and society at large.

Disease prevention is not an "English-only" issue on many KY farms. Materials were needed to support training Spanish-speaking farmworkers.

What has been done

The Stand Up to Falling program is used in Kentucky to highlight the importance of physical activity, medical management, healthy vision and home safety as best practices to prevent falling.

KSU led an Extension project on Foreign Animal and Zoonotic Diseases on Small, Non-Commercial Scale Farms.

Results

A total of 404 participants had a better understanding of ways in which to reduce the risk of falling; 260 participants reported that they would make changes to their home to reduce the risk of falling; 328 participants reported that they would be more physically active; and 319 reported that they learned how to safely get up from a fall.

KSU developed 12 on-line foreign animal/zoonotic disease publications in English plus translated them to Spanish.

4. Associated Knowledge Areas

KA Code	Knowledge Area
723	Hazards to Human Health and Safety

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

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Change in behavior towards healthy living.

Key Items of Evaluation

Surveys, testimonials

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Social and Economic Opportunity

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
315	Animal Welfare/Well-Being and Protection	0%	0%	3%	0%
601	Economics of Agricultural Production and Farm Management	0%	100%	24%	100%
602	Business Management, Finance, and Taxation	1%	0%	0%	0%
603	Market Economics	0%	0%	9%	0%
604	Marketing and Distribution Practices	17%	0%	9%	0%
605	Natural Resource and Environmental Economics	4%	0%	14%	0%
606	International Trade and Development	0%	0%	8%	0%
607	Consumer Economics	0%	0%	5%	0%
608	Community Resource Planning and Development	78%	0%	8%	0%
609	Economic Theory and Methods	0%	0%	5%	0%
610	Domestic Policy Analysis	0%	0%	2%	0%
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	0%	0%	11%	0%
901	Program and Project Design, and Statistics	0%	0%	2%	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	25.0	4.0	5.0	0.5
Actual Paid	27.0	8.3	22.1	3.9
Actual Volunteer	24740.0	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
435246	258620	477917	130025
1862 Matching	1890 Matching	1862 Matching	1890 Matching
468386	124597	2140015	43402
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	79981	0	8737

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Delivery of educational programming and workshops on topics such as understanding community dynamics, asset analysis, business planning, marketing and hospitality management
- Efforts to educate producers about marketing and adding value to Kentucky Agricultural products including MarketMaker, Agritourism, Farmers Markets, Kentucky Proud Campaign, specialty livestock markets and marketing programs, Kentucky Entrepreneurial Institute, etc.
- Formation of nontraditional advisory councils in the areas of community and economic development, tourism, agritourism, and arts where appropriate need and resources are identified
- Research projects including estimating how changing agricultural trade policies and macroeconomic conditions influence U.S. agricultural exports, value-based supply chain design and policy impacts, understanding the factors that lead farmers to stop farming, the value of equines to Kentucky's economy, and adaptive management through the use of precision technologies
- The Family Economics and Management Program will focus on Earned Income Credit and Tax Credit opportunities for Kentucky Families. Youth entrepreneurship education
- Entrepreneurial development and outreach to educate local officials and leaders on the importance of planning for economic development

KSU has research projects are focusing on market potential for aquaculture species and livestock, including studies that showed a strong potential for sales of locally-grown Australian red claw crayfish in farmers' markets in Kentucky.

2. Brief description of the target audience

- county extension agents
- Kentucky crop, livestock, produce producers
- entrepreneurs
- agritourism providers
- active and potential community leaders
- 4-H members
- scientific community
- High school students, teachers, and counselors

1. Locally elected and appointed officials

3. How was eXtension used?

Use to connect with communities of practice, participation in webinar trainings

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	352025	4772679	64228	842237

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	29	34

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- na
Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of new coalitions formed as a result of Extension efforts
2	Number of individuals reporting changes in knowledge, opinions, skills or aspirations related to economic or enterprise development
3	Number of farmers self-reporting an increase in profits as a result of adopting one or more practices recommended by Extension
4	Number of citizens (youth & adults) utilizing skills learned through Extension programming
5	Use of data analysis and tools developed for policy makers and entrepreneurs

Outcome #1

1. Outcome Measures

Number of new coalitions formed as a result of Extension 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	550

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Effective communication between Extension agents, volunteer leaders and elected officials is crucial in identifying issues that are important to our clientele. In many cases, the greatest impact can be achieved when working with community partners.

What has been done

Trimble County Extension Agents facilitated a conversation with volunteer leaders and elected officials during the Legislative Appreciation Breakfast. Several counties including Campbell have worked with Planning and Zoning and Property Valuation Administration to address County Ordinances and Policies that impact the farming community. Daviess County conducted seminars on the farm bill.

Results

As a result of the educational opportunities regarding farm bill enrollment provided by the Daviess County Cooperative Extension Service, 99 percent of Daviess County landowners chose the agricultural risk coverage option of the new farm bill.

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices
608	Community Resource Planning and Development

Outcome #2

1. Outcome Measures

Number of individuals reporting changes in knowledge, opinions, skills or aspirations related to economic or enterprise development

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	32294

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

County leadership continues to identify entrepreneurship and economic development as important areas for cooperative extension service programming.

A small, socially disadvantaged producer in Shelby County requested assistance from KSU for completing a housing application to the USDA Rural Development Agency for home repairs.

Beulah Mountain Christian Academy, located in McCreary County, houses and educates 29 at-risk students from across the United States. The school is located on 300 acres, with 100 acres in farmland. The Academy wanted to teach agriculture practices and provide experiences and skills that will benefit students in the future.

In the counties of Knox, Whitley, and Laurel there are girls (daughters of small, socially disadvantaged farmers) who have never been to a mall or worn new clothing. Due to the poverty of their families the majority of these girls have never even thought about attending a University.

KSU sought a forum for Extension professionals and small farmers to learn together and from each other to understand the natural progression of plants, animals, and soils under realistic farming conditions facing limited resource operations.

What has been done

The Food Connection project is a \$5 million public-private partnership designed to elevate and promote a vibrant, healthy, sustainable food economy. The Kentucky Agricultural Leadership Program (KALP) is an intensive two year program designed for young agricultural producers and agribusiness individuals who want to be on the cutting edge of decisions that affect agriculture, rural communities and society in the 21st century.

With KSU's assistance, the application was submitted for the amount of \$15,000.

KSU and McCreary County Bee Club, Beulah Mountain Christian Academy, distributed beehives and equipment that provided education and a sustainable food source for the school. The students were taught the honey bee life cycle and beehive activities.

The KSU Small Farm agent along with UK, helped limited resource teen girls learn about attending college and how to dress professional for jobs. Girls visited KSU's Aquaculture Research Center, were introduced to aquaponics and vegetable production, and met with KSU representatives to learn about applying for college and financial aid.

KSU maintained its support for the Third Thursday Thing attracted farmer participants (minorities, refugees, home-schooled and traditional K-12 students, and women) to monthly programs; most were small-scale and limited-resource and 15-50% were beginning farmers. Ag and other media covered events regularly along with social media for expanded outreach.

Results

KALP has graduated 267 participants covering ten different classes, with many of these individuals taking on leadership positions within agriculture. The Food Connection is UK university-wide initiative

USDA awarded \$ 7,500 and a second application has been submitted to the Kentucky Housing Corporation to obtain the second \$7,500. With these improvements, the farmer will be better able to operate his farm independently and produce adequate income to service his debts, maintain his farming operations, and provide a reasonable standard of living for his family.

The instructor of the Bee club and the students gained knowledge and experiences on how to function as beekeepers and manage beehives. Students learned how to extract and process the honey as a successful STEM hands-on activity.

Donations secured by a local organizations these teenage girls were allowed one outfit they could wear on a job interview. The girls not realize they could attend college and what to wear to a professional job--something they had never been introduced to by their local community. One girl is thinking about college and wants to attend KSU.

Regular participants for 2-4 years reported 70-90% have adopted a practice or new enterprise and use it on their operations or in their programming to remain abreast of the research and the industry.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
603	Market Economics
604	Marketing and Distribution Practices
605	Natural Resource and Environmental Economics
607	Consumer Economics
608	Community Resource Planning and Development

Outcome #3

1. Outcome Measures

Number of farmers self-reporting an increase in profits as a result of adopting one or more practices recommended by Extension

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	9643

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

There is a need to have access to information provided by the extension on grain marketing when determining price expectations and budgets for corn, soybean, and wheat production.

A beginning farm couple moved to Casey County from Phoenix and wanted to learn how to farm the land they had purchased. They possessed limited knowledge about how to raise produce and other farm products.

One Whitley County woman, with a strong desire to teach her children how to live off the farm, wanted to learn how to produce what food they needed to eat and to sell off the extra for support of her large family.

Many socially disadvantaged, small, veteran, women, and other beginning and limited-resource farmers are not connected with USDA Agencies or their programs.

What has been done

Extension worked to get a local feed mill established in an area that would serve producers in multiple counties.

KSU's Small Farm Program and Beginning Farmer Grant collaborated with UK to provide farmers in Casey County training and livestock to raise pastured poultry, honeybees, and vegetable gardens.

Through the Beginning Farmers Grant, KSU placed one hundred Cornish Cross chickens and the pen to house them in. The producer was given training on how to brood birds and raise them to a 4-6 pound bird in a six-week period.

KSU supported of Farmers2CityConnection African American cooperative, located in the Strike Force Zone, aided development of spinoff businesses--roadside stands, value-added online markets, inner cities markets (Louisville, KY and Nashville, TN), local direct markets, and a restaurant in Louisville.

KSU staff assisted limited resource farmers in applying to USDA/NRCS programs for EQIP

funds.

KSU applied for and received Small Farm Development Program funds from the state (since 2013) and provided grants to small farmers to implement aquaculture, value-added, and organic projects.

KSU provided technical assistance for several years to the Fairview Produce Auction in Christian Co. and it is located in the Strike Force Zone.

KSU provided technical assistance and mentoring to farmers with disabilities.

The KSU Small Farm Program worked with farm cooperators on a one-to-one basis to conduct technical assistance and connect these social disadvantaged producers to improve their farming practices.

Results

The local feed mill began purchasing corn from local growers January 2015. Corn growers were pleased with the price offered. It improved local basis 40 cents per bushel over historic basis. That will potentially be an increase of \$560,000 that local producers will receive for the corn they sell to the poultry feed mill. That is a \$70 increase in income per acre for a farmer who has an average yield of 175 bushels per acre.

After learning from several mistakes and overcoming some obstacles, beginning farmer program participants attended additional classes and through perseverance had better success with the pasture poultry and are working to develop additional markets for the birds, increasing production, and planning a farm stand.

This limited resource small farmer has been able to speed her chicken production, customers are happy with the product, and as a result, orders have increased.

Members have improved their farm income by \$75,000.

32 farmers were awarded funding and installed NRCS high tunnels to add to their farming operations and enhance income opportunities.

Of 331 applicants, 147 were approved for \$636,246 with most of the projects in the Promise and Strike Force Zones.

The Fairview Produce Auction has grown to \$2.3M in annual sales.

Three disabled African American farmers received assistive technology grants and tractor modifications from USDA AgrAbility program.

KSU small farm cooperators will show average increases in farm income: African American = \$5500; Hispanic = \$1,000; Veterans = \$4,000; active transitioning military veterans = \$500; women = \$5,000; beginning = \$6,000; and limited-resource = \$3,000. The total economic impact is anticipated to be \$2.4 million on cooperators' farms and \$7 million for their communities.

The economic impact of KSU's Small Farm outreach has averaged over \$3.75 million annually in increased producer incomes, \$1 million in annual producer savings, and local multiplier effects projected to be \$9 million annually.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
607	Consumer Economics
608	Community Resource Planning and Development

Outcome #4

1. Outcome Measures

Number of citizens (youth & adults) utilizing skills learned through Extension programming

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	165133

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In today's economy managing your financial stability is increasingly important. A family's ability to secure and manage their basic needs of food, clothing, and shelter is an integral part of that stability. Kentucky's unemployment rate is 6.5% with Northern KY experiencing major companies leaving or relocating their plants to other areas thus impacting the economy negatively.

What has been done

Extension programs in Northern Kentucky are focusing on financial empowerment.

Results

Networking with local industry experts has enhanced the program by providing real world examples and up to date information. A number of respondents planned to take action to implement at least one estate planning strategy.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
603	Market Economics
604	Marketing and Distribution Practices

- 605 Natural Resource and Environmental Economics
- 606 International Trade and Development
- 607 Consumer Economics
- 608 Community Resource Planning and Development

Outcome #5

1. Outcome Measures

Use of data analysis and tools developed for policy makers and entrepreneurs

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)

The last thorough inventory of Kentucky's signature equine industry took place over 35 years ago. Little was known about the true number of horses and horse breeds in the state or their contribution to the economy. Economists, business owners and policy makers recognized a need for updated data and analysis regarding the state's most recognizable agricultural industry.

What has been done

During 2011-2012 a comprehensive survey of the state's equine population was conducted to inventory horse numbers by breed, acres dedicated to equine operations, and equine related expenditures and income. An analysis of economic impact was also conducted during the following year. This analysis considered total output in sales and services, employment, and value added impact through new income and profits or dividends earned.

Results

The 2012 survey indicated that there are more than 240,000 horses and approximately 35,000 equine operations comprising 1.1 million acres of dedicated equine land use in the state. The total value of Kentucky's equine and equine-related assets was estimated at over \$23 billion. The study also showed that more than 5 times the number of horses in the state are used for trail riding and pleasure than the number actively used for racing.

These results have been used within the last year to inform both state and national policy as well

as economic development. At a state level, results were used to help estimate the impact of sales tax relief on the equine industry as part of a bill being proposed to the government. More locally, county-level data from the study is being used to help educate local leaders on the economic relevance of the equine industry in the county, with the goal of driving economic development strategies. At the National level, this survey along with others led to the USDA National Agricultural Statistics Service returning to their original methodology for counting horses and estimating cash receipts after briefly changing the procedure. Results from the survey have been used by businesses, entrepreneurs and organizations to develop business plans and grant applications.

4. Associated Knowledge Areas

KA Code	Knowledge Area
315	Animal Welfare/Well-Being and Protection
601	Economics of Agricultural Production and Farm Management
901	Program and Project Design, and Statistics

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Knowledge gained, practice change

Key Items of Evaluation

Survey, interviews, follow up calls, testimonials

V(A). Planned Program (Summary)

Program # 5

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	0%	1%	1%	4%
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	0%	3%
205	Plant Management Systems	58%	27%	14%	8%
211	Insects, Mites, and Other Arthropods Affecting Plants	0%	0%	20%	0%
212	Pathogens and Nematodes Affecting Plants	0%	0%	12%	0%
215	Biological Control of Pests Affecting Plants	0%	0%	12%	8%
216	Integrated Pest Management Systems	0%	0%	1%	2%
301	Reproductive Performance of Animals	0%	0%	1%	0%
302	Nutrient Utilization in Animals	0%	0%	19%	0%
303	Genetic Improvement of Animals	0%	0%	0%	4%
304	Animal Genome	0%	0%	4%	0%
307	Animal Management Systems	36%	67%	7%	69%
311	Animal Diseases	0%	0%	9%	0%
601	Economics of Agricultural Production and Farm Management	0%	1%	0%	2%
604	Marketing and Distribution Practices	6%	0%	0%	0%
704	Nutrition and Hunger in the Population	0%	4%	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	180.0	9.0	50.0	16.0
Actual Paid	163.0	5.6	102.6	16.3
Actual Volunteer	23247.0	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
2785575	301063	4778836	660907
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2997670	61697	16996522	186420
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	41895	0	132081

V(D). Planned Program (Activity)

1. Brief description of the Activity

The development and transfer of technical resources is a critical dimension of a strategy to advance agriculture and the competitiveness of the state's agricultural economy.

- Field days, demonstration programs, plotwork and hands-on training by agents and specialists will continue to be important mechanisms for disseminating technical information on production agriculture and horticulture
- Printed material, mass media, Web sites, audio, and electronic communications will be employed to disseminate the latest research findings on decision-making
- Featured programs for this plan of work cycle will include: Grain Crops Academy, Master Grazer Program, Horse College and the Innovative Tobacco Producer Program
- Goat Production and Management Programs
- Small Farm Program at KSU will focus on needs of small and limited resource farmers,
- The Kentucky Fruit and Vegetable Conference plays a major role in commercial horticultural producer education
- Third Thursday programs will be conducted at KSU and their research and demonstration farms will attract small and limited resource farmers and will also serve as training for County Extension Agents and students
- Aquaculture and Fish Disease/Management Programs
- Master Cattlemen and advanced Master Cattlemen programs will be conducted
- Educational programs qualifying producers to receive Tobacco Settlement funds in the areas of goats, forages, bull selection and hay storage will improve producer skills in these areas
- New Research findings from KSU's Aquaculture Research center, pawpaw, goats, and honeybees will be the subject of field days and meetings to bolster the expanding alternative in Kentucky and the Southern Region Demonstration and training for appropriate production and processing of pastured poultry and honey.
- Home-based processing training
- On-site food demonstrations

Ongoing research at UK supporting competitive agriculture will include:

- plants and their systems
- animals and their systems
- precision agriculture technologies including unmanned systems
- development of food and non-food products
- technologies for improving food quality

KSU has active research areas in areas of:

- Aquaculture projects are concerned with the commercialization of paddlefish, and tilapia, as well as nutrition and diet formulation for aquaculture species, freshwater and salt water crustaceans, and developing technologies for raising largemouth bass.
- Doe and kid production evaluation for meat goats is a relatively new research and extension thrust for KSU.
- Mechanisms of drought stress in crop plants.
- Pawpaw, hazelnut, primocane blackberries, and ornamental crops, such as orchids, are under development as niche crops in Kentucky.
- high tunnel fruit and vegetable production and aquaponics.
- agroforestry and forestry management practices for small land owners.
- sorghum drought resistance.
- The control of Nosema diseases is being researched as a potential cause of colony collapse disorder (CCD) of honey bees.

2. Brief description of the target audience

- Kentucky farmer operations with agents recruiting and selecting producers for participation in Grain Academy, Master Cattlemen, Innovative Tobacco Grower Program, Horse College, and Master Grazer Programs
- Farm owners, operators, absentee land owners with a variety of backgrounds and experiences
- Farmers' market members and potential members
- Community and farm leaders
- Consumers
- Extension agents

3. How was eXtension used?

Used to find publications, connect with communities of practice, participate in online webinars

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	2075712	15303904	52186	312325

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	29	238	267

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- na
Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of families who gained knowledge about eating healthy foods
2	Number of families that reported eating more healthy foods
3	Number of families that reported supplementing their diets with healthy foods that they produced/preserved (utilizing community/backyard gardens, fishing, hunting, etc.)
4	Number of individuals adopting one or more recommended practices to increase access to food or make it more affordable
5	Developing new feed sources for aquaculture species
6	Availability of new therapies for managing infectious diseases in agricultural animals
7	Availability of new targets for controlling fungal diseases

Outcome #1

1. Outcome Measures

Number of families who gained knowledge about eating healthy foods

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	162195

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

According to a recent Kentucky Health Issues poll, only 26% of individuals meet the daily recommended dietary intake of fruits and vegetables.

What has been done

Extension partnered with Local Health Department, Farmers Markets, and Local Food Initiatives to expand farmers markets and to provide more access to fresh foods. A Farm Days event was held in Perry county to educate the public on access to fresh foods. The Plate It Up Program was used to promote healthy food preparation.

Results

Farmers market hours were expanded, thus allowing more time for sales/access to food and a double dollars program was implemented to increase low - income customer usage of their WIC and Senior Farmers Market Nutrition vouchers and SNAP benefit usage at the Farmers Market. Farm Days events increased residents' knowledge of importance of eating fresh produce.

4. Associated Knowledge Areas

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

211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
215	Biological Control of Pests Affecting Plants
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
307	Animal Management Systems
311	Animal Diseases
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices
704	Nutrition and Hunger in the Population

Outcome #2

1. Outcome Measures

Number of families that reported eating more healthy foods

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	53352

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

There is a lack of access to healthy foods, whether in rural Kentucky or in urban areas.

What has been done

A gardening program entitled Grow Breathitt County is now finishing up its second year. In Grow Breathitt County, families are taught the basic principles of gardening.

Results

In Breathitt County, almost 24,000 lbs. of vegetables were grown by the participants this year. Much of that was consumed fresh and the rest was canned, frozen or dehydrated for winter use.

At an average price of \$2.00 per pound, this program saved these participants \$48,000 or on average of \$1600 per family.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
307	Animal Management Systems
604	Marketing and Distribution Practices
704	Nutrition and Hunger in the Population

Outcome #3

1. Outcome Measures

Number of families that reported supplementing their diets with healthy foods that they produced/preserved (utilizing community/backyard gardens, fishing, hunting, etc.)

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	21894

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

According to the Center for Disease Control, Kentucky adults rank among the 10 highest in poor consumption of fruits and vegetables. The lack of consumption of fruits and vegetables directly affects the health of adults and families in the state of Kentucky.

What has been done

Kentucky utilized a Plate it Up program to promote healthy eating and food preparation

Results

Over 2,000 Plate It up participants across Kentucky indicated that they increased the amount of fruits and vegetables they consumed as a result of participating in the program.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
311	Animal Diseases
604	Marketing and Distribution Practices
704	Nutrition and Hunger in the Population

Outcome #4

1. Outcome Measures

Number of individuals adopting one or more recommended practices to increase access to food or make it more affordable

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	32441

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many residents in Kentucky suffer from hunger across the state. There is a need for organizations to work together to provide affordable access to healthy food options.

Wayne Co grain growers were faced with a limited amount of available, suitable land for row cropping. They needed to optimize yields and maximize efficiency in order to compete with farmers in other areas who have access to more acres.

School cafeterias struggle to provide fresh nutritious, affordable locally grown vegetables for their food service. Many of today's youth are unaware how their food is grown.

Honeybees and other pollinators are critical to generating and sustaining the food supply. Additionally, the demand for local honey continues to outpace its availability in KY.

What has been done

Extension collaborated with River Cities Harvest, a food gleaning organization who gathers, and purchases, food from many sources to provide food to those in need.

KSU worked with UK agents to support a local farmer's participation in the KY Extension Corn Yield Contest.

KSU and UK in Wayne County teamed with the Vo-Ag teacher/FFA adviser to conduct vegetable growing demonstrations.

KSU hosted and conducted annual instructional event for beekeepers, the annual "Bluegrass Bee School" on the KSU campus in collaboration with local beekeepers.

KSU teamed with local beekeepers and the Kelleybee beekeeping supply company in Clarkson KY, to deliver educational presentations to local and regional beekeepers, at the Kelleybee factory.

KSU teamed with the KY Dept of Agriculture and other beekeeping specialists presented at the annual Eastern Apicultural Society conference at Eastern Kentucky University in Richmond.

KSU Extension assisted Minority farmers and veteran farmers to connect with local churches by providing high-quality produce at a cheaper cost to limited-resourced communities. KSU also produced the Thorobred Nutrition Kitchen and subsequently developed a plan for mobile market service.

Results

The River Cities Harvest partnership has grown from a small all-volunteer group gathering leftover food from local restaurants to supplying food to over 20 organizations now, in two counties in KY and one in OH. There are also two permanent part-time employees who oversee the day to day operations. Over 500,000 pounds of food are distributed annually.

With information about fertility management, pesticide recommendations, and crop rotation, the farm assisted by UK and KSU yielded 303.88 bushels/acre and was the only no-till, non-irrigated yield of over 300 bushels ever reported in the contest. The farmer increased average yield by 20 bushels/acre more than others in county and a net profit of \$15,000 for the 225 acre corn crop.

Students processed vegetables including over 2,000 lbs. of grape tomatoes, worth about \$4,000, and representing one third of the produce utilized by the school lunch system. The garden will expand to 3.0 acres next year and is a source of school and community pride. The local school food service gained access to locally grown, affordable, and popular food items for their menus.

The KSU beekeeping program was attended by about 300 beginning and experienced beekeepers and seven vendors of beekeeping equipment.

These sessions were attended by about 250 beekeepers. Kelleybee is one of the largest beekeeping supply companies in the world.

This conference was attended by about 400 beekeepers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
307	Animal Management Systems
604	Marketing and Distribution Practices
704	Nutrition and Hunger in the Population

Outcome #5

1. Outcome Measures

Developing new feed sources for aquaculture species

2. Associated Institution Types

- 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)

There is a need for the development of additional species and culture systems for aquaculture production in the U.S. At KSU there has been an ongoing program of evaluating and developing alternative aquaculture species for regional suitability and efforts to identify low cost feed replacements for aquaculture production.

What has been done

Studies conducted on largemouth bass nutrition examined the potential of replacing the expensive fishmeal component in the diet with less-expensive plant and animal protein sources. No research has previously evaluated feeding largemouth bass entirely on plant protein ingredients. Four diets were formulated to be isonitrogenous (40% protein) and isoenergetic. A control diet was formulated similar to a commercial largemouth bass diet containing 30% fishmeal, while the other three diets contained no fishmeal and were replaced with soybean meal and soy protein concentrate as the primary plant protein sources. Experimental diets relied on lipids from either fish oil, flaxseed oil, or sunflower oil in combination with a whole cell algae (*Schizochytrium* sp.). Juvenile largemouth bass were stocked at 15 fish/tank into sixteen 110-L glass aquaria in a closed recirculating system. Fish were fed to apparent satiation twice daily. There were four replicate tanks per dietary treatment. After 81 days, largemouth bass were evaluated for weight gain under the various diets.

Results

Largemouth bass fed the whole cell algae / sunflower oil diet were similar in final weight and percent weight gain compared to juveniles fed the fish oil diet, but were significantly lower compared to fish fed the control diet. Notably, largemouth bass fed the fish oil diet did not differ to the control diet for these variables. Fish fed the flaxseed oil diet had the poorest growth performance and was significantly lower compared to all other treatments. In summary, these data suggest that juvenile largemouth bass can utilize plant protein sources well when fish oil is added thereby reducing feed costs for fish production.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #6

1. Outcome Measures

Availability of new therapies for managing infectious diseases in agricultural animals

2. Associated Institution Types

- 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)

Equine influenza virus (EIV) is one of the most common viral infections in horses. EIV can facilitate secondary bacterial infections which can be life threatening. Though EIV vaccines are generally considered to be effective, vaccine breakdowns still occur, in part because influenza viruses have abilities to evade the various arms of the host immune response.

What has been done

The hypothesis that EIV downregulates the cytokine IL-23, a key mediator of immune response to bacterial infection, was tested. The influence of influenza viral NS1 activity was shown to inhibit the expression of CHOP-10 which in turn down-regulates expression of IL-23p19. To follow up, an in vivo experiment was conducted in which mice were administered a lethal combination dose of influenza virus and Streptococcus bacteria, and treated with either exogenous IL-23 or placebo.

Results

There was a significant difference in mortality between the treated and untreated groups of mice ($P < 0.007$), whereby the IL-23 treatment increased total survival from 0% (placebo) to 40%. These results suggest a new alternative therapeutic approach (treatment with cytokine IL-23) for severe cases of influenza that are frequently complicated by secondary bacterial infection.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases

Outcome #7

1. Outcome Measures

Availability of new targets for controlling fungal diseases

2. Associated Institution Types

- 1862 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)

Every year plant diseases result in huge economic losses to US agriculture and new diseases are emerging with alarming regularity. A large proportion of the major crop diseases are caused by fungi, or fungus-like oomycetes. Unfortunately, options for controlling diseases caused by these organisms are gradually diminishing, due to their propensity to overcome resistant plant varieties; and due to a steady rise in fungicide resistance within pathogen populations. As such, it is vital that new and improved methods of fungal disease control are developed, or US and global agriculture could soon be in crisis. Natural plant resistance holds great promise for combating diseases in a durable and environmentally friendly manner. However, as pathogens continually evolve to defeat newly deployed resistance genes, the pools of resistant germplasm that are available to breeders are rapidly diminishing. Consequently, it is becoming increasingly difficult to develop new, resistant crop cultivars. In contrast, host specificity - the phenomenon wherein pathogen populations specialized to one host plant genus cannot infect other genera - rarely breaks down.

What has been done

Studies of the interactions between the fungal pathogen *Magnaporthe oryzae* and its various host plants have shown that the genetic control of host-specificity versus cultivar-specificity is identical - both are controlled by small numbers of major pathogen genes and they both function in a gene-for-gene fashion. Clearly, however, there must be some key differences, which would explain why one is durable yet the other is not.

Classical genetics were used to identify the genes that determine *Magnaporthe oryzae* host specificity on foxtail. Segregation of virulence to rice in an initial cross between a foxtail pathogen and a rice pathogen suggested that four genes determined virulence to rice. Several backcrossing schemes were performed to segregate individual genes. However, efforts to

examine segregation within the backcross generations were severely hampered by the fact that many progeny produced mixed infection types on rice.

To clone these host specificity genes in the face of indeterminate phenotypes, an alternative approach was taken to cloning the genes. The genomes of three clearly avirulent strains from a 3rd generation backcross were sequenced, with the rationale that each strain should contain only 12.5% of the genome from the original avirulent parent. We expected to be able to narrow the host specificity gene down to ~ 0.2% of the genome (84 kb). Unfortunately, however, large segments of the genome exhibited recombination suppression, with the result that all three progeny inherited almost all of chromosome 1 (~8 Mb) intact.

Results

It was found that, in essence, many individual strains of *Magnaporthe oryzae* were both virulent and avirulent on the same leaf. Such behavior cannot be explained by the prevailing gene-for-gene model of plant microbe recognition. A clue to the curious behavior came from the genetic analysis of another host specificity gene inherited from a weeping lovegrass pathogen. This gene also exhibited an indeterminate phenotype when certain progeny were inoculated on rice and our data are consistent with the hypothesis that the gene is phenotypically silent in some progeny. We believe that the fungus uses this clonal variation in avirulence gene expression as a bet-hedging mechanism to escape host recognition. Together, our data suggest that a large number, if not a majority, of host specificity genes function in an indeterminate fashion because the fungus uses epigenetic mechanisms to silence them in individual colonies. This represents a major breakthrough to understanding why host specificity is durable while cultivar specificity is not. This knowledge will be valuable for the continued development of resistant plant varieties.

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants

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

Knowledge gained, change in behavior

Key Items of Evaluation

Surveys (pre/post, retrospective), follow up interviews

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Agricultural and Environmental Quality

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	0%	0%	5%	0%
102	Soil, Plant, Water, Nutrient Relationships	0%	2%	42%	0%
104	Protect Soil from Harmful Effects of Natural Elements	0%	0%	3%	42%
112	Watershed Protection and Management	2%	7%	9%	0%
123	Management and Sustainability of Forest Resources	19%	57%	0%	3%
131	Alternative Uses of Land	0%	5%	0%	7%
133	Pollution Prevention and Mitigation	0%	0%	4%	0%
135	Aquatic and Terrestrial Wildlife	0%	5%	0%	0%
136	Conservation of Biological Diversity	0%	0%	3%	0%
205	Plant Management Systems	17%	0%	16%	46%
213	Weeds Affecting Plants	0%	0%	9%	0%
403	Waste Disposal, Recycling, and Reuse	4%	24%	9%	0%
605	Natural Resource and Environmental Economics	58%	0%	0%	2%
	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	35.0	4.0	10.0	9.0
Actual Paid	27.0	2.1	19.2	6.1
Actual Volunteer	29655.0	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
435246	36246	638961	154243
1862 Matching	1890 Matching	1862 Matching	1890 Matching
468386	20895	3395708	109210
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	2393	0	3008

V(D). Planned Program (Activity)

1. Brief description of the Activity

The University of Kentucky and Kentucky State University are engaged in a wide range of programs geared towards achieving greater harmony between agriculture, people, and the environment. All components of the research and extension focus on the broader goal of practicing agricultural and related disciplines in a manner consistent with improving sustainability of resources and protecting ecosystem integrity. Program examples include:

- Master Gardener Program consisting of 12-15 three-hour sessions related to gardening, resource management, botany, soils, pesticides and pesticide safety
 - Master Logger program consisting of three one-day sessions focusing on best management practices, safety, laws and regulations
 - Integrated Pest Management programs including programs aimed at homeowner application of pesticides and fertilizers.
 - Woodlot owner education program focusing on best management practices, harvesting, contracts, wood products and alternative forest products.
 - Water quality, Water Pioneer, daycamps, and forestry camp programs aimed at developing a better understanding of stewardship between youth and the environment.
- Agricultural and environmental research will include:
- best management practices for improving water quality on farms, rural home sites, in horticultural operations and mine reclamation sites
 - soil microbial communities, soil health and biogeochemical processes
 - environmental impact and hazard of chemical pesticides in landscapes and turf
 - KSU Extension Programs will continue to support efforts related to policies to improve environmental quality
 - Organic Agricultural Programs

KSU research projects focusing on improving environmental quality include:

- Developing organic production methods for oil seed crops and vegetables crops
- Developing biological conservation control for pests of crop plants
- biochar and biofilters for on-farm bioremediation of pesticide residues in surface runoff and seepage water arising from agricultural fields,
- soils quality, forest resource management, agroforestry,
- remote sensing geospatial applications. In agriculture and forest areas

2. Brief description of the target audience

- General public
- Community volunteers advanced in horticulture instruction and willing to give back to the community
- Individual commercial loggers in Kentucky and those out of state wishing to do business in Kentucky
- Woodlot owners
- Farm owners and operators
- Homeowners

3. How was eXtension used?

Access to resource materials, webinars

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	313905	952957	119236	370594

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	54	54

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- na
Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of producers adopting resource management technologies (IRM, IPM, soil testing, soil fertility management) as a result of Extension programs
2	Number of individuals adopting practices (recommended by Extension) that ensure safe water
3	Number of individuals utilizing forest management practices recommended by Extension
4	Number of individuals who made a lifestyle change for the purpose of improving water and/or natural resources (due to recommendations from Extension)
5	Farmers adopting cover crops in soil management
6	Adoption of recommendations for on-site water treatment systems

Outcome #1

1. Outcome Measures

Number of producers adopting resource management technologies (IRM, IPM, soil testing, soil fertility management) as a result of Extension programs

2. Associated Institution Types

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

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	22698

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Kentucky farmers are in need of strategies that will enhance and preserve the natural resources on their land.

There is a need to increase the number of individuals from low-income communities completing the Jefferson County Master Gardener Program, which historically, has been one of Extension's most popular programs in traditionally white neighborhoods.

In Wayne Co, livestock and grain farmers wanted to learn how to improve their farming practices in a sustainable, environmentally-friendly, and profitable manner.

What has been done

Clark County Extension emphasized programming around practices focused on constructing a rotational grazing system, implementing a farm water quality plan and proper disposal of dead livestock. UK researchers are conducting studies on cover crops.

The Jefferson County Master Gardener Program, coordinated by KSU, offered sessions at the Louisville Nature Center and sessions given by industry professionals. Participants also attended lab classes that featured pruning lessons from Limbwalker Tree Service, Holistic Gardening, and even a water quality canoe trip on the Beargrass Creek Watershed.

The KSU small farm assistant and UK agent aided Wayne Co farmers in adoption of no-till practices on more than 90% of their grain acreage. Beef farmers learned rotational grazing, adopted GPS systems for applying pesticides, poultry litter, and commercial fertilizer, and improved accuracy of application. KY Farm Bureau and the Valley Farm Center also provided support for these initiatives.

Research at KSU examined the persistence of any allelopathic effects of Sudex, buckwheat,

and hemp grown as summer cover crops on subsequent crops of direct-seeded winter grains and tomato.

Results

Clark County farmers have received (50% cost share) and invested over \$240,000 into fencing, forage improvement, and other investments.

A total of 28 participants completed the required Master gardener course work and exam portion, and at least 12 have already begun volunteering. From 2014-2015 Master gardener volunteers and interns gave 1,228 hours of volunteer service to Jefferson County.

The poultry industry supplied litter for the Wayne County project, saving \$250,000 while improving soil health. The farmers' improved accuracy of fertilizer application saves money on inputs, reduces any negative environmental impact, and improves overall conservation practices in their grain and livestock operations.

Summer cover crops of Sudex, buckwheat, and hemp were grown in 2014 until frost kill. Winter grains (wheat, rye and barley) and tomato were direct-seeded into soil collected from summer cover crop plots, grass-covered plots, and bare plots every month between February and June, 2015. No allelopathic effect of summer cover crops was observed on subsequent plantings of winter grain and tomato. Allelochemicals produced by the summer cover crops may have degraded before the first soil collection. The results show that farmers could plant winter grain and tomato crops after summer cover crops of Sudex, buckwheat, and hemp without concern for persistence of allelopathic effects.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
133	Pollution Prevention and Mitigation

Outcome #2

1. Outcome Measures

Number of individuals adopting practices (recommended by Extension) that ensure safe water

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	21722

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Kentucky is home to over 90,000 miles of streams and rivers. In 2012, the Kentucky Division of Water reported that over 9,000 miles of Kentucky's streams do not meet water quality standards for their designated uses; they recommend a watershed approach to improving Kentucky's waterways.

Kentucky has over 230,000 ponds. Invasive aquatic plant growth is a common problem. Excessive aquatic plant growth frequently interferes with pond use: drinking water for people and livestock, irrigation and recreation. Incorrect use of herbicides/algaecides and plant identification often leads to ineffective treatments and loss of money.

What has been done

UK Cooperative Extension Service personnel partnered with watershed experts from Auburn University and private consulting firms to offer a three-day watershed academy

KSU conducted training on aquatic plant and algae identification, and herbicide and algaecide use, and with the Southern Regional Aquaculture Center provided aquatic plant control publications and consultations. CEU's were offered for pesticide/herbicide applicators and pond owners.

KSU's Fish Disease Diagnostic Laboratory performed tests on 58 fish disease cases (36 were private growers; others were universities and governmental agencies); 21 water quality cases; and 7 inspections.

Results

As a result of the academy, attendees had an increase in understanding of watershed hydrology, watershed ecology, stream morphology, watershed restoration, and stakeholder involvement. All attendees planned to explore watershed restoration opportunities in their local communities and fourteen attendees indicated they planned to encourage decision makers to make watershed restoration a priority in their local community.

The pond/aquatic workshops minimized travel and eliminated registration fees for attendees. Evaluations indicated 100% of workshop attendees gained knowledge and skills about pond management (68% strongly agreed); 100% will use what they learned (67% strongly agreed).

Based on assistance from the KSU fish disease diagnostic lab, approximate value was \$3000/case saving the KY industry and surrounding states approximately \$108,000.00 for 36 fish disease cases; 21 water quality testing cases had an approximate value of \$42,000.00 (estimated value of \$2000/water quality case); and seven fish health inspections (required for shipping live fish into many states) saved KY growers \$21,000.00 (about \$3000 each).

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
133	Pollution Prevention and Mitigation

Outcome #3

1. Outcome Measures

Number of individuals utilizing forest management practices recommended by Extension

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	2806

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Woodlands are a major resource in Kentucky, thus allowing Forestry to play an important role in Farm income.

What has been done

A tri-state woodlands and wildlife workshop was offered as well as Master Logger classes offered to foresters.

Results

In Christian County, over 72% learned more about tree identification. Nearly 73% gained knowledge of wood identification. More than 85% percent gained knowledge about managing their woodlands. Nearly 84% percent indicated they will use the information to manage their property. In Knox County 32 landowners attending a woodland workshop; 75% indicated increased knowledge of the timber sales process and plan to utilize the skills they learned.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land

Outcome #4

1. Outcome Measures

Number of individuals who made a lifestyle change for the purpose of improving water and/or natural resources (due to recommendations from Extension)

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	8200

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Kentucky producers are in need of more awareness of ways to protect water and other natural resources.

What has been done

Over 400 participants attended a total of 11 classes held by Boone County Extension. The classes focused on best practices for home, consumer and hobby growers of vegetables, fruits and herbs.

Results

The classes focused on practices that helped improve Boone County stream water quality with regard to much reduced levels of harmful E. coli along with increased numbers of beneficial aquatic macroinvertebrates in the streams. Overall water quality improved in three Boone County streams. As a result, 25 participants have taken a more active role in their communities or have become local leaders.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land

403 Waste Disposal, Recycling, and Reuse

Outcome #5

1. Outcome Measures

Farmers adopting cover crops in soil management

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)

Some cover crops that increase soil organic matter, reduce weed pressure, and improve soil quality are also thought to display allelopathy, releasing toxic substances that suppress growth of other plants; thereby, also reducing the productivity of crop plants planted after cover crops.

What has been done

Research at KSU examined the persistence of any allelopathic effects of Sudex, buckwheat, and hemp grown as summer cover crops on subsequent crops of direct-seeded winter grains and tomato. Summer cover crops of Sudex, buckwheat, and hemp were grown in 2014 until frost kill. Winter grains (wheat, rye and barley) and tomato were direct-seeded into soil collected from summer cover crop plots, grass-covered plots, and bare plots every month between February and June, 2015.

Results

No allelopathic effect of summer cover crops was observed on subsequent plantings of winter grain and tomato. Allelochemicals produced by the summer cover crops may have degraded before the first soil collection. These results show that farmers could plant winter grain and tomato crops after summer cover crops of Sudex, buckwheat, and hemp without concern for persistence of allelopathic effects.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
104	Protect Soil from Harmful Effects of Natural Elements

Outcome #6

1. Outcome Measures

Adoption of recommendations for on-site water treatment systems

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)

Thirty-eight percent of the households in the Southern Region utilize septic systems or alternative decentralized wastewater treatment systems for their wastewater treatment. This is well above the national average of 23% of households not on a sewer system. Although estimates of septic system failure are challenging, if the conservative estimate of 10% of these septic systems are failing then 173 billion gallons of untreated wastewater is being released into the Southern Region's watersheds each day. Better management by homeowners can prevent many of these septic system failures. Unfortunately, potential home-buyers have very little if any knowledge of septic systems other than the permit requirement. Kentucky's diverse regional geology and soils require intensive on-site investigations to assess site suitability for best treatment approaches.

What has been done

Over the last five years, about 103 Health Department Environmentalists participated in class and field training workshops to improve their soil morphology evaluation skills and establish more efficient site assessment and system performance protocols. The training included sites in the Bluegrass and Eastern Kentucky, where fragipan and shallow to bedrock soils pose severe limitations in the installation, operation, and management of septic systems. A series of diverse soils were evaluated in the above regions and the performance of the installed wastewater treatment systems was monitored on a regular basis. In addition, several alternate systems were evaluated on sites not conducive to conventional treatment system installation. In a parallel project an educational program was developed for county extension agents and environmental health specialists and educators aimed at reducing the number of septic system failures and improving water quality and environmental health in the Southern Region.

Results

The Soil Site Evaluation training provided to Health Department Professionals improved their skills in more objectively and efficiently assessing soil suitability ratings and selecting the best treatment system possible for each site. Furthermore, it provided the opportunity to monitor the short and long-term performance of the installed systems and compare treatment efficiencies. The data base developed from these studies can serve as an invaluable source of information for improving our state and regional waste water treatment guidelines and drastically reducing ground water contamination risks. For example, as a result of working with the program, the Bacon Creek Watershed Alliance was able to obtain grant funding to repair or replace failing septic system with those recommended for the particular soils within the watershed.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
133	Pollution Prevention and Mitigation

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Government Regulations
- Competing Programmatic Challenges

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Increased awareness, knowledge gained of subject matter

Key Items of Evaluation

Surveys, secondary data analysis

V(A). Planned Program (Summary)

Program # 7

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
501	New and Improved Food Processing Technologies	9%	0%	13%	0%
502	New and Improved Food Products	0%	0%	27%	0%
703	Nutrition Education and Behavior	82%	67%	0%	0%
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	0%	33%	2%	0%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	9%	0%	58%	100%
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	12.0	0.5	2.0	4.0
Actual Paid	12.0	0.2	10.1	3.6
Actual Volunteer	3053.0	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
174098	2205	356673	151383
1862 Matching	1890 Matching	1862 Matching	1890 Matching
187354	1271	1596084	76326
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Training and certification workshops will be conducted for home-based microprocessors
 - Research will be conducted on the identification of best practices to reduce contamination of food pathogens and toxins
 - Research will develop better detection methods for monitoring food risks
 - Educational programs will be targeted toward parents and others who prepare food in the home
 - Educational programs will be directed toward young children and teens on basic cleanliness such as hand washing
- KSU research examined whether the source of irrigation water, surrounding land use, handling practices during harvesting, post harvesting and handling practices such as washing, packaging and storage on produce safety. Safer methods to keep foods safe were also examined

2. Brief description of the target audience

- extension agents
- food producers
- food processors
- parents
- volunteer leaders
- youth and children
- consumers

3. How was eXtension used?

Publications, resources provided by communities of practice, webinars

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	90919	1216271	24886	323313

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	18	18

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- na
Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of individuals who experienced a change in knowledge, opinions, skills or aspirations regarding the safe storage, handling, or preparation of food (safe preservation techniques, hand washing, following time and temperature guidelines)
2	Number of individuals who implemented recommended practices for the safe storage, handling or preparation of food (safe preservation techniques, hand washing, following time and temperature guidelines)
3	Total number of individuals reached through Extension programming related to health and safety

Outcome #1

1. Outcome Measures

Number of individuals who experienced a change in knowledge, opinions, skills or aspirations regarding the safe storage, handling, or preparation of food (safe preservation techniques, hand washing, following time and temperature guidelines)

2. Associated Institution Types

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

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	71403

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

A high percentage of home-based (food) processors use unsafe food safety and manufacturing practices, thus putting their products in high risk categories for: illness, food-borne illness related deaths, injury and economic losses, should improper procedures be utilized. There is also a need for producers to supplement their income through value-added approaches.

What has been done

The Homebased Processor and Microprocessor program allows Kentucky farmers to use their home kitchens to produce certain value-added products for sale at farmers markets, roadside stands, or on their farms.

Results

In Barren County, 42 producers have participated in the program with 100% of participants receiving adequate scores on the two exams administered during the class. Following the program, participants were surveyed via handouts to evaluate the effectiveness of the program. A total of 93% of participants indicated the program provided them the information they needed to provide a safe, home processed product for consumer purchase and that they will use the information they learned to become certified Home-based Microprocessors.

4. Associated Knowledge Areas

KA Code	Knowledge Area
----------------	-----------------------

- 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 #2

1. Outcome Measures

Number of individuals who implemented recommended practices for the safe storage, handling or preparation of food (safe preservation techniques, hand washing, following time and temperature guidelines)

2. Associated Institution Types

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

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	35508

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

According to the Department of Public Health, numerous local individuals make and sell baked goods (for profit) without proper licensure, sanitary kitchens, or with the use of proper Certified Commercial Kitchen facilities.

Small and limited resource farmers need a safe, reliable, and nearby location to process their chickens, rabbits, shrimp, and other items rather than transporting animals at least 3 hours one way, paying high rates for processing, and in the end, making little if any profit.

What has been done

Home-Based Microprocessor Training is offered to clientele.

KSU constructed mobile certified kitchens and a mobile food preparation (cooking) training trailer. The KSU mobile processing unit provided approved processing for poultry, rabbits, fish, and shrimp for local sales. KSU trained 2 classes of 40 of producers.

Participating conventional, certified and non-certified organic small and limited-resource farmers were contacted and two new farmers were recruited through a mailing list from Kentucky State University's current outreach and extension programs, including participants from the Small Farm Program, Third Thursday Thing, the Socially Disadvantaged Farmer Outreach Project and the

Organic Association of Kentucky. Each new farmer was given a survey that explored details regarding certification status, fertilization practices (such as the type(s) of manure or compost and/or chemicals, age of the manure or compost and the time of application), the source of irrigation water, surrounding land use, handling practices during harvesting, post harvesting and handling practices such as washing, packaging and storage. Further, the survey was targeted to help in ascertaining the needs and gaps in knowledge of the farmers in various aspects of 'on farm' food safety.

Results

There are currently 125 producers statewide who have met all the requirements of the Homebased Microprocessor program. Some farmers have expanded the sale of their value-added products to the commercial market. One of these is a Kenton County farmer who started selling her pepper jellies at her local farmers market and now her products are offered for sale online and at retail stores across Kentucky.

KSU expects 30-50 people to use mobile kitchens annually once final approvals are received. KSU's Third Thursday program provides at least 4 trainings annually to some 350 producers on food safety and local food systems.

The information collected from the farm survey was used to identify associations with the microbiological results. In all, 22 small and limited resource farmers, comprising 16 certified and non-certified organic farmers and 4 conventional farmers were recruited who consented to offer access to soil, water and produce samples for analysis. Although bacteria were found to be present, not disease causing bacteria were detected indicating the farmers were producing safe produce for consumers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Total number of individuals reached through Extension programming related to health and safety

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
-------------	---------------

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many residents who wish to become business owners are not aware of The United States Food and Drug Administration (FDA) regulations requiring that canned foods need to be tested by a qualified process authority to make sure the products are safe.

What has been done

The Food Systems Innovation Center, partnering with the Food Microbiology Laboratory in the UK Department of Animal and Food Science, has tested, reviewed and issued process review letters for 67 different products from 27 small businesses from Ohio, Kentucky, Wisconsin, and Missouri.

Results

The Food Systems Innovation Center program has provided process and product consultation through phone and email, specifically to help customers fill out their product details on the FDA regulatory form.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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
- Appropriations changes
- Government Regulations
- Competing Programmatic Challenges

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Increase in knowledge, change in behavior, adoption of best practices

Key Items of Evaluation

Surveys, follow-up calls, secondary data analysis

V(A). Planned Program (Summary)

Program # 8

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
123	Management and Sustainability of Forest Resources	0%	0%	0%	40%
132	Weather and Climate	0%	100%	50%	60%
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%	0%	50%	0%
604	Marketing and Distribution Practices	100%	0%	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	3.0	0.0	1.0	0.5
Actual Paid	1.0	0.5	1.0	0.6
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
43525	20626	0	38731
1862 Matching	1890 Matching	1862 Matching	1890 Matching
46839	11891	0	12045
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Emergency preparedness plans will be implemented with be prepared for all Extension offices
- The Agricultural Weather Center will supply information on temperature and moisture conditions to guide agricultural operations
- Economists will conduct educational programs for Extension agents and agricultural producers on ways to reduce risks while conducting research on how producers use climate and weather data
- Research on the impact of climate change on the ecology of plant systems, pests and diseases
- Creation of new technologies and best management practices for mitigating greenhouse gas emissions and managing production systems in a changing climate
- KSU offered a floating science lab to show students the impact of climate and human use on aquatic systems. KSU conducted research in the fluxes of carbon, water and methane gases from pasture and forest soil ecosystems in Kentucky.

2. Brief description of the target audience

- extension agents
- extension office staff
- agricultural producers
- community leaders
- general public

3. How was eXtension used?

Online trainings, informational webinars, networking with colleagues

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	591	467	152	117

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	2	15	17

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- na
Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of individuals reporting changes in knowledge, opinions, skills or aspirations related to the impact of public policies on agriculture and the environment
2	Number of individuals reporting an increase in knowledge, opinions, skills or aspirations related to climate change
3	Improved understanding of how climate change will impact forage-based production systems
4	Improved knowledge of how climate change will impact plant pathogens in production systems

Outcome #1

1. Outcome Measures

Number of individuals reporting changes in knowledge, opinions, skills or aspirations related to the impact of public policies on agriculture and the environment

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	25469

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The urban canopy is decreasing in many urban centers due to invasive diseases, insect pests, urban development, storms, an aging green infrastructure, and budget cuts that have resulted in reduced maintenance and replacement. These factors in conjunction with geography have resulted in Louisville, KY having the fastest increasing heat island effect in the US.

What has been done

Extension worked with the Louisville Tree Advisory Commission to implemented tree planting and maintenance programs

Results

Nearly 1000 trees have been planted in the city of Louisville and 140 volunteer Urban Foresters have been trained in the care and maintenance of the urban forest. Through the 2015 Arbor Day program, 300 youth learned about proper installation and maintenance at the Kentucky Arborists' Association educational sessions and participated in the installation of new trees to make the built environment livable.

4. Associated Knowledge Areas

KA Code	Knowledge Area
132	Weather and Climate
604	Marketing and Distribution Practices

Outcome #2

1. Outcome Measures

Number of individuals reporting an increase in knowledge, opinions, skills or aspirations related to climate change

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	7550

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Pesticide usage is a necessary part of modern conventional agriculture. One issue, however, is that a lot of people consider the amount of used plastic containers in which the pesticides are stored. In addition, Americans, on average, produce over 4 pounds of waste per person per day with roughly only 35% being recycled or composted.

Climate change and greenhouse gases have the potential to affect human life, the environment, public health, and the economy. Local strategies are needed to protect our communities and demonstrate leadership on this issue

What has been done

Extension worked with Farm Bureau and the Kentucky Department of Agriculture to implement a "Rinse and Return" Program. Backyard composting workshops also took place.

KSU provided environmental and sustainability education programs (13 workshops, 16 presentations, 8 curriculum certification trainings, 2 field days, and 1 weeklong youth camp) on topics ranging from mitigation and adaptation of climate change to maintaining healthy watersheds to sustaining international food systems and more.

Results

In Hardin County, over 12 farms from Hardin County, along with 3 farm supply stores, representing over 40,000 acres of farmland, returned triple rinsed pesticide containers. Participants of composting workshops have reported using the information learned at a variety of youth and adult programs, including afterschool, Master Gardener, and family-based programs, totaling over 275 people in attendance.

KSU initiatives directly reached a total of 1,885 participants, of which 143 were youth.

4. Associated Knowledge Areas

KA Code **Knowledge Area**
132 Weather and Climate

Outcome #3

1. Outcome Measures

Improved understanding of how climate change will impact forage-based production systems

2. Associated Institution Types

- 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)

The ability of tall fescue, a dominant forage of the eastern U.S., to persist and be productive under a warmer and wetter environment, as is predicted for much of this region as a result of climate change, will likely depend on a symbiotic relationship the plant can form with the fungal endophyte, *Epichloë coenophiala*. While this symbiosis can confer environmental stress tolerance to the plant, the endophyte also produces alkaloids toxic to insects (e.g. lolines) and mammals (ergots; which can cause 'fescue toxicosis' in grazing animals); therefore, it is critical to understand how the symbiosis will respond to future climatic conditions.

What has been done

Infrared radiant heaters and artificial precipitation treatments were used to study the effects of a warmer and wetter climate on pasture composition in research plots. Ambient air temperatures were raised by three degrees Celsius and plots were monitored over the course of this project. The prevalence of tall fescue and concentrations of ergot alkaloids were measured.

Results

Research conducted at the University of Kentucky has shown that warming (+3 degrees C) reduced the relative abundance of tall fescue in the pasture (by >50%, especially in the summer and fall), and additional precipitation did not ameliorate this effect. Warming did not alter the incidence of endophyte infection within the tall fescue population; however, it significantly increased concentrations of ergot alkaloids (by 30-40%) in fall-harvested material. Although future warming may reduce the dominance of tall fescue in eastern U.S. pastures and have limited effect on the incidence of endophyte infection, persisting endophyte-infected tall fescue will have higher concentrations of toxic alkaloids which may exacerbate fescue toxicosis. This provides

critical information for adjusting management practices in forage-based animal production systems in response to climate change.

4. Associated Knowledge Areas

KA Code	Knowledge Area
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants

Outcome #4

1. Outcome Measures

Improved knowledge of how climate change will impact plant pathogens in production systems

2. Associated Institution Types

- 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)

Under climate change, alterations to precipitation and temperature regimes are expected to impact ecosystem structure and function. These impacts may in part be determined by feedbacks between plants and associated microbes, including both endophytic fungal symbionts and viral pathogens.

What has been done

These interactions were assessed by monitoring barley and cereal yellow dwarf viruses in a field climate change project at the University of Kentucky where temperature (+3 degrees C), precipitation, and endophyte infection status of the forage grass, tall fescue, were manipulated.

Results

Elevated temperature and precipitation impacted virus prevalence, but effects varied among years and interacted with endophyte presence. In the last year of the study, elevated precipitation increased virus prevalence in endophyte-infected (2x) but not endophyte-free tall fescue. That same year, regardless of endophyte infection, elevated temperature also increased virus prevalence in tall fescue, perhaps driven by vector abundance as aphids were found more frequently in heated plots. Impacts of climate change on virus prevalence in pastures will depend on the responses of aphid vectors and the presence of endophytic fungal symbionts.

4. Associated Knowledge Areas

KA Code	Knowledge Area
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Government Regulations
- Competing Programmatic Challenges

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Increase in knowledge, raised awareness, change in behavior

Key Items of Evaluation

Surveys, community forums, secondary data

V(A). Planned Program (Summary)

Program # 9

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
131	Alternative Uses of Land	0%	67%	0%	0%
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	17%	0%
204	Plant Product Quality and Utility (Preharvest)	1%	0%	17%	100%
402	Engineering Systems and Equipment	99%	33%	66%	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	5.4	1.0	5.0	1.0
Actual Paid	1.0	0.2	7.9	0.9
Actual Volunteer	340.0	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
43525	6195	292588	32358
1862 Matching	1890 Matching	1862 Matching	1890 Matching
46839	1380	1310265	16440
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	1267	0	4561

V(D). Planned Program (Activity)

1. Brief description of the Activity

Researchers at UK are addressing the limitations to current technologies for conversion of biomass to energy and other products using a systems approach. Projects are addressing issues related to feedstock availability and supply chain logistics as well as biological pre-treatment and conversion processes.

2. Brief description of the target audience

- producers
- extension agents
- electric company representatives
- other researchers and extension specialists

3. How was eXtension used?

Networking with communities of practice, accessed publications/online resources

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1662	609	9292	3450

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

Patent Applications Submitted

Year: 2015
 Actual: 1

Patents listed

Application # 20140329285: ON-FARM INTEGRATED HIGH-SOLIDS PROCESSING SYSTEM FOR BIOMASS

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	3	12	15

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- na
Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of individuals who reported an increase in knowledge of sustainable energy as a result of Extension related programming
2	Number of individuals who incorporated practices suggested by Extension that promote sustainable energy (i.e., applied water conservation policies, participating in energy audits, installed energy efficient equipment, etc.)
3	Number of producers who reported an increase in their production of bioenergy crops (corn, soybeans, switchgrass, etc.)
4	Number of youth reporting an increase in knowledge of energy conservation practices

Outcome #1

1. Outcome Measures

Number of individuals who reported an increase in knowledge of sustainable energy as a result of Extension related programming

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	4008

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

We are dependent on earth's natural resources. Everything from the air we breathe, to the water we drink, to the soil we use for food production--these resources are vital to our existence. In the US, shortage of scientists & people understanding natural resource stewardship is a major issue. There is a need for a diverse pool of trained scientists to frame and solve problems & educate others.

What has been done

Extension offered annual Forestry Field days aimed at 4th and 5th graders; 4-H hosted Tech Day Camps; a Youth Empowerment through Sustainability program that incorporates sustainable agriculture, experiential education, and community education was developed to bridge the opportunity and inclusion gap that exists in neighborhoods

Results

The Youth Empowerment program contributed to social equity by engaging youth in community awareness and service opportunities that teach them the importance of community development.

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land
402	Engineering Systems and Equipment

Outcome #2

1. Outcome Measures

Number of individuals who incorporated practices suggested by Extension that promote sustainable energy (i.e., applied water conservation policies, participating in energy audits, installed energy efficient equipment, etc.)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	3129

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The benefits of the urban forest are significant. The urban tree canopy improves air quality and property values, reduces air pollution and storm water runoff. Streets with an effective canopy have been demonstrated to increase retail sales by up to 20% compared to streets with similar retail outlets but without an effective tree canopy. Many communities are not knowledgeable of proper planting techniques.

What has been done

The Lexington Urban County Government (LFUCG) installed Willow oak (*Quercus phellos*), a species that requires acidic soils, in an area downtown with poor soil conditions. Extension worked with LFUCG tree board and local arborist to evaluate the condition of the trees.

Results

The city of Lexington utilized Extension's recommendations by replacing dead trees and the surrounding soil with multiple, high pH tolerant species to increase the species diversity. Gradual replacement will also allow the city to spread out the financial cost of replacement, avoid the visual shock of an aesthetically unappealing (tree-less) downtown corridor during a major public relations event (2015 Breeders Cup) while improving the long term health of the urban forest.

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land
402	Engineering Systems and Equipment

Outcome #3

1. Outcome Measures

Number of producers who reported an increase in their production of bioenergy crops (corn, soybeans, switchgrass, etc.)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	1085

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Market grain prices have declined considerably following six years of high price levels and subsequent wide profitability margins. Much of the year's crop will be marketed at a price 20 percent lower than received the year before and all expectations are that the upcoming 5 years will provide nothing greater than breakeven and possibly negative profit margins.

What has been done

Extension has hosted workshop and field days with a focus on bioenergy crops

Results

There has been an increase in seed yields/acre; In Grant County, over 1200 tons of Grant County, farmers have realized an increase value in silage over straight dry hay. Corn growers realized \$60/ton cost compared to other purchased feed supplements that cost at a minimum of \$250/ton. Corn growers converting crop into silage, recognizing a cost savings replacing two tons of silage from one ton of supplement to the tune of \$106,000.

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land

Outcome #4

1. Outcome Measures

Number of youth reporting an increase in knowledge of energy conservation practices

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	18322

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many of today's youth are unaware of the energy sources available through natural resources.

What has been done

Graves County elementary school teachers offered students hands-on activities to enhance students' understanding of scientific concepts. The University of Kentucky and Kentucky State University Extension Programs took part in the Louisville Water Company's 7th Annual Adventures in Water Festival.

Results

Over 1500 youth learned first-hand how the Louisville Water Company provides clean and sanitize water to their home and school by touring the water treatment facility.

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land
402	Engineering Systems and Equipment

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Government Regulations
- Competing Programmatic Challenges

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Increased awareness, knowledge gained, increase in crop yields

Key Items of Evaluation

Assessment tools, follow up visit/interviews

V(A). Planned Program (Summary)

Program # 10

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	60%	41%	0%	0%
724	Healthy Lifestyle	40%	59%	100%	0%
	Total	100%	100%	100%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	30.0	3.0	0.5	0.5
Actual Paid	17.0	1.1	0.5	0.0
Actual Volunteer	10495.0	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
261148	29967	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
281032	17276	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	30597	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- conducting educational programs for children
- training extension agents

2015 University of Kentucky and Kentucky State University Combined Research and Extension Annual Report of Accomplishments and Results

- developing educational materials
- conducting programs with parents
- conducting research on EFNEP programming effectiveness

2. Brief description of the target audience

- children
- youth
- extension agents
- teachers
- parents

3. How was eXtension used?

Online webinars, publications, networking

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	123199	646121	156839	822336

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	2	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- na
 Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Total number of children and youth reached through Extension programming related to eating healthy foods
2	Total number of children and youth who gained knowledge about eating more healthy foods
3	Total number of children and youth who reported eating more healthy foods
4	Number of environmental changes implemented to support physical activity (e.g., walking trails opened, bike paths built)

Outcome #1

1. Outcome Measures

Total number of children and youth reached through Extension programming related to eating healthy foods

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	172173

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The 2015 County Health Rankings & Roadmaps for Kentucky had Owsley County ranked 120 out of 120 for health outcomes. For health behaviors including physical inactivity and obesity, Owsley County ranked 110 out of 120.

What has been done

Extension provided health education workshops on a weekly basis to middle school youth.

Results

A total of 94% of youth learned to identify different physical activities related to aerobic activity, strength training and flexibility.

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

Total number of children and youth who gained knowledge about eating more healthy foods

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	168762

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Kentucky has the fifth-highest rate of obesity in the nation and about one-third of U.S. adults (33.8 percent) are obese.

KY has one of the highest rates of childhood obesity in the nation. Approximately 38% of KY children ages 10-17 years are considered overweight or obese according to BMI-for-age standards. Half of KY's children in poor families are overweight or obese.

What has been done

The Mommy & Me in the Kitchen Program was conducted as an eight-month series for children 6-8 years of age and their parents. Caldwell County Extension Agents collaborated with local farmers and ag businesses to host a Farm, Food and Fitness Day Camp

KSU worked with schools in three counties to collect anthropometric data in over 1,000 students and conducted regular fitness courses, food security activities, and special "Fun Food Day" events.

Results

A post-test indicated that 100% of the Mommy and Me participants learned that exercise and healthy eating are both needed to combat obesity. 100% of the participants stated that they would make lifestyle changes by eating healthier and exercising more frequently.

KSU programs reached nearly 800 individuals with basic nutrition education and cooking classes in order to develop better dietary habits. KSU worked with over 500 students and their families to teach them healthy fitness practices and the importance of how our food is grown, processed, and eventually delivered to communities.

4. Associated Knowledge Areas

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

Outcome #3

1. Outcome Measures

Total number of children and youth who reported eating more healthy foods

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	71254

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

According to Child Health in Northern Kentucky (child policy Research Center: Vision 2015), nearly half of all parents in N.KY struggle to provide healthy food for their children. The convenience and cost of healthy food options in N.KY appears to be a problem.

What has been done

The Mommy & Me in the Kitchen Program is an eight-month series for children 6-8 years of age and their parents, grandparents or guardians. The program focuses on helping the children and their parents learn, practice and adopt key skills for life such as cooking, and choosing/eating healthy foods.

Results

End of program results revealed that one hundred percent of the families now spend more time together and fifty-four percent of the families now eat more nutritious foods such as vegetables, fruits, yogurt and eggs. Sixty-nine percent of the parents stated that the program has encouraged their children to try new foods. One family reported saving \$50-100 per month by preparing meals at home.

4. Associated Knowledge Areas

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

Outcome #4

1. Outcome Measures

Number of environmental changes implemented to support physical activity (e.g., walking trails opened, bike paths built)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	1492

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Kentucky 4-H aims to address the obesity epidemic in Kentucky by educating youth on the importance of engaging in healthy lifestyle through proper nutrition and physical fitness.

What has been done

This year, a total of 60 Kentucky counties implemented youth physical fitness and healthy lifestyle programs, resulting in nearly 8000 youth developing a better understanding of the relationship between healthy eating, exercise and well-being

Results

Program evaluations revealed that 7999 created individual plans for healthy eating and physical activity, 6892 increased their level of physical activity outside of the program, 5224 feel more confident about themselves, and 1394 have noticed changes in their physical appearance.

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Government Regulations
- Competing Programmatic Challenges

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Knowledge gained, change in behavior, implementation of best practices

Key Items of Evaluation

Surveys, observations, interviews

VI. National Outcomes and Indicators

1. NIFA Selected Outcomes and Indicators

Childhood Obesity (Outcome 1, Indicator 1.c)	
71254	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 with 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.