

2016 University of Kentucky and Kentucky State University Combined Research and Extension Annual Report of Accomplishments and Results

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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 2016 accomplishments include: hosting The Kentucky Hunger Dialogue to raise awareness and to develop action plans for a healthier Kentucky; Promotion of Woodlands and Wildlife webinars for provide woodland owners with a convenient way to gain beneficial information; Educational 4-H programs that relate to college and career readiness in science, engineering and technology; the disaster preparation emergency support system, and; continued focus on Kentucky Beef IRM through Master Cattleman program. UK specialists have been engaged in the zika virus pandemic, thus contributing to research on the mosquito-borne pathogen that impacted most of South and North America. Extension programming and related research have centered around fescue toxicosis, a general term used for the clinical diseases that can affect cattle consuming endophyte-infected tall fescue. 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. This included Extension working with local food banks in five Kentucky counties are conducting outreach programs and targeting services to veterans. Family and Consumer Sciences offering free relationship checkups to the Lexington community, available for couples who are interested in maintaining or strengthening connections with their partner. High impact educational programs resulted in significant improvements in consumer and commercial horticulture, animal health, farm income, natural resources and the environment. Parenting remains an emphasis for skill development with the purpose of equipping families with the essentials needed to raise productive youth. One avenue included providing military camps for teenagers between 14 and 18 years old who have lost a service member parent.

In 2016, we continued our routine follow up to assess our issues discovery process, which earmarks the beginning and updates for county Plan of Work discussions. Our volunteer leaders met with agents and administrators to discuss what is needed at the county level and what statewide concerns should be addressed. 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 again 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 will be summarized through success stories and other reports in 2017-18.

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 are still in development and displayed on the UK Extension homepage.

Agricultural research through Kentucky's land-grant programs has been providing new opportunities to farmers and residents for well over a century. With external grants and contracts nearing \$40 million a year, agriculture researchers address problems of agribusiness, consumers, international trade, food processing, nutrition, community development, animal health and development, soil and water and the

environment with over 300 externally funding projects. Research advances included advances in diagnostics and therapies to address animal diseases. new tools to combat fescue toxicosis in Kentucky's signature horse and beef industries, and new insights into how plant and animal production systems can be optimized for sustainability and profitability.

As a result of our collaborations with volunteers and other stakeholders, the 2016 program year, the percentage of our contacts were in the following areas:

- 32% Global Food Security and Hunger
- 5% Social and Economic Opportunity
- 24% Life Skill Development
- 3% Childhood Obesity
- 11% Leadership and Volunteerism
- 2% Food Safety
- 16% 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: 2016	Extension		Research	
	1862	1890	1862	1890
Plan	470.0	48.0	200.0	37.7
Actual	546.0	44.8	194.8	45.1

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 within its 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 are invited to be part of the interviews for key administrative positions, including associate deans, department chairs, and center directors. . 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 are periodically held in various 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 developed. 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. For example, in 2016 UK's Grain and Forage Center of Excellence was established as the result of a grass-roots effort by stakeholders to bolster the grain and forage-based livestock industries by expanding resources at the Research and Education Center located in the western part of the state. 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 FY16 included:
 - Water Quality - continue the education process among Kentucky landowners and consumers has been key in preventing water pollution
 - Bedbugs -The impact caused on the state's travel and hospitality industry in general
 - Food Security- Engaging communities in conversations around effective ways to address hunger
 - Economic & Financial Stability- stakeholders have indicated that families are in need of Extension's up-to-date information regarding financial management. 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 serving in the country and abroad to craft ways of tracking the virus and its impact on society;specialists served on international teams to better understand the health consequences and economic impact of the virus
 - Accessing Healthy Foods - stakeholders are taking more interest in community gardens to address the shortage of healthy fresh food options. With assistance from stakeholders, Extension is in a better position to provide best practices to help residents gain access to local foods
 - Health Disparities/Weight Management - Obesity among youth and adults continues to be a statewide dilemma. Stakeholders continue to demand more current information that is easily accessible either in the local office or online.
 - Disaster Education Program - Stakeholders believe that Extension needs to remain proactive and versatile with programs and this was revealed when county agents rallied to the needs of those affected by flood waters in eastern Kentucky.
 - Industrial Hemp- Research continues into the second year, as an interest in the role in which hemp can serve as a viable alternative crop.
 - 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. This has come to fruition.
 - Impact of local farm operations - County profiles revealed the amount of income and employment farm operations provide to the state's economy
 - Natural Resource Initiatives for youth - camps have helped spark youth interest in nature and physical activity.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
9404861	3261840	6574252	3694138

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	8834902	1038789	7061625	1955968
Actual Matching	9404861	1222366	24694043	1288677
Actual All Other	0	332875	0	132279
Total Actual Expended	18239763	2594030	31755668	3376924

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	0	0	487373	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	3%	10%	0%	100%
802	Human Development and Family Well-Being	51%	80%	0%	0%
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	0%	0%	67%	0%
805	Community Institutions, Health, and Social Services	46%	0%	0%	0%
806	Youth Development	0%	10%	0%	0%
903	Communication, Education, and Information Delivery	0%	0%	33%	0%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
Plan	120.0	16.0	5.0	0.2
Actual Paid	133.0	11.0	5.4	0.2
Actual Volunteer	134898.0	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
2120377	208984	71356	5014
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2257167	136305	392912	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	209424	0	15041

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

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	941873	4359904	1129657	5328771

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

Patent Applications Submitted

Year: 2016

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2016	Extension	Research	Total
Actual	3	2	5

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

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
2016	142131

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Written and oral communications is a key component of educational standards and considered by most as critical life skills. However, less emphasis seems to be placed on these areas as communicating through technology and virtuality moves closer to the forefront. Kentucky Extension (4-H specifically) has long identified communications as an important part of 4-H in the community and have worked to build a strong communications program.

What has been done

Kentucky counties organized Talk Meets in addition to other events to develop skills to compete in communication contests. Others have gone beyond the traditional 4-H club approach and are arranging a variety of community venues where youth are given speaking and presentation opportunities at local events.

Results

Over 22,000 youth participated in Kentucky 4-H speeches and demonstrations in classes in schools across the state, with nearly 10,000 adults serving as volunteers for these programs. Several teachers have reported an increased confidence of students during required class reports, reporting specific changes in children that had notable public speaking anxieties prior to competing in 4-H speaking contests or just completing the 4-H communications curriculum during club time. More than 11,000 youth reported that they also developed meaningful relationships with the adults who helped them prepare speeches.

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
805	Community Institutions, Health, and Social Services
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
2016	76727

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.

What has been done

To enhance these opportunities, agents in McLean, Webster, Hopkins and Logan counties worked together to host the fourth annual Team Challenge Camp. The camp was designed to be very similar to the TV Reality Show, The Amazing Race. Participants were given a set of coordinates and had to use GPS units to find the location of 8 challenges, which aided youth in developing technical and social skills together.

Kentucky counties have hosted livestock skillathon, where youth demonstrate their ability to identify, judge and evaluate several areas related to the production and management of beef cattle, meat goats, sheep and swine. This in turn contributes to youth developing responsibility and competence.

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.

Results

A total of 23,457 Kentucky youth utilized skills learned to make an impact through community service projects. In addition, the Kentucky 4-H Livestock Skillathon team brought home the national championship from the North American International Livestock Exposition in Louisville.

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
805	Community Institutions, Health, and Social Services
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
2016	81469

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Kentucky, like many states, struggles with the substance abuse among its citizens including youth. Kentucky ranks in the top five among states for drug overdose deaths. According to the Office of Drug Control Policy's 2014 Overdose fatality report, the number of these deaths has climbed every year for over a decade.

What has been done

During this year, 20 counties have reported organization of and participation in Truth or Consequences, a program designed to educate youth on the perils of substance abuse. A reported 3120 students completed the program.

Results

Of the total participants, 2548 students indicated that they developed a better understanding of the legal consequences of substance abuse; 2,553 students reported that they developed a better understanding of the health consequences of substance abuse; 2,681 students reported that they developed a better understanding of the risk and harm of substance abuse after the program. Over 600 parents reported a gain in awareness of the problem and impacts of substance abuse in communities as a result of Extension efforts and 485 reported gaining knowledge about the resources that are available for substance abuse.

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
2016	21325

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Financial illiteracy is a major problem across all social and economic groups and at all age levels

The average U.S. household consumer debt profile includes credit card debt of \$15,355, mortgage debt of \$165,892, auto loan debt of \$26,530 and student loan debt of \$47,712. Families continue to struggle as the uncertainties of the economy remain.

What has been done

Trimble County Cooperative Extension Service staff hosted Financial Peace University. Financial Peace University, is a seven step approach to reducing personal debt. A beginning assessment profile showed that the participants had a total non-mortgage debt of \$214,000 and just over \$59,950 in cash available.

Family & Consumer Sciences & Agriculture & Natural Resources agents provided, Planning for Family Financial Transitions. Emphasis was placed on the estate planning process, specific estate planning tools (Power of Attorney, Trusts, and Wills), the probate process, insurance, funeral planning and gift and estate tax laws. To address teens lack of financial knowledge, the Cooperative Extension Service has co-sponsor the High School Financial Planning Programs.

Results

By the conclusion of Financial Peace University, participants had reduced non-mortgage debt by \$1,128 saved \$7,700 and closed six credit card accounts.

Participants were surveyed following the estate planning classes. Respondents (98%) indicated that they increased their ability to manage/address current estate planning issues. Additionally, 97% planned to create at least one specific estate planning goal, had plans to implement at least one strategy in regard to estate planning and plan to take action toward implementing at least one estate planning strategy as a result of participating in the program.

Of the students participating in High School Financial Planning, 59 percent indicated that they had changed their spending patterns; the two primary ways that the students changed spending habits were that they now only purchase things they really need and that they spend more wisely.

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
2016	16897

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Positive, father-child relationships are critical to the benefit of children. However, many parenting programs do not have a primary focus on ways to engage men. Extension must put forth additional efforts, given that absent or mildly-engaged fathers can cause a significant decline in youth experiencing positive development.

Prevent Child Abuse Kentucky (PCAKY), 2016 purports that in 2015 there were 54,177 reports of abuse and neglect statewide in Kentucky. Fayette County accounted for 3394 of those cases. (PCAKY, 2016). Approximately 2668 families were involved in the substantiation of 1593 cases in Fayette County Kentucky, PCAKY, 2016. The maltreatment of neglect accounted for 75% of all reported cases (PCAKY, 2016). Neglect is defined as the failure of a parent or other person with responsibility for the child to provide needed food, clothing, shelter, medical care, or supervision to the degree that the child's health, safety, and well-being are threatened with harm (Children's Bureau, 2016).

What has been done

Kentucky started a program for incarcerated fathers through the Todd County Detention Center. Nearly 70 dads have completed the program. There has also been an emphasis on providing more programs for fathers and father figures in Kentucky counties.

The Kentucky State University Strengthening KY Families (SKY) Parenting Program provides instructional information on relevant issues that help divert crisis situations when parenting infants through young adults. There were 592 face to face contacts for the program. SKY Families offers 3 twelve-week programs per year. Each week participants receive information from the Nurturing Parenting Curricula that focuses on preventing or intervening in familial crisis situations that leads to abuse or neglect. The goal of the SKY Families Parenting Program is to help parents develop effective parenting skills that promote positive health and wellness as well as to learn accountability, responsibility and effective communication skills. Parents also learn to model health behaviors such as anger management, conflict resolution, increase family bonding and to learn non-violent discipline techniques. During this fiscal year, 58 families participated in the program. SKY Families uses a strength-based, community partnered approach to facilitate the Nurturing Parenting Curricula which enhances existing parenting skills. In collaboration with its faith-based partner Imani, participants receive a light meal, free childcare and instructional information in small group settings. The program facilitators encourage and engage parents to strengthen their protective factors which ultimately enhances the quality of life for families and their communities. SKY Families offers an evidence based, culturally competent program to aid the family reunification process and helps individuals to move towards self-sufficiency.

Results

All fathers who have completed the program for incarcerated fathers in Todd County revealed that they have improved their communication skills with their children and have a renewed sense of what a good father is supposed to be. Responses indicate a positive progression toward more effective parenting, based on survey results. All respondents revealed an increase in positive perceptions (mean score of 4.25 on a scale of 1 to 5) about their relationships with their children. Informal interviews with program participants have revealed that the fathers all have a self-realization after participating in the program; that, despite the fact that they feel they are good fathers, they always notice areas that need improvement and state they are willing to use the information they have learned through the program to continue to improve.

How has the program helped you? ?It has helped me learn better ways to help my kid.? ?It has taught me how to communicate with children and how to respond and listen to their needs.? ?It has helped me better understand to care for myself, and my children in more efficient ways.? ?I've learned better ways to cope with a lot? ?This program has helped me explore new ways to handle specific situations with my children and to communicate with them more effectively with less anger and yelling.?

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
801	Individual and Family Resource Management	0%	10%	0%	0%
802	Human Development and Family Well-Being	0%	10%	0%	0%
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	100%	0%	0%	0%
902	Administration of Projects and Programs	0%	25%	0%	38%
903	Communication, Education, and Information Delivery	0%	55%	0%	62%
	Total	100%	100%	0%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
Plan	77.0	10.0	0.0	1.5
Actual Paid	59.0	14.4	0.0	6.8
Actual Volunteer	83579.0	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
971839	146726	0	159933
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1034535	532474	0	373642
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

- 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

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	443838	1076476	183613	439687

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

Patent Applications Submitted

Year: 2016

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2016	Extension	Research	Total
Actual	5	0	5

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

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
2016	26841

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Leadership plays a vital role in the Expansion and Development of our Extension Programs and Facilities not only at the County level but for the District, Region and State. However, many of Kentucky's Rural counties lack trained leaders. Several counties have conducted local leadership programs. Extension Homemakers also work to identify and address local needs.

What has been done

Extension agents have partnered with Extension specialists and local Chambers of Commerce to develop county Leadership programs. The goal is to help citizens develop more leadership skills, be aware of community and business opportunities, and further develop their personal and business networks. Boyle County Homemakers created mats for the homeless and donated them to people and organizations in need of having a dry place to rest. Nelson County Homemakers provided blankets for Little Lambs, a club that mentors pregnant teen girls in one of the high schools. Blankets were also provided to an assisted living help group for low income participants.

Results

Efforts have allowed citizens to have a better understanding of the value of good leadership. Data has revealed the importance of desired outcomes and are being used in the marketing of the local leadership programs.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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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
2016	17701

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many residents lack knowledge of civic and political processes. Citizens must be educated on how to go about addressing community needs through their service and the help of public servants.

Citizen Review Panels are federally mandated groups that have the charge of reviewing their State's Child Protective Services System. Panels were established as a result of the Child Abuse Prevention and Treatment Act (CAPTA) in 1996 (UK Training Resource Center, 2016). Kentucky has three panels; one in Louisville, the Southern Bluegrass Region and a statewide panel that is inclusive of members for 9 service areas (UK Training Resource Center, 2016.) Members meet monthly to strategize and implement three projects per year. Each project is designed to not only provide public oversight but also to inform the community of services offered by the Department of Community Based Services.

What has been done

The Franklin-Simpson Leadership program consisted of nine monthly meetings where the participants explored business and industry, agriculture, local government, health systems and education in communities. A government day conducted by the Trigg County 4-H Agent allowed youth to learn about their local government & community.

As a member of the Southern Bluegrass Citizen Review Panel, the Area Agent III, was able to

promote diversity, assist in collecting data through a cross panel research project and helped to plan and implement a community forum on the child welfare system. These three projects aided in providing resources to community members and child welfare providers alike. During this fiscal year as a member of the Southern Bluegrass Citizen Review Panel hosted its annual ?Conversation on Collaboration.? This yearly symposium is used to provide valuable information about resources and is attended by a variety of community partners and interest citizens including attorneys who work in abuse/neglect court, school social workers and service providers who work with families and/or children. This year?s theme was ?A Cabinet Referral from Start to Finish.? Individuals were guided from the initial referral, through the Court procedure, on to the providers working to assist in reunification, and then eventually to a foster child who ?aged out? of the system.

Results

Sixty percent of the Franklin-Simpson leadership program participants have already used the leadership skills they learned during group decision making and problem solving at work and on committees. While a pre-survey indicated only 15% of the Trigg County youth understood the roles of their elected county officials, 100% agreed they had a better understanding after the program and believed they could make contributions to their community that makes a difference.

The meeting was well attended and everyone from the former child abuse prosecutor to the foster care alum rallied the group to continue to provide optimum services. At the end of the meeting ?break-out? sessions occurred wherein participants discussed their feelings generally about the symposium. It was the general consensus that, in order for Kentucky?s kids in care to thrive, the Cabinet, the providers, the Courts, and anyone else working with the child or family need to come together and work as a team.

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
2016	2013

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. For example, Monroe County Extension worked with the city of Tompkinsville to form a mayors youth council.

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. Also, Monroe County youth are gaining hands-on experience serving in advisory positions.

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
2016	42557

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Youth are the future leaders of our communities, but there is a need to cultivate their leadership skills. A State level Cooperative Extension issues survey found that expanding youth leadership opportunities and promoting volunteer development and education were high priorities.

What has been done

The KY Youth Engagement Leadership Program (YELP) is an innovative, integrated knowledge-based and voice-expressing program which introduces high school students to the importance of developing and engaging their knowledge and voice by expressing the economic and social needs of themselves, their family and community.

The Kentucky Jr. MANRRS program affords high school youth with leadership skills that will prepare individuals for college and their careers.

Results

The YELP program has allowed students to develop skills to make a difference within themselves, their family, and their community. Participants have expressed and demonstrated new-found confidence and abilities in promoting local change.

Several former Jr. MANRRS members are now serving as officers in the UK (college) MANRRS chapter. One member was recently elected as the national undergraduate student president of the national organization.

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
2016	9315

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

Volunteer leadership forums are conducted each year. Also, in order to increase the number of KY volunteers receiving orientation and to accommodate the busy schedules of volunteers, a series of on-line 4-H Volunteer Orientation modules were developed.

Results

Over 26,000 volunteers were engaged in the Kentucky 4-H program last year. These individuals served in various capacities, from judging contests to planning major events. A majority of these volunteers have reported that the benefits of serving include developing their own skills while nurturing youth.

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%	8%	0%
502	New and Improved Food Products	0%	0%	25%	0%
701	Nutrient Composition of Food	0%	10%	25%	80%
703	Nutrition Education and Behavior	98%	10%	0%	0%
721	Insects and Other Pests Affecting Humans	0%	0%	34%	0%
722	Zoonotic Diseases and Parasites Affecting Humans	0%	0%	8%	0%
723	Hazards to Human Health and Safety	1%	0%	0%	0%
724	Healthy Lifestyle	1%	80%	0%	20%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
Plan	95.0	2.0	8.0	0.0
Actual Paid	89.0	0.5	4.3	1.2
Actual Volunteer	45793.0	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
1413584	42435	152302	80832
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1504778	0	1148439	11279
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	4371	0	8888

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.
- 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

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	737451	8792459	325589	3950235

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

Patent Applications Submitted

Year: 2016

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2016	Extension	Research	Total
Actual	10	14	24

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

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.).
5	Availability of methods to improve the healthfulness of processed foods

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
2016	151409

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 remains in the top 10 among most obese state in the nation.

What has been done

Six Kentucky counties formed coalitions of community stakeholders to determine perceived causes of obesity in these counties; a menu of evidence-based options to promote healthy eating and active living were presented to the coalitions.

The State Plate It Up Program has provided educational materials on the importance of healthy eating.

Results

Counties have now set priorities and allocated resources toward changes in the physical activity built environment and the food retail environment. A smartphone application has also been developed. Statewide efforts from the Plate It Up program revealed that over 6,000 residents had plans to eat more vegetables, 7,444 planned on eating more fruits. After the program, over 600 of the past participants reported an increase in their consumption of fruits and/or vegetables a day.

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
2016	59135

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.

Obesity is a major public health concern in the United States and has been linked to many health problems such as heart disease, stroke, diabetes, high blood pressure, sleep disorders, and breathing problems (Food and Drug Administration, 2016). Research suggests that there is strong correlation with sedentary movement and obesity. Kentucky ranks #7 as least healthy states in America (Centers for Disease and Prevention, 2016). At least 20.6% of its children and adolescents are obese (CDC, 2016). During the 2015-2016 school year, students enrolled in the Imani UConnect Program acknowledged that sedentary movement contributed to obesity.

What has been done

Partnerships were formed with a variety of community agencies throughout Jefferson County (Louisville) to deliver nutrition education programming, including low-income housing developments, social service agencies, work sites, rehabilitation centers, churches, and public

libraries.

Students determined that they did not exercise regularly and listed reasons such as not having physical education as part of their daily school schedules, video games and not having anything to do in their neighborhoods as reasons for the lack of exercise in their lives. During this semester 12 students, 5 girls, 7 boys, (2 Hispanic male and girl, 1 Native American girl, 1 White girl, 4 black girls 4 black boys) participated in the Imani UConnect Program. All of which participated in at least 3 hours per week of physical activity to combat obesity. Participants played basketball, volleyball, kickball, soccer and other sports for at least one hour each day they attended the program.

This year, the Taking Ownership of the Diabetes Program was extended to Hispanic audiences in Lexington, Kentucky.

Results

During the program year, 95% of Jefferson County SNAP-Ed and EFNEP program graduates showed a positive change in their consumption of fruits, vegetables, grains, protein or dairy foods as a result of nutrition education programming efforts. Nutrition education programming continues to make a significant positive impact on the health of families. As a result of this intervention ten Taking Ownership of Your diabetes publications were translated into Spanish and are available for Agents to use with Hispanic clients.

Because of this program participants noted improvements in their overall physical well-being. Many students reported that they shared the information with their families, and were beginning to change their eating habits. One student notes that "playing basketball is my favorite part of the program." A parent of one of the student's noted that, "I like the program because it keeps her active and involved."

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
2016	11386

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Given the busy schedules of residents, many fail to take time to prepare and consume healthy meals which can lead to unhealthy food choices. In addition, not putting forth the effort to take health precautions can increase the incidence of chronic diseases.

What has been done

Extension partnered with Kentucky Farm Bureau to host a State Women's Leadership Conference Health Fair.

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

A total of 62 families were represented at the Health Fair. All participants (100%) mentioned that after the presentation they obtained knowledge and were more aware of making healthy food choices and the steps needed to prevent chronic diseases. All participants (100%) also indicated that they would eat more fruit and vegetables, drink more water and share the information they learned with others.

The breast cancer program assisted KSU in improving its social media campaign for future programming.

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

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	16701

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The chances of falling and being seriously injured in a fall increases with age. Approximately one-third of seniors 65 years and older fall in Kentucky each year. The Kentucky Injury Prevention and Research Center reports that older patients who are hospitalized for falling are six times more likely than younger patients to be admitted into a nursing home. Fall related injuries for seniors cost around \$20 billion a year.

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.

Results

A total of 364 participants had a better understanding of ways in which to reduce the risk of falling; 255 participants reported that they would make changes to their home to reduce the risk of falling; 255 participants reported that they would be more physically active; and 267 reported that they learned how to safely get up from a fall. This has aided Kentucky in potentially saving an estimated \$18,000-21,000 in health care costs per person.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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Outcome #5

1. Outcome Measures

Availability of methods to improve the healthfulness of processed foods

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Comminuted products made from finely chopped meat with fat, for example, nitrite-cured or noncured bolognas, are among the most widely consumed processed foods by an average consumer. The quality of these products critically depends on the physical (integrity) and chemical (oxidation) properties of the fat that is emulsified by proteins as surfactants. However, the growing concern with the potential adverse impact of dietary fat and cholesterol on human health has stimulated the interest to utilize nutritionally balanced vegetable oils to replace animal fat in these meat products. Replacing animal with vegetable fat may require the creation of interactive proteinaceous interfacial membranes to protect emulsion oil droplets from oxidant attack.

What has been done

A study was conducted to investigate the relative reaction rate of protein and lipid oxidation in different bi-phasic model systems (linoleic acid; liposome; oil-in-water emulsion) containing myofibrillar protein (MP) under hydroxyl radical stress. In addition, researchers sought to construct functional interfacial membranes for oil-in-water food emulsions using low-cost food proteins to improve the oxidative stability. Native soy protein isolate (SPI), denatured SPI, and sodium caseinate (SC, as comparison) were used individually to construct interfacial membranes. Emulsions with 10% soybean oil were prepared using either 0.25, 0.5, and 1% (w/v) proteins or 2% Tween 20 as emulsifiers, then subjected to hydroxyl radical oxidation at 4 °C for 0, 2, and 24 hours.

Results

Researchers were able to demonstrate to the food industry that interfacial membranes formed in oil-in-water emulsions by salt-soluble muscle proteins and soy proteins play an important role in oxidative stability of the emulsion products. Partially denatured soy proteins are more effective than native soy proteins. Interestingly, in such emulsion systems, proteins are more susceptible to

free radical attack than lipids, indicating a protective antioxidant role. These results are valuable because it is now possible to produce "healthier" sausage (frankfurters) by replacing a portion of animal fat with vegetable oils in emulsion without compromising the product's oxidative stability.

4. Associated Knowledge Areas

KA Code	Knowledge Area
502	New and Improved Food Products

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%	5%	0%
601	Economics of Agricultural Production and Farm Management	0%	100%	27%	100%
602	Business Management, Finance, and Taxation	1%	0%	0%	0%
603	Market Economics	0%	0%	6%	0%
604	Marketing and Distribution Practices	17%	0%	9%	0%
605	Natural Resource and Environmental Economics	1%	0%	11%	0%
606	International Trade and Development	0%	0%	11%	0%
608	Community Resource Planning and Development	81%	0%	11%	0%
610	Domestic Policy Analysis	0%	0%	3%	0%
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	0%	0%	15%	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: 2016	Extension		Research	
	1862	1890	1862	1890
Plan	25.0	4.0	12.0	0.8
Actual Paid	28.0	9.4	0.0	4.6
Actual Volunteer	20705.0	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
441745	194262	570935	155590
1862 Matching	1890 Matching	1862 Matching	1890 Matching
470243	362737	2084865	89126
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	79741	0	0

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

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	331914	10612862	58277	1872858

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

Patent Applications Submitted

Year: 2016

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2016	Extension	Research	Total
Actual	6	11	17

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

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
2016	307

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Collaborations between Extension, organizations and agencies are crucial in identifying issues that are important to clientele. In many cases, the greatest impact can be achieved when working with community partners.

What has been done

Jefferson County Extension partners with Catholic Charities by providing management and administrative services for their refugee community garden program.

KSU Extension partners with the states Child Protective Services to inform communities of services offered.

Results

There are over 140 refugees, representing nearly 60 families from 5 different countries, that garden at the Jefferson County site.

Over 50 families took advantage of the early sign-up period, which gave both agencies an opportunity to answer questions and discuss present and future concerns about the community garden. Additionally, other gardeners took advantage of this activity allowing them to meet one another and have open discussions about vegetable production and different farming traditions and customs from other countries.

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
2016	21895

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.

An African America small vegetable farmer in Lincoln County, Kentucky, contacted the Area Agent for Small Farms at Kentucky State University to request assistance in filling out an application for a high tunnel with Natural Resource Conservation Service Agency, United States Department Agriculture.

What has been done

The E-Discovery Challenge is a high school educational program for entrepreneurship. It was launched in twenty of the most economically distressed counties in Appalachian (eastern) Kentucky. During the 2015-2016 school year, 45 teachers took part in a training program to prepare them with the educational tools to help students launch new businesses.

The application was submitted in June 2014 and approved February 2016 with NRCS.

Results

Over 900 students participated in the E-Discovery Challenge; they launched approximately 250 businesses that sold products and services at entrepreneurial fairs. Based on written and verbal feedback from teachers and students, this initiative has influenced how teachers teach. They welcome more creativity associated with entrepreneurship. They also discovered that entrepreneurship provides a context for students to become more engaged with learning. Most of the teachers will continue the program in the next school year regardless of external funding.

The farmer received a high tunnel and 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.

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
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
2016	7110

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

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

What has been done

The USDA and the Kentucky Agricultural Development Board have made cost share funds available for energy efficiency improvements, requiring an energy assessment or audit as part of the application. Extension specialists from the UK Biosystems and Agricultural Engineering Department assisted these programs by providing technical assistance for potential program applicants.

Results

Energy assessments were provided for 75 grain farms that applied for cost share funds from one or both programs. Energy assessments provided the following estimate of benefits for these projects:

- Annual value of energy savings: \$713,000 per year
- Average annual savings per grower: \$9,510 per farm
- Average simple payback on project cost: 14.3 years
- Portion of total cost share funds: 43%
- Portion of total energy savings: 36%

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
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
2016	133296

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

An understanding of all factors that influence individuals and families positive progression as members of society is important in developing healthy and sustainable communities.

What has been done

The Rosenwald Center for Families and Children launched a program called The Thursday Learning Experience at Rosenwald. This program offers weekly educational experiences that build capacity and expose individuals and families to advancements in education, nutrition, health and wellness, family resource management, horticulture, agriculture, and gardening.

Results

A total of 127 adults and 73 youth have participated in the program. Of the adult participants that were surveyed, 100% indicated an increase in knowledge gained and 90% indicated that they plan to utilize the information from the workshop.

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
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
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	605

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Extension is in need of relevant ways to gather information that is pertinent to helping meet the needs of residents. Appropriate and accurate data sources are key.

What has been done

Kentucky: By The Numbers is used to field requests from individuals and organizations not only for data but for analyses as well. Data requests range from looking for a few specific numbers or national trends to requests that cover multiple variables for all counties in the state.

Results

Through Kentucky by the Numbers, an Extension specialist has conducted custom data analyses (related to housing and population projections) and shared the results in community presentations. This year, there were 4 additional requests for custom analyses and presentations on the population projections. In Washington county, the analysis was presented to local leaders including the Judge Executive, Mayor, and educational leaders. In Taylor county, in addition to local elected leaders, the audience included local media, economic development professionals, and leaders in the local business and education community. Other stakeholder audiences have included community leaders, the Chamber of Commerce, the regional Board of Realtors area, and the local media.

4. Associated Knowledge Areas

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

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%	5%	1%	7%
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	5%	12%	11%
205	Plant Management Systems	57%	40%	8%	3%
211	Insects, Mites, and Other Arthropods Affecting Plants	0%	0%	19%	0%
212	Pathogens and Nematodes Affecting Plants	0%	0%	9%	0%
215	Biological Control of Pests Affecting Plants	0%	0%	10%	7%
216	Integrated Pest Management Systems	0%	0%	0%	2%
301	Reproductive Performance of Animals	0%	0%	9%	0%
302	Nutrient Utilization in Animals	0%	0%	15%	0%
303	Genetic Improvement of Animals	0%	0%	0%	4%
304	Animal Genome	0%	0%	3%	0%
307	Animal Management Systems	35%	30%	6%	64%
311	Animal Diseases	0%	0%	6%	0%
402	Engineering Systems and Equipment	0%	0%	2%	0%
601	Economics of Agricultural Production and Farm Management	0%	10%	0%	2%
604	Marketing and Distribution Practices	8%	0%	0%	0%
704	Nutrition and Hunger in the Population	0%	10%	0%	0%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
Plan	180.0	9.0	110.0	20.3
Actual Paid	176.0	5.1	130.5	20.6

Actual Volunteer	20192.0	0.0	0.0	0.0
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2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
2827169	292624	4698077	1130110
1862 Matching	1890 Matching	1862 Matching	1890 Matching
3009556	140727	15992010	536397
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	8742	0	56726

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

Ongoing research at UK supporting competitive agriculture included basic and applied investigations of:

- 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

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1675343	16870786	60983	521777

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

Year: 2016
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2016	Extension	Research	Total
Actual	16	115	131

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

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	Development of new plant varieties that benefit agriculture in Kentucky and beyond
8	Improved understanding of factors influencing regulation of skeletal muscle mass in animals
9	Availability of optimized production systems for organic farming
10	Development of a new pawpaw variety as a niche crop for small farmers in Kentucky and the surrounding region

Outcome #1

1. Outcome Measures

Number of families who gained knowledge about eating healthy foods

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	146981

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Daily calories consumed from home food sources and time spent in food preparation have decreased significantly for several decades. During this same time period, obesity has increased to epidemic proportions affecting 33% of Kentucky adults. Low-income food consumers have shown the greatest decline in cooking and bear a disproportionate obesity burden.

What has been done

Extension embarked upon a social marketing project by collecting market research data in eight Kentucky counties. As a result the Cook Together, Eat Together (CTET) program was developed and tailored for the Kentucky SNAP-Ed audience. A pilot test was conducted in eight CTET counties and eight comparison counties.

Results

Preliminary results indicated that the CTET social marketing approach, compared to a more traditional nutrition education approach, results in better food resource management and greater fruit and vegetable intake. The CTET group also reported greater fiber and Vitamin C intake.

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
402	Engineering Systems and Equipment
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
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	61687

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.

Jefferson County Cooperative Extension and South Louisville Community Center partnered to present the 2nd "Brown Bag Series, Eating to Live".

What has been done

Campbell County Extension taught a four part series at the Campbell County Senior Center called Seasons with the Seniors to 20 participants each session. At each session, which correlated with

the four seasons, Plate It Up recipes were sampled, and the fruit or vegetable nutritional facts, selection, storage, and preparation were presented.

The series focused on proper health and nutrition for Special Need Adults that suffered from mild to moderate disabilities. The program was five sessions. Each session duration was an hour. The sessions were teaching techniques were displayed through hand on activities, food demonstrations, and games. Each sessions was attended by 12 participants. Each participant had the opportunity to try new foods and recipes.

Results

End of the session written evaluations from Campbell County participants showed that 92% of the participants planned to make the recipes at home. One month follow-up evaluations showed that 46% of the participants had actually made healthier recipes, and 75% had increased their fruit and vegetable intake since attending the classes.

At the end of the session, the worker reported that one of the individuals never tried any new foods. He had tried 3 of the new recipes that was introduced in the class. Each participant reported that they would incorporate the "MyPlate" more frequently into each of their meals. Increasing the proper food and nutrition knowledge from 25% knowing about what was in there food and their personal consumption, to a 100% active participation.

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
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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. Individuals also benefited from participating in Master Gardener programs.

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. Of the 1149 master gardeners in 2016, over 800 reported adopting 2 or more practices (to grow healthy foods) they learned from Extension programming. Residents in Madison, Ohio and Webster counties reported increases in those preparing healthier meals at home instead of eating out.

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
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	37018

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.

What has been done

Extension has worked with communities to establish community gardens and provide educational programming on accessing healthy foods.

Results

A total of 14,135 individuals experienced an increase in knowledge, opinions, skills, or aspirations regarding lifestyle changes (diet, exercise, etc.) that improve personal health and a total of 3,922 individuals made lifestyle changes (diet, exercise, etc.) for the purpose of improving their health.

In Jefferson County, 67% of the participants increased their intake of vegetables increasing from 0.7 servings to 1.2 servings, thus increasing their intake of Vitamins A and C. All participants reported consuming 3 meals a day with snacks and getting 30-60 minutes of physical activity daily.

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

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	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

Kentucky State University Division of Aquaculture collaborated on a project to integrate aquaculture and water reuse at a Water Resource Recovery Facility. The project takes advantage of decommissioned facilities, a secure location, treated water discarded from the plant, and other components of the facility to grow fish.

Results

KSU Extension is in the process of finalizing details of a proposed production research demonstration involving Laurel County farm ponds. Potential grower cooperators with suitable farm ponds for demonstrations have been identified. The research and experience gathered during this project will help to determine if aquaculture and marketing of fresh fish could be a viable industry in additional areas throughout Kentucky, thus offering farmers opportunities to explore alternative farm practices.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
303	Genetic Improvement of Animals
307	Animal Management Systems
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices

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
2016	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Equine protozoal myeloencephalitis (EPM) is a debilitating neurologic disease caused by the protozoan parasite *Sarcocystis neurona*. The disease is easily spread by opossums and is of substantial economic importance to the horse industry. More effective methods are needed for diagnosis, treatment and prevention. *S. neurona* is related to a broad array of disease-causing parasites and insight into its genetic controls of survival and pathogenesis will enhance its value as a comparative model for the study of other parasites.

What has been done

The genome of the SN3 strain of *S. neurona* was sequenced and searched for potential virulence factors based on known sequences from *Toxoplasma gondii*. The resulting annotated *S. neurona* genome was mined for homologous genes of interest. The search revealed a calcium-dependent protein kinase 1 (CDPK1) homologue with the glycine "gatekeeper" residue found in other apicomplexans, which can be inhibited with bumped-kinase inhibitors (BKIs). In vitro and cell culture studies were conducted to test the ability of BKIs to inhibit CDPK1.

Results

Detailed examination showed that BKIs bind and inhibit recombinant SnCDPK1 in vitro and *S. neurona* growth in cell culture. Experiments in a murine model of sarcocystosis showed that treatment for 30 days with a BKI protected mice that were challenged with *S. neurona*. Collectively, the studies suggest that these BKIs are promising candidates for developing a new therapy for horses afflicted with EPM. Other work has led to the construction of a trivalent recombinant antigen that was shown to provide accurate detection of antibodies in a single enzyme-linked immunosorbent assay (ELISA) which is being used to evaluate whether diagnostic tests can be developed to distinguish between horses with EPM and those with *S. neurona* infections but no clinical signs of the disease. This work has developed promising results for both improved treatment and diagnostics for a disease with an estimated economic impact of greater than \$100 million annually. As a member of the phylum Apicomplexa which includes other disease-causing parasites, fundamental research will also contribute new knowledge that can be applied to a broad array of animal diseases.

4. Associated Knowledge Areas

KA Code **Knowledge Area**
311 Animal Diseases

Outcome #7

1. Outcome Measures

Development of new plant varieties that benefit agriculture in Kentucky and beyond

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Fescue toxicosis from grazing on endophyte-infected tall fescue is a significant concern to livestock producers. It is estimated to cost the US beef industry between \$500 million and \$1 billion in losses annually. New tall fescue varieties are needed which perform as well as endophyte-infected fescues and produce quality forage, but without the ergot alkaloids that cause fescue toxicosis.

What has been done

Selections were made from endophyte-free Kentucky 31 and related tall fescue lines. A novel endophyte strain developed in New Zealand was inserted. Evaluation of experimental populations of these forage species included yield trials, grazing tolerance trials, ploidy determinations, and forage quality characterization.

Results

The resulting tall fescue variety released at the end of 2015, Lacefield MaxQ II, contains an active novel endophyte that provides improved vigor, insect resistance and drought tolerance but does not produce the toxic ergot alkaloid. A two-year grazing study showed improved steer body weight gains and no fescue toxicosis symptoms compared to Kentucky 31 infected with the toxic endophyte. Lacefield MaxQ II has been tested in numerous university field trials for forage yield, winter hardiness, seedling vigor, and persistence. It has proven to be widely adapted, surviving winters in Wisconsin and Pennsylvania, and summers in Georgia and Mississippi. In addition, the new variety flowers later than another commercially available fescue containing a novel endophyte, extending the length of time it can be available for grazing. The release of this new

non-toxic, endophyte-infected variety provides a new tool to maximize profitability of forage animal production systems by providing high-quality forage while minimizing losses from fescue-toxicosis.

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms

Outcome #8

1. Outcome Measures

Improved understanding of factors influencing regulation of skeletal muscle mass in animals

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

To understand the mechanisms underlying the development and maintenance of muscle mass, it is necessary to understand the regulation of muscle protein synthesis and degradation. This can be accomplished by studying the effects of various anabolic stimuli, such as feeding and exercise, on the activation of the signaling pathways of protein synthesis and protein degradation. The development and maintenance of muscle mass is not only of critical importance to an athletic animal such as the horse, but also for livestock and poultry species such as cattle, pigs and chickens that are raised for lean gain for human consumption. Although the signaling pathways regulating muscle synthesis have been well explored in neonatal piglets, rodents and humans, there is limited data from other livestock species, particularly horses. Additionally, very little data exists in any species regarding the signaling pathways that regulate muscle protein degradation.

What has been done

Muscle biopsy samples were collected from horses before feeding a high protein meal (or continued fasting), before exercise and then 1 and 2 hours following exercise. The muscle samples were

analyzed for the activation of pathways that regulate protein synthesis (rpS6) and degradation. In another study, muscle samples from aged (19 - 22 years old) horses to determine the activation of the signaling pathways of muscle protein synthesis and degradation in response to both

feeding and amino acid supplementation.

Results

Feeding horses prior to exercise resulted in an increased activation of rpS6 following exercise, indicating increased muscle protein synthesis. These findings are novel because they provide some of the first evidence that providing amino acids prior to exercise may improve skeletal muscle responses to exercise. In the aged horse study, feeding resulted in an activation of a factor related to the activation of protein synthesis (rpS6), regardless of which amino acids were supplemented in the diet. However, in the diet that was not supplemented with additional amino acids, horses in the unfed state had higher levels of a protein associated with muscle protein degradation (Atrogin-1) than when horses received supplemental amino acids. The findings from this study are important for two reasons: first, because we have demonstrated that similar to younger horses, old horses also appear to upregulate muscle protein synthesis in response to feeding; and second, when supplemental amino acids were not provided, horses may have had greater rates of muscle protein degradation, which over time could influence their ability to maintain muscle mass.

4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals

Outcome #9

1. Outcome Measures

Availability of optimized production systems for organic farming

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In Kentucky, and throughout the eastern United States, organic cucurbit production is limited by striped cucumber beetle, spotted cucumber beetle, and squash bug. In addition to the feeding

damage these insects cause, their main impact results from the transmission of a bacterium they vector. Cucumber beetles vector the causal agent of bacterial wilt, and squash bugs vector cucurbit yellow vine decline disease. These bacteria are primarily introduced into the plant after feeding, as feces are deposited on/near the feeding site. Since there is no way to stop the internal spread of these diseases, fruit loss is common. These pest and diseases complexes make organic cucurbit production extremely difficult in Kentucky. A robust pest control system is needed by organic farmers to relieve the current constraints on cucurbit production.

What has been done

A field trial was conducted at the University of Kentucky Horticulture Research farm to compare two pest management systems capable of excluding cucumber beetles and squash bug. Two important cucurbit crops, muskmelon and acorn squash, were evaluated and two main experiments were conducted. The experiments tested the usage of two pest management exclusion materials, ProtekNet and Remay, and the usage of different mulches for weed control. The Remay was placed over transplants and removed only for two weeks for pollination. The ProtekNet was in place for the entire growing season and bumblebees were used for pollination. All fertility and pest management practices followed those typical to an organic system appropriate for this region. Yield was collected, as was disease and insect presence.

Results

The ProtekNet system installed on bent electrical conduit hoops provided excellent season long control of the main limiting pest of cucurbits. The ProtekNet system allowed for yields that were 96% of conventionally grown muskmelon on our farm. In our best treatments yields were in the 9,000 marketable fruit per acre range. This confirms that a mesotunnel system can alleviate the critical pest of cucurbits for organic farmers. Observations this year were that timing of introducing the bumblebees under the ProtekNet is critical and we had reduced yields in some treatments when the bees were added too late. Additionally it was shown that aphids could be a problem in the mesotunnels since predators have been removed. This was addressed by introducing lady beetles that controlled the aphid populations. This system provides a viable option for organic producers to expand production of cucurbits in Kentucky and the region.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants

Outcome #10

1. Outcome Measures

Development of a new pawpaw variety as a niche crop for small farmers in Kentucky and the surrounding region

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The North American pawpaw is a native tree fruit in the expanding field of commercial fruit production in Kentucky. With a unique tropical-like flavored fruit with a blend of mango, pineapple and banana flavor, pawpaw has great potential for fresh market sales at farmers' markets, on-farm sales, and CSAs, as well as the processing market. New high-yielding varieties would help jump start the pawpaw industry.

What has been done

Pawpaw seedlings from both crosses and open pollinated sources were evaluated as part of the KSU pawpaw breeding program. The selection Hi7-5 was identified, propagated, and evaluated over a ten year period. Grower trials suggest that Hi7-5 is a superior new pawpaw variety for Kentucky growers.

Results

KSU-Benson™ is new high-yielding pawpaw variety that has been released to the public. This pawpaw variety is a round-medium sized fruited, early season ripening variety, with a unique mango-banana-pineapple-like flavor. This selection is unique in that it bears round fruit that are attractive and can also be packed. Growers can now purchase this variety from licensed nurseries.

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms
205	Plant Management Systems

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%	7%	0%
102	Soil, Plant, Water, Nutrient Relationships	0%	20%	60%	0%
104	Protect Soil from Harmful Effects of Natural Elements	0%	0%	5%	35%
112	Watershed Protection and Management	3%	15%	0%	0%
123	Management and Sustainability of Forest Resources	20%	10%	0%	7%
131	Alternative Uses of Land	0%	5%	0%	7%
133	Pollution Prevention and Mitigation	0%	0%	13%	0%
205	Plant Management Systems	16%	30%	0%	40%
213	Weeds Affecting Plants	0%	0%	15%	0%
402	Engineering Systems and Equipment	0%	10%	0%	7%
403	Waste Disposal, Recycling, and Reuse	4%	10%	0%	0%
605	Natural Resource and Environmental Economics	57%	0%	0%	4%
Total		100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
Plan	35.0	4.0	35.0	4.1
Actual Paid	29.0	1.6	15.9	7.3
Actual Volunteer	26168.0	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
441745	57966	881134	234867
1862 Matching	1890 Matching	1862 Matching	1890 Matching
470243	42577	2872959	213833
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	15041

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

- 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 conducted by the University of Kentucky includes:

- 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
- assessments of biodiversity and ecosystem services, including resiliency of natural predators of pests in managed ecosystems

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

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	79224	679273	114137	349928

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

Patent Applications Submitted

Year: 2016
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2016	Extension	Research	Total
Actual	34	32	66

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

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

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

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	19787

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.

What has been done

The Kentucky Nutrient Management Plan was developed so that producers had a mechanism for developing their own plans. Three, two-day workshops were held across the state; over 50 staff from various Conservation Districts, Kentucky Division of Water, UK Cooperative Extension Service, and Kentucky Dairy Development Council were trained to assist farmers.

Results

The workshops provided technical and hands-on activities, allowing the staff to create a sample nutrient management plan on their own. Post-workshop surveys indicated that over 88 percent of people agreed or strongly agreed they could assist landowners in developing a nutrient management plan. As a result, staff who attended a training can now provide local assistance to help producers develop a Kentucky Nutrient Management Plan, KY Ag Water Quality Plan, and apply for needed permits to be in compliance with state law. In Fleming County, a farmer was able to successfully plant over 500 trees on his property. The planted trees will be very beneficial in helping to prevent soil erosion and maintain established pasture grasses.

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
2016	21479

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.

What has been done

Extension specialists from the University of Kentucky (UK) partnered with colleagues at 11 other land-grant institutions in the Mississippi River basin to form SERA-46 (Southern Extension-Research Activity-46), a multi-state partnership to work alongside federal agencies to address water quality issues contributing to the Gulf of Mexico hypoxic zone.

University of Kentucky water quality specialists partnered with the Friends of Wolf Run to develop a backyard stream manual and workshop to educate key stewards in specific Watersheds.

Results

A UK Extension specialist now serves on the leadership team for the group, and a US EPA grant has been awarded to bring farmer and watershed leaders together to identify best practices for managing nutrients on the farm. In addition to developing multi-state partnerships, this effort has enhanced relationships among Kentucky-based state and federal agencies working locally on similar issues.

In Pendleton County, based upon efforts of Extension, an increase of 43 plans can be attributed to Ag Water Quality Plan and Nutrient Management Plan Workshops. These plans play a vital role in the conversations taking place among farmers and their role of natural resource protection and conservation.

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
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	3196

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. The Kentucky Forestry Economic Impact Report provided analysis of the economic contribution of the forestry sector to Kentucky, indicating over \$9.1 billion in direct contributions.

The report estimated Kentucky forest industries employed over 28,000 individuals and were responsible for a total employment of 62,445. There is a need to develop forestry ambassadors in Kentucky to address the limited organizational capacity to ensure that Kentucky woodlands are as healthy and productive as possible.

What has been done

UK Forestry Cooperative Extension Service created the Kentucky Master Woodland Stewards Program. The Master Logger program also remains in existence.

Results

Environmental assessment of the Master Logger program participants indicated that best management practices usage ranged from 75 to 98 percent for streamside management zones and haul road and skid trail drainage control practices to 30 to 40 percent for the use of improved stream crossings and successful re-vegetation of skid trails. The end result was 443 perennial streams and 1,220 intermittent streams were provided environmental protection from potential impacts of non-point source pollution from improper timber harvesting.

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
2016	7343

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

Forestry Extension developed and is administering a plan to provide training of 2,900 Kentucky Master Loggers and the 75 Kentucky Division of Forestry regional and county rangers that inspect logging operations. Extension has partnered with Louisville Metro Metropolitan Sewer District (MSD) to provide data and technical assistance in reducing the negative impact surface storm water has on urban streams.

Results

Trainings will result in over 4,012 streams (1,068 perennial and 2,944 intermittent) being provided improved protection with over 6,677 landowners annually benefiting from improved practice on 213,664 acres. This success is an extremely clear example of Extension and research teams working within the land grant mission to provide a positive solution to improve the environment for the betterment of the peoples of the Commonwealth of Kentucky.

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

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	410

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.

What has been done

The Kentucky Master Grazer program provides educational information to landowners

Results

A total of 107 participants implement rotational grazing practices to help improve soil quality, while 410 renovated pastures with legumes.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
205	Plant Management Systems
403	Waste Disposal, Recycling, and Reuse
605	Natural Resource and Environmental Economics

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	7%	0%	5%	0%
502	New and Improved Food Products	0%	0%	32%	0%
503	Quality Maintenance in Storing and Marketing Food Products	0%	0%	33%	0%
703	Nutrition Education and Behavior	72%	100%	0%	0%
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	0%	0%	3%	0%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	21%	0%	27%	100%
Total		100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
Plan	12.0	0.5	8.0	6.8
Actual Paid	14.0	0.1	7.3	3.9
Actual Volunteer	3154.0	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
176698	8888	399755	179594
1862 Matching	1890 Matching	1862 Matching	1890 Matching
188097	0	838881	49038
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	36583

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

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	79224	1258858	20426	314715

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

Patent Applications Submitted

Year: 2016

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2016	Extension	Research	Total
Actual	3	13	16

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

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

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	49117

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 Green County, a pre-survey revealed that 66% of participants expressed that they had a desire to learn how to do home canning. The other 34% reported that they already felt confident enough to do home canning. In Jackson, Menifee and Green Counties, 100% reported learning something about food preservation through Extension programming.

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

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	30657

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.

What has been done

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.

Results

Several small- to medium-sized food processors/food business owners from Kentucky and 2 from Ohio participated in a food processing workshop. All 19 participants successfully completed the training and obtained the Better Process Control Certification.

In Fayette County, 236 participated in food preservation trainings. The six month follow up evaluation revealed that 62% actually preserved food at home, 77% had tried a new method of canning or a new recipe and 90% had gained new confidence after attending the food

preservation classes and hands-on workshops.

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
2016	218131

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 different products from small businesses in several states.

Results

A total of 9616 individuals were impacted through Extension programming that aimed to educate Kentuckians on topics related to food safety.

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
101	Appraisal of Soil Resources	0%	0%	50%	0%
132	Weather and Climate	0%	100%	50%	100%
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: 2016	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.5	5.0	3.0
Actual Paid	1.0	0.5	2.0	0.3
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
88349	32517	18579	10028
1862 Matching	1890 Matching	1862 Matching	1890 Matching
94048	0	333687	0
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
 - Research on the impact of climate variability and change on onsite wastewater treatment systems
 - 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

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	454	2760	41	240

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

Patent Applications Submitted

Year: 2016
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2016	Extension	Research	Total
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Actual	4	1	5
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V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

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

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
2016	20794

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Producers are in need of educational programming that focuses on policies that impact today's agricultural environment.

What has been done

Extension specialists in Ag Economics hosted the Master Marketer program, reaching another 118 producers in 5 multi-county groups.

Results

Before the Master Marketer program, producers rated their general marketing knowledge and knowledge of futures and options at 3.3 and 2.7 out of 10, respectively. After the program, producers rated their general marketing knowledge at 6.9 and their knowledge of futures and options at 6.6. Prior to the program, less than 6% of participants were using price risk management. In post-session evaluations, 58% indicated that they planned to start using price risk management tools.

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
2016	9040

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

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

KSU provided environmental and sustainability education programs on topics ranging from mitigation and adaptation of climate change to maintaining healthy watersheds to sustaining international food systems and more.

Extension worked with Louisville Metro Tree Advisory Commission (LMTAC) and Trees Louisville have set a goal of 45% canopy cover by 2045. Reaching this goal will require the planting of trees on public and private property.

Results

In Louisville, there is a goal to achieve a healthier and economically sustainable urban forest. This will result in a healthier work and living environment for citizens, improved business environment. Stormwater runoff will be reduced, energy units for heating and cooling of structures will be reduced, transportation infrastructure will last longer, property values will be higher, and retail sales tax revenues will be higher (as compared to current levels).

4. Associated Knowledge Areas

KA Code	Knowledge Area
132	Weather and Climate

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%	100%	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%	0%	66%	0%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
Plan	5.4	1.0	15.0	1.0
Actual Paid	1.0	0.1	8.8	0.2
Actual Volunteer	313.0	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
88349	0	269487	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
94048	7546	1030290	15362
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

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

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1819	630	7334	2521

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

Patent Applications Submitted

Year: 2016

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2016	Extension	Research	Total
Actual	4	10	14

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

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
2016	3127

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, lack of information and expertise in natural resource stewardship is a major issue.

What has been done

University of Kentucky Extension and Kentucky State University collaborated with the Louisville Water Company to educate more than 1500 elementary and middle school youth through its Adventures in Water Education Program. Campbell County Extension provided educational programs and recycling opportunities for 105 students to learn the principles of sustainability, waste management, and how their actions make a difference.

Results

In Campbell County, it was reported that students thought more deeply about the choices they made when it came to sustainability after participating in the programs. In Hardin County, 14 farms and 2 farm supply stores returned plastic pesticide containers to be recycled.

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
2016	3589

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Agricultural producers are constantly attempting to develop new and innovative ways to increase profitability while ensuring long-term sustainability of their operation. Energy is a considerable input cost for most agricultural operations. Increased savings as a result of improved energy efficiency will allow producers to be better positioned during periods of adverse variable costs such as low commodity prices or high energy costs.

What has been done

Simpson County Extension collaborated with the Governors Office of Agricultural Policy and the Kentucky Center for Agriculture and Rural Development to present an area meeting aimed to educate participants on the installation and benefits of increased energy efficiency, USDA grant and loan programs and their requirements, federal tax credits and energy audits.

Results

A total of 21 participants attended from eight different counties in South Central Kentucky. All (100%) attendees reported that they had increased their awareness about the positive impact that improved energy efficiency could have on their bottom line. As a result of this program, two horticultural business operators utilized a USDA grant for their high tunnel and installed a passive geothermal system that will cool the soil in the summer and warm it in the winter to improve crop production and lengthen the selling season. This system will not require any additional energy

usage once installed. Another large dairy is currently looking at options for reducing lighting costs and considering a geothermal system due to this program.

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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	1403

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Market grain prices have declined over the years. This has also affected how livestock operations are managed.

What has been done

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

Results

The Extension Services of Clinton and Russell County, along with the UK Master Grazer program conducted a master grazing school in Clinton County. Sixty five producers attended the grazing school representing twelve different counties in Kentucky. Thirty-five are planning to either begin or expand their rotational grazing practices, 36 are planning to implement or expand stockpiling forages on their farms, 31 say they will begin to soil test regularly and apply fertilizer based on recommendations, and 33 stated that they will pay closer attention to mineral needs of grazing animals.

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
2016	18660

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

The University of Kentucky 4-H Natural Resources and Environmental Science Academy (NRESci) provides youth from eastern Kentucky the opportunity to learn about water, soil, forestry, and wildlife resources. This was conducted through a rain water garden workshop and environmental camp experiences.

Results

Youth calculated the appropriate size of a rain garden, designed the garden, excavated the soil, and planted and mulched the garden. The rain garden is approximately 35 square feet and will collect stormwater from roughly 340 square feet of impervious rooftop area. A pre- and post-test was completed by the youth at the workshop, with a pre-test average of 31% and a post-average of 70%. In Jessamine County, 176 youth participated in overnight environmental camping; 80% of youth reported a stronger desire to take care of the environment more after this experience.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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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	61%	50%	0%	0%
724	Healthy Lifestyle	39%	50%	0%	0%
	Total	100%	100%	0%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
Plan	30.0	3.0	2.0	0.0
Actual Paid	17.0	1.0	0.0	0.0
Actual Volunteer	10033.0	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
265047	54387	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
282146	0	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

2016 University of Kentucky and Kentucky State University Combined Research and Extension Annual Report of Accomplishments and Results

- training extension agents
- 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

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	109220	640323	140777	814956

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

Patent Applications Submitted

Year: 2016
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2016	Extension	Research	Total
Actual	1	0	1

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

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 Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	183816

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Research has shown there is a natural link between nutrition, physical activity, and reading. Reading books that focus on preparing and eating healthy foods and being physically active may motivate children to adopt positive food and physical activity behaviors that last a lifetime.

What has been done

Extension provided health education workshops on a regular basis for school age youth.

Results

Over 5,000 Kentucky youth have created an individual plan for healthy eating and physical activity, with 2,651 already noticing a change in their bodies due to implementing what they learned through Extension programming..

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
2016	148546

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

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 Kentucky 4-H Culinary Challenge is one way 4-H is increasing interest among youth in learning to cook and doing it with health and safety in mind. The Literacy Eating and Activity for Preschoolers (LEAP) program is used to target children at an early age.

Results

In Todd County 77 preschoolers participated in a Literacy Eating and Activity for Preschoolers program. Approximately 88% of students can now recognize healthy foods vs junk foods; 94% understand that exercise is important; 94% know that milk, juice, or water are healthier than soft drinks; and 88% understand brushing your teeth is a healthy habit.

Extension targeted 52 classrooms (grades K, 1st, 2nd, and 3rd) in the Boyle County, Danville City, and Danville Christian Academy school systems reached 1,040 students. Highlights of the evaluations of all 1st-3rd grade classrooms included an increase in the number of youth who could correctly identify nutritious foods after participating in Extension programming.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

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

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	67665

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

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

Extension has utilized various curricula to address the need for youth to be more educated on eating a healthy diet.

Results

End of program results in Cumberland county revealed that 55% of the youth increased fruit consumption, 30% reported an increase in physical activity and 36% reported following food safety best practices more often.

Warren County Extension presented 165 lessons focusing on nutrition and physical activity and educating over 2700 children in kindergarten through sixth grades. Post surveys show that 41% of participants ate fruit everyday compared to only 34% at the beginning of the program; 92% of all Kindergarten, 1st and 2nd graders can correctly identify foods and place them in the correct food group, and; at least 30% convinced their parents to buy a lower fat milk.

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

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	2234

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 Kentucky Extension implemented youth physical fitness and healthy lifestyle programs, resulting in over 100,000 contacts. These programs, in turn, afforded youth with opportunities to develop a better understanding of the relationship between healthy eating and physical well-being.

Results

Program evaluations revealed that 5,251 increased their level of physical activity due to education provided through Extension programming, with nearly 80% (4, 091) feeling more confident about themselves.

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)	
67665	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.