2018 Kansas State University Combined Research and Extension Annual Report of Accomplishments and Results

Status: Accepted

Date Accepted: 08/20/2019

I. Report Overview

1. Executive Summary

K-State Research and Extension (KSRE) is a statewide network of educators sharing unbiased, research-based information and expertise on issues important to Kansas. The KSRE network includes offices in all 105 counties, along with four regional extension offices, five agricultural research centers distributed throughout the state to encompass variability in climate and soils, four satellite units, four agronomy experiment fields and five horticulture centers and experiment fields. In addition, KSRE funds research projects in 20 departments across five colleges.

We are effectively using our statewide network of offices to share research-based information related to our five grand challenges: global food systems, water, health, developing tomorrow's leaders, and community vitality. The new ideas and knowledge developed through research and disseminated by extension to address the five grand challenges will provide direction and closely align with the university's plan to be a Top 50 research institution by 2025.

In addition to traditional one-on-one methods of communication, our faculty and staff use technology to deliver research-based programs to clients across the state and beyond, including web- based smart phone applications that help our audiences have the information needed to make management decisions. Utilizing volunteers to increase the reach of extension programs is also critical. In 2018, volunteers invested more than 197,000 hours in helping to extend Extension programs that resulted in an additional 182,228 direct educational contacts.

These five grand challenges directly or indirectly affect all Kansans and we are not going to solve these challenges alone. By developing partnerships within Kansas, across the United States, and internationally, we are educating and working with the next generation of students, scientists, and extension educators. KSRE's statewide presence lends itself to collaborative efforts with organizations, private business and industry, local groups, state and federal organizations, and colleagues in other states. Quality faculty draw businesses and funding to K-State and to Kansas including:

- Several high-profile projects are under way in the Biosecurity Research Institute, and infrastructure development for the National Bio and Agro-Defense Facility.
- Two partnerships created in the last five years provided new opportunities to focus on specific issues of rural communities. The Dane Hansen Foundation provided funding to hire a Community Vitality Specialist in Northwest Kansas. Kansas Masons pledged their support to Kansas communities by funding a second specialist for the Kansas PRIDE program.
- Family and Consumer Sciences is a partner of the Kansas Department for Aging and Disability Services to provide health insurance education to Medicare eligible Kansans. Approximately 1/3 of the contacts are vulnerable beneficiaries with incomes below 150% of the poverty level.
- The Kansas 4-H Foundation, the Department of 4-H Youth Development and KSRE partnered to provide grants to local programs to increase 4-H membership, reach new and underserved audiences and incorporate STEM programs and activities.
- K-State - in partnership with four other universities and several industry partners have joined efforts to

create the Irrigation Innovation Consortium, a collaborative research effort to accelerate the development and adoption of efficient irrigation technologies and practices.

- The Culture of Health initiative was created to facilitate community conversations around the state about health. A goal of the community conversations is to bring about engaged, collaborative initiatives that address a significant public need through community partnership and coalitions.

We continually evaluate our programs to ensure we are making the best use of our resources. We have many more tools because of technology, but the purpose has not changed to serve the wants, desires, needs, and dreams of Kansas' citizens to improve lives, livelihoods and communities. We accomplish our goals when we have positive impact on individuals, but our ultimate goal is achieved when we also provide social impact. We view new discoveries and engaging people we serve as benefiting both individuals and society.

Published, peer-reviewed studies containing estimates of return on research and development investment that are specific for Kansas have shown a long-term benefit-cost ratio of 33.6:1 for agricultural research and outreach education, yielding a 10.2 percent average annual return to productivity that can be directly correlated with a long term benefit of $5.5 billion to the state of Kansas.

Food and agriculture research continues to be a priority for Kansas State University. Dollars expended for research from scientists funded through the Kansas Agricultural Experiment Station (KAES) topped $100 million again this past year and continue to be the greatest single entity contributing to the total research expenditures at Kansas State University. KAES expenditures represented 53% ($103 million/$193 Million) of the University total.

The demographics of Kansas continue to change. KSRE is reaching out to both underserved and traditional audiences through new venues. To increase multicultural competency and sensitivity among our workforce, the College of Agriculture/KSRE Diversity Programs Office provides regular Navigating Difference training for new Extension professionals. A new component of this training is the addition of the Intercultural Development Inventory for each participant. This goal of this program is to bring systemic change and diversity to the KSRE team and provide cultural competency awareness and skills that they can practically apply in their day to day work.

An emerging and growing effort within KSRE is the Multicultural Undergraduate and Graduate Summer Research Fellowship program. This program specifically targets under-represented populations of students to establish networking relationships back to their respective home institutions, as well as K-State faculty. Although the undergraduate institutions of these students have not exclusively been from 1890 Land Grants, those institutions have heavily dominated the applicant pool to date. The K- State Research and Extension fellow program places these students in a laboratory or field setting with a K-State Research and Extension scientist to work on a focused set of research goals that can be accomplished in the eight-week program. This program has a specific goal of growing the minority populations of students within graduate programs in the College of Agriculture and across other partner Colleges represented within K-State Research and Extension.

Kansas 4-H developed new partnerships to reach new and underserved youth. A partnership with Boys and Girls Club in Northeast Kansas resulted in the development of a summer program that included weekly activities in science, technology, engineering and math for Native American youth in the Iowa Tribe of Kansas and Nebraska and the Kickapoo Tribe in Kansas. Another partnership with the College of Education resulted in a two-day residential camp for middle school students to promote college access for first-generation youth from underrepresented populations. A second Boys and Girls Club Partnership along with a National 4-H Mentoring Grant (4-H Youth Futures:College within Reach) resulted in approximately 30 underrepresented youth in Northeast Kansas receiving both mentoring and college and career readiness skills with the support of an on-site coordinator.

KAES researchers continue to have impact. The wheat variety Everest, developed by KAES researchers, continued to be the number 1 wheat variety planted in Kansas. Resistant starch technology developed by KAES cereal chemist remained the most productively commercialized technology license by the Kansas State University Research Foundation. K-State wheat geneticists successfully used gene editing technology to increase the kernel size in wheat. Swine Immunobiologist from K-State in collaboration with scientists at the University of Missouri genetically modified pigs to be resistant to the Porcine Reproductive and Respiratory Syndrome (PRRS) virus.

KSRE has a long tradition of training leaders for the future. Since 2011, more than 700 members from 135 communities have participated in a Community Board Leadership Series to build skills, increase participation in public processes and address critical issue within communities. The 4-H Citizenship in Action program encourages teen from across the state to learn more about how government functions and how to actively participate in the legislative process. Also, the 4-H SET program focuses on preparing more youth who are proficient in science, engineering, and technology. Youth are learning skills in such areas as global positioning systems and computer interface. Ninety-five percent of youth in 4-H have reported being comfortable with making their own decisions, and ninety-one percent have a plan for reaching their goals.

Environmental stewardship remains a critical focus. Several years ago, KSRE partnered with Kansas Farm Bureau, Kansas Department of Health and Environment, Kansas Department of Agriculture, Kansas Department of Commerce, USDA Natural Resources Conservation Service to identify best management practices for the storage and utilization of poultry litter to protect the air and water quality of Kansas. Research continued into 2018 to help producers make informed decisions about storage site selection and construction.

The Great Plains Grazing Project is a coordinated effort by a regional network of researchers and extension specialists working to safeguard and promote regional beef production while mitigating its environmental footprint. More than 60 collaborators are currently affiliated with the project including Kansas State University, Oklahoma State University, the University of Oklahoma, Tarleton State University, the Samuel R. Noble Foundation and the U.S. Department of Agriculture Research laboratories.

K-State Research and Extension professionals worked to develop the tools and educational focus to support Kansas agriculture producers, lenders and other agricultural stakeholders dealing with the pressures of low commodity prices and high input costs, including high loads of debt from land and equipment purchases. These educational programs and training efforts were begun in 2016, and will continue for the next 2 to 3 years.

FTEs have been adjusted with reduced numbers in extension positions. This occurs through elimination of positions through vacancies and realignment of specializations through formation of districts. Over the past decade, faculty positions supported through state and federal appropriations have declined by approximately 10% forcing our system to focus its priorities. At this time, 50 counties have formed 17 districts.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2018	Extension		Research	
	1862	1890	1862	1890
Plan	385.0	0.0	292.0	0.0
Actual	380.7	0.0	276.3	0.0

II. Merit Review Process

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

- Internal University Panel
- Combined External and Internal University Panel
- Expert Peer Review

2. Brief Explanation

At the local level, extension agents work with Program Development Committee (PDC) members - local volunteers - who provide input in determining the local and statewide efforts needed to address social, economic, and environmental concerns. Information is then shared with the appropriate statewide Program Focus Team (PFT) - a team of agents and specialists that work together to develop a series of educational program activities that agents can use in their community. Educational action plans are submitted to the local extension council and KSRE for approval.

Research that is proposed by scientists supported by the KAES is reviewed internally by a process overseen by the KAES director. The review process may include disciplinary colleagues, academic department heads and the associate director. In general, capacity projects describe areas of work to be investigated and these areas are reviewed for scientific merit and for their relevance to the priorities of Kansas and USDA/NIFA. Priorities for the state are verified by the relationship of areas of investigation for their relevance to the Kansas agricultural and rural economy, or the potential for the area of investigation to become a relevant factor in the state's food and agricultural economy or to improve the lives of citizens of Kansas. Part of the review process includes confirmation of the audience of interest and consistency of the knowledge areas defined by NIFA with the priorities of the state.

For multi-state projects with contributions from KAES scientists, project objectives and approaches are identified by the membership of the committee. Renewing and new projects are first reviewed by the administrative advisor to the multi-state research committee and then by the regional multi-state review committee. The chair of the regional committee provides feedback to the project writing team. The writing team, in turn, considers the input and makes changes to the proposal as appropriate for improvement and clarity.

III. Stakeholder Input

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

- Survey of traditional stakeholder groups
- Survey of selected individuals from the general public
- Other (Survey of underserved, minority groups)

Brief explanation.

K-State Research and Extension is rich with advisory panels, teams, councils, and committees through every discipline of research and extension work. In Kansas, local Cooperative Extension is organized with elected Program Development Committees (PDCs). Individuals throughout the community are targeted to seek election for their experience and interest broadly in needs and issues of agriculture, family, youth, and community. Six individuals are elected/appointed to each of the four committees in all counties across the state. This equates to roughly 2500 private citizens taking an active role as stakeholders in setting priorities for extension programming at the local level.

In 2017-2018, 19 listening sessions were conducted to engage extension staff, extension councils, external partners and the general public in providing input regarding the future direction for K-State Research and Extension. Information from those meetings was organized into six strategic emphases:

• Understanding and Engaging the Peoples and Communities of Kansas;
• Enhancing Our Programs and Services;
• Improving Our Marketing and Public Relations;
• Developing a Better Workplace;
• Expanding Our Programming Capacity; and,
• Securing and Increasing Our Base Budget Appropriations.

In an effort to improve communication with boards, KSRE implemented a new generation of Partnership Meetings by Zoom to have more frequent contact with our local unit partners and to allow more Extension Council members to participate.

Several years ago, a comprehensive effort was undertaken to provide resources for agents and program development committee members to increase effectiveness in recruiting new members, assessing community needs, and developing and evaluating a comprehensive educational program.

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 Surveys

Brief explanation.

Following are several examples of processes used to select advisories:

• The Director of K-State Research and Extension and Dean of the College of Agriculture has an advisory that is carefully selected through a nomination process. The individuals invited to serve are

selected based upon the target audience represented, gender, race, ethnicity, and leadership. This group meets three times annually to review programs and provide advice to the Dean and Director on key initiatives to strengthen the programs in research, extension, and teaching.

• The State Extension Advisory Council is elected through their leadership on local Extension Boards. Individuals are approached and encouraged to accept nomination to the process. Then their peers go through an election process to identify the representatives they wish to serve on this advisory. This advisory meets twice annually with the Director for Extension and the administrative team to identify priorities and opportunities to fulfill the mission.

• The Associate Director for Research actively participates on stakeholder boards with direct contact to commodity groups within the state. For example, the Associate Director participates in the Kansas Wheat Alliance and the Kansas Wheat Research Foundation boards. This connection provides guidance to researchers developing varieties and studying problems key to Kansas' wheat production.

• The Southwest Kansas Research and Extension Center (SWREC) located in Garden City meets annually with their research advisory committee -- one producer from each county in the Southwest Extension Region for a total of 24 members. Additional representatives are invited to participate: southwest area county agents; three commercial crop consultants; and any members of the corn, wheat, sorghum, soybean or sunflower commissions who reside within the southwest extension area. Members are provided updates about ongoing research and engage in discussion to ask questions and share production challenges. The day concludes with participants identifying the highest priority targets for research.

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 individuals
- Survey specifically with non-traditional individuals
- Survey of selected individuals from the general public

Brief explanation.

Stakeholder input is a continuous process across the breadth of programming for research and extension educational programs in an effective grass-roots organization like K-State Research and Extension. Stakeholder input happens through local, regional, state, multi-state, and national input processes. The stakeholder input process is a comprehensive effort to seek focus on critical issues and problems needing research and answers that fit well within our defined mission priorities. This input continues throughout planning, project implementation, and program delivery. Specifically, face-to-face meetings that include strategic planning, small group process, and reporting back to the recipient institution are commonly used. Nominal group processes are employed to assure hearing of all voices.

With the State Extension Advisory Council, that group is given the task to seek input from others outside of the face-to-face meeting, and to bring that knowledge and experience to the meetings through their sharing of such input.

We have stakeholder groups who focus on our non-traditional audiences and programming. Specifically, the Kansas Center for Sustainable Agriculture and Alternative Crops operates with an advisory council for the expressed purpose of providing input on projects and ideas across both research and extension. This group assists in identifying opportunities for directing seed grant funds to research and extension faculty to better reach nontraditional needs and audiences.

The breadth of advisory groups giving input and sharing needs and ideas range from the traditional Dean's advisory council to advisories working through every academic department and research/extension center to every local Extension office. Within program areas, we have advisors made up of stakeholders in areas of family nutrition, meat science, food science, crop commodity groups, livestock commodity groups, agricultural bankers, and the list goes on. We estimate that at any given time K-State Research and Extension has formal relationships with more than 200 advisory stakeholder groups who provide continuous input and feedback on research and extension initiatives, priorities, and direction. No new processes were employed in 2018.

3. A statement of how the input will be considered

- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Action Plans
- To Set Priorities

Brief explanation.

One example of how input shapes our research and extension programs is exemplified in our wheat breeding program. We maintain wheat variety development on both our main campus and at our Agriculture Research Center in Hays. Both of our faculty breeders have close contact and relationships with the Kansas Wheat Commission, the Kansas Association of Wheat Growers, seedsmen, milling and baking companies, etc. They continually receive input as to the direction of their breeding programs and the breeders listen and adjust accordingly. Moreover, wheat breeders continually are forward looking for the next disease or other challenge and seeking genetic solutions to those unending challenges.

Budget priorities are established through input on creating or redirecting funds to a new position or program direction based in part upon discussions with stakeholder groups as we identify priorities they have that match with our funding opportunities.

In 2013, KSRE developed a strategic action and alignment plan as part of an overall strategic initiative, K-State 2025--to be recognized as one of the nation's Top 50 Public Research Universities. The Cooperative Extension plan contributes to the overall plan by setting a direction to result in becoming a national leader and model of excellence in engagement through the vision and tradition of a land-grant University mission to serve the people of Kansas with honor, integrity and commitment.

A key initiative is to continually engage our Program Development Committees, volunteers, stakeholders and citizens to determine the educational needs related to the Grand Challenges. This initiative led to the creation of the PDC Task Force and the development of web-based resources and tools to help extension agents and PDCs in needs assessment and program development.

While significant budget reductions have resulted in loss of faculty and staff positions, we continue to use the priorities set forth in that strategic plan to provide guidance on communication, professional development, and structural reorganization to meet those goals, along with budget realities. No changes in 2018.

Brief Explanation of what you learned from your Stakeholders

Industry trends, entrepreneurial interests, gaps in knowledge and understanding, problems and pitfalls in adaptations of knowledge and technology, lack of information within a given commodity production or processing system are all common learning experiences for faculty and administration in our listening relationship with key stakeholders.

In times of budgetary strain, stakeholders continue to emphasize the importance of local presence, attention to the long-term issues and problems of Kansas, and finding ways to improve our efficiency without sacrificing the effectiveness. The result has been in deeper discussions and development of multi-county Extension units, greater use of technology to deliver training, updates, and public education. We have experienced a significant increase in the use of web-based educational delivery, while still finding ways to maintain the desires of interaction and connectedness to our clientele.

Research undertaken by KAES scientists frequently flows from challenges with crop or livestock production that emerge from within the state. Plant diseases discovered in prior years are great examples of how stakeholder (growers) challenges drive the direction of research priorities. A significant portion of the KAES research portfolio is funded by Kansas commodity groups. Decisions regarding funding of proposals is determined by farmer/producer review committees. In addition, academic department heads from the College of Agriculture serve as liaisons to the research committees of every major commodity group. Moreover, departmental and college level advisory groups are populated by producer representatives or employees of various agribusiness. These individuals provide guidance to us regarding priorities for research on a regular basis.

Another more indirect process that is used to check the relevance and application of our research is to annually compare our research expenditures with knowledge areas to Kansas agricultural statistics published rankings of economic activity with various commodity areas. For example, if Kansas agricultural statistics ranks beef cattle as a very important economic driver in the state, we verify that beef cattle research is among our highest areas for research expenditures.

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	5300000	0	4504858	0
Actual Matching	20774240	0	34005329	0
Actual All Other	12597394	0	7320409	0
Total Actual Expended	38671634	0	45830596	0

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

V. Planned Program Table of Content

V(A). Planned Program (Summary)

Program # 1

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
201	Plant Genome, Genetics, and Genetic Mechanisms	5%		10%	
205	Plant Management Systems	28%		14%	
216	Integrated Pest Management Systems	5%		10%	
307	Animal Management Systems	36%		19%	
311	Animal Diseases	0%		24%	
501	New and Improved Food Processing Technologies	2%		2%	
502	New and Improved Food Products	0%		1%	
511	New and Improved Non-Food Products and Processes	2%		1%	
601	Economics of Agricultural Production and Farm Management	19%		14%	
603	Market Economics	1%		0%	
606	International Trade and Development	0%		5%	
703	Nutrition Education and Behavior	1%		0%	
704	Nutrition and Hunger in the Population	1%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2018	Extension		Research	
	1862	1890	1862	1890
Plan	89.0	0.0	129.0	0.0
Actual Paid	155.5	0.0	150.2	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
1755498	0	2449592	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
7396109	0	18491429	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
5778720	0	3980650	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Sustain Profitable Agricultural Production Systems--

- Develop animal and crop production systems that thrive in the variable conditions of the Great Plains.
- Develop horticulture, forestry, and alternative green enterprises that thrive in the variable conditions of the Great Plains.
- Advance new and improved systems of agricultural production to meet the need of producers and consumers.
- Enhance the value of agricultural products.

Ensure an Abundant Food Supply for All--

- Improve access to high quality foods, especially for consumers with limited resources.
- Increase food variety and value by developing new and enhanced food products.

2. Brief description of the target audience

Farm and ranch managers; agricultural producers and agribusinesses throughout the food industry supply chain with emphasis on producers who want to help themselves; people who influence producers and producer decisions, including educators (veterinarians, media, industry organizations, packers/purchasers); government agencies/ regulators; the lending industry; and policy makers.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2018	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	110653	0	251	0

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

Patent Applications Submitted

Year:	2018
Actual:	19

Patents listed

Compositions and Methods for Diagnostic Assays and Vaccines of Porcine Parainfluenza Virus 1 (PPIV1); Microbial Cells, Methods of Producing the Same, and Uses Thereof; Inactivation of Viruses by a Combination of Medium Chain Fatty Acids, such as African Swine Fever Virus (ASFV) and Classical Swine Fever Virus (CSFV); Bacterial Glycosyltransferase Inhibitors as Anti-virulence Compounds; Lipid Nanoemulsion-Doped Anti- microbial Packaging Films; Novel Design of a Triple CRISPR Gene Drive (3 separate genetic loci) where S. pyogenes Cas9 can Operate in trans and Allow for Propagation of 3 Genetic Elements in a Diploid Cell; Antioxidant Protein Hydrolysates and Peptides from Sorghum and Corn; Universal Fluorescence Assay of High Affinity Ligand Transport; Timed Release of Solutes Encapsulated in Branched Amphipathic Peptide Capsules; Nicotinamide Riboside Chloride Delays the Onset of Subjective Fatigue; Cloning of a Leaf Rust Resistant Gene in Wheat; Prepare and Characterize Acid- or Enzyme- degraded Starches Modified by Propylene Oxide (PO); Composition for Improving Vaccine Safety and Methods of Use Thereof; Chemical Mitigation of African Swine Fever Virus; Preparation and Structure of Î±-amylase-degraded Octenylsuccinic Waxy Maize Starches with Different Substitution Patterns; Zoysiagrass Named 'KSUZ 0802'; (KSR4652) Winter Canola Line "CP320W"; Surefire (KSUR1211) winter canola; Novel Methodology and Control Agents for Management of the Lone Start Tick, Amblyomma Americanum

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2018	Extension	Research	Total
Actual	15	45	60

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of individuals participating in programs

Year	Actual
2018	17761

Output #2

Output Measure

- Number of new/improved varieties, inbreds, germplasm developed and released

Year	Actual

2018	1

Output #3

Output Measure

- Number of educational events (e.g., meetings, demonstrations, field days, press releases, and distributed publications) delivered

Year	Actual
2018	7474

Output #4

Output Measure

- Number of producers engaged in one-on-one consultations through Kansas Farm Management Association or Farm Analyst programs

Year	Actual
2018	2287

Output #5

Output Measure

- Number of presentations at national and international conferences

Year	Actual
2018	96

Output #6

Output Measure

- Number of research papers cited above a threshold (10)--indicative of high impact

Year	Actual
2018	31

Output #7

Output Measure

- Number of research grants received in excess of $50,000.

Year	Actual
2018	24

Output #8

Output Measure

- Number of hours reported annually by Master Gardener volunteers

Year	Actual
2018	104302

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Livestock producers demonstrate best management practices (BMPs) in regard to management and production, including genetic selection, reproduction, nutrition, health, animal care and well-being, livestock safety and quality, environmental management, and optimal marketing strategies (Measured by number of producers adopting BMPs)
2	Kansas farmers and ranchers increase awareness of financial performance (based on number members reported by farm management association)
3	Kansas farmers experience higher yields, more stable yields and/or a higher value of their crop as a result of plant breeders development of new varieties or germplasm (Measured by number of acres planted to KAES-developed materials or materials derived from KSU varieties, inbreds, or germplasm)
4	Improved sustainability of Kansas farms and ranches through membership in the Kansas Farm Management Association program and through assistance received through the K-State Farm Analyst program (Measured by number of members and number receiving assistance through KFMA and Farm Analyst program)
5	Public value communicated by Master Gardener volunteers (measured by number of hours and activities reported annually)
6	Increase food variety and value by developing new and enhanced food products (Measured by number of new products developed)
7	Improve access to high quality food, especially for consumers with limited resources (measured by improvement in food budgeting)

Outcome #1

1. Outcome Measures

Livestock producers demonstrate best management practices (BMPs) in regard to management and production, including genetic selection, reproduction, nutrition, health, animal care and well-being, livestock safety and quality, environmental management, and optimal marketing strategies (Measured by number of producers adopting BMPs)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	3400

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Kansas livestock producers faced drought from early to mid-2018 and then a very wet fall and winter that challenged their management practices. In addition, trade uncertainties directly impacted market prices received for all livestock commodities and resulted in a financially strained livestock sector in Kansas and across the United States. Assisting producers and stakeholders in reducing input costs, and improving herd health and reproductive success continue to be major program emphases.

What has been done
Livestock extension/outreach programs focused on optimizing feed cost, calving management, and animal health and were delivered through extension publications, newsletters, popular press articles, one-on-one consultations, and public meetings. Specifically:
- Six calving schools were conducted around the state training 491 producers. Topics included winter cow nutrition, managing cull cows and body condition scoring.
- Eleven local, state and national presentations on improved reproductive management and artificial insemination skills were held with 740 participants.
- Beef quality assurance training was held across the state and resulted in certifying approximately 240 producers. To increase producer knowledge, live necropsy demonstrations were conducted to help producers understand where common disease processes occur in cattle, visualization of injection site locations and the importance of a local veterinarian to obtain facts on herd mortalities.
- Information and awareness of African Swine Fever as an emerging foreign animal disease was provided to swine producers. Kansas State University is a national leader in providing information and assistance to prevent this from entering the United States. Producers were provided

nutritional updates to lower feed cost in light of heavy losses due to trade and export challenges.
- The dairy extension program continues to benchmark key performance indicators of dairy herds continued to gain visibility and adoption.

Results
Calving Schools: From the post meeting surveys, the program was able to reach 54,000+ head of cows in Kansas. Of completed responses, 37% of ranches estimated the value of this education to be between $1,001-5,000, and 42% of ranches estimated the value to be between $100-1,000 in added benefit.

Reproductive Management: According to a survey given post-meeting at one location, 83% of respondants indicated they planned to implement changes based on what they learned.

Dairy: By using this tool (www.drinkdairy.com) 26 herds from KS, NE and OK use this service and approximately 70% of dairy cows from KS are enrolled in this program.

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

Kansas farmers and ranchers increase awareness of financial performance (based on number members reported by farm management association)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	1883

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The state of the economy, along with volatile commodity and input prices, make business planning in agriculture increasingly difficult and raises the stakes of each decision a producer must make. Having good information on which to base decisions is critical for producers to remain

profitable and sustainable for the future. Education, training and assistance in keeping good records and in the appropriate methods to analyze and use those records will provide the needed knowledge to make informed decisions.

What has been done
The goals of the KFMA program are to provide each member with farm business and family financial information for improved farm business organization and decision making; use this information to increase farm sustainability, profitability and to minimize risk; and, distribute this information to benefit all involved in Kansas and American agriculture.

Activities in 2018 included: 6800 face to face meetings with 2287 producers; 64 presentations to 1950 individuals; 2179 farm business analyses; 2844 individual crop and livestock enterprise analyses; 6 radio interviews; numerous newsletter and newspaper articles; and in-class instruction to more than 200 students at KSU.

Results
Through one-on-one consultations, 2287 Kansas producers have increased awareness of their current financial position and their financial performance during the past year.

4. Associated Knowledge Areas

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

Outcome #3

1. Outcome Measures

Kansas farmers experience higher yields, more stable yields and/or a higher value of their crop as a result of plant breeders development of new varieties or germplasm (Measured by number of acres planted to KAES-developed materials or materials derived from KSU varieties, inbreds, or germplasm)

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	3300000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

According to the Kansas Department of Agriculture, agriculture is the largest economic driver in Kansas valued at nearly $67.5 billion, accounting for 40.4 percent of the state's total economy. In Kansas, there are 46,137,295 acres of farmland, which accounts for 88 percent of all Kansas land. More than 21 million acres in Kansas is harvested for crops.

Many challenges exist for southern Great Plains crop production including erratic rainfall, extreme temperatures and significant evaporative demand. As a result, hard red winter wheat is the primary crop grown because it develops during cooler and wetter periods of the growing season.

What has been done
KAES supports breeding programs located in Manhattan and at our Hays experiment station. Faculty with basic wheat genetic and genomic expertise support the breeding program with basic technologies including gene editing, genomic selection methods and field-based high throughput phenotyping platforms.

Results
KAES wheat varieties continue to succeed in an intensely competitive environment. For the sixth consecutive year, Everest, a KAES variety, was the most planted wheat variety in Kansas in 2018. Four of the five most planted varieties were either developed by KAES or have significant contribution (25% or more by pedigree) from KAES germplasm. Overall, KAES-released varieties were planted on 18.2% of the state's acres. Another 12.4% of the acres were planted to varieties that were derived from KAES-developed varieties and germplasm. In addition 12.2% of the acres were planted to varietal blends, most of which likely contained a KAES variety.

4. Associated Knowledge Areas

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

Outcome #4

1. Outcome Measures

Improved sustainability of Kansas farms and ranches through membership in the Kansas Farm Management Association program and through assistance received through the K-State Farm Analyst program (Measured by number of members and number receiving assistance through KFMA and Farm Analyst program)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	2287

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The state of the economy, along with volatile commodity and input prices, make business planning in agriculture increasingly difficult and raises the stakes of each decision a producer must make. Having good information on which to base decisions is critical for producers to remain profitable and sustainable for the future. Education, training and assistance in keeping good records and in the appropriate methods to analyze and use those records will provide the needed knowledge to make informed decisions.

What has been done
Producers were provided reliable and accurate information on which to base decisions, along with the necessary education, tools, training and assistance in keeping good records and the appropriate methods to analyze and use those records to acquire the needed knowledge to make the best decisions possible in each situation.

Results
KFMA members and producers increased awareness of the financial performance of their farm operations. Whole-farm analysis provided information comparative information on the current year as well as trend analysis for the last five years resulting in improved decision-making.

4. Associated Knowledge Areas

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

Outcome #5

1. Outcome Measures

Public value communicated by Master Gardener volunteers (measured by number of hours and activities reported annually)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	111328

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Extension Master Gardener (EMG) volunteers are a vital part of K-State Research and Extension. Donating time in return for horticultural training, EMG volunteers help Extension agents meet the need for horticultural information in their communities. The EMG program is designed to provide trained volunteers to help meet that need at minimal cost.

What has been done
The means of providing this information is diverse including horticultural "hotlines," demonstration gardens, garden shows, public presentations and garden tours. EMG volunteers require continual education in best management practices, conservation of natural resources, waste management, integrated pest management, and identification and selection of proper plant materials for healthy people, plants, and the environment.

Results
EMG volunteers donated more than 104,000 hours with a value over $2.3 million in 2018. The level of enthusiasm and commitment not only impacts our volunteer projects but often results in our EMG volunteers influencing family, friends and neighbors to use proven horticultural practices. Homeowners sometimes over-fertilize and often misdiagnose problems in their landscape and garden resulting in overuse of unneeded or ineffective products. By providing timely, accurate information, our Extension Master Gardeners influence our clientele to use less and more effective inputs resulting in better results and a savings of time and money. Using less fertilizers and pesticides also helps protect the environment.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #6

1. Outcome Measures

Increase food variety and value by developing new and enhanced food products (Measured by number of new products developed)

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	14

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Existing Kansas companies and entrepreneurs have to keep an edge on the market by continuously developing new and innovative products.

The Value-Added Foods Program provides educational opportunities and technical support to food companies and entrepreneurs in the state along with personnel from regulatory agencies and students.

Value-added agricultural products are raw commodities whose value has been increased through the addition of ingredients or processes that make them more attractive to the buyer and/or more readily usable by the consumer.Simple examples would be producing a high fiber breakfast cereal from wheat, or adding a marinade to a cooked beef steak and selling it in a microwaveable package. The process would thus create new jobs and keep more dollars in a community. In addition, the profit margin of a value-added product is generally higher than that of a raw commodity.

What has been done
In 2018, staff responded to more than 800 requests from more than 130 food processors and start-up businesses, tested and generated ingredient labels and Nutrition Facts panels for more than 200 food products and trained 12 undergraduate students on food product development and food testing concepts.

In addition:
- Taught food processors concepts of "Food Safety Preventive Controls" to comply with the new Food Safety Modernization Act (FSMA)
- Certified food processing personnel, and K-State students as "Process Control Qualified Individuals" (PCQI) as required by FSMA
- Started re-issuing all Nutrition Facts panels for Kansas food processors in the new format required by regulations.
- As Process Authority, helped certify tens of canned Kansas food products to be legally produced and sold in the state and across state lines.

Results
A conservative estimate of the dollar value of the services provided to Kansas companies and entrepreneurs in 2018 is $1 million based on industry standards for the cost of such services. Additionally, the value to students involved in these activities is tremendous as evidenced by the job offers they got last year based in big part on their experiences with this program.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
502	New and Improved Food Products
603	Market Economics

Outcome #7

1. Outcome Measures

Improve access to high quality food, especially for consumers with limited resources (measured by improvement in food budgeting)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The selection of healthy foods depends, in part, on people having access to high-quality foods. Research has demonstrated that some people living in the U.S. lack access to affordable, nutritious foods in their neighborhoods. High-quality foods include nutrient-dense foods that are of acceptable or better freshness, within optimal "use by" date if processed, and obtained in socially-acceptable ways.

Access includes not only availability of high-quality foods, but also affordability and safety, and the knowledge and skills to procure and prepare high-quality foods. To support their ability to eat healthfully, many consumers (especially but not exclusively those with limited resources) need help acquiring skills regarding meal planning, basic food preparation, and food budgeting.

Lack of access may be related to overall disparities in health. Kansans with adequate resources possess the assets required to overcome those barriers to accessing high-quality foods that are encountered by Kansans with fewer key resources. In times of economic instability, those barriers are encountered by more persons, more often, for longer periods, and more deeply.

For the last five years Wyandotte County (Kansas City, KS) has ranked last of the state's 105 counties for social determinants of health which includes access to healthy food.

What has been done
Extension in Wyandotte County worked with the Public Health Department, Healthy Communities Wyandotte (HCW) and the Latino Health for All Coalition to increase access to healthy foods. Projects included:
- Provided leadership to the Food Systems Action Team for HCW and facilitated a revised Hen Ordinance that allows more residents to have hens;
- Facilitated ordinance revisions with local government to define mobile markets and allow a

Mobile Market to launch in food desert areas.
- Provided leadership to facilitate community involvement in the completion of the first Food Economy Assessment of the county.
- Participated in the Latino Health for All Coalition to increase the number of healthy foods in Latino corner stores and restaurants, and to launch our first healthy mobile market to our county.

Results
Wyandotte County Unified Government commissioners have approved the changes in the Hen ordinance and the zoning changes to allow more residents to have hens and more residents to have access to healthy food through the mobile market. This is the first ordinance in the state that defines a mobile market and removes permit barriers.

The Latino Health for All Initiative reached 13 small restaurants participating in the healthy restaurant initiative that includes increasing and labeling healthy options on their menus. The corner stores participating in the Health Food Retail Initiative has now reached 11.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population

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
- Other (Technological change)

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Short-Term Knowledge

• Producers will improve their knowledge of efficient use of inputs to improve efficiency of feed and water use, reproduction and animal health.
• Producers will improve their knowledge of business skills that relate to cost of production,employee management, legal and regulatory issues and marketing.

Medium-Term (Behavior)

- Producers will demonstrate improved efficiency of feed and water use, reproduction and animal health.
- Producers will use alternative ingredients, improve forage use efficiency, adjust stocking rates,improve feeding accuracy, implement growth technologies, and strategically supplement.
- Producers will apply reproductive technologies, test and improve semen quality, maintain or improve percent calf crop, use genetic selection to improve reproduction, and alter heifer development strategies to lower costs and improve longevity.
- Producers will implement biosecurity plans, reduce pregnancy wastage and disease transmission, use value added health programs, follow BQA guidelines and improve animal welfare.
- Producers will improve costs of production, employee management, management of legal and regulatory issues, and marketing skills
- Producers will improve record keeping skills, use partial budget tools, improve risk management and utilize benchmarks.
- Producers will improve training and communication regarding expectations of employees and utilize labor saving practices.
- Producers will develop plans for leadership transitions and tax purposes, use stronger leases and improve environmental management.
- Producers will increase use of value added programs and non-traditional markets and increase communication and advocacy for agriculture and the beef industry.

Long-Term (Change in Condition)

- Kansas beef industry will be economically and environmentally sustainable to help feed people in Kansas, the US and throughout the world.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 2

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
702	Requirements and Function of Nutrients and Other Food Components	15%		15%	
703	Nutrition Education and Behavior	30%		20%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	15%		15%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	30%		30%	
723	Hazards to Human Health and Safety	0%		10%	
724	Healthy Lifestyle	10%		0%	
802	Human Development and Family Well-Being	0%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2018	Extension		Research	
	1862	1890	1862	1890
Plan	55.0	0.0	48.0	0.0
Actual Paid	39.7	0.0	35.2	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
347520	0	574699	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
1619732	0	4337507	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
1629653	0	933758	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

• Develop new rapid methods for the surveillance, detection, isolation, and quantification of microbes and chemical residues in animals, plants, and food products.
• Develop risk monitoring techniques to detect potential hazards in the distribution chain.
• Validate the efficacy of techniques in controlling and eliminating microbial and chemical hazards.
• Disseminate food safety and bio-security information through extension and research seminars, workshops, and resident and distance education programs, using a variety of media options and communication tools.
• Offer safe food production, handling, and sanitation education to groups involved in all levels of food production and service.
• Identify best management practices to prevent foodborne illness and to enhance the security of the food supply throughout the food chain.
• Develop technology to reduce the hazards and improve the quality of animal food products, which will complement the development of HACCP programs by USDA.
• Develop, complement, and maintain an aggressive technology transfer system that effectively communicates work about Food Safety to consumers, students, industry, government, and other scientific investigations.

2. Brief description of the target audience

• Growers and processors of agricultural commodities, commercial and non-commercial food service personnel, market and home gardeners, other food handlers, retail markets, consumers, and educator;
• Families and individuals of all ages living in Kansas, including populations with limited resources; low literacy skills; varying ethnicities; disabilities, diseases, or impairments; and documented or identifiable health disparities;
• Economic stakeholders, and policy and funding agencies;
• Health care, education, and nutrition professionals;
• K-State Research & Extension faculty and staff with responsibilities for food and/or nutrition;
• Government; and
• Consumer groups (i.e., STOP).

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2018	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	70368	0	0	0

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

Patent Applications Submitted

Year: 2018

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2018	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of rapid methods developed for the surveillance, detection, isolation, and quantification of microbes and chemical residues in animals, plants, and food products

Year	Actual
2018	0

Output #2

Output Measure

- Number of therapeutic, chemical, and physical treatments developed for animals and plants and their products to eliminate or reduce contamination with potential hazards

Year	Actual
2018	0

Output #3

Output Measure

- Number of ServSafe certification workshops

Year	Actual
2018	62

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increase knowledge level and improve attitude of clientele in safe food production, handling, and sanitation programs; best management practices to prevent foodborne illness; and social, economic, and communications issues related to food safety and agricultural bio-security (Measured by number of participants increasing knowledge)
2	Increase adoption of recommended safe food handling practices at the individual, family, community, production, and supply system levels (Measured by number of participants in food service manager certification class who successfully complete the exam)
3	Reduce incidence of foodborne illness (Measured by number of foodservice facilities with trained employees)
4	Increase number of viable technologies to improve food safety (Measured by number of viable technologies developed or modified for the detection and characterization of food supply contamination from foodborne threats)
5	Increase understanding of the ecology of threats to food safety from microbial and chemical sources (Measured by number of students enrolled in Food Safety and Defense graduate certification)

Outcome #1

1. Outcome Measures

Increase knowledge level and improve attitude of clientele in safe food production, handling, and sanitation programs; best management practices to prevent foodborne illness; and social, economic, and communications issues related to food safety and agricultural bio-security (Measured by number of participants increasing knowledge)

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Increase adoption of recommended safe food handling practices at the individual, family, community, production, and supply system levels (Measured by number of participants in food service manager certification class who successfully complete the exam)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	510

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Food safety is an important public health priority. Foodborne illness is a common, costly, yet preventable, public health problem. The U.S. Centers for Disease Control and Prevention estimate that roughly one in six people in the U.S. (about 48 million) get sick, 128,000 are hospitalized and 3,000 die of foodborne illness each year. Most cases of foodborne illness can be prevented through proper hygiene practices, including hand washing and following proper food handling and preparation recommendations.

What has been done
K-State Research and Extension (KSRE) Family and Consumer Sciences (FCS) professionals in partnership with the Kansas Restaurant and Hospitality Association (KRHA) provided food safety training to foodservice outlets and community organizations in Kansas. The ServSafe® Food Safety Education program is a nationally recognized certification and training program. This program targets foodservice managers, entry-level food handlers, and community organizations who provide food to the public.

In 2018, our efforts resulted in over 351 contact hours of food safety education. Extension agents and KRHA educators help deliver a wide variety of consumer, food handler and food service manager food safety education trainings. Whether instructing a restaurant owner, line cook, culinary arts student or church dinner volunteer, educators provide training and tools focusing on risk factors known to be the most important when it comes to preventing foodborne illness.

Results
In 2018, ServSafe® Food Safety Manager Classes reached 623 foodservice workers statewide. These 33 classes resulted in 510 foodservice employees receiving ServSafe Food Protection Manager Certification.

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #3

1. Outcome Measures

Reduce incidence of foodborne illness (Measured by number of foodservice facilities with trained employees)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	84

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Food safety is an important public health priority. Foodborne illness is a common, costly, yet preventable, public health problem. The U.S. Centers for Disease Control and Prevention estimate that roughly one in six people in the U.S. (about 48 million) get sick, 128,000 are hospitalized and 3,000 die of foodborne illness each year. Most cases of foodborne illness can be prevented through proper hygiene practices, including hand washing and following proper food handling and preparation recommendations.

What has been done
K-State Research and Extension (KSRE) Family and Consumer Sciences (FCS) professionals in

partnership with the Kansas Restaurant and Hospitality Association (KRHA) provided food safety training to foodservice outlets and community organizations in Kansas. The ServSafe® Food Safety Education program is a nationally recognized certification and training program. This program targets foodservice managers, entry-level food handlers, and community organizations who provide food to the public.

In 2018 our efforts resulted in over 351 contact hours of food safety education. FCS extension agents and KRHA educators help deliver a wide variety of consumer, food handler and food service manager food safety education trainings. Whether instructing a restaurant owner, line cook, culinary arts student or church dinner volunteer, educators provide training and tools focusing on risk factors known to be the most important when it comes to preventing foodborne illness.

Results
Twenty-nine ServSafe Food Handler classes were held with 731 participants completing the class. Participants in 25 classes responding to a post-session survey indicated that they had increased knowledge and skills of best food safety practices. Of the participants completing the post survey in the ServSafe Food Handlers classes, 85% indicated they plan to use what they learned at work and/or at home. Participants reported they intend to wash their hands, check food temperatures and use food thermometers more often, and to be more cautious of cross contamination and food left out at room temperature.

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
723	Hazards to Human Health and Safety

Outcome #4

1. Outcome Measures

Increase number of viable technologies to improve food safety (Measured by number of viable technologies developed or modified for the detection and characterization of food supply contamination from foodborne threats)

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Increase understanding of the ecology of threats to food safety from microbial and chemical sources (Measured by number of students enrolled in Food Safety and Defense graduate certification)

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

Due to a changeover in personnel, we are not able to report on Food Safety Outcomes 1, 4 and 5. It would be our expectation that the personnel responsible for reporting to these outcomes will be in place and able to submit results for the 2019 program year.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Short-Term (Knowledge)

- Program participants improve their attitudes toward, and awareness of, issues related to food safety.
- Participating Extension agents, Master Food Volunteers, food service professionals, farmers market vendors, produce growers, and food service volunteers increase their knowledge and skills of safe food handling from production to consumption.
- Public program participants increase their knowledge of and skills in safe food handling practices, food safety regulations, hand washing, and home food preservation techniques.

Medium-Term (Behavior)

- Participating Extension agents, Master Food Volunteers, food service professionals, farmers market vendors, produce growers, and food service volunteers demonstrate increased safe food handling practices (including handwashing) from production to consumption.
- More venues serving food in Kansas have food-safety trained employees or volunteers.
- Program participants demonstrate increased use of safe food handling practices and home food preservation techniques.

Long-Term (Change in Condition)

- Fewer Kansans experience food borne illness, resulting in reduced health care costs.
- Foodborne illnesses reported by the Kansas Department of Agriculture and KDHE Office of Epidemiology decrease.
- Kansas Department of Agriculture food service code violations in various kinds of food service operations decrease.

- Fewer incidences of foodborne illness from home food handling and preservation are reported

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Natural Resources and Environmental Management

☑ 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	12%		12%	
104	Protect Soil from Harmful Effects of Natural Elements	13%		8%	
111	Conservation and Efficient Use of Water	19%		15%	
112	Watershed Protection and Management	10%		7%	
121	Management of Range Resources	5%		7%	
132	Weather and Climate	2%		7%	
141	Air Resource Protection and Management	3%		5%	
205	Plant Management Systems	8%		8%	
511	New and Improved Non-Food Products and Processes	15%		12%	
601	Economics of Agricultural Production and Farm Management	3%		3%	
603	Market Economics	7%		3%	
605	Natural Resource and Environmental Economics	3%		13%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2018	Extension		Research	
	1862	1890	1862	1890
Plan	50.0	0.0	80.0	0.0
Actual Paid	77.9	0.0	64.9	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
2752441	0	1058352	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
8691381	0	7989195	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	1719876	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

• Understand the sources, fate, and transport of important water contaminants (i.e., fecal coliform bacteria, nutrients, sediment, and pesticides [especially atrazine herbicide]), and develop and determine the environmental and economic effectiveness of best management practices for these potential contaminants.
• Quantify the environmental and economic effectiveness of best management practices for improving water quality at the watershed level.
• Disseminate science-based information through environmental education programs for both youth and adults, and deliver extension programs aimed at stakeholders that focuses on adoption of best management practices in targeted areas for water quality improvement.
• Develop and test new crop, livestock, bioenergy, and riparian forest systems that will reduce water use while optimizing productivity, environmental quality, and profitability, including water saving technologies for concentrated animal feeding operations (CAFOs) and industries that process agricultural commodities.
• Develop an information and education program for policy makers, producers, water professionals, and youth audiences with respect to the Ogallala Aquifer, including assessment of the potential impacts of climate change on this important water resource.
• Develop an understanding of air quality impacts of rangeland burning, including extent and timing of burn events, influence of fuel load on emissions, modeling the downwind transport of particulate matter, and developing a climatology of extreme events.
• Disseminate science-based information and transfer technologies to stakeholders, and implement youth education programs focused on air quality.
• Disseminate science-based information regarding the sustainability of biofuel production and processing.
• Develop new processes to modify agricultural-based materials into higher value products.
• Develop resources and pathways to increase climate literacy.
• Provide decision tools for adaptive best management practices that address the effects of climate change.

2. Brief description of the target audience

• Agricultural producers, youth, policymakers/regulators, crop and livestock consultants
• Growing industry based on bioprocessing and bioconversion, including the existing ethanol and biofuels industry

- International grain processors
- Industrial products manufacturers: adhesives, composites, bio-based chemicals, solvents and lubricants
- Entrepreneurs and investors seeking to enter this industry
- Audiences whose production systems will be influenced by climate change, as well as those who consult or influence the decision-makers of these producers. Secondary audiences will be decision-makers and leaders responsible for preparing communities for change (e.g., state and local elected officials, environmental groups)

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2018	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	55309	0	1250	0

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

Patent Applications Submitted

Year:	2018
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2018	Extension	Research	Total
Actual	10	38	48

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational programs delivered

Year	Actual
2018	897

Output #2

Output Measure

- Number participating in educational programs

Year	Actual
2018	12209

Output #3

Output Measure

- Number of refereed research publications

Year	Actual
2018	38

Output #4

Output Measure

- Number of presentations at national and international conferences

Year	Actual
2018	20

Output #5

Output Measure

- Number of workshops, web-based curricula, and field days/tours related to climate change

Year	Actual
2018	29

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Producers adopt BMPs that protect environmental quality (measured by number adopting BMPs)
2	Producers adopt BMPs for atrazine and soil erosion (measured by number of acres)
3	Measurable improvement in water quality (percent reduction atrazine) in Little Arkansas River Watershed
4	Improve utilization of biological raw materials as bioconversion substrates (measured by number of new processes developed).
5	Agricultural/natural resource producers, and/or business representatives modify existing practices or technologies and/or adopt new practices to protect/enhance natural resources and/or enhance biodiversity (Measured by # documented)
6	Development of new knowledge and technologies (Measured by percentage of participants who increase knowledge of management practices under climate variability and change)
7	Improve climate mitigation strategies and their adoption (Measured by number of farms and landowners reducing carbon and energy footprints)
8	Increase knowledge and understanding of new methodologies and technologies that agricultural producers can use to extend the usable aquifer life (measured by number of Water Technology Farms established that year)

Outcome #1

1. Outcome Measures

Producers adopt BMPs that protect environmental quality (measured by number adopting BMPs)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	214

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Water affects every facet of our lives, from drinking supplies to recreation. Its quality and quantity determines how and if it can be used. In Kansas, nearly 500 square miles are covered in water. In addition, there are more than 10,000 miles of streams and rivers in Kansas, most of which are privately owned.

In terms of quality, assessments from the Kansas Department of Health and Environment (KDHE) found many Kansas streams to be impaired by pollutants such as fecal coliform bacteria, herbicides, nitrogen, phosphorus and/or sediments. Pollutants come from a variety of sources including: substances discharged from factories, runoff from agricultural land or storm drains and yards in urban areas. Furthermore, bacteria, sediment, and excess nutrients from livestock and poultry waste have been shown to contaminate surface and groundwater and soils.

A primary source of this groundwater is the High Plains/Ogallala aquifer, which spans 225,000 square miles through portions of Kansas, Nebraska, Oklahoma, Texas, Colorado, South Dakota, Wyoming and New Mexico. Irrigation consumes more than 90 percent of the groundwater used in Kansas. In recent years, drawdown or depletion of the aquifer has greatly surpassed the rate of natural recharge, which illustrates the limitations of what was once thought to be a boundless resource.

What has been done
The K-State Watershed Specialist program began in 2000, as a partnership with the Kansas Department of Health and Environment and other agricultural groups. This partnership assigned specialists to high-priority watersheds. The specialists work closely with local Watershed Restoration and Protection Strategy (WRAPS) groups as service providers and coordinators to develop and implement plans to improve surface water quality and to meet state water quality

standards. The Specialists also provide technical assistance on Kansas Department of Health and Environment Livestock Waste Management Section livestock referrals when required.

Watershed specialists participated in and/or facilitated 530 educational events reaching more than 10,000 Kansans in 2018. Specialists delivered over 120 presentations in addition to several news articles (5) and radio/tv interviews (3). Mailings were also sent out in one watershed reaching thousands. Two hundred fifty-five (255) on-farm assessments and one-on-one consultations took place with many resulting in BMP implementation.

Results
The Watershed Specialist team provided technical assistance in the implementation of 214 BMPs. This includes 56 livestock BMPs, affecting nearly 3,600 animal units on 859 acres, 157 cropland BMPs affecting roughly 19,082 acres and 1 streambank BMP, affecting 10 acres of streambank.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
121	Management of Range Resources
141	Air Resource Protection and Management

Outcome #2

1. Outcome Measures

Producers adopt BMPs for atrazine and soil erosion (measured by number of acres)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	6389

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The project goal is to assist farmers to voluntarily implement atrazine herbicide best management

practices (BMPs) to meet surface water quality standards of 3 micrograms per liter, with no seasonal spikes. A decision was made to target specific sub-watersheds within the Little Arkansas River watershed in order to document water quality improvements.

What has been done
Turkey, Sand and Emma Creek sub-watersheds within the Little Arkansas River watershed were targeted for implementation of BMPs for atrazine herbicide. Corn and grain sorghum fields were targeted in these sub-watersheds. One-on-one consultations took place with landowners to get them to sign up for the incentive program offering several atrazine BMPs at variable incentive rates.

Results
Landowners/producers committed to implementing 39 atrazine BMPs on 6,389 acres of corn and grain sorghum. BMP implementation was predicted to reduce atrazine runoff by 43.2% on 6,389 acres and a total load reduction of 220.77 lbs.a.i. in targeted acres

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
121	Management of Range Resources
141	Air Resource Protection and Management

Outcome #3

1. Outcome Measures

Measurable improvement in water quality (percent reduction atrazine) in Little Arkansas River Watershed

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	43

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The project goal is to assist farmers to voluntarily implement atrazine herbicide best management practices (BMPs) to meet surface water quality standards of 3 micrograms per liter, with no seasonal spikes. A decision was made to target specific sub-watersheds within the Little Arkansas River watershed in order to document water quality improvements.

What has been done
Tukey, Sand and Emma Creek sub-watersheds within the Little Arkansas River watershed were targeted for implementation of BMPs for atrazine herbicide. Corn and grain sorghum fields were targeted in these sub-watersheds. One-on-one consultations took place with landowners to get them to sign up for the incentive program offering several atrazine BMPs at variable incentive rates.

Results
Landowners/producers committed to implementing 39 atrazine BMPs on 6,389 acres of corn and grain sorghum. Implementation of atrazine BMPs resulted in 906.7 (8.9%) less atrazine being applied in the targeted areas. After including all BMPs implemented and using KSU BMP effectiveness data, BMP implementation was predicted to reduce atrazine runoff by 43.2% on 6,389 acres and a total load reduction of 220.77 lbs.a.i. in targeted acres.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management

Outcome #4

1. Outcome Measures

Improve utilization of biological raw materials as bioconversion substrates (measured by number of new processes developed).

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The U.S. consumes more than 140 billion gallons of transportation fuels annually. Due to finite reserves, non-uniform distribution, and volatile prices of fossil fuels, renewable fuels from biomass could make a significant contribution toward a more sustainable future. Recent legislation has called for this nation to annually produce 36 billion gallons of renewable fuel by 2022 to help offset impending concerns over climate change and energy security. Such targets have implications of national security, economic development, and sustainable practices for the future.

What has been done
Both fundamental and applied research has been conducted in the area of biofuel and biobased materials. Key projects include 1) cellulosic biomass as feedstock for biofuels; 2) biobased materials from renewable resources; 3) development of pretreatment methods to increase biomass conversion efficiency; 4) development of NIR models for quick analysis of biomass composition and physical properties.

Results
Our mean results include: 1) a novel biomass pretreatment method using metal oxide was developed; 2) the potential of sorghum mutant stalks for biofuel production; 3) biobased adhesives developed using plant protein and lignin; and 4) developed NIR methods for quick analysis of biomass composition and physical properties.

4. Associated Knowledge Areas

KA Code	Knowledge Area
511	New and Improved Non-Food Products and Processes

Outcome #5

1. Outcome Measures

Agricultural/natural resource producers, and/or business representatives modify existing practices or technologies and/or adopt new practices to protect/enhance natural resources and/or enhance biodiversity (Measured by # documented)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	550

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Forest stewardship is very important in Kansas, even though woodlands cover a small percentage of the state. These woodlands and tree plantings are very important for air and water quality and wildlife habitat. Riparian buffers help stabilize stream banks, and filter out pollutants. Windbreaks prevent wind erosion, enhance crop yields and improve livestock health. Black walnut is the leading timber crop in Kansas, and supports a multi-million dollar industry.

What has been done
Numerous workshops, field days, and demonstration areas were conducted including:
- The Fall Forestry Field Day attracted 105 participants, and focused on timber, wildlife and riparian area management.
- Over 380 natural resource professionals and students participated in the 11th Annual Kansas Natural Resources Conference with the theme "Conservation Delivery in Changing Times." It was held in cooperation with several natural resource societies. A total of 66 concurrent presentations included prescribed fire, water quality, range, wildlife, fisheries and riparian forest management topics.
- A woodland prescribed burning demonstration and research area has been established on university-owned property, with assistance from the National Wild Turkey Federation, the Kansas Forest Service, and the Kansas Department of Wildlife, Parks and Tourism. A burn was conducted in April 2018.

Results
It is estimated that 50 natural resource producers will modify their management from knowledge gained at the educational programs.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water

Outcome #6

1. Outcome Measures

Development of new knowledge and technologies (Measured by percentage of participants who increase knowledge of management practices under climate variability and change)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Producers in the Southern Great Plains face a wide range of climate issues that are constantly in flux and climate change is projected to increase this variability in the future. This is certainly important to both the beef cattle industry and row crop agriculture in the region.

What has been done
Great Plains Grazing is a coordinated effort by a regional network of researchers and extension specialists in Kansas, Oklahoma and Texas to adapt grazing strategies to changing conditions.

In addition to other Extension activities, one of the projects of the Great Plains Grazing Project is the development and coordination of a webinar series:

National Cattle Comfort Advisor, 34 views
Beef Cattle Supplementation: Win-win solutions for sustainability in grazing systems, 87 views
Limit Feeding During Drought, 97 views
Composint Animal Mortalities, 20 views
Environmental Footprints of beef cattle production in the United States, 27 views
Impacts of Authentic Research Experiences for Teachers (ARET) on Agriculture Education, 14 views

Results
The monthly webinars series resulted in a total of 279 views. There were 602 subscribers to the Great Plains Grazing mailing list at the end of 2018 as compared to 537 at the end of 2017 (an increase of 65 subscribers) with an overage open rate of 24%.

Social media followers are also on the increase for Facebook and Twitter.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water

Outcome #7

1. Outcome Measures

Improve climate mitigation strategies and their adoption (Measured by number of farms and landowners reducing carbon and energy footprints)

Not Reporting on this Outcome Measure

Outcome #8

1. Outcome Measures

Increase knowledge and understanding of new methodologies and technologies that agricultural producers can use to extend the usable aquifer life (measured by number of Water Technology Farms established that year)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	4

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The High Plains Aquifer of western Kansas is in decline. Many producers are seeking new methodologies and technologies to extend the usable aquifer life and limit the economic impact of loss of aquifer pumping capacity, such as improved soil and water conservation practices, more efficient irrigation applications and deficit irrigation management strategies.

What has been done
Several producers approached K-State Research and Extension and the Kansas Water Office to offer their farms to demonstrate the installation and testing of the latest irrigation technologies on a whole field scale.

Water Technology Farms are a three year pilot public-private partnership where irrigation technology is demonstrated, related research is conducted on the field scale and water conservation is supported. New irrigation technologies, management techniques and cropping patterns can be tested on a larger scale on these farms. They are also an opportunity for agronomy research to be conducted by K-State Research and Extension.

K-State Research and Extension, Kansas Water Office and other governmental and private entities helped in the design, installation and monitoring of the demonstration farms also know as the Water Technology Farms (WTF). In 2016, 3 WTFs were established and by 2018 there were 10 WTFs established across the state.

Field days were held on each farm to showcase and assess the performance of the new technologies and management practices with more than 400 producers attending.

Results
In 2018, four additional producers established new demonstrations farms. In addition to the field days, there have been additional tours and group visits that occur on the farms throughout the year representing Kansas Legislators, national commodity groups, national and regional media correspondents, and a variety of international and local visitors. Invitations to speak at regional and national forums has also occurred. In three years, the project has reached approximately 3000 people and garnered national television and magazine coverage.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
605	Natural Resource and Environmental Economics

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Short Term (Knowledge)
Target audiences will become aware of both existing and emerging natural resource issues.Participants will gain an understanding of:

- Improved knowledge of environmental concepts and Kansas natural resources
- Increased knowledge and skill development in the area of interpretation and leadership
- Why environmental issues are of interest or concern
- Who/what is impacted by these environmental issues
- Which research-based methods could be employed to address and ultimately resolve the issues

Audiences will increase their knowledge base regarding economically and environmentally sustainable practices that will prevent future problems. Stakeholders will recognize and appreciate the importance of their role in the process of collaboration and resolution of natural resource issues.Addressing water quality and quantity issues are the focus of this year's plan, and evaluation tools are being developed to improve the reporting of program impacts in this area. This should lead to collaboration with other teams, such as Horticulture for landscape water management, and Crops for soil and water conservation.

Medium-Term (Behavior)
Stakeholders and participants will develop long-range strategic plans and implement best management practices as they relate to the sustainable management of grasslands, water, forestry,energy, wildlife, and air. Partnerships will be made among stakeholders to work collaboratively to alleviate and prevent environmental concerns throughout Kansas.

Long-Term (Change in Condition)
Target audiences will benefit from measurable improvements in existing natural resource concerns and mitigation of emerging threats. Kansas citizenry will be environmentally literate and will make sound decisions regarding natural resources. Participants and their associated interests will become economically viable and environmentally sustainable. KDHE water quality monitoring data will show measurable improvement, similar to what has been shown in Clarks Creek, Grouse-Silver Creek, and the Cheney reservoir. The water footprint for the production of crops and livestock, and the maintenance of home landscapes and gardens has been reduced.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 4

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
702	Requirements and Function of Nutrients and Other Food Components	5%		35%	
703	Nutrition Education and Behavior	70%		55%	
724	Healthy Lifestyle	20%		0%	
802	Human Development and Family Well-Being	5%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2018	Extension		Research	
	1862	1890	1862	1890
Plan	45.0	0.0	15.0	0.0
Actual Paid	20.2	0.0	3.8	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
37493	0	62361	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
453205	0	470749	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
1044530	0	101341	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Educational programs about making healthy food choices and increasing physical activity

2. Brief description of the target audience

- Families and individuals of all ages living in Kansas, including populations with limited resources; low literacy skills; varying ethnicities; disabilities, diseases, or impairments; and documented or identifiable health disparities;
- Economic stakeholders, and policy and funding agencies;
- Health care, education, and nutrition professionals;
- KSRE faculty and staff with responsibilities for food and/or nutrition;
- Consumer groups (i.e., STOP)

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2018	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	70368	0	0	0

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

Patent Applications Submitted

Year:	2018
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2018	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of workshop series conducted

Year	Actual
2018	113

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Children and youth increase their physical activity and/or reduce sedentary time. (Measured by percentage of number reached)
2	Adolescents reporting healthier lifestyle habits (e.g., eating meals from a variety of food groups; increased frequency and/or time spent participating in physical activity per day) (Measured by increased percentage of those reached)
3	Children and youth increase consumption of foods such as fruits, vegetables, and whole grains, as recommended by the U.S. Dietary Guidelines for Americans (measured by percentage of those reached).
4	Families/caregivers adopt healthy eating patterns, such as eating breakfast, eating as a family, healthier snack choices (Measured by percentage of those reached)
5	Kansans of all ages engage in increased physical activity.

Outcome #1

1. Outcome Measures

Children and youth increase their physical activity and/or reduce sedentary time. (Measured by percentage of number reached)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Between 2013-2016, one in seven adolescents aged 12-19 years had high blood pressure or elevated blood pressure. High blood pressure increases the risk for cardiovascular disease and nearly half of the youth with high blood pressure had a BMI greater than the 95th percentile which classified them as obese.

Approximately one-third of U.S. adults have high blood pressure and research shows that risk factors that start in youth are likely to be carried over into adulthood.

Regular physical activity has been shown to improve the overall health of youth by reducing their risk of cardiovascular diseases and obesity.

What has been done
The Ignite Project is a community-based program that increases the opportunities for youth to be active during the school day outside of designated P.E. class in a Meade County middle school. The program targets overweight and obesity prevention among adolescents in limited resource, minority communities. An important component of this project includes guidance for community members on the importance of community involvement, including youth in the decision-making process, and developing programs that build year-to-year that are sustainable.

Results
Collaboration between the community and schools to provide physical activity opportunities outside of school increased. Opportunities included providing discounted "passes" for swimming at the local pool, local parks and recreation hosting field days for youth to explore various terrains and locally owned fitness-centered business providing various levels of physical activity opportunities during the school year.

Students reportedly had more energy and were more focused in class which resulted in improved academic performance.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle
802	Human Development and Family Well-Being

Outcome #2

1. Outcome Measures

Adolescents reporting healthier lifestyle habits (e.g., eating meals from a variety of food groups; increased frequency and/or time spent participating in physical activity per day) (Measured by increased percentage of those reached)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Between 2013-2016, 1 in 7 U.S. adolescents aged 12-19 had high blood pressure or elevated blood pressure. High blood pressure increase the risk for cardiovascular disease and nearly half of the youth with high blood pressure had a BMI greater than the 95th percentile which classified them into the obesity category.

Regular physical activity and a balanced diet have been shown to improve the overall health of adolescents by reducing their risk of cardiovascular diseases and obesity.

What has been done
The Ignite Project is a community-based program that targets overweight and obesity prevention among adolescents in limited resource, minority communities. Meade County school implemented a policy that integrated Ignite Project activities related to physical activity and nutrition education

into the eighth grade health and wellness curriculum. The curriculum included information about the importance of physical activity and the benefit of a balance diet, and it also incorporated hands-on activities to reinforce the information taught in class.

Results
The Ignite Project resulted in a healthier school environment that supports increased physical activity and healthier eating learning opportunities during the school day. According to focus group discussions, improvements in academic performance was reported.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle
802	Human Development and Family Well-Being

Outcome #3

1. Outcome Measures

Children and youth increase consumption of foods such as fruits, vegetables, and whole grains, as recommended by the U.S. Dietary Guidelines for Americans (measured by percentage of those reached).

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Nutrients associated with fruit, vegetables and whole grains play a vital role in the proper growth and development of children and youth.

What has been done
A component of the Ignite Project was to initiate mid-morning healthy snack options during the school day.

Results
Youth were observed eating healthy snack options. As a result, fewer kids went to the nurse's

office feeling sick, tired or lightheaded and less students were seen in the principal's office for disciplinary reasons related to inappropriate aggressive behavior in the classroom.

4. Associated Knowledge Areas

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

Outcome #4

1. Outcome Measures

Families/caregivers adopt healthy eating patterns, such as eating breakfast, eating as a family, healthier snack choices (Measured by percentage of those reached)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	77

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Diabetes adversely impacts the lives of over 282,000 adults in Kansas. People with diabetes may experience a shorter life expectancy, financial struggles due to higher healthcare costs, and an increased risk for developing long-term health problems associated with diabetes such as heart disease, stroke, high blood pressure, blindness, kidney disease, and loss of limbs.

In 2015, diabetes was the seventh leading cause of death in Kansas. The estimated cost of diagnosed diabetes incurred by the State of Kansas is $2.4 billion (2017).

What has been done
Dining with Diabetes is a national extension program provided to Kansans by certified extension professionals and community health partners. The program is comprised of four-2 hour sessions and a follow-up session. Classes provide support and motivation for participants and include instruction on carbohydrate counting, portion control, menu planning, label reading, diabetes self-care, and healthful food choices. A five to ten minute low-impact physical activity, demonstrations on tasty, healthy familiar foods, food sampling, and cooking techniques are key components. Weekly goal-setting activities help participants apply the information learned at each session. Extension educators presented the program 18 times during the 2017-2018 program year in 14

counties with 224 people attending.

Results
In a pre and post test survey, there was an increase from before the program compared with after the program in the number of respondents that agreed with the following statements:
- When it comes to diabetes and health, what I do can make a positive difference for me or the person I care for with diabetes.
- I feel confident I can keep my diabetes under control or help the person I care for keep their diabetes under control.

As a result of participating in Dining with Diabetes, participants also reported:
- Cooking more at home (77%)
- Eating smaller portions (89%)
- Using healthy recipes provided in the course (71%)

Responses to post program evaluations also indicated a significant increase in reviewing food labels to make healthy choices and an increase in daily physical activity.

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
724	Healthy Lifestyle
802	Human Development and Family Well-Being

Outcome #5

1. Outcome Measures

Kansans of all ages engage in increased physical activity.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	10171

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The 2014 State Indicator Report on physical activity from the U.S. Centers for Disease Control and Prevention (CDC) indicates that people who are physically active generally live longer and have a lower risk for heart disease, stroke, type 2 diabetes, depression and some cancers. Physical activity can also help control weight.

However, less than 47% of adults living in Kansas meet the minimum aerobic physical activity guidelines and 16.5% meet strengthening guidelines. Less than 20% of older adults engage in adequate physical activity and fewer perform strength training and flexibility exercises. Underserved populations often have even lower rates of physical activity.

What has been done
Extension professionals worked to improve the health and vitality of individuals and communities through two programs - Walk Kansas and Stay Strong, Stay Healthy. These programs are evidence based and reflect current physical activity and healthful eating guidelines.

Stay Strong, Stay Health (SSSH): This program helps to mitigate many of the health issues older adults face. The program aims to prevent frailty, injury and disease, improving the quality of life for older adults by increasing independence and productive living. 371 participants completed at least 10 out of 16 exercise classes, one hour in length. Nutrition education topics, specific to older adults, are available during class.

Walk Kansas: an 8-week team-based walking program focused on improving overall health that reached approximately 9800 people.

Results
Stay Strong, Stay Healthy:
100% felt their overall health improved
92% increased their knowledge of strength training
76% met strength training and flexibility recommendations
75% felt confident to continue on their own
70% increased the amount of weight used during exercise
52% indicated their joints felt better

Walk Kansas:
86% of participants reached the minimum goals for physical activity (150 minutes per week) and 85% were confident they would continue for six months.
76% reported eating more fruits and vegetables and 89% were confident they would continue eating more fruits and vegetables for six months

Over the eight week period, participants reported the following:
47% increased energy
40% increased endurance
37% improved mood
30% better sleep
28% decreased weight
24% increased muscle strength

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle
802	Human Development and Family Well-Being

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

At the conclusion of the workshop, the following indicators were measured:

- What awareness, knowledge or change in attitudes did program participants gain regarding healthy eating, meal planing, food preparation, budgeting for food, and physical activity?
- What awareness or knowledge did program participants gain regarding food assistance programs, gardening, home food preservation or other strategies that improve their access to high-quality and safe food?
- What awareness, knowledge or change in attitudes did program participants gain regarding breastfeeding?
- What awareness or knowledge did staff and volunteers gain regarding environments that support healthy food choices and physical activity?
- What awareness or knowledge did staff and volunteers gain regarding improving access to high-quality, safe food for limited-resource residents in their community (e.g., promoting private and community gardens, increasing local food production for food insecure persons, donations to food pantries, CSAs, electronic benefit transfer devices at Farmers Markets, SNAP outreach)?

Three to six months after a program:

- What changes do participants report regarding more healthful eating, meal planning, food preparation, budgeting for food and physical activity habits?
- What changes do participants report regarding use of food assistance programs, gardening,home food preservation, low-cost meal preparation and other strategies that increase their access to high-quality, abundant and safe food?
- Do participants who are new mothers report initiating breastfeeding, exclusively breastfeeding for a long time, and still breastfeeding at 6 months?

- What changes have staff and volunteers taken to support healthier food choices and physical activity in schools and public venues?
- What changes have staff and volunteers taken to support increased access to high-quality,abundant and safe food (e.g., promoting private and community gardens, increasing local food production for food insecure persons, donations to food pantries, CSAs, electronic benefit transfer devices at Farmers Markets, SNAP outreach)?

Long-Term

- Are more Kansans at a healthy weight and report consuming more vegetables and fruits and being physically active on most days?
- Do more Kansans have access to high quality, abundant and safe foods?
- Are the Healthy People 2020 Breastfeeding Goals met in Kansas?
- Do more Kansas schools and public venues plan and ensure environments for healthy eating and physical activity?
- Do more Kansas communities use strategies that increase their residents' access to high quality,abundant and safe foods?

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Healthy Communities: Youth, Adults and Families

☑ 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
724	Healthy Lifestyle	20%		10%	
801	Individual and Family Resource Management	10%		15%	
802	Human Development and Family Well-Being	15%		20%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	15%		15%	
806	Youth Development	40%		10%	
903	Communication, Education, and Information Delivery	0%		30%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2018	Extension		Research	
	1862	1890	1862	1890
Plan	146.0	0.0	20.0	0.0
Actual Paid	87.4	0.0	22.1	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
407048	0	359854	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
2613813	0	2716449	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
4144491	0	584784	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

• Develop/identify theory- and evidence-based educational programs to promote healthy communities: youth, adults, and families.
• Disseminate, implement, and evaluate effectiveness of programs to promote healthy communities: youth, adults, and families.
• Strengthen collaborative capacity within K-State Research and Extension and among communities/ organizations to promote healthy communities: youth, adults, and families.
• Provide technical assistance and educational programs to citizens seeking to make their communities healthy and sustainable places for meeting human needs.
• Establish links between community development researchers and practitioners for cooperative efforts that result in healthy, sustainable communities.
• Provide experiential learning opportunities for children and youth to address key and emerging issues that affect their growth and development.
• Deliver and evaluate evidence-based community-development strategies for positive youth development in structured out-of-school settings (e.g., after-school programs, youth-serving organizations, clubs).
• Strengthen the support for a volunteer development system through training and education on the experiential learning model, 4-H essential elements, ISOTURE model, age appropriate learning experiences and emerging aspects of youth development.
• Provide imaginative, motivational, and experiential learning experiences to help youth build competencies and master life skills.

2. Brief description of the target audience

• Families and individuals of all ages living in Kansas, including populations with limited resources; low literacy skills; varying ethnicities; disabilities, diseases, or impairments; and documented or identifiable health disparities
• Economic stakeholders, and policy and funding agencies
• Health care and education professionals
• K-State Research & Extension faculty and staff with responsibilities for healthy communities: youth, adults, and families

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2018	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	345912	0	17301	0

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

Patent Applications Submitted

Year: 2018

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2018	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational programs delivered to increase knowledge of healthy communities: youth, adults, and families

Year	Actual
2018	4798

Output #2

Output Measure

- Number of program participants

Year	Actual
2018	72491

Output #3

Output Measure

- Number of educational programs to increase knowledge of volunteer development, experiential learning, and youth development competencies

Year	Actual
2018	1200

Output #4

Output Measure

- Number of communities that participate in community capacity building trainings and activities led through Extension.

Year	Actual
2018	79

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Community projects engage participants in process to address community goals (Measured by number of substantial community projects that reflect shared participation in addressing community goals)
2	Community members are engaged in community improvement programs (measured by number of volunteer hours)
3	Volunteers, faculty, and staff understand and demonstrate effective youth development principles in service to youth (e.g., 5 Cs of positive youth outcomes, essential elements to positive learning environments)(Measured by number demonstrating competency)
4	Youths improve competence, confidence, connection, and character and caring (measured by number of youths who improve: (a) Competence - believe they are capable and successful; that they have mastery. (b) Confidence - know they influence the world around them (i.e., people and events); that they have independence. (c) Connection - know they are cared about; that they belong. (d) Character and Caring - Youths practice helping others; they are generous.)

Outcome #1

1. Outcome Measures

Community projects engage participants in process to address community goals (Measured by number of substantial community projects that reflect shared participation in addressing community goals)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	943

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Kansas PRIDE (not an acronym) supports community development efforts by providing a structure to mobilize local organizations and governments as they address quality of life issues. Communities are encouraged to assess their needs, set goals, implement plans, evaluate the impact and celebrate.

What has been done
The PRIDE program adopted the community capitals model as a framework for the current program. This framework reveals the interactions between different parts of a community.

Results
In 2018, 74 PRIDE communities were involved in 943 projects at the local level. PRIDE communities reported that 213 of these projects engaged youth. Of the projects reported, 528 projects were ongoing, 137 projects were new, and 278 projects were completed.

4. Associated Knowledge Areas

KA Code	Knowledge Area
803	Sociological and Technological Change Affecting Individuals, Families, and Communities

Outcome #2

1. Outcome Measures

Community members are engaged in community improvement programs (measured by number of volunteer hours)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	68661

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The philosophy of community development that Kansas PRIDE encourages is based on the fundamental valuing of volunteer hours.

What has been done
In 2018, PRIDE communities were involved in 943 projects at the local level. PRIDE communities reported that 213 of these projects engaged youth. 528 projects were ongoing, 137 projects were new, and 278 projects were completed.

Results
In 2018, 74 PRIDE communities reported 68,661 hours of volunteerism. This conservatively calculates to a dollar value of more than $1,552,940 as caculated using the Independent Sector Calculator for Volunteer Time. Kansas PRIDE communities reported raising $475,923.82 for reinvestment in their communities during 2018.

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
806	Youth Development

Outcome #3

1. Outcome Measures

Volunteers, faculty, and staff understand and demonstrate effective youth development principles in service to youth (e.g., 5 Cs of positive youth outcomes, essential elements to positive learning environments)(Measured by number demonstrating competency)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	10647

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
More than 74,837 youth participate in the Kansas 4-H Youth Development program annually. 4-H learning experiences are based on principles and practices to enhance young people's ability to grow into tomorrow's leaders and communicators. Kansas 4-H plays a vital role in helping youth achieve future success because of a structured learning environment that includes encouragement and mentoring.

What has been done
Kansas 4-H conducted a study to determine the program's effectiveness in fostering positive connections, encouraging responsible decisions, and developing communication and citizenship skills. More than 2,600 Kansas youth ages 8 to 18 year old from rural and urban areas participated in the study. Using a subset of Common Measures, an evaluation tool used nationally by 4-H, K-State Research and Extension professionals surveyed Kansas youth to gather data on the potential benefits of a young person's participation in 4-H. The outcomes measured in this study were:
* Positive connections with others;
* Responsible decision making;
* Communication skills; and
* Citizenship and contributions to their communities.

Results
Among the youth who responded to the survey:
* Positive Connection with Others: 96 percent reporting working successfully with adults and having caring friends. 93 percent are connected to adults who are not their parents.
* Making Responsible Decisions: 95 percent reported being comfortable with making their own decisions and 91 percent have a plan for reaching their goals.

* Growth in Citizenship Skills: 94 percent reported they gained important skills by serving their communities and 97 percent reported a strong desire to help others.
* Leadership: 95 percent reported an increased effort to allow everyone to have a voice. 95 percent reported they treat everyone fairly and equally when they are in charge of a group.
* Communication: 4-H participants in their third year or more reported a 60 percent increase in their confidence in public speaking compared to newer participants.

The results of the survey of Kansas 4-H youth demonstrate the vital role 4-H youth development programs play in helping Kansas youth achieve future successes and becoming tomorrow's leaders.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #4

1. Outcome Measures

Youths improve competence, confidence, connection, and character and caring (measured by number of youths who improve: (a) Competence - believe they are capable and successful; that they have mastery. (b) Confidence - know they influence the world around them (i.e., people and events); that they have independence. (c) Connection - know they are cared about; that they belong. (d) Character and Caring - Youths practice helping others; they are generous.)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	2587

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Youth Development research indicates that youth involved in 4-H Youth development experiences are more 2.5 more likely to be involved in their communities. The ethic of community involvement help youth to feel they are capable and successful, helps youth build mastery and teamwork, demonstrates in a visible way how they are able to participate in the world around them and connect with others, and learn and practice a sense of generosity. Involvement in a local community service day is a way to engage youth, adults and the community at large in projects that improve the health and vitality of communities.

What has been done
For the fifth year, the Kansas 4-H Youth Leadership Council has coordinated a two-day service event that involves local 4-H groups, alumni and friends across the state to participate in 48 Hours of 4-H. As a finale for National 4-H Week, the statewide community service project required careful planning by youth and adults working together and coordinated communication plans. This 48-hour service project was a collaborative effort among the Kansas 4-H Youth Leadership Council, 4-H Youth Development and the local Extension units and 4-H youth and volunteers across the state

Results
The 48 Hours of 4-H project took place October 7-8, 2017 and was promoted as a weekend of service - a lifetime of impact. The project resulted in 90 community service projects across Kansas. The type of projects primarily included collections and donations; benefits; educational events; clean up and beautification projects. There were a total of 2281 participants of which 306 were 4-H alumni. Results: $24,566 was raised for charities; and 9740 items collected (primarily nonperishable food); 101 new youth joined 4-H. 40 Kansas Extension Units (Counties and Districts) were represented.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes
- Appropriations changes
- Public Policy changes
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Short-Term (Knowledge)
Youth increase their awareness and knowledge of positive youth development, adopt new or different attitudes; develop opinions, new aspirations and/or new motivation related to:

- Competence- ability to act effectively in school, in social situations and at work;
- Confidence- an internal sense of overall self-worth and efficacy;
- Connection- positive bonds with people and social institutions;
- Character- respect for society and cultural rules, an inner moral compass; and
- Caring- a sense of sympathy and empathy for others and a commitment to social justice.

Indicators

- Percentage of youth who increased their knowledge about mastery of skills
- Percentage of youth who increased their knowledge, awareness and skills about self-awareness
- Percentage of youth who learned how to build healthy interpersonal relationships
- Percentage of youth who increased their awareness and attitude for developing positive interpersonal skills
- Percentage of youth who increased their awareness and knowledge of serving others

Medium-Term (Behavior)
Youth use and act on their skills attributed to positive youth development, i.e., practice new behaviors or demonstrate new positive youth development abilities.

Indicators

- Percentage of youth participating in opportunities to demonstrate competence such as project groups, competitions, academic achievements, etc.
- Percentage of youth practicing an internal sense of self worth
- Percentage of youth consistently participating in clubs, teams, groups
- Percentage of youth consistently demonstrating ethical behavior in society
- Percentage of youth consistently leading and participating in meaningful service-learning opportunities

Long-Term (Change in Condition)
All youth will grow up fully prepared for and fully engaged in life by having the ability to participate effectively by caring for themselves and by giving of themselves at home, in the community and in civic life.

Indicators

- Youth are effective participants socially, at work and in school
- Youth are independent and self-confident
- Youth identify with people, social settings and everyday life
- Youth are law abiding citizens and contribute positively to society
- Youth are sympathetic and empathic to others
- Youth are generous with their time, resources and compassion toward community and other people

Key Items of Evaluation

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.