2017 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 2017 accomplishments include: engaging over 91,000 youth and 5,000 adults in various aspects of Science, Engineering & Technology projects; Conducting a study to show agriculture's impact to local economies (through the Community & Economic Development Initiative of Kentucky), hosting the Kentucky Hunger Dialogue to raise awareness and to develop action plans for a healthier Kentucky; Offered free urban tree workshops for residents; Aided producers in achieving record-breaking corn yields; Hosted a week of workshops and trainings on water quality to focus on the impact of climate change on the water system; Conducted a Woodland owners short course for experienced and novice landowners; Educational programs that teach nutrition education to English as Second Language learners; Forming a partnership to provide new sewing machines to residents in two villages in Ghana, and; Hosted an equine showcase to highlight the university's equine programs and relevant industry findings with an emphasis on safety and horse welfare.
Extension specialists and county agents continued a focus on Kentucky Beef IRM through Master Cattleman program. 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 stormwater runoff. Local foods initiatives remain a movement to advocate for fresher, healthier eating habits. 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 agriculture and home environments, animal health, farm production, and natural resources. 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 fatherhood programs that help increase parenting skills.
In 2017, there were inherent listening sessions and discussion around our statewide Extension review. A number of recommendations were presented as a goal to make Extension more financially solvent and maintaining its relevance to clientele and other stakeholders. This also put in motion an opportunity to take a look at the process in which needs assessments are conducted. A committee was formed to identify ways to improve steps toward engaging stakeholders more effectively, which earmarks the beginning and updates for county Plan of Work discussions. This process will aim to seek methods that better serve all 120 counties. The data remains useful in assessing and maintaining programs that address pertinent issues. Several programs are continuously being evaluated for impact and will be summarized through success stories and other reports in the coming year.
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. There has been an increase in the number of public value statements that serve as a strong marketing tool for our Extension System.
With external grants and contracts setting a record for this year (second only behind the medical school),

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 a number of externally funded projects. Research achievements included advancements in developing ways to manage invasive pests, finding new targets for pesticide and veterinary drug development to control economically devastating diseases, improving management techniques for production operations and urban landscapes that help preserve natural resources, and identifying opportunities for economic gains by producers and rural businesses.
As a result of our collaborations with volunteers and other stakeholders in the 2017 program year, the percentage of our contacts were in the following areas:
26% Global Food Security and Hunger
3% Social and Economic Opportunity
21% Life Skill Development
2% Childhood Obesity
7% Leadership and Volunteerism
5% Food Safety
8% Diet, Nutrition and Healthy Lifestyles
6% Sustainable Energy
20% Agricultural and Environmental Quality
2% 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 KYSU remain committed to maximizing effectiveness to stakeholders.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	470.0	52.5	180.0	46.7
Actual	499.0	42.0	214.4	47.5

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, relevance 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 Programs 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 commodity groups and state-selected boards that relate to agriculture and natural resources issues. 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 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. In addition a steering committee comprised of grain crop and forage system stakeholders met with UK officials regularly to provide input on a new Grain and Forage Center of Excellence.
Kentucky State University's Cooperative Extension Program established a new advisory group to

help promote the university's research initiatives and Extension programs and advocate for the Land Grant Program in communities across the state. The Kentucky State University Land Grant Program Extension and Research Advisory Council (ERAC) is made up of community members and business leaders from across the state. It serves as a grassroots leadership group that advises the KYSU Land Grant Program on important issues facing the citizens in the Commonwealth. The ERAC works to ensure that research-based information is made available to the public by providing adequate leadership and support of the university's agriculture programs in their communities. Some areas of focus of the ERAC include advising staff on programs deemed appropriate as well as those that no longer meet the needs of communities, and establishing lines of communication to community leaders and local organizations.

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 audiences within 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. 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 FY17 included:

- Water Quality - continue educating Kentucky landowners and consumers on ways of preventing water pollution
- Plant camp - offering youth an opportunity to learn about soil science and horticulture and to engage in insect and tree identification
- Grain storage - helping to provide alternative grain structures to help farmers who have experienced an increase in corn yields.
- Kentucky Income Tax Seminar Program - a highly successful outreach series (of 50 years) that presents updates on both federal and state tax preparation for tax professionals, enrolled agents, certified public accountants, certified financial planners and attorneys.
- Downtown revitalization - received $1.4 million grant to help revitalize the downtown area in several southeastern Kentucky towns.
- Food Security- Engaging communities in conversations around effective ways to address hunger
- Economic & Financial Stability- continued emphasis on the need for Extension to continue focusing on educating youth and families about managing financial resources.
- Diseases transmitted by mosquitoes - offered distinguished lecture on managing mosquito-born pandemics
- Accessing Healthy Foods - stakeholders are taking more interest in locally grown foods to address the shortage of healthy fresh food options. This includes produce grown in gardens as well as a splurge in backyard poultry/egg production
- 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.
- Pasture management - offering workshops relevant for horse owners and farm managers interested in the latest information about horse pasture management.
- Industrial Hemp- Planned and organized the nation's first help conference.
- Grain Crops- a Grain Crops Center of Excellence was put into operation to help address productivity, disease management, irrigation and environmental sustainability
- Impact of local farm operations - County profiles revealed the amount of income and employment farm operations provide to the state's economy
- Environmental Camp Initiatives for youth - camps have helped spark youth interest in nature and environmental systems

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
{No Data Entered}	{No Data Entered}	{No Data Entered}	{No Data Entered}

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	9943746	1544556	6549199	1970092
Actual Matching	9397958	1614503	6549199	1844812
Actual All Other	0	0	30847407	0
Total Actual Expended	19341704	3159059	43945805	3814904

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	0	0	5249355	0

V. Planned Program Table of Content

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	6%	11%	0%	100%
802	Human Development and Family Well-Being	14%	56%	0%	0%
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	0%	0%	67%	0%
806	Youth Development	80%	33%	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: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	120.0	16.5	4.5	0.1
Actual Paid	107.0	4.3	6.2	0.1
Actual Volunteer	89026.0	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**
2088187	251746	37450	5196
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
1973571	89729	37450	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	462435	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

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

• In-service training for extension agents on planning and retirement •Agents and specialists conducting estate planning and retirement workshops and meetings for adult citizens of Kentucky •Agents providing extension homemaker lessons on wills and retirement •Small Steps to Health and Wealth and GPS Programming have become life skills featured programs •Financial Stability Initiatives •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 •Development of agricultural productivity and sustainable land management models for small farmlands.

Through research, faculty in the department of Community and Leadership Development investigate effective methods for conveying STEM content through secondary agricultural education programs and the impact on success in college degree programs and subsequent careers in agriculture. Research also explored the sociological factors that impact community innovation and develop best practices that can be effective in promoting innovation.

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 Citizenship projects and Beyond Youth entrepreneurs •Secondary agriculture/school teachers •Community leaders

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

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	748733	5807164	701088	5360459

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

Patent Applications Submitted

Year: 2017

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	2	0	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Contact numbers and publication numbers are included

Year	Actual
2017	0

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.
6	Number of individuals reporting improved knowledge and skills related to securing financial stability (such as managing financial and non-financial resources; personal goal setting to maintain and improve financial stability)
7	Number of youth who apply the skills learned in 4-H and in other activities at home, school or in the community
8	Number of individuals who applied practical living skills to advance education or employability.
9	Number of youth that have improved their communication skills
10	Number of participants reporting behavior changes related to healthy, independent or quality aging (such as increasing communication and enhancing relationships; improving mental health; engaging a family unit to embrace aging issues)

Outcome #1

1. Outcome Measures

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

Not Reporting on this Outcome Measure

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.

Not Reporting on this Outcome Measure

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
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

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.)

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

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

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Number of individuals reporting improved knowledge and skills related to securing financial stability (such as managing financial and non-financial resources; personal goal setting to maintain and improve financial stability)

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	323038

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Financial literacy remains low among consumers of all ages and social/economic backgrounds. With the steady increase of consumer debt among the state and national households, there is a tremendous need to aid families in obtaining solid financial security

What has been done
Kentucky State University provided training for 60 Family and Consumer Sciences agents on the "Real Skills for Everyday Life" curriculum. Small Steps to Health and Wealth (SSHW) was also utilized; it is a national extension program designed to encourage participants to make positive behavior changes to simultaneously improve their health and personal finances. The SSHW program consists of two main sections: a discussion of 20 similarities between health and personal finance issues and 10 suggested behavior change strategies that can be applied to either area of life. Several Kentucky counties have implemented this program.

Results
As a part of the on-line six week program SSHW challenge, 350 consumers participated. The participants reported saving or investing $7,605 and learned something new related to personal finance.

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 #7

1. Outcome Measures

Number of youth who apply the skills learned in 4-H and in other activities at home, school or in the community

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	122443

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Kentucky 4-H Youth Development holds prestige in its development and delivery of innovative youth programming across the state and its reputation across the United States. However, there is still a need for additional youth to take advantage of what the organization can offer.

What has been done
4-H Teen Conference attracted 536 high school 4-Hers from 89 counties across the Commonwealth of Kentucky. Nearly 500 middle school 4-Hers attended teen summit.

Results
For those participating in teen conference, 68.8% developed leadership skills, while 40% reported obtaining skills they plan to take back to their county and utilize in other settings. In regard to those attending teen summit, over 50% reported improving their team building and leadership skills. As a result of participating in other 4-H projects, 22,662 youth report that they were able to follow instructions step-by-step to do or make things themselves. Another 16,238 youth reported that they followed safe practices, while 17,119 youth reported that they demonstrated what they learned to do for themselves.

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 #8

1. Outcome Measures

Number of individuals who applied practical living skills to advance education or employability.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	43786

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
A growing concern for society is having citizens who are prepared to go to work. In recent years, employers have become alarmed that young people coming out of the educational system are unprepared to join the workforce. Employers are looking for workers who are creative and responsible problem solvers and have skills and attitudes on which to build.
Jefferson County Public Schools District has had a number of initiatives implementing gardening programs to introduce students to healthier food options and sustainable ways to obtain these foods. Gardening classes also supplement common core subjects with outdoor learning opportunities. Unfortunately, in many cases, gardens are underutilized and neglected. In addition, the teacher involved may leave the school and their replacement, who may have no gardening experience, inherits a neglected garden.

What has been done
In order to prepare local teens in Breckinridge County for the workforce, a 4-H Career Club was initiated to 1) introduce teens to a variety of career opportunities and educational paths, 2) improve written and verbal communication skills and improve their job interview skills, and 3) explore skills (e.g. team building) needed to maintain a successful career. In Greenup County, Extension collaborated with a local shelter to educate participants about the importance of honing employable skills. In Warren County, 557 youth from 5th-12th grade were educated on career awareness, learning about career clusters, different types of jobs, job applications, and resume writing.
The Extension Agent spoke with several school coordinators and began a program that included designing gardens and series of accompanying activities at two schools. The Agent gave assistance to garden programs at Lassiter Middle School in their greenhouse and classroom. A six-week course covered everything from seeds to soil, including setting up a home-scale hydroponics system. Several hands-on activities provided students the opportunity to observe different components of soil and the germination of broadleaf and grass plants. For Frayser Elementary School's program, four garden beds were constructed.

Results
After participating in the Breckinridge County program, post-surveys indicated 100% of the teens could identify careers in their field of interest, as well as, the specific education, skills, and characteristics needed to be successful in a career. All teens (100%) indicated they had a better understanding of college life and funding sources to help pay for college, 83% reported a better understanding of higher education options in Kentucky, and 100% felt confident in their ability to successfully complete a college degree. As a result of the program in Greenup county, one participant was able to acquire a full-time job at a local long term care facility and was using the financial information to help save part of her income to help eliminate debt and move out on her own.
Students were able to plant various vegetables in the garden and observe plant growth through the school year. The teachers reported that several students showed positive changes in behavior during and after the lessons. 80% of the students enjoyed the class and had a change in the perception of gardening and its implementation. The Extension Agent formed many positive

relationships with the students, one of whom expressed considerable gratitude for the class saying, I absolutely love coming to the garden class. The staff at the school who assisted with the class were happy that someone with the knowledge of gardening was able to provide activities and lessons for the students and give them non-traditional learning opportunities.

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 #9

1. Outcome Measures

Number of youth that have improved their communication skills

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	46431

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Communication skills are often mentioned as one of the most important areas of youth development. Interpersonal skills and how youth express themselves in written and spoken form has significant effects on youth personal endeavors throughout their lives. There is a need for more youth to gain exposure to the skills associated with effective communication.

What has been done
Boyle County Extension and 4-H Councils identified improving the ability to communicate as a key life skill and collaborated with teachers in the Boyle County, Danville, and Danville Christian systems to provide public speaking contests within their classrooms. Jefferson County 4-H agents conducted over 60 Communications School Enrichment programs to teach 4-Hers the skills to

successfully create and deliver a speech or demonstration.

Results
In Boyle County, eight youth went on to participate at the Area level with one ultimately competing at State Communications day where he was runner-up in his speech age division. In Jefferson County, over 1,100 youth participated. As a result, 78% of participants learned how to and the importance of collecting and analyze data, 87% of youth learned how to organize a speech in writing, and 70% said they felt more comfortable in their ability to speak in front of a group.

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 #10

1. Outcome Measures

Number of participants reporting behavior changes related to healthy, independent or quality aging (such as increasing communication and enhancing relationships; improving mental health; engaging a family unit to embrace aging issues)

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	181411

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Health and safety-related decisions that individuals and families make across the lifespan directly affect overall well-being and the ability to age well. Yet many individuals make choices which result in poor overall health and high chronic disease rates.

What has been done

Keys to Embracing Aging is a Cooperative Extension educational health intervention aimed at improving overall health by focusing on ways in which individuals and families can be empowered to take control of their own lifestyle decisions and behaviors in terms of health and well-being. A number of Kentucky FCS agents presented various individual Keys to Embracing Aging lessons to 1,792 participants.

Results

As a result of the lessons, 1,585 participants reported improved understanding regarding the impact lifestyle choices have on overall health and well-being. A total of 1,481 participants reported intentions to implement at least one strategy to improve their overall lifestyle. All participants were asked to complete a 30-day follow-up evaluation. Of the 658 returned follow-up evaluations, 452
reported that they implemented at least one strategy to enhance either brain activity, positive attitude, financial management, health numbers, healthy eating, physical activity, safety, social activity, stress management, taking time for oneself, and/or tuning-in to the times.

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

length of programs

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Increase in behavior and intentional practices

Key Items of Evaluation

Surveys, one-on-one interviews, testimonials

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%	3%	0%	0%
802	Human Development and Family Well-Being	0%	3%	0%	0%
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	100%	5%	0%	0%
902	Administration of Projects and Programs	0%	47%	0%	55%
903	Communication, Education, and Information Delivery	0%	42%	0%	45%
	Total	100%	100%	0%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	77.0	10.0	0.0	6.4
Actual Paid	35.0	14.6	0.0	10.2
Actual Volunteer	38780.0	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**
696062	394795	0	109032
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
657857	823885	0	708902
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. Diversity workshops will be offered to program and county councils. Sustainable land management ecological training for socially disadvantaged farmers and community.

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?

Reference materials, etc.

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	306961	962480	157186	495823

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

Patent Applications Submitted

Year:	2017
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	7	0	7

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Contact numbers and publication numbers are included

Year	Actual
2017	0

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
6	Number of individuals who practice personal and interpersonal leadership skills in clubs, schools and community outreach
7	Number of people who reported acquiring new leadership opportunities (through KY Extension Leadership & Youth Engagement Leadership Programs)
8	Number of people who have taken on leadership roles as a result of participating in Extension leadership programs (Ky Extension Leadership & Youth Engagement Leadership Programs)
9	Number of youth who indicated they know how to use information they are given to make decisions
10	Number of empowered individuals assessing community needs, engaging in existing coalitions or organizations, addressing a significant community issue and implementing solutions

Outcome #1

1. **Outcome Measures**

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

Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

Number of people who increase their knowledge of governmental process

Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

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

Not Reporting on this Outcome Measure

Outcome #4

1. **Outcome Measures**

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

Not Reporting on this Outcome Measure

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

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Number of individuals who practice personal and interpersonal leadership skills in clubs, schools and community outreach

2. Associated Institution Types

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

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	7225

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Youth need delivery modes to ensure that they have the opportunity (through programs) to attain appropriate leadership skills. Camp programs can provide that venue to give youth what they need to build these and other critical life skills.

What has been done
During the year, all 120 counties in Kentucky attended one of 34 camp program sessions. A total of 7,906 campers (age 14 and under), 998 teens (age 15 to 17), 1,033 adults (age 18+) and 233 extension staff (e.g. agents, interns, program assistants) were involved in some aspect of summer residential camp.

Results
Kentucky 4-H Camp continues to provide to campers the essential elements of youth development: belonging, independence, mastery, and generosity. Over 90% of youth attending summer camp reported making a new friend at camp (belonging). Nearly 85% of youth attending summer camp reported achieving a goal or being successful as a result of learning new skills at camp (mastery). A total of 89% of youth attending summer camp reported learning a new life skill they plan to replicate at school, home, or in their community (independence).

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 #7

1. Outcome Measures

Number of people who reported acquiring new leadership opportunities (through KY Extension Leadership & Youth Engagement Leadership Programs)

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	5912

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
With the rise of area youth in metropolitan areas being involved with unsafe, risky, and problem behaviors, communities across the state have suffered from youth succumbing to crime, incarceration and even death. A disconnect exists between cultural understanding of the youth generation and their experiences.

What has been done
The Youth Engagement Leadership Program (YELP) seeks to equip youth with the civic engagement and entrepreneurial skills needed for them to emerge as change agents for their community. YELP provides opportunities to strengthen the youth voice around important social and economic issues that will impact future generations. A Herd Dynamics For Leaders: Learning Leadership Competencies From Horses workshop was conducted, where participants collaborate with horses to learn leadership competencies.

Results
The YELP program reached 173 youth and 18 leaders/volunteers. The programs took place in a variety of settings with several partners, including 4-H Youth Development Agents, Schools, Community Organizations, Chambers of Commerce, and Youth Service Centers.
As a result, 5 youth reported taking new leadership roles in clubs. In Crittenden County, participants held the first youth-led Youth Night in partnership with a local restaurant to address the need of youth needing a place to gather. Carter County YELP participants assisted with the planning stages of the Galaxy Project Community Youth Center in Olive Hill, KY. The Herd

Dynamics workshop taught participants the importance of patience, effective listening, observations, and team building.

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 #8

1. Outcome Measures

Number of people who have taken on leadership roles as a result of participating in Extension leadership programs (Ky Extension Leadership & Youth Engagement Leadership Programs)

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	3274

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Kentucky Extension relies on the commitment of youth and adult volunteers to aid in planning, implementing, and evaluating programs. However, these individuals must be equipped for the tasks at hand.

What has been done
The Kentucky Volunteer Forum provided professional development training to a total of 761 volunteers from across the state. In Carlisle County, 4-H is working to offer opportunities for youth to step up and lead.

Results
A follow-up survey revealed that 48% of the volunteers responded that their volunteer role has changed or expanded as a result of their participation in the volunteer forum. A Carlisle County teen served as the president of the Purchase Area 4-H Teen Council this year, and two Carlisle

County teens served on the Teen Retreat Planning Committee. They also assisted with afterschool 4-H programs, volunteered at county and area 4-H events, and served on the county 4-H council to assist in developing program ideas.

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 #9

1. Outcome Measures

Number of youth who indicated they know how to use information they are given to make decisions

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	118457

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Civic engagement helps create and cultivate vibrant communities. Studies have shown social capital is necessary for effective government and economic development. Part of social capital is engaging in the legislative process, serving on local boards/councils, and contributing in topics important to that community. Overall in the US, social capital has been on the decline. Currently, Kentucky ranks very low in civic health.

What has been done
The West Kentucky Area Teen Retreat is a program offered to the Kentucky District 6 and 7 teens (8th grade through high school). This program offers classes, fun shops, guest speakers, and a way for the teens to network with others in the area while developing leadership skills and learning of other opportunities available to 4-H teens across the state. Livingston County 4-H joined with four counties(Lyon, Trigg, Caldwell and Crittenden)to create and develop the Teen Leadership Academy. The Russell County 4-H program collaborated with Russell Springs

Elementary School to present a program on goal setting for 150 4th and 5th graders.

Results

In regard to the Teen Leadership Academy, 100% of the youth surveyed (post evaluation) indicated that they were confident in leading a group activitiy. While 95% of the youth indicated that the program increased general confidence in themselves, 90% of the youth indicated that their communications skills were improved as a result of the program. In Russell County, youth learned to set SMART goals. After two months, seventy-three percent (73%) of the youth indicated that they had met their goal. Youth felt as if the goal setting allowed them to be more aware and more responsible.

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 #10

1. Outcome Measures

Number of empowered individuals assessing community needs, engaging in existing coalitions or organizations, addressing a significant community issue and implementing solutions

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	6809

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Agriculture depends on skilled and passionate leaders to be effective advocates for issues facing agriculture, our local communities, Kentucky and our nation. However, there is a need to train individuals to have the confidence and competence to address community issues.

What has been done

For the past six years, the Motivating and Educating Agricultural Leaders (MEAL) program has provided leadership development experiences and training for south central Kentucky agricultural leaders.

Results

Before participating in MEAL, none had contacted an elected official about an issue, yet 100% of the participants contacted an elected official during or after completing MEAL. Leaders expanded their reach beyond agriculture this year. Some of the successes included foci on: Road projects, transportation issues, wet/dry vote, voting procedures, community legislative reception and outreach to non-agriculture individuals to tell agriculture?s story. Others participated in the Kentucky Agricultural Leadership Development Program, one took a group of kids to Frankfort to see how government worked replicating a MEAL program activity, three have been on local radio promoting agriculture, three have taken leadership roles in the Young Farmers Program, local cattlemen?s association, FFA Alumni and County Extension Council and one hosted a local leadership group at their farm.

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

Use of Extension resources; State level and local Extension personnel provided expertise

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Increase in knowledge, skills, improved practices and behavior

Key Items of Evaluation

use of survey items, case studies, focus groups

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%	6%	0%
502	New and Improved Food Products	0%	0%	15%	0%
701	Nutrient Composition of Food	0%	58%	17%	100%
703	Nutrition Education and Behavior	42%	0%	0%	0%
704	Nutrition and Hunger in the Population	0%	0%	17%	0%
721	Insects and Other Pests Affecting Humans	0%	0%	39%	0%
722	Zoonotic Diseases and Parasites Affecting Humans	0%	0%	6%	0%
723	Hazards to Human Health and Safety	3%	0%	0%	0%
724	Healthy Lifestyle	55%	42%	0%	0%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	95.0	2.0	6.0	1.5
Actual Paid	38.0	1.8	8.8	0.8
Actual Volunteer	27988.0	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**
795500	146038	280180	43709
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
751837	0	280180	12307
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	1200624	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

• Contacts with clientele related to diet and health will include volunteer training, health fairs, Extension Homemaker leader lessons, safe night programs, healthy homes programs, and more.
• Multidisciplinary programs aimed at strengthening local food systems. Examples of programs to be offered will include: 4-H school enrichment, after-school programs and day and/or summer camp programs on 4-H Health, 4-H Youth Physical Fitness and Healthy Lifestyles, Small Steps to Health And Wealth - Kentucky physical activity and weight management programs, LEAP-Literacy, Eating and Activity for Preschool Program and other programs 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: • Alternative technology to replace unhealthy fats in processed foods • Bioprotective effects of phytochemicals to mediate immunity and antigenotoxic potential • The biology, ecology and control of disease vectors and other insects of importance to public health • Understanding hoe in-store marketing and product placement influence healthy food purchases in low-income caregivers

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 •Food processors

3. How was eXtension used?

Reference materials

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	326435	6336924	246191	4780486

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

Patent Applications Submitted

Year: 2017

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	3	16	19

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Contact numbers and publication numbers are included

Year	Actual
2017	0

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	Number of individuals who experienced an increase in knowledge, opinions, skills, or aspirations regarding lifestyle changes (diet, stress management, etc.) that improve personal health
6	Number of individuals who made lifestyle changes (diet, exercise, managing stressors, etc.) for the purpose of improving their health
7	Number of people reporting improved lifestyles through a focus on proper nutrition, disease and injury reduction and comprehensive health maintenance.
8	Number of individuals who reported an increase in their fruit and/or vegetable consumption

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

   Not Reporting on this Outcome Measure

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

   Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

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

   Not Reporting on this Outcome Measure

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.).

   Not Reporting on this Outcome Measure

Outcome #5

1. **Outcome Measures**

   Number of individuals who experienced an increase in knowledge, opinions, skills, or aspirations regarding lifestyle changes (diet, stress management, etc.) that improve personal health
2. **Associated Institution Types**

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

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	15699

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
In Kentucky, approximately 1 in 8 adults have been diagnosed with Type 2 Diabetes and it is estimated that 138,000 Kentuckians have Type 2 Diabetes but are unaware of their condition.

What has been done
Counties across the state with high diabetes and obesity rates have been able to raise awareness through programming that focuses on nutrition and opportunities for physical activity.

Results
In Fayette County, 12 participants provided feedback on their experience participating in a Diabetes program. Post-surveys from participants revealed: 64% were better informed on how to take medications; 92% could identify foods that help control blood sugar; 83% learned what to do if blood sugar is too low or high, and; 75% learned the importance of checking their feet every 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 #6

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	12842

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Statistics show that the average American devotes over 10 hours a day to screen time (computer, iPhone or television). Getting families and adults off the couch and off their devices is a goal of Extension across Kentucky. Several counties have promoted ?The Couch Potato Challenge to get community members to be more physically active and enjoy active time with friends and family. Grants have also been obtained to promote exercise and to educate the public on the perils of a sedentary lifestyle.

What has been done
Through a CDC grant to FCS Extension, six counties (Clinton, Elliott, Letcher, Lewis, Logan, Martin) with obesity rates greater than 40% have been able to improve infrastructure for accessing nutritious foods and increasing opportunities for physical activity.

Results
Infrastructure has been purchased and installed in the counties involved in the CDC grant project. Community members are starting to use these enhancements. Examples of infrastructure include but are not limited to grocery stores selecting new displays to help market fresh fruits and vegetables. Agents have demonstrated Plate-It-Up recipes in grocery stores and farmers' market. Four counties have installed fit trails. One county has created story walks. Filtered water bottle filling stations have been installed in schools making water the easy choice for a beverage. Benches and bike racks have been installed throughout several communities making walking more enjoyable and feasible for those less fit. Park bathrooms have had facelifts to encourage folks to bring children and to stay longer. Baseline data has been collected and intermediate data is presently being collected.

4. Associated Knowledge Areas

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

Outcome #7

1. Outcome Measures

Number of people reporting improved lifestyles through a focus on proper nutrition, disease and injury reduction and comprehensive health maintenance.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	18016

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
According to the Center for Disease Control and Prevention (CDC), approximately 1 million Kentuckians have prediabetes. This means that blood sugar levels are elevated, but not high enough to be diagnosed with diabetes. Unfortunately, up to 30% of those with prediabetes will develop full-blown diabetes within 5 years.

What has been done
In response to these staggering statistics on diabetes, the University of Kentucky Cooperative Extension Service, alongside eight states in the Southern Extension Region, are exploring the use of County Family and Consumer Science Agents as trained Lifestyle Coaches for the National Diabetes Prevention Program (NDPP). Developed by the CDC, this extensively studied research-based program has shown that participants within structured lifestyle intervention programs reduce their risk of developing diabetes by 50%.

Results
Over the last year, approximately 210 individuals have taken healthy actions to improve their health as a result of Kentucky's Taking Ownership of Your Diabetes program. Of these individuals: 94% were seen by a healthcare professional as a means of managing their diabetes one or more times during the year; 96% had their A1C checked in the past year; 73% took part in physical activity for 30 or more minutes on five or more days of the week, and; 80% now use a diabetes meal plan.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

723	Hazards to Human Health and Safety
724	Healthy Lifestyle

Outcome #8

1. Outcome Measures

Number of individuals who reported an increase in their fruit and/or vegetable consumption

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	9062

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Kentucky has the fifth highest adult obesity rate in the nation. This is due in part to an increased consumption of unhealthy food. Families need healthy advice about ways to obtain and prepare fruits and vegetables.

What has been done
Kentucky State University Center for Family Nutrition and Wellness Education began it's pilot program of the "Rookie Cooking Camp", an introductory cooking camp for middle school and high school boys and girls. In Boone County, 36 individuals attended the two-hour frozen food basics lesson that included hands-on cooking with frozen food products. Several counties utilized the Weight: The Reality Series curriculum as a means to promote healthy eating.

Results
Over the past year, over 7,000 adults completed the Weight: The Reality Series program, with 4,364 participants reporting a lifestyle change to improve their health. Over 3,000 participants reported accessing healthier foods through Farmers Markets and other local food sources. As result of Extension programs, clientele have been able to learn effective ways to manage body weight by eating more fresh fruits and vegetables.

4. Associated Knowledge Areas

KA Code	Knowledge Area
723	Hazards to Human Health and Safety

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

Additional programs that related to Extension programs; participants willingness to fully participate

V(I). Planned Program (Evaluation Studies)

Evaluation Results

increase in knowledge, awareness, practice and behavior changes

Key Items of Evaluation

surveys, interviews, observations collected

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
601	Economics of Agricultural Production and Farm Management	0%	83%	25%	100%
602	Business Management, Finance, and Taxation	11%	0%	0%	0%
603	Market Economics	1%	0%	0%	0%
604	Marketing and Distribution Practices	0%	4%	4%	0%
605	Natural Resource and Environmental Economics	9%	0%	13%	0%
606	International Trade and Development	0%	0%	13%	0%
607	Consumer Economics	1%	0%	0%	0%
608	Community Resource Planning and Development	78%	13%	25%	0%
610	Domestic Policy Analysis	0%	0%	16%	0%
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	0%	0%	4%	0%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	25.0	10.5	20.0	4.6
Actual Paid	15.0	12.4	15.8	2.8
Actual Volunteer	14157.0	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**
298312	255504	407056	119971
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
281939	517269	407056	60118
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	2121576	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 nontraditonal 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, investigating how community structure and policy impact entrepreneurship, understanding how health policy and health system structure impact rural communities and low-income families, finding ways to optimize the economic value of precision agriculture and understanding how consumers and producers react to unexpected shocks in agriculture markets due to natural disasters and food safety incidents •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 focusing on examining aquaculture and livestock economics opportunities for socially disadvantaged and small farmers 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 •Locally elected and appointed officials

3. How was eXtension used?

Reference materials to enhance programming

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	231191	3258072	30443	444283

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

Patent Applications Submitted

Year: 2017

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	3	3	6

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Contact numbers and publication numbers are included
  Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of new coalitions formed as a result of Extension efforts
2	Number of individuals reporting changes in knowledge, opinions, skills or aspirations related to economic or enterprise development
3	Number of farmers self-reporting an increase in profits as a result of adopting one or more practices recommended by Extension
4	Number of citizens (youth & adults) utilizing skills learned through Extension programming
5	Number of individuals who reported increased levels of understanding how to manage/address current estate planning issues facing the family, farming operation, or business
6	Number of businesses reached through CED-based Extension programming (e.g., Business Retention, Agritourism, First Impressions, Economic Gardening)
7	Number of artisans who reported an increase in income based on what they learned through Extension's Arts & Creativity programs
8	Number of partners Extension engaged in community strategic planning processes
9	Availability of new tools to determine the impact of farm management decisions on profitability

Outcome #1

1. **Outcome Measures**

   Number of new coalitions formed as a result of Extension efforts

   Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

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

   Not Reporting on this Outcome Measure

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

   Not Reporting on this Outcome Measure

Outcome #4

1. **Outcome Measures**

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

   Not Reporting on this Outcome Measure

Outcome #5

1. **Outcome Measures**

   Number of individuals who reported increased levels of understanding how to manage/address current estate planning issues facing the family, farming operation, or business

2. **Associated Institution Types**

   - 1862 Extension
   - 1890 Extension
   - 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	210577

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Regardless of net worth, estate planning is important to protect, and ensure personal and financial goals are realized after death. Unfortunately many people fail to properly plan for transfer of possessions and property at the time of death.
The Kentucky State University Small Farm Program is an Extension program designed to help farm families with decision-making skills to solve farm and home problems. One of the goals of the Small Farm Program is to focus on developing a sub-wholesale system that will readily provide nutrient-dense foods of high quality and reduced price to Kentuckians.

What has been done
Extension Offices in Kentucky hosted Estate Planning workshops for the general public. Emphasis was on the estate planning process, including steps to develop an estate plan, establishing goals for an estate plan, explanation of estate planning tools, the probate process, insurance, funeral planning and estate tax laws.
Kentucky State University Cooperative Extension Program, in collaboration with the Southern Kentucky Producers (SOKY Producers), utilizes a building rented by a farmer to aid in the distribution of sustainably produced fresh produce, vegetables, and meats directly to the general public, wholesale buyers, and institutions, including schools and food banks.

Results
A total of 379 consumers participated in the workshops across Kentucky. Participants were surveyed following the classes. An assessment of the data revealed that participants had increases in knowledge on how to manage/address current estate plans in regard to their families, farms or businesses. Additionally, 97 % planned to create at least one specific estate planning goal, while 96% planned to implement at least one strategy in regard to estate planning as a result of participating in the program.
In 2015, through this collaboration, the SOKY Producers, delivered more than 6700 melons. These melons were valued at more than $26,800 ($4 per unit average). The melons reached end-markets in Southern Indiana, Southern Ohio, Middle Kentucky (of the area surrounding Interstate 65), and Middle Tennessee. In 2016, these producers delivered more than 3100 melons through the program. The value of these melons was more than $17,050 ($5.50 per unit average). The melons were delivered to end-markets in Southern Indiana, Southern Ohio, Middle Kentucky, and Middle Tennessee.

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices

608 Community Resource Planning and Development

Outcome #6

1. Outcome Measures

Number of businesses reached through CED-based Extension programming (e.g., Business Retention, Agritourism, First Impressions, Economic Gardening)

2. Associated Institution Types

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

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	2665

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
In today's economic climate, many residents are taking proactive measures to be more entrepreneurial and/or pursuing their own business opportunities. As a result, more individuals are in need of guidance.

What has been done
Extension continues to lead efforts that promote the economic and business vitality across the commonwealth of Kentucky. Extension professionals have served on committees and other entities to promote local business ventures.

Results
In Jessamine County, Extension worked with partners to solidify one of its major employers with the establishment of a 41,000 square feet facility that supports the local manufacturing facility. The Harrison County Extension office coordinated with the UK Center for Crop Diversification to present a series of trainings titled "Growing Online" to address basic Tools for Internet Marketing for local businesses. In Allen County, Extension worked with the Main Street program to improve its downtown streetscape and building infrastructure improvement master plan.

4. Associated Knowledge Areas

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

602	Business Management, Finance, and Taxation
603	Market Economics
604	Marketing and Distribution Practices
605	Natural Resource and Environmental Economics
607	Consumer Economics
608	Community Resource Planning and Development

Outcome #7

1. Outcome Measures

Number of artisans who reported an increase in income based on what they learned through Extension's Arts & Creativity programs

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	357

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Over the past several years, staple arts education programs have been cut from several Kentucky schools. Many local community members who desire to participate in arts activities (theatre, music, dance, painting) have few options but to travel outside of their county or sometimes out of state. Extension professionals and local stakeholders have identified the need for more local arts programs, for both youth and adults. These programs have proven vital to many rural/small communities.

What has been done
The Breathitt County Extension office partnered with a local, self-taught artist to offer monthly adult painting classes. The Greenup Extension Arts Council has made collaborations a part of its mission in order to support and promote local arts to keep local talent alive and appreciated. In Whitley County, 300 youth participated in an event highlighting colonial culture and artistry.

Results
In Breathitt County, Family teamwork and bonding are being nurtured through attending arts classes and new clientele who are experiencing Cooperative Extension for the first time through these arts classes have begun to attend and become involved in other Extension programming. In

Greenup, 8 visual artists now have permanently installed artwork in public places, 76 musicians and audio engineers have been employed and classes have been offered to 85 students who reported that they learned a new arts skill.

4. Associated Knowledge Areas

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

Outcome #8

1. Outcome Measures

Number of partners Extension engaged in community strategic planning processes

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	2693

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Community involvement and input from a strong local leadership base is essential for any County Cooperative Extension program. It is imperative that Extension serve as the organization to bring local residents together to put forth plans for the future.

What has been done
An urban neighborhood in Lexington experienced limited community involvement in the development of a long-term cultural plan. Extension educators worked with the local leaders to create an alternative environment for community participation by organizing a walk through the neighborhood.

Results

Several hundred people learned how to conduct cultural walks through the neighborhood. The sensory information provided input into long range cultural plan for the community. The process involved school children, teachers, artists, business people, planners and other stakeholders. It generated a greater sense of community awareness and new possibilities for the neighborhood. The local community development corporation is using the ideas from the walks for a long-term plan.

4. Associated Knowledge Areas

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

Outcome #9

1. Outcome Measures

Availability of new tools to determine the impact of farm management decisions on profitability

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Precision agriculture technologies can provide farm managers with a means to increase production, profitability and environmental stewardship, but they need guidance to determine the economically optimal use of precision technologies. Farmers are often faced with information from industry touting a generic return on investment of precision agriculture technologies that are

inflated with simple techniques that ignore the time value of money. Research is needed to provide information that farm managers can use to determine whether to adopt particular agricultural technologies and how best to optimize their use.

What has been done

Applied research was conducted on the economic potential of high-speed planting. Analysis was conducted for 12-row and 16-row planter scenarios on a representative 1000h grain farm in Kentucky. A whole farm analysis was also completed for a Kentucky commercial operation to maximize the net returns using variable maturity group of corn and soybeans. Derived demand for drying and storage equipment throughout harvest was estimated corresponding to profit-maximizing combinations of grain types, their respective maturity groups, and yield potential over different topsoil depths.

Results

Whole farm optimization modeling of a 1000 ha Kentucky corn and soybean operation found that operating cost savings (labor, fuel, tractor repairs) and yield increases together overcome the annual ownership costs of high-speed planting technology. Changes in farm net returns are positive for all 12-row planter scenarios and double speed cases for the 16-row planter though not for a 50% increase in speed with the 16-row planter. The greatest profit potential occurred when adopting the combination of high speed planting and variable rate application (VRA), with increased net returns of up to 6.57% compared to conventional speed without VRA for the 12-row planter.

Results of the variable maturity group planting analysis showed that drying equipment becomes a limiting factor in the proposed system, preventing storage facilities from reaching full capacity. Overall, producers with access to variable rate maturity group planting technology need to be aware of the implications their planting strategy has on net returns and the use of harvest equipment such as dryers and grain bins so they might capture full value in the futures market. The results of these studies were incorporated into extension programs geared toward maximizing economic profitability of grain farms in the state.

4. Associated Knowledge Areas

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

levels of expertise within communities

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Pre/post evaluations, observations, case studies

Key Items of Evaluation

Case studies

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%	2%	0%	2%
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	10%	8%
205	Plant Management Systems	28%	33%	8%	3%
211	Insects, Mites, and Other Arthropods Affecting Plants	0%	0%	15%	0%
212	Pathogens and Nematodes Affecting Plants	0%	0%	8%	0%
215	Biological Control of Pests Affecting Plants	0%	0%	8%	6%
216	Integrated Pest Management Systems	0%	0%	5%	1%
301	Reproductive Performance of Animals	0%	0%	5%	0%
302	Nutrient Utilization in Animals	0%	0%	11%	0%
303	Genetic Improvement of Animals	0%	0%	0%	3%
304	Animal Genome	0%	0%	5%	5%
307	Animal Management Systems	22%	62%	5%	69%
311	Animal Diseases	0%	0%	5%	0%
313	Internal Parasites in Animals	0%	0%	5%	0%
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals	0%	0%	5%	0%
315	Animal Welfare/Well-Being and Protection	0%	0%	5%	0%
601	Economics of Agricultural Production and Farm Management	0%	1%	0%	2%
604	Marketing and Distribution Practices	2%	0%	0%	0%
704	Nutrition and Hunger in the Population	48%	2%	0%	1%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	180.0	9.0	105.0	19.1
Actual Paid	131.0	5.2	158.5	20.5
Actual Volunteer	44232.0	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**
2585374	364999	4303517	950346
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
2443469	75845	4303517	762485
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	20876980	0

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 •Establishing a Grains Center of Excellence at UK's Research and Education Center at Princeton •Featured programs for this plan of work cycle will include: Grain Crops Academy, Master Grazer Program, Horse College and the Innovative Tobacco Producer Program •Goat Production and Management Programs •Small Farm Program at KSU will focus on needs of small and limited resource farmers, •The Kentucky Fruit and Vegetable Conference plays a major role in commercial horticultural producer education •Third Thursday programs will be conducted at KSU and their research and demonstration farms will attract small and limited resource farmers and will also serve as training for County Extension Agents and students •Aquaculture and Fish Disease/Management Programs •Master Cattlemen and advanced Master Cattlemen programs will be conducted •Educational programs qualifying producers to receive Tobacco Settlement funds in the areas of goats, forages, bull selection and hay storage will improve producer skills in these areas •New Research findings from KSU's Aquaculture Research center, pawpaw, goats, and honeybees will be the subject of field days and meetings to bolster the expanding alternative in Kentucky and the Southern Region Demonstration and training for appropriate production and processing of pastured poultry and honey. •Home-based processing training •On-site food demonstrations

Ongoing research at UK supporting competitive agriculture will include: •plants and their systems (corn, soybeans, wheat, forages, horticultural crops, specialty crops like chia and industrial hemp)

•animals and their systems (beef, horses, dairy, swine, and poultry) with special emphasis on forage-based production •technologies for precision agriculture •biology, ecology and control of insect pests in plant, animal, and human systems •development of food and non-food products •how socioeconomic factors and food system structure impact food purchasing choices in rural and urban

communities •optimization of irrigation in row crop and horticultural production

KSU has active research areas in areas of: • Aquaculture projects are concerned with the commercialization of paddlefish and other aquaculture species, nutrition and diet formulation for freshwater and saltwater crustaceans ant other aquaculture speices, 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. • 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. • Drought resistance of agronomic crops. • 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?

Reference materials

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1058445	12471826	264736	3117957

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

Patent Applications Submitted

Year: 2017

Actual: 1

Patents listed

App. no. 62346728 Fungal chromosome-end knockoff strategy. Inventors: Schardl, Florea, Farman

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	7	122	129

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Contact numbers and publication numbers are included

Year	Actual
2017	0

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	Development of new niche crops for small farmers in Kentucky and the surrounding region.
6	Number of residents indicating a willingness to support local food markets as a result of awareness raised through Extension programming.
7	Number of residents reporting an increase in accessing fresh, local foods
8	Number of individuals reporting that they utilized delivery systems/access points (e.g. farmers markets, CSAs WIC, Food Panty) that offer healthy foods
9	Number of individuals who assessed the cost savings and/or benefits associated with newly adopted practices
10	Number of people who increased access to vegetables through Farmers Markets, farm-to-institution and community supported agriculture programs
11	Development of shrimp production in recirculating aquaculture systems as a niche crop for small farmers in Kentucky and the surrounding region.
12	Availability of non-drug based tools for increasing reproductive efficiency in agricultural animals
13	Availability of new methods for biological control of invasive pests
14	Availability of new tools to manage plant diseases

Outcome #1

1. **Outcome Measures**

Number of families who gained knowledge about eating healthy foods

Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

Number of families that reported eating more healthy foods

Not Reporting on this Outcome Measure

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.)

Not Reporting on this Outcome Measure

Outcome #4

1. **Outcome Measures**

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

Not Reporting on this Outcome Measure

Outcome #5

1. **Outcome Measures**

Development of new niche crops for small farmers in Kentucky and the surrounding region.

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Number of residents indicating a willingness to support local food markets as a result of awareness raised 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
2017	39211

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
A significant portion of Kentucky's population is unhealthy and almost 17% of the total population of Kentucky is food insecure, including 22% of Kentucky's children. Furthermore, Kentucky ranks as the 12th highest state in adult obesity, and the highest in high school student obesity, 13% of the adult Kentucky population has diabetes, and 39% of the adult population has hypertension. Establishing a strong, accessible local food system has proven to address such issues as food insecurity as well as helping to reverse poor health outcomes such as obesity, diabetes, and hypertension in other states.

What has been done
The University of Kentucky Cooperative Extension Service and the Kentucky Nutrition Education Program are actively involved in supporting the success of local food systems through farmers' markets, community supported agriculture, farm-to-school programs, urban agriculture, community gardens, and agritourism. Also, The University of Kentucky Human Environmental Sciences (HES) Supplemental Nutrition Assistance Program Education (SNAP-Ed) and the Community & Economic Development Initiative of Kentucky (CEDIK) collaborated with eight county Extension offices in a project to engage community members and health program leaders in learning more about local health related policies, systems and environment (PSE).

Results
Following listening sessions conducted by Extension, feedback was gathered from participants regarding the impact of the facilitated process. When asked if the focus group experience improved their awareness of community policies, community systems of operation, or community environment, 58% of the participants responded very much, while 39% noted a little Improvement. In addition, 68% of service providers and 44% of community member participants

identified positive changes their organization or family can make related to policies, systems, or environment.

4. Associated Knowledge Areas

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

Outcome #7

1. Outcome Measures

Number of residents reporting an increase in accessing fresh, local foods

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	38037

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Food insecurity is rapidly increasing across the state of Kentucky. There is a need to address the number of children and families with little access to healthy food choices.

What has been done

Magoffin County offered training in Good Agricultural practices (GAP) for food safety. In Ballard County, the ANR agent developed a module to teach kids the origin of the food they eat. Caldwell County Cooperative Extension and Farmers Market supporters collaborated to host a free Farm to Table Dinner which featured all local products.

Results

In Magoffin County, a total of 13 market vendors received their diploma in Good Agricultural Practices (GAP), a program that addresses food safety concerns and aims to decrease the likelihood of cross contamination of fresh fruits and vegetables. In addition to GAP training, eight vendors completed the WIC training and were able to accept WIC vouchers for the first time. Furthermore, the agent received a grant on behalf of the market from Community Farm Alliance's Double Dollar initiative which allowed WIC participants to double their vouchers on purchases made at the market. In Morgan County, residents reported a 95% increase in purchase & preparation of locally grown fruits & vegetables for families. The Boone County SNAP Ed program saw an 84% overall improvement in the diets of 54 program participants. In Christian County, $500 were collected and donated to Feeding America & Kentucky's Heartland and will provide 3,500 meals to individuals and families.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
307	Animal Management Systems
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices
704	Nutrition and Hunger in the Population

Outcome #8

1. Outcome Measures

Number of individuals reporting that they utilized delivery systems/access points (e.g. farmers markets, CSAs WIC, Food Panty) that offer healthy foods

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	19080

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Local Farmers Markets play a key role in the local food system by providing access to fresh and nutritious fruits, vegetables, eggs, and other locally produced goods. The local markets often fill the void in low economic areas, providing these high quality items to all socioeconomic classes.

What has been done
There were 10,558 Kentucky families enrolled in the KYNEP nutrition educational curriculum series and over 20,000 lessons were taught. The Clark County Extension Office collaborated with a local organization to provide information to seniors on the importance of fruits and vegetables in the diet, food demonstrations and taste testing on how to select and prepare fruits and vegetables and provided sign-ups for Senior Farmer Market Nutrition Program Vouchers.

Results
In regard to accessing foods throught the nutrition education program, participants reported that 95% made a positive change in food group choices. In Clark County, through the Senior Farmer Market Nutrition Program Vouchers over $2,124 worth of fresh fruits and vegetables were purchased.

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 #9

1. Outcome Measures

Number of individuals who assessed the cost savings and/or benefits associated with newly adopted practices

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	3215

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The ability to obtain a household budget is crucial for the financial and physical well-being of most families. Budgeting and financial management are crucial skills for healthy family and farm life. It is also essential in operating a farm or business.

The task of food production has traditionally been in the hands of aging farmers. To increase the production of food and meet the demands of an ever-growing population, the involvement of young people in agriculture must be encouraged. The Food and Agriculture Organization of the United Nations (FAO) reported the realization that youth are the future of food security is obvious, yet few young people indicate an interest in agriculture.

What has been done

Kentucky State University hosted a two-day workshop with over 200 people in attendance from 12 different Eastern KY counties. Farmers learned how to produce Pasture Poultry, proper goat management, farm finances, proper soil management, hoop house production. The Warren County Cooperative Extension Service provided technical support for the Southern Kentucky Marketplace. The horticulture extension agent trained 9 producers through the Produce Best Practice Training.

The Kentucky State University Extension Program continues to advocate the involvement of youth in agriculture by supporting young adults with a Small Commercial Vegetable (SCV) enterprise.

Results

Based on reports from the market manager in Warren County, projected sales for the 2017 growing season were estimated at $185,000 for 47 farm businesses. Those reports also showed an average of 493 consumers attending the market each Saturday to purchase local food.

The KSU Small Farms Program agent was able to illustrate the commercial production of strawberry and cut greens on black plastic mulching as an effective way to minimize the amount of dollars invested on the farm to produce high-quality SCV products for sale at maximum profit.

The Extension Agent was able to assist a young man who grew up in inner-city Louisville begin crop production on one acre. In the future, the young farmer plans to increase the acreage under production to 10 acres producing SCVs and ultimately to thirty acres in subsequent years.

4. Associated Knowledge Areas

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

604	Marketing and Distribution Practices
704	Nutrition and Hunger in the Population

Outcome #10

1. Outcome Measures

Number of people who increased access to vegetables through Farmers Markets, farm-to-institution and community supported agriculture programs

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	1070

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Over the last several years, there has been a call for consumers to buy locally grown produce and meat. However, there is still a limited target audience that enjoy all the market has to offer.

What has been done
Several counties have expanded the reach of their Farmers Markets.

Results
Menifee County experienced a 560% increase in WIC Vouchers. Scott County's new location has quickly filled to capacity with a total of 14 vendors selling locally grown, made and produced fruits and vegetables, soaps, jams, spreads and crafts. Martin County distributed WIC vouchers to 150 WIC recipients and Senior vouchers to 80 Senior Citizens (to be used at the local Farmers market). The Owsley County Farmers Market Partnered with Mountain Comprehensive Health Care who has a Clinic in the County to improve the Health of Individuals and their families by means of a more nutritional diet by receiving fresh fruits and vegetables FREE from the Farmers Market.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
201	Plant Genome, Genetics, and Genetic Mechanisms
205	Plant Management Systems

211	Insects, Mites, and Other Arthropods Affecting Plants
215	Biological Control of Pests Affecting Plants
303	Genetic Improvement of Animals
307	Animal Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #11

1. Outcome Measures

Development of shrimp production in recirculating aquaculture systems 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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Shrimp is the most popular seafood item in the United States, but 85% or more of the shrimp we consume is imported. Many of the aquaculture practices employed in developing countries to produce shrimp have questionable environmental and human health implications. Furthermore, the demand for fresh, never frozen shrimp in the US cannot be satisfied by imports and is difficult to fulfill at inland locations with wild-caught shrimp.

What has been done
Trials were conducted in indoor tanks to explore important shrimp production characteristics and ways of improving those characteristics using sustainable, recirculating aquaculture technologies, which can be utilized at inland locations near metropolitan markets to produce fresh, high-quality shrimp. A series of experiments examined shrimp stocking densities and plastic substrate addition to the culture tanks.

Results
Sustainable indoor recirculating systems for shrimp production were developed. Water quality and shrimp production metrics are affected by density and substrates used to culture shrimp. This project provided farmers with information on how to establish effective shrimp farming operations to provide safe, fresh shrimp that are desirable by consumers and produced using

environmentally friendly methods.

4. Associated Knowledge Areas

KA Code	Knowledge Area
303	Genetic Improvement of Animals
307	Animal Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #12

1. Outcome Measures

Availability of non-drug based tools for increasing reproductive efficiency in agricultural animals

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Impaired reproductive performance is a major cause of reduced productivity for ruminants and of reduced profitability for dairy and meat animal producers. In Kentucky, beef producers often operate on endophytic fungus infected-tall fescue pastures (EIF) grown in selenium (Se)-poor soils, which provides challenges to production efficiency. Ovarian-produced steroids are known mediators of oviductal function, and the manipulation of ovarian physiology by synchronization of estrus may be affecting the ability of the oviduct to promote early embryonic development. By enhancing basic knowledge of the underlying biology surrounding ovarian function and embryonic survival, new strategies can be developed for application by producers and veterinarians. Further, strategies for optimum selenium supplementation may have positive effects on reproduction. Management strategies that are not drug-based are needed to provide options that are economic and user-friendly to producers as well as consumers while preserving food quality and safety.

What has been done

UK Animal Science researchers set out to reveal how ovarian produced steroids are affecting the ability of the oviduct to establish a pregnancy. Gene expression technologies were used to determine which genes present in the oviduct, genes known to encode for fertility-related mRNA, are regulated by changing steroidal profiles. Following determination of steroid-regulated genes,

their cellular localization within the different sections of the oviduct was determined by immunohistochemistry. Researchers also investigated whether specific forms of selenium supplementation affect follicular growth and the production of steroids. The researchers completed a transcriptomal analysis describing how estradiol/estrogen receptor a (ESR1) affects the oviductal and collected new evidence describing how the form of supplemental selenium supplied to forage-based grazing beef cattle affects ovarian function and fertility.

Results

Research revealed that a 1:1 blend of organic and inorganic forms of selenium (MIX) increased early luteal phase concentrations of progesterone. Subsequent breeding results indicate support the hypothesis that this increase in progesterone increases fertility. In year one, conception to a single artificial insemination was increased from 32 to 62% in cows maintained on MIX versus the industry standard of inorganic selenium alone. In year 2, conception rates were increased from 44 to 61% in cows maintained on MIX versus inorganic selenium alone. Evidence suggests that the MIX-induced increase in early luteal phase concentrations of progesterone advances development of the uterine endometrium, facilitating early embryonic growth and the establishment of a viable pregnancy. These results can be incorporated into beef and dairy management systems to improve reproductive efficiency in operations like many found in Kentucky.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals

Outcome #13

1. Outcome Measures

Availability of new methods for biological control of invasive pests

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many pest insects show variability in their biology: some strains ("biotypes") might attack different plant species than others. When new biotypes occur in pest insects, they often cause new problems, and existing methods of control may become ineffective. Understanding what causes this sort of variation is an important step toward predicting pest problems and improving pest control.

Recent research has shown that some of this variability in pest insects is caused by bacterial symbionts, which are often inherited by offspring from the mother. Sometimes symbionts are transferred among insect species. Bacterial symbionts have also been shown to affect which enemies can successfully attack the pest. A better understanding of how symbionts influence the distribution of pests and their natural enemies is needed to devise new and effective management techniques.

What has been done

UK entomology researchers are manipulating symbiont infection in a pest aphid and evaluating how this affects host plant usage and susceptibility to attack by aphid enemies. They are also evaluating how effective aphid defenses (symbiont-derived or not) are against various natural enemies, and whether defended aphid populations are more prone to being pests than undefended aphids.

Results

Researchers have found that some strains of the cowpea aphid are toxic to the introduced multicolored
Asian lady beetle, but are NOT particularly toxic to other ladybeetle species, including native species. The cowpea aphid can act as a "refuge" food source for these other ladybeetles in the field, providing them with a resource that is relatively free from a dominant invasive species. These results indicate that the cowpea aphid serving as a food source for non-invasive ladybeetles could play a critical role in preserving
native predators from displacement by an invasive predatory species.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
215	Biological Control of Pests Affecting Plants

Outcome #14

1. Outcome Measures

Availability of new tools to manage plant diseases

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Epichloë coenophiala, the fungal endophyte of the forage grass tall fescue, provides the grass protection from stresses such as drought, from invertebrates such as insects and nematodes, and from small and large grazing animals. Protection from invertebrates and small mammals is agriculturally beneficial, but toxicity to livestock is a problem. The endophyte produces chemicals called alkaloids as part of the plant defense. Among these, a complex ergot alkaloid, ergovaline, is particularly toxic to livestock. By understanding the importance of different alkaloids we can begin to identify endophytes with or genetically alter them for the most beneficial alkaloid profiles.

What has been done
The genome of an E. coenophiala from tall fescue cultivar Kentucky 31 was sequenced. Two homeologous clusters of genes were identified and designated EAS1 and EAS2, of which EAS1 had 11 ergot alkaloid biosynthesis genes, and EAS2 had copies of all 11 genes but with one inactivated by natural mutation. Taking advantage of the location of EAS1 near a chromosome end, a novel method was developed to efficiently eliminate all of the EAS1 genes, and the resulting EAS1 deletion mutant (exgenic strain) was introduced into tall fescue plants.

Results
Plants with the exgenic strain lacked the ergovaline toxin as expected, but surprisingly also lacked most other intermediate ergot alkaloids. When the wild-type lpsB gene from the EAS cluster of a related species was introduced into the exgenic strain it restored ergovaline production. Genome sequence results indicated that no exogenous genes were present in the exgenic strain, and the only exogenous DNA was a 45-bp oligonucleotide introduced by the procedure adjacent to the telomere sequence repeats that protect the end of the chromosome from which the EAS1 gene cluster had been removed. A strain of tall fescue lacking ergovaline was generated by elimination of one of two clusters of ergot alkaloid biosynthesis genes, and that strain and the novel method to produce it are the subject of a patent application. Subsequent commercialization of this strain provides a new tool for forage based animal agriculture to avoid the damaging impacts of fescue toxicosis.

4. Associated Knowledge Areas

KA Code	Knowledge Area
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals

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

cross programming, participant response/involvement levels

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Increase in knowledge and awareness; more positive behavior changes

Key Items of Evaluation

Post evaluations, follow up assessments, testimonials

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%	14%	0%
102	Soil, Plant, Water, Nutrient Relationships	33%	4%	38%	3%
104	Protect Soil from Harmful Effects of Natural Elements	0%	0%	3%	18%
111	Conservation and Efficient Use of Water	0%	0%	4%	0%
112	Watershed Protection and Management	5%	15%	0%	0%
123	Management and Sustainability of Forest Resources	7%	4%	0%	11%
125	Agroforestry	0%	6%	0%	0%
131	Alternative Uses of Land	0%	4%	0%	5%
133	Pollution Prevention and Mitigation	26%	0%	14%	0%
135	Aquatic and Terrestrial Wildlife	0%	32%	9%	3%
136	Conservation of Biological Diversity	0%	0%	6%	0%
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	0%	15%
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%	0%	2%	0%
205	Plant Management Systems	12%	0%	0%	34%
216	Integrated Pest Management Systems	1%	0%	1%	0%
301	Reproductive Performance of Animals	0%	0%	9%	0%
402	Engineering Systems and Equipment	0%	22%	0%	7%
403	Waste Disposal, Recycling, and Reuse	0%	13%	0%	0%
605	Natural Resource and Environmental Economics	16%	0%	0%	4%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	35.0	4.0	20.0	9.8
Actual Paid	100.0	2.3	11.9	7.1
Actual Volunteer	46504.0	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**
1988749	71036	772635	328009
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
1879592	89834	772635	191543
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	3330430	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

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

• Master Gardener Program consisting of 12-15 three-hour sessions related to gardening, resource management, botany, soils, pesticides and pesticide safety •Master Logger program consisting of three one-day sessions focusing on best management practices, safety, laws and regulations •Integrated Pest Management programs including programs aimed at homeowner application of pesticides and fertilizers. •Woodlot owner education program focusing on best management practices, harvesting, contracts, wood products and alternative forest products. •Water quality, Water Pioneer, daycamps, and forestry camp programs aimed at developing a better understanding of stewardship between youth and the environment.

Agricultural and environmental research at UK includes: • best management practices for improving water quality on farms, rural home sites, in horticultural operations and mine reclamation sites •impact of reclaimed water and solids use on soil and human health •examination of micro- and nano-scale particles in the soil environment •soil microbial community structure and function •investigating how soil physical properties impact biogeochemical processes across multiple scales in cropping systems •environmental impact and hazard of chemical pesticides in landscapes and turf •impact of feral horse populations and management strategies on agricultural lands

KSU Extension Programs will continue to support efforts related to policies to improve environmental quality •Gardendata.org •Organic Agricultural Programs

KSU research projects focusing on improving environmental quality include: •Organic production practices, •biochar and biofilters for on-farm bioremediation of pesticide residues in surface runoff and seepage water arising from agricultural fields, • soils quality, carbon flow, and greenhouse gasses in forest resource management, and 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?

Resources for programming

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	729184	9958355	203095	2808767

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

Patent Applications Submitted

Year:	2017
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	288	22	310

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

● Contact numbers and publication numbers are included

Year	Actual
2017	0

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	Number of landowners who implemented one or more new best practices for soil conservation as a result of Extension programming
6	Number of individuals who made informed decisions that affect water quality
7	Number of producers reporting changed or improved pasture management practices
8	Number of youth who use their skills to conserve natural resources
9	Availability of strategies to protect pollinators

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

   Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

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

   Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

   Number of individuals utilizing forest management practices recommended by Extension

   Not Reporting on this Outcome Measure

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)

   Not Reporting on this Outcome Measure

Outcome #5

1. **Outcome Measures**

   Number of landowners who implemented one or more new best practices for soil conservation as a result of Extension programming

2. **Associated Institution Types**

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

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	2110

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
As the cost of buying farmland and renting farmland has exploded over the last few years, more farmers are looking at ways to improve the land they already own and make it more productive. Soil testing is one of the most important management tools of any crop production program. Soil testing can increase yields by enabling the producer to apply exactly what is needed and can save money by eliminating over application of unneeded nutrients.

Nutrient pollution is one of America?s most challenging environmental problems. Leading the list of contaminants are nitrogen and phosphorous, which are commonly found in lawn and garden fertilizers and natural amendments.

What has been done
Extension continues to provide research-based education on the importance of proper soil management.

UK's Cooperative Extension Service is teaming with homeowner associations, master gardeners, and other community organizations to implement a public education program (No P on My Lawn) to engage Fayette County residents on proper nutrient management.

Results
A Carter Co. producer stated that he saved $480 an acre on 18 acres of tobacco by adhering to the knowledge gained from Extension. Soil testing in the county increase from 88 in the previous year to 254 in the year to follow.

Five pilot workshops were held to assess and refine program content and delivery. The first workshop was presented to 12 Master Gardeners who will be trained as a second cohort of educators. Their feedback augmented the refinement of the program for the residential audience. To initiate the program, Extension partnered with the Urban Forest Initiative utilizing their existing community contacts and previous summer workshop experience. The programs linked through the common denominator of stormwater management. This partnership also served to assist homeowners connect their actions in their lawn to the health of their trees; Of the 40 participating homeowners, 20 signed up to conduct a soil test. The majority of participants indicated that they will be more mindful of application of nutrients and consult with their lawn care company to determine if excess fertilizer is being applied.

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
205	Plant Management Systems
216	Integrated Pest Management Systems

Outcome #6

1. Outcome Measures

Number of individuals who made informed decisions that affect water quality

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	3958

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The Kentucky Agriculture Water Quality Act was passed in 1994 and requires farms 10 acres or greater in size to have a water quality plan developed and implemented to protect water resources. Despite the law being in place for more than 20 years, many farmers are not aware of the requirement.

What has been done
Specialists from Agriculture Extension Programs and Agricultural Communications developed and produced three promotional videos encouraging farmers to develop and implement water quality plans. The videos feature Kentucky farmers who successfully balance water quality plan implementation with production agriculture, and leave the viewer with information on how to develop a plan for his/her farm. Approximately 250 Kentucky high school students participated in two Kentucky Envirothon regional training days related to agricultural soil and water conservation stewardship.

Results
In Morgan County, 325 producers have participated in Extension programming. As a result, sixty percent of these producers have indicated increased knowledge of the importance of improved water quality, the need for nutrient management and ag water quality plans, and how reducing environmental impacts can improve livestock performance. Several farmers have also reported implementing measures to control mud and manure handling, better nutrient application practices,

and longer grazing seasons.

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 #7

1. Outcome Measures

Number of producers reporting changed or improved pasture management practices

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	3330

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Proper pasture management is vital to livestock. Extension remains a primary resource for producers who wish to maximize their herd operations.

What has been done
Forty eight producers, conservation district, NRCS, UK agents and industry professional recently completed a two day grazing school at the UK Grain and Forage Center of Excellence in Princeton. A Forage School was held in Livingston County with 45 participants. The school was co-hosted by agents from Crittenden, Livingston, Lyon, Marshall and McCracken counties.

Results
A total of 94% of the Forage School participants felt it was well organized and 84% thought it was related to the current needs of the industry. Sixteen farmers indicated that in the next month they would fertilize, pull soil samples, over seed pastures, plant annuals or get more information. In the

next six months the farmers indicated they would try many different practices to improve their forage production including testing fescue for toxins, clipping pastures, and/or reseed.

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 #8

1. Outcome Measures

Number of youth who use their skills to conserve natural resources

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	41116

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Kentucky has over 91,000 miles of rivers and streams and more than 225,000 acres of ponds, lakes, and reservoirs. These water resources not only play a vital role in Kentucky's drinking water systems, but also are imperative to our agriculture industry. Our youth need to play an active part in knowing how to protect this vital resource.

What has been done
The 4-H Natural Resources and Environmental Sciences Academy (NRESci) is a three-year program designed to teach middle and high school aged youth about their natural environment. The overall goal of the program is for youth to develop a greater understanding of natural resources and environmental sciences in Kentucky while increasing leadership skills.

Results
The Natural Resources Program engages 4-H members in a variety of hands-on activities and experiences that foster an increased understanding and appreciation for Kentucky's natural

resources. Projects and activities are offered in the areas of environmental science, entomology, forestry, geology, soils, water, and wildlife. As a result of the program, 7,026 youth used their skills to conserve natural resources , a total of 7,259 youth were able to identify the natural resources in their community, a total of 10,624 youth gained an understanding of the ecosystems in nature and 1,092 youth engaged in a community service project related to natural resource 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
131	Alternative Uses of Land
403	Waste Disposal, Recycling, and Reuse

Outcome #9

1. Outcome Measures

Availability of strategies to protect pollinators

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

There is growing concern about the decline of the bees which provide >$20 billion value in pollination services to US Agriculture and how urban pest management may be contributing to that decline. Land care professionals and homeowners must be able to manage destructive pests such as emerald ash borer or Japanese beetle without harming the environment or contributing to health risks. Simple, cost effective strategies are needed for supporting pollinator habitat within the urban landscape.

What has been done

Pollinator assemblages associated with >75 species of flowering trees and shrubs were assessed at >350 landscape sites in central KY and southern OH. Identifications were made for 50 bees at each observed plant or planting. Observations were repeated for each plant species at five different sites.

Results

This project resulted in a list of ornamental landscape plants common to the Ohio River Valley that rated as bee-friendly. The list includes rating of relative bee-friendliness and time of blooming to assist landscapers and homeowners in making landscaping decisions that also support pollinator habitats. This was the first study of its kind and has generated a user-friendly tool that can be used through extension and other outreach partners.

4. Associated Knowledge Areas

KA Code	Knowledge Area
136	Conservation of Biological Diversity
216	Integrated Pest Management Systems

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

individuals' levels of participation, response rate of surveys, length of programs

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Change in knowledge/skills/practices/behaviors

Key Items of Evaluation

Surveys, reports

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	11%	0%	5%	0%
502	New and Improved Food Products	0%	0%	25%	0%
503	Quality Maintenance in Storing and Marketing Food Products	0%	0%	5%	0%
603	Market Economics	0%	0%	40%	0%
703	Nutrition Education and Behavior	43%	100%	0%	29%
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	33%	0%	5%	0%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	13%	0%	20%	51%
723	Hazards to Human Health and Safety	0%	0%	0%	20%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	12.0	3.0	10.0	3.1
Actual Paid	24.0	0.1	4.5	5.1
Actual Volunteer	22632.0	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**
497187	5196	476469	333499
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
469898	0	476469	92023
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	921001	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

-Training and certification workshops will be conducted for home-based microprocessors
-Research will be conducted on the identification of best practices to reduce contamination of food pathogens and toxins
-Research will develop better detection methods for monitoring food risks
-Research includes analysis of how changing food safety standards impact producers
-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

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?

Reference materials

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	186832	913407	173544	843144

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

Patent Applications Submitted

Year:	2017
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	13	3	16

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Contact numbers and publication numbers are included

Year	Actual
2017	0

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
4	Number of producers who were encouraged by Extension programming to seek additional training on food safety (FAP, FSMA, etc.)
5	Number of producers who were successfully trained by Extension on food safety (GAP or FSMA)
6	Number of individuals who demonstrated safe handling and preparation of food

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)

Not Reporting on this Outcome Measure

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)

Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

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

Not Reporting on this Outcome Measure

Outcome #4

1. **Outcome Measures**

Number of producers who were encouraged by Extension programming to seek additional training on food safety (FAP, FSMA, etc.)

2. **Associated Institution Types**

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

3a. **Outcome Type:**

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	1151

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The U.S. FDA (Food and Drug Administration) is responsible for regulating 80% of the US food supply and has worked closely with different federal, state, and local agencies to establish regulatory guidelines. Food safety issues continue to be a problem. According to reports by the Centers for Disease Control and Protection (CDC), 48 million people suffer from foodborne illness or disease every year.

What has been done
The University of Kentucky Food Systems Innovation Center (UK-FSIC) through its certified FSMA preventive controls for human food (PCHF) trainers offered the course to 5 health inspectors/regulators from the Kentucky Department of Public Health Food Safety Branch and 10 industry personnel from 5 different food industries in Kentucky.

Results
All 15 participants successfully completed the 3-day course by completing breakout exercises at the end of each of the 16 chapters and obtained PCQI certificates. As PCQI's the 5 inspectors can now work across the state of Kentucky to oversee and help Kentucky based food processors in the preparation of prevention based food safety plans to meet the FDA's new regulatory requirements. The 10 food industry personnel will do the same within their companies to meet the FDA's new regulatory requirements.

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 #5

1. Outcome Measures

Number of producers who were successfully trained by Extension on food safety (GAP or FSMA)

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	1024

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The U.S. FDA (Food and Drug Administration) is responsible for regulating 80% of the US food supply and has worked closely with different federal, state, and local agencies to establish regulatory guidelines. Food safety issues continue to be a problem. According to reports by the Centers for Disease Control and Protection (CDC), 48 million people suffer from foodborne illness or disease every year.

What has been done
The University of Kentucky Food Systems Innovation Center (UK-FSIC) through its certified FSMA preventive controls for human food (PCHF) trainers offered the course to 5 health inspectors/regulators from the Kentucky Department of Public Health Food Safety Branch and 10 industry personnel from 5 different food industries in Kentucky.

Results
Extension tested, reviewed and issued process review letters for 42 different products from 17 small businesses in Kentucky. This Process Authority letter helped all 42 processors obtain a commercial permit from the Kentucky State Food Safety branch, which authorizes the processors to sell their value added products at any market not just in Kentucky or within the U.S but also across the globe.

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 #6

1. Outcome Measures

Number of individuals who demonstrated safe handling and preparation of food

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	12554

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
According to the most recent data from the Kentucky Cabinet for Health and Family Service's Report, there were 110,516 Supplemental Nutrition Assistance Program (SNAP) recipients in Jefferson County, Kentucky. In order to bridge the gap between providing access to nutritious foods and a lack of knowledge regarding healthy food preparation, nutrition education programs have been designed and implemented.

What has been done
The Kentucky Nutrition Education Programs encompass two separate USDA programs: The Expanded Food and Nutrition Education Program (EFNEP), and the Supplemental Nutrition Assistance Program (SNAP-Ed). Both programs target low income families and individuals with nutrition education. The goals of both are to educate limited resource families with young children and Food Stamp clientele to plan nutritious meals on a limited budget, acquire safe food handling practices, improve food preparation skills and change behavior necessary to have a healthy lifestyle.

Results
A total of 453 adults completed the Nutrition Education Program in Jefferson County. Of these program graduates, 60% demonstrated an improvement in food safety practices. In Taylor County, The first food safety seminar discussed the use of Genetically Modified Organisms (GMOs) in the food system both truths and myths. As a result of this program: 100% of participants have a better understanding of how GMOs affect our food supply, 78% of participants feel more confident about GMO use in our food supply.

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

awareness of subject matter

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Change in knowledge and practices

Key Items of Evaluation

Surveys, testing

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%	33%	0%
102	Soil, Plant, Water, Nutrient Relationships	0%	0%	34%	0%
132	Weather and Climate	17%	100%	33%	100%
403	Waste Disposal, Recycling, and Reuse	60%	0%	0%	0%
601	Economics of Agricultural Production and Farm Management	23%	0%	0%	0%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.5	1.0	0.6
Actual Paid	9.0	0.4	1.6	0.1
Actual Volunteer	2836.0	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**
198875	34458	70969	10392
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
187959	0	70969	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	669949	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 conduct research and educational programs for Extension agents and agricultural producers on ways to reduce risks
-Research on the impact of climate change on the ecology of plant pests and diseases is conducted
-Creation of new technologies and best management practices for managing production systems and on-site wastewater treatment in response to climate change and variability is ongoing
-KSU will offer a floating science lab to show students the impact of climate and human use on aquatic systems.

2. Brief description of the target audience

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

3. How was eXtension used?

Resource materials

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	94427	1507334	14589	225234

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

Patent Applications Submitted

Year:	2017
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	3	6	9

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Contact numbers and publication numbers are included

Year	Actual
2017	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of individuals reporting changes in knowledge, opinions, skills or aspirations related to the impact of public policies on agriculture and the environment
2	Number of individuals reporting an increase in knowledge, opinions, skills or aspirations related to climate change
3	Number of individuals reporting improved knowledge, opinions, skills, and/or aspirations in understanding: disaster preparedness, pest management, going green, energy conservation, solid waste management, water conservation, home safety or built environment
4	Number of producers who incorporated best practices (in regard to soils) recommended by Extension
5	Number of producers making changes to their operation as a result of increase knowledge of economic impacts of environmental policy

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

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

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

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Number of individuals reporting improved knowledge, opinions, skills, and/or aspirations in understanding: disaster preparedness, pest management, going green, energy conservation, solid waste management, water conservation, home safety or built environment

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	66570

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Every year thousands of empty chemical jugs need to be disposed of after all the chemical spraying is done. Due to the materials previously held by these pesticide containers they cannot be recycled with your ordinary household plastics. There is also a need for more residents to properly dispose of hazardous wastes.

What has been done

The Rinse and Return program allows for the proper recycling of these pesticide containers. This reduces the amount of material entering the landfill or being disposed of by other means. Some of the end products include drainage pipe, highway sign posts, underground utility conduit, and wire/cable spool flanges. Campbell County hosted a hazardous waste disposal program.

Results
Campbell County participation rose by 31% in regard to hazardous waste disposal participation. A total of 48% of participants disposed of oil or hydraulic fluid, an increase of 16% from last year. 75% of people dropped off paint, and 48% disposed of electronics. Members of the Household Hazardous Waste Coalition, including the County Agent, worked the event with over 100 volunteers from schools and businesses.

4. Associated Knowledge Areas

KA Code	Knowledge Area
132	Weather and Climate

Outcome #4

1. Outcome Measures

Number of producers who incorporated best practices (in regard to soils) recommended by Extension

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	15717

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
There are more than 12 million acres of woodlands in Kentucky. The overwhelming majority (88%) of these woodlands are privately-owned with more than 73 percent of these privately-owned woodlands considered family owned. These woodlands are not only important to the families that own them but they also provide countless ecosystem services and support a major economic engine in the Commonwealth.

What has been done
UK Forestry Cooperative Extension Service, in partnership with the Kentucky Division of Forestry, produces and publishes the grant-supported Kentucky Woodlands Magazine (a color 28-page magazine) full of woodland and wildlife information. For each issue, 12,000 copies are printed

with more than 10,500 copies mailed directly to woodland owners across the Commonwealth and the remaining disseminated at educational programs.

Results
Cooperative Extension Service coordinates and delivers statewide educational programs such as the Forestry Webinar Series and the Woodland Owners Short Course. More than 320 woodland owners attended these programs in 2016; combined, they owned over 36,000 woodland acres. Through program evaluations these woodland owners reported they had or would use the information they learned from these programs on 24,297 woodland acres. Through outreach and education, UK Forestry Cooperative Extension Service continues to have positive impacts on Kentucky's families and the woodlands they own which benefits them and the entire Commonwealth.

4. Associated Knowledge Areas

KA Code	Knowledge Area
132	Weather and Climate
601	Economics of Agricultural Production and Farm Management

Outcome #5

1. Outcome Measures

Number of producers making changes to their operation as a result of increase knowledge of economic impacts of environmental policy

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	509

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The average age of farmers in Lincoln County is 57.2 years old. As people age their health begins to change. Ag leaders in Kentucky communities need more information about the health challenges they are personally facing.

What has been done
Extension partnered with the University Of Kentucky College Of Nursing to offer a program about staying healthy and safe on the farm. This program allowed specialists from the College of Nursing and leaders in the community to educate the audience about signs of hearing loss,

arthritis, stress, multitasking and injury, communication, just to name a few.

Results

Participants filled out an initial survey at the event that evening, then had follow up surveys by telephone 2 weeks and 6 weeks after the program. The program revealed that farmers are in need of making plans to better prepare for emergencies on the farm. It was also apparent that female spouses should have a more active role to be prepared to serve in leadership roles when necessary.

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

number of participants with interest

V(I). Planned Program (Evaluation Studies)

Evaluation Results

increase in awareness, practice change

Key Items of Evaluation

surveys, observations

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	63%	100%	0%	0%
204	Plant Product Quality and Utility (Preharvest)	0%	0%	0%	100%
402	Engineering Systems and Equipment	37%	0%	100%	0%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	5.4	0.2	10.0	0.9
Actual Paid	28.0	0.1	6.8	0.4
Actual Volunteer	7294.0	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**
596625	0	200923	20055
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
563877	7546	200923	17434
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	1264412	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research at UK included developing pre-treatment and conversion processes for biomass conversion to fuels and other chemicals of value from a variety of feedstocks.

2. Brief description of the target audience

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

3. How was eXtension used?

Reference materials

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	270180	5878356	106650	2286028

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

Patent Applications Submitted

Year: 2017
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	5	7	12

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Contact numbers and publication numbers are included

Year **Actual**

2017	0

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
5	Number of individuals reporting improved knowledge regarding environmental sustainability and responsibility
6	Number of producers that implemented sustainable practices as a result of participating in Extension programs
7	Number of individuals who implemented one or more energy conservation strategies (at home, on the road, in appliances, water conservation)
8	Number of individuals who implemented one or more new or additional strategies to promote environmental sustainability
9	Availability of economically and logistically viable feedstocks for bioenergy development

Outcome #1

1. **Outcome Measures**

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

   Not Reporting on this Outcome Measure

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.)

   Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

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

   Not Reporting on this Outcome Measure

Outcome #4

1. **Outcome Measures**

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

   Not Reporting on this Outcome Measure

Outcome #5

1. **Outcome Measures**

   Number of individuals reporting improved knowledge regarding environmental sustainability and responsibility

2. **Associated Institution Types**

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	3072

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
With a number of changes in policy in regard to agriculture and farm policies, residents are in need of being educated on the impact on Kentucky farms. Extension maintains an opportunity to be the premier source for providing pertinent information.

What has been done
Farm Series for Women was designed by Nicholas, Scott, Bourbon and Harrison County Agents by using information from an introductory session with over 40 female attendees. Fayette County Extension hosted an Agriculture Education Day at Locust Trace School in Fall of 2016. Presentation were made in the areas of equine production, large and small animal production, veterinary science, environmental science, greenhouse and aquaculture, gardening, biotechnology, and crop production. Hardin County hosted a farm city day.

Results
The Farm Series for Women offered over 250 participants with an educational experience to aid them in their farm and agricultural knowledge. All indicated an increase in awareness. In Fayette County, over 250 students participated in the Agriculture Education Day, learning more about the source of their food. In Hardin, approximately 265 participated in the Farm City Day.

4. Associated Knowledge Areas

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

Outcome #6

1. Outcome Measures

Number of producers that implemented sustainable practices as a result of participating in Extension programs

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	6986

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
With a number of changes in policy in regard to agriculture and farm policies, residents are in need of being educated on the impact on Kentucky farms. Extension maintains an opportunity to be the premier source for providing pertinent information.

What has been done
Boone County Extension focused a series of classes and programs on our local wildlife and ecosystems.

Results
Participants of all classes hosted by Boone County Extension totaled 66 landowners individuals. Topics included local amphibians, wildlife management, forest wildflowers, local reptiles, pond ecosystems, stream ecology, and native grass and pollinator habitats. Participants learned to identify wildlife, the importance of natural areas and biodiversity, and management of land and aquatic areas. Of the evaluated participants in the wildlife management class, 8 have evaluated the natural resources on their land and 15 plan to do so. A total of five participants received cost-share program credits and four participants have requested additional assistance from Extension to further their farm management plans.

4. Associated Knowledge Areas

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

Outcome #7

1. Outcome Measures

Number of individuals who implemented one or more energy conservation strategies (at home, on the road, in appliances, water conservation)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	372

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
With a number of changes in policy in regard to agriculture and farm policies, residents are in need of being educated on the impact on Kentucky farms. Extension maintains an opportunity to be the premier source for providing pertinent information.

What has been done
Todd County Extension offered two classes to educate local citizens about LED lighting. A total of 38 people attended. The classes were designed to help homeowners understand the benefits of LEDs (long life, energy efficiency, instant full brightness, contain no mercury, available in many sizes, shapes, & colors, etc.) as well as their disadvantages (extreme directionality, sensitivity to heat, higher purchase prices (particularly for the 75 and 100 watt-equivalent? bulbs), and higher short-term failure rates compared to incandescent and CFL bulbs).

Results
Participants completing the Todd County program had positive experiences. A total of 96% said their next bulb purchase would be an LED; 100% indicated they better understood light color (soft white vs. daylight, etc.) and that they would make use of bulbs other than the traditional soft white bulbs.
Approximately 96% said they understood that new light bulb packages would soon have a federally-mandated standard label listing light output, color, expected life, and energy use.

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land

Outcome #8

1. Outcome Measures

Number of individuals who implemented one or more new or additional strategies to promote environmental sustainability

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	1970

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Kentucky ranks high in total energy consumption and energy consumption per capita. Many residents need to be educated on the benefits of being proactive to saving energy.

What has been done
Shelby County Extension hosted a outdoor naturalist program to promote environmental sustainability. Boyle County offered Radon programs and hosted arbor week. Madison County Extension hosted an environmental field day.

Results
In Boyle County, A total of 730 students from kindergarten to fifth grade were reached. Teachers reported that 90% of students retained basic knowledge of why trees are important, what they need to grow and how they aid the energy process. In Madison County, 98% of those attending the environmental field day said they would start conserving water at their homes.

4. Associated Knowledge Areas

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

Outcome #9

1. Outcome Measures

Availability of economically and logistically viable feedstocks for bioenergy development

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Industrial hemp is an annual herbaceous crop historically grown for fiber in the U.S. and worldwide. Despite existing applications of industrial hemp based fiber and oil products, hemp-based biofuels and bioproducts represent a new potential application area. Several key questions still remain for the technical and economic feasibility of using hemp as a bioenergy crop. Research in needed to determine the best cultivars and process conditions for maximum biomass yield and conversion to biofuel and bioproducts.

What has been done
A study was conducted to evaluate the agronomic yield of 11 hemp varieties, their potential for conversion to ethanol, and the economic feasibility compared to other biomass feedstocks (e.g. kenaf, switchgrass and sorghum).

Results
Experimental results show an ethanol yield of 85-100 gallons /dry ton hemp stems using dilute alkali or acid pretreatment, enzymatic hydrolysis and fermentation, which is comparable to the other three tested feedstocks. Agronomy data suggest that the per hectare yield of industrial hemp stem alone was at a similar level to the other energy crops such as switchgrass and sorghum; while the hemp plants may require reduced inputs. Field trial also showed that approximately 1200 kg/ha hemp grain can be harvested in addition to stems. A preliminary cost analysis indicates that industrial hemp could generate higher per hectare gross profit than the other crops if both hemp grains and biofuels from hemp stem were counted. These combined evaluation results demonstrate that industrial hemp has great potential to become a promising regional commodity crop for producing both biofuels and value-added products.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

length of programs, use of evaluation tools

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Change in knowledge, opinions, skills, aspirations, behavior

Key Items of Evaluation

Surveys, interviews, testimonials

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	96%	80%	0%	79%
724	Healthy Lifestyle	4%	20%	0%	21%
	Total	100%	100%	0%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	30.0	3.0	0.5	0.6
Actual Paid	8.0	0.5	0.0	0.5
Actual Volunteer	9592.0	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**
198875	20784	0	49883
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
187959	10395	0	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

-conducting educational programs for children
-training extension agents

-developing educational materials
-conducting programs with parents
-conducting research to understand the relationship

2. Brief description of the target audience

-children
-youth
-extension agents
-teachers
-parents

3. How was eXtension used?

Resource materials

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	57695	203080	197378	60660

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

Patent Applications Submitted

Year: 2017
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	2	0	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Contact numbers and publication numbers are included

Year	Actual
2017	0

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)
5	Number of individuals who experienced an increase in knowledge, opinions, skills, or aspirations regarding lifestyle changes (diet, exercise, etc.) that improve personal health
6	Number of individuals who reported improving at least one behavior related to subjects taught (e.g., food preparation, addition of fruits and vegetables into the diet, movement of the body that leads to better physical fitness, and reducing the risk of chronic disease)
7	Number of children grades 3-5 who report eating vegetables & fruits
8	Number of youth that report making healthy lifestyle choices

Outcome #1

1. **Outcome Measures**

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

   Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

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

   Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

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

   Not Reporting on this Outcome Measure

Outcome #4

1. **Outcome Measures**

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

   Not Reporting on this Outcome Measure

Outcome #5

1. **Outcome Measures**

   Number of individuals who experienced an increase in knowledge, opinions, skills, or aspirations regarding lifestyle changes (diet, exercise, etc.) that improve personal health

2. **Associated Institution Types**

   - 1862 Extension
   - 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	7655

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
According to most recent healthcare profiles and health facts for many Kentucky counties, at least 33% of adults are obese, 31% report a lack of personal physical activity, 12.6% adults have diabetes. In addition local healthcare and school professionals across the state report an increase in health disparities among youth in relation to obesity.

What has been done
Campbell County Extension collaborated with the school system to focus the after school program on healthy eating habits and physical activity.

Results
In Campbell County, 100% of the students learned a new recipe to make for their family. Most of the students enjoyed certain foods and a few of them had already made items for their family at home by the end of the program and 100% of the students learned about different ways to exercise.

4. Associated Knowledge Areas

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

Outcome #6

1. Outcome Measures

Number of individuals who reported improving at least one behavior related to subjects taught (e.g., food preparation, addition of fruits and vegetables into the diet, movement of the body that leads to better physical fitness, and reducing the risk of chronic disease)

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	2117

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Moderate physical activity can reduce the risk of developing heart disease, diabetes, colon cancer, stress and high blood pressure. Physically active people live longer and better quality lives that inactive people. Physical activity levels decrease across the lifespan. Children and youth should engage in 60 minutes of moderate to vigorous physical activity, ideally every day. There is a significant decrease in the amount of physical activity between elementary school and high school students.

What has been done
A total of 19 county 4-H Youth Development programs across Kentucky provided a 4-H Health educational opportunity for their youth and community to celebrate Kentucky 4-H Health Month.

Results
A total of 2134 youth, ages 5 - 18, intentionally selected a fruit or vegetable for a snack at 4 or more meetings, the majority reported drinking more water as the beverage of choice and all reported a minimum of fifteen minutes of physical activity at 4 or more 4-H events.

4. Associated Knowledge Areas

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

Outcome #7

1. Outcome Measures

Number of children grades 3-5 who report eating vegetables & fruits

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	23387

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Healthy eating in childhood and adolescence is important for proper growth and development and to prevent various health conditions. Although total fruit intake and whole fruit intake among children and adolescents may have increased, most youth still do not meet fruit and vegetable recommendations.

What has been done
Breathitt County 4-H offered the Taste of the Month program to 90 students in grades K-12. In other programs across Kentucky, over 27,000 youth have been exposed to programs that have helped them identify fruits and vegetables.

Results
As a result of Extension programs, 23,387 young children reported eating fruits and vegetables on a regular basis. In Breathitt County, At the end of the program, 100% of the students could identify the MyPlate symbol and 95% of them could name all five food groups. The majority of the group indicated that they had tried more new foods during the program. Around half of the group indicated that they had taken a recipe and made the food again at their home.

4. Associated Knowledge Areas

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

Outcome #8

1. Outcome Measures

Number of youth that report making healthy lifestyle choices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	45083

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. Hands-on activities are also critical for learning about making healthy choices.

What has been done
Adair County Cooperative Extension Service collaborated with local partners to offer the Literacy, Eating, and Activity for Primary Youth Health curriculum (LEAP) to approximately 40 preschoolers. The Shelby County Family and Consumer Sciences Extension Agent and the 4-H Assistant created and presented a nutrition program in 28 4-H clubs in the elementary schools. A total of 718 children from Shelby County participated in the 4-H school club nutrition program titled "Eat Right, Be Active Every Day!"

Results
In Adair County, Teachers reported that as a result of the LEAP for Health program, 100% of the students indicated they would participate in physical activity at home; 100 percent indicated that they could name foods that grow in a garden. Teachers also reported that 100% of the students were able to name a least one or more health benefit of physical activity and consuming nutritious foods (fruits and/or vegetables). Parents were also informed about the importance of proper nutrition and physical activity via newsletters sent home by the students.

As a result of the Shelby County program, 227 students completed a follow-up survey that revealed 61% of these students ate 5 or more servings of fruits and vegetables daily, 90% of the group ate breakfast each morning to have energy for the day, 76% ate healthy snacks to get the nutrition they need each day, and 88% chose nutritious drinks such as water, milk, and 100% fruit juice. Seventy-seven percent of the students said they shared their new nutrition knowledge with their families.

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

length of program, target audience

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Change in knowledge and behaviors

Key Items of Evaluation

Follow-up survey, observations

VI. National Outcomes and Indicators

1. NIFA Selected Outcomes and Indicators

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