

# 2016 Texas A&M University and Prairie View A&M University Combined Research and Extension Annual Report of Accomplishments and Results

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## I. Report Overview

### 1. Executive Summary

Texas is the second largest state in the nation with approximately 25 million citizens. The size and scope of Texas poses unique challenges with a wide range of diversity including both the agricultural and human sectors. The issues and needs of Texans vary by numerous factors and, in many cases, are complex. Texas is one of the most rural and most urban states in the nation with a majority of its citizens living in 20 of the 254 counties in the state.

#### **AgriLife Extension and AgriLife Research**

Texas A&M AgriLife Research (AgriLife Research) and the Texas A&M AgriLife Extension Service (AgriLife Extension) are the land-grant research and Extension components of the Texas A&M System and are headquartered in College Station, Texas. Since its beginning in 1876 as a land-grant institution, Texas A&M University has been a recognized leader in agriculture, food, and natural resources. Today, Texas A&M University, AgriLife Research, and AgriLife Extension continue this legacy through outstanding academic programs, important contributions to science through research and discovery, and life-long learning and youth development through Extension programs.

The work of both AgriLife Research and AgriLife Extension is guided by strategic plans. AgriLife Research developed a strategic plan to focus its resources on issues of highest importance as identified by agency scientists and other stakeholders. The major topical areas in the strategic plan are identified as priorities. These priorities are vital and equally important to ensuring a positive future for Texas and its citizens. The priorities are as follows:

- 1) Achieve resilience in food, fiber, and ecological systems through adaptive strategies.
- 2) Detect, monitor, and mitigate insect vector-borne diseases and invasive species.
- 3) Enhance agricultural information systems and expand their use through innovative applications.
- 4) Integrate basic and applied research at the nexus of food and health.

The Extension strategic plan is designed to enable the dissemination of research-based information to the citizens of Texas on issues of importance as identified through grassroots and other stakeholder input processes. This information is intended to allow the citizens of Texas to make sound decisions that will improve the overall quality of life for themselves and all Texans. The goals of the Extension strategic plan are:

- 1) Ensure a sustainable, profitable, and competitive food and fiber system in Texas.
- 2) Enhance natural resource conservation and management.
- 3) Build local capacity for economic development in Texas communities.
- 4) Improve the health, nutrition, safety, and economic security of Texas families.
- 5) Prepare Texas youth to be productive, positive, and equipped with life skills for the future.
- 6) Expand access to Extension education and knowledge resources.

Work on issues of importance in the state is a joint endeavor by both AgriLife Research and AgriLife Extension. Research-based information is translated to practical best management practices and disseminated via multiple channels including the network of agents in all 254 counties in the state. Both AgriLife Research and AgriLife Extension conduct identification of issues and needs at multiple levels. Grassroots involvement by citizens, advisory groups, and commodity and industry groups are just a few of the ways this information is generated. Work with other states on areas of shared interest is also of high priority.

This Plan of Work addresses programs of primary importance in Texas. The programs selected also address federal initiatives for agriculture and natural resources, individuals and families, communities, and youth and adult leadership development.

### **Cooperative Extension Program and Cooperative Agricultural Research Center**

The mission of the **Cooperative Extension Program** is to respond to the needs of underserved Texans through life changing opportunities that empower families, promote agriculture, strengthen communities and foster leadership development in youth. The Cooperative Extension Program utilizes various methods to engage stakeholder groups to identify and address emerging issues thus meeting state and federal priorities. More than one in six Texans live in poverty, and 25% are children. Therefore, well-trained Extension staffs are positioned and available offering relevant outreach programs to address the needs of underserved audiences in rural and urban communities. Currently, we have staff in 35 of the 254 Texas counties. Given the targeted audience that encompasses various ethnic groups, religions, cultural and socioeconomic backgrounds, the outreach methods used to address the identified needs are client focused and culturally sensitive. The present and emerging needs such as Global Food Security and Hunger, Childhood Obesity, Climate Change, Food Safety, Human Development and Family-Well Being, Youth Development, Individual and Family Resource Management provided the direction for development and implementation of educational outreach methods in the counties. These methods are delivered through local and state collaborators, College of Agriculture & Human Sciences faculty, staff and research scientists.

The Agriculture and Natural Resources (AgNR) unit focused its efforts on developing sustainable farming and ranching operations by improving their ability to manage risks related to their operations. Our extension specialists and agents plan and implement diverse outreach series targeting local producers, farmers, and ranchers. Workshops and hands-on clinics provided information about grant and loan opportunities. Programs helped participants find reasonable and helpful cost reductions in their agriculture plans and enterprises. Partnerships with the USDA Farm Service Agency (FSA) assisted small-scale agricultural producers with individual assistance in completing microloan and youth applications. Additional outreach activities engaged small scale producers with the knowledge needed to maintain their livestock in a sufficient and sustainable way. Programs covered, including (but not limited to) herd health, vaccination protocols, and parasite management. Other educational efforts addressed soil health related issues emphasizing the need to test the soil to determine proper fertilization, proper pH adjustment rates, weed control and the use of cover crops to reduce soil exposure and add organic matter to the soil. CEP partnered with the Cooperative Agricultural Research Center (CARC), Natural Resource Conservation Service (NRCS) and the 100 Ranchers, a local community-based organization, and offered a series of workshops over Southeast Texas. Various field days and farm tours engaged producers in new revenue streams for Texas producers at local farmers' markets. A survey of participants attending trainings reported that 59% will sell produce at local farmers' markets. Technical support and training on sustainable urban farming attracted organic farmers in Houston who have successful organic produce markets and desire to engage youth through community gardens. One-on-one technical assistance and consultations included 1,352 individuals, 43 workshops, seven on-farm demonstrations were conducted and 69 farmers were assisted with loan applications totaling \$5,873,000.00. Furthermore, a new production technology transfer was developed for improved cultivation of a healthier variety of grafted cucumbers.

As a result of the Community and Economic Development staff's efforts, limited resources individuals across the State of Texas have experienced positive outcomes in small business creation, business expansion, home ownership, foreclosure prevention, financial literacy, emergency preparedness, and youth entrepreneurship. Businesses have received millions of dollars in contract opportunities and hundreds of youth have been trained in entrepreneurship. Participants (25) enrolled in the Individual Development (IDA) program are estimated to accumulate over \$250,000 to be used for higher education, home ownership and in some cases, for purchasing a vehicle for transportation. This additional economic boost will create jobs as participants buy homes and graduate from college with less debt. Of the 394 applications submitted for home loans and rehabilitation, 123 were approved at the time of this report. A

total of \$3,105,000 invested in home repair and of that amount, \$2,460,000 is the line of credit approved by underserved participants at 1% for repairs. One-hundred sixty were assisted with first-time home buyer and low interest mortgages at a value of \$19,200,000 in approved applications. The flagship program implemented was the Businesses In Development (BID) program, a 12-week training course conducted in various counties. The workshops focused on training new and existing businesses how to get and successfully execute State contracts. The Program had 230 course participants, 267 HUB profiles reviewed, and 89 new Historically Underutilized Businesses (HUBs) established. Further impact of CED includes: 310 workshops conducted, 13 videos developed for train-the-trainer programs and online workshops, 977 youth trained in Agribusiness, 353 youth trained in entrepreneurship, and \$625,000 in loans approved for small business with one of the loans saving 20 jobs in a rural community. The 4-H and Youth Development unit engaged youth and adult volunteers in outdoor exploration and environmental education and hands-on STEM activities for exposure to career pathways in agriculture and other related sciences. Through a diverse agenda of youth development activities and programs implemented by Extension agents, 160,000 youth and adult direct contacts were reached. Minorities underrepresented in STEM careers are creating a national crisis called a skill gap or broken worker pipeline. Extension agents recruited various community volunteers and collaborators to develop relevant outreach activities and enrolled 6,348 youth in STEM education. Evaluation data indicates that over 40% improved their science skills. The Agrobotics program increased 4-H youth enrollment in clubs and competitions at the Houston Livestock Show and Rodeo and Prairie View A&M University. More than 800 youth have enhanced STEM skills through this innovative program. Three summer leadership programs exposed 150 youth to college and STEM careers. Certain 4-H members received and accepted an invitation to meet former astronauts while at the NASA Space Center in Houston. Junior Master Gardener Programs engaged 534 youth contacts in Cass and Travis Counties in the Heroes 4-Health project. The Heroes 4-Health banner program continues to develop youth advocacy around nutrition and physical health with the goal to mobilize underserved youth in a community healthy living campaign. Diabetes and obesity continue to be a serious crisis facing families in Texas. Thus, the number of diabetes-related deaths and people enduring devastating health complications also continue to foster pressure and financial impact on health care. Family & Consumer Sciences Extension agents designed a variety of nutrition and wellness activities including childhood obesity and reached more than 60,000 families. Of 10,000 participants evaluated, 74% adopted healthy living behaviors. Conflict within families is one of the most difficult situations to deal with. Much of the conflict resides around the lack of communication. However, families are an intricate part of society, and they are the dominating fabric of society. The Active Parenting series conducted in Harris and McLennan Counties enrolled 1,914 parents in a three or six series of interactive sessions. The need to provide information to grandparent's was met through the Grandparent Caregiver program with 646 participants. Unfortunately, many families do not discuss money management until there is a problem. Good family relationships and economic security begin when families can discuss their finances. Within today's economy, money management is a key factor in family stability. County agents used Real World simulation activities and the Money Matters curriculum to reach rural and urban youth and Savvy Saving Seniors for adult audiences. Adults learned ways to change behaviors to improve health and nutrition status through the MyPlate series and Eating Smart Being Active informal classroom settings reaching 10,709. FCS agents and headquarters staff members are working with their Ag & Natural Resource and 4-H agents to demonstrate healthy meals with produce from community garden projects and the University farm demonstration plots. Each of the aforementioned accomplishments has addressed and provided assistance for the underserved and underrepresented clientele served by the Cooperative Extension Program and the Cooperative Agricultural Research Center in critical areas of importance to the State of Texas. In addition, the programs have persistently addressed federal initiatives for agriculture and natural resources, individuals, families and communities as well as youth and adult leadership development in accordance with the land-grant mission championed by the College of Agriculture and Human Sciences at Prairie View A&M University. The research mission of Prairie View A&M University, College of Agriculture and Human Sciences, led by the **Cooperative Agricultural Research Center (CARC)**, is to ascertain new scientific knowledge, hearten innovative approaches and craft solutions based on sound science that addresses challenges

facing agriculture, natural resources, environment, and interrelated human systems for limited resource farmers and ranchers in Texas, Texans in general, the U.S., and the globe.

The high impact research focus areas covered by CARC Plant System scientists include hybrid sweet potato genomics that have facilitated the production of new lines of high-yielding insect resistant purple and orange-colored varieties; zero calorie sweetener medicinal plant metabolomics that have facilitated the discovery of ultra-high accumulations of antioxidants in *Phyla dulcis*, an otherwise obscure herb of Central America; chemistry of polymeric plant-derived materials that have facilitated the synthesis of novel biomaterials with potential applications in medicine; and horticultural production of those specialty organic fruits and vegetables that enjoy extensive markets in many urban cities of Texas. These are high applied agricultural research areas for Prairie View A&M University, the State of Texas, USDA, and the Nation because of their immediate impact on our stakeholders by, the plant-derived natural zero-calorie sweetener research project is hoped to catch the market for the dietary management of obesity and diabetes, the twin scourge that afflict the primary health of millions in the U.S.

The Food System of CARC addresses research-based food quality and food products. The Food System developed protocols to get the approval to carry out work on microbial pathogens in the laboratory. Procedures are also being developed to test for antibiotics in goats' milk and associated products made from goats' milk. The tetracycline antibiotic assay of goat milk was completed and the results were published in two peer-reviewed journal articles. Work was carried out on to increase omega-3 fatty acids in goat meat by changing the feed and testing the quality of the meat produced. The part of the project that involved feeding of lactating goats with rations containing supplemented levels of omega-3 fatty acids from fish oil was completed and milk samples were collected at various stages of feeding. Currently, the collected milk samples are being analyzed by gas chromatography-mass spectrometry to identify and quantify the profile of polyunsaturated fatty acids. Research with the antioxidant lutein in "high" and "low" oleic peanuts previously coated with milk proteins (the caseins) was completed and the results showed that the coated peanuts were oxidized slower than uncoated peanuts.

The program of the Animal System and International Goat Research Center is dedicated to developing sustainable farming/ranching operations focusing on increasing the health and productivity of livestock through optimizing nutrition and reproduction. The purpose is to ensure that these agricultural operations are not only profitable but they are also friendly to the community and the environment.

Major programs offered are i) small ruminants and alternative livestock and poultry production programs; ii) beef cattle and forage production; iii) hay and forage production and utilization, and iv) cool season forage for winter grazing. The collaborative efforts of research staff are contained within two main research focus areas: i) increasing the efficiency of artificial insemination and embryo transfer: We are focusing our efforts in the areas of breeding and reproductive management. Technologies in these areas are moving rapidly and hold great promise to reduce production costs and increase genetic merit and farm profits. Studies will define factors that influence male fertility and cryopreservation of semen for use in AI. Studies in the female will center on defining the window of receptivity for early embryonic development and improvements in embryo transfer efficiencies. The second main research area is ii) The role of Residual Feed Intake (RFI) on reproductive performance, milk production and offspring performance in Alpine goats: RFI is a measure of livestock feed efficiency. Animals with low RFI consume less feed at the same level of production as high RFI cattle. To measure RFI, animals need to be fed individually. We installed an eight bunk GrowSafe feed intake and behavior monitoring system and will validate this system for use in goats.

The Natural Resources and Environmental System conducted the following research activities including: assessing estimating irrigation water requirements for major crops in the northern High Plains of Texas and citrus water requirements across some of the major citrus producing areas in the world under current and future climate scenarios; analyzing potential future climate and climate extremes in the Brazos headwaters basin, Texas; developing a web-based tool to calculate agricultural crop and urban landscape irrigation water requirements; evaluating land use change effects on net ecosystem CO<sub>2</sub> exchange using satellite measurements; studying the effect of torrential rain and drought on groundwater storage in Texas; evaluating the performance of different four satellite soil moisture products over the state of Texas; evaluating the Electromagnetic Induction Sensor, EM-38 in monitoring soil moisture; and studying

microbial decomposition of organic matter in lowland and upland systems.

**Total Actual Amount of professional FTEs/SYs for this State**

Year: 2016	Extension		Research	
	1862	1890	1862	1890
Plan	381.0	69.5	148.9	31.0
Actual	429.4	54.0	148.2	24.5

**II. Merit Review Process**

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

- Internal University Panel

**2. Brief Explanation**

**AgriLife Extension and AgriLife Research**

AgriLife Research and AgriLife Extension Administrative Leaders serve as merit reviewers for the Federal Plan of Work, the Federal Report of Accomplishments and Results, and associated grants and contracts. This team is comprised of senior administrative staff, as well as department heads and associate department heads for Extension. This leadership team is responsible for the oversight and management of all programs conducted by research and Extension faculty.

**Cooperative Extension Program and Cooperative Agricultural Research Center**

Extension programs initiated in the state of Texas are funded in whole or part from Smith Lever or Section 1444 and 14445 funds requiring a merit review process. The review panel is comprised of Cooperative Extension Program administrative leaders, Dean of the College of Agriculture and Human Sciences, Cooperative Agricultural Research Center director, scientists, faculty, and Texas AgriLife middle managers. These help determine if appropriate strategies are designated to reach the limited resource clientele mandated by the United States Department of Agriculture. The plans are reviewed based on needs assessment, planned programs, outcomes and evaluation. This combined leadership team is responsible for the oversight and management of all programs planned and implemented by Extension staff members.

All proposed research projects that are funded under either Evans-Allen, Experiment Station (Hatch), or otherwise, undergo a merit review process. Each proposal submitted for support is routed through an internal review committee and if deemed necessary, each proposal is routed through the University Committee on Research. The Research Director selects a set of individuals to serve as members of an internal review panel in consultation with the University's Vice President for Research. At a minimum, three individuals review and evaluate each proposed project prior to approval for external submittal and/or internal fund allocation. Scientific peer review is incorporated in that all project reports including Current Research Information System must show evidence of external review. Written comments should be included with final proposals for campus routing. Routing proposals through quality control check points (Research Director, Dean of the College and Vice President for Research) are designed to ensure that proposals meet RFP guidelines as well as meet scientific merit qualifications. All proposals are checked by our on campus Office of Sponsored Programs.

### III. Stakeholder Input

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

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of the general public
- Survey specifically with non-traditional groups

#### Brief explanation.

##### **AgriLife Extension and AgriLife Research**

Both AgriLife Extension and AgriLife Research use multiple methods to reach stakeholder groups within the State of Texas. AgriLife Extension uses multiple sources of input from various stakeholders. These include local clientele, commodity/special interest groups, trend data monitored by specialists, various county committees, elected officials, and emerging issues. Teams of Extension and research faculty meet to analyze these issues, which lead to priority setting and development of programs to address the needs and issues raised by the various stakeholder groups and methods.

In 2015, AgriLife Extension held open forums to identify issues. These forums were held in each of the 254 counties. Issues identified were entered into a state-wide database and used to guide programming. Local Leadership Advisory Boards (LABs) meet to validate issues raised in the local stakeholder input process in the non-forum years. Leadership Advisory Boards serve as a conduit to local citizens and their needs. These boards are comprised of community opinion leaders charged with providing long-term visioning and advocacy for the local Extension program. Approximately 2,500 individuals serve on Leadership Advisory Boards across the state. This process continues as the local process to raise and validate issues. Another 10,000 citizens serve on program area committees, task forces, coalitions, and youth boards. These volunteers represent specific areas of the local program and are involved in issues identification, program development and delivery, evaluation and interpretation of programs, and management of other volunteers. These volunteers represent all 254 counties in the state.

AgriLife Research Administration, Department Heads, and Resident Directors regularly meet with the major agricultural industries and commodity groups in Texas. AgriLife Research has encouraged the public to participate in helping set priorities, assess current program and process effectiveness, and determine future directions. These processes were open, fair, and accessible to encourage individuals, groups, and organizations to have a voice, and treated all with dignity and respect. Stakeholders were initially identified by membership in listed organizations, though all events were public and were announced in the press and other written notice. Input from these events was captured by AgriLife Research participants, and in some cases, was published for further public use. Stakeholder input has always been critical to AgriLife Research processes and programs, and listed events and organizations continue as essential partners in setting the AgriLife Research agenda and recognizing and addressing emerging issues. A concentrated effort was done for small grains, corn, sorghum, and cotton resulting in a jointly developed strategic plan. AgriLife Research also met

with leading animal health companies, large cow-calf operators, stockers, cattle feeders, and leaders in high-throughput sequencing to develop a research strategy to benefit the beef industry.

### **Cooperative Extension Program and Cooperative Agricultural Research Center**

The Cooperative Extension Program (CEP) used various methods to reach stakeholder groups within the State of Texas. Multiple sources of input were gathered from stakeholders including local clientele commodity/special interest groups, various county committees and elected officials. CEP also used media outlets such as public service announcements and online communications. Focused programs were conducted and analyzed, which led to priority setting and development of educational programs addressing the needs and issues raised by various stakeholder groups in the stakeholder input process. Extension used Leadership Advisory Boards ( LABs ) to validate issues raised in the local stakeholder input process. LABs serve as a conduit to local citizens and their needs. These boards are comprised of community opinion leaders charged with providing visioning and advocacy for the local Extension program. Additional citizens serve on program area committees, task forces, coalitions, and youth boards. These volunteers represent specific areas of the local program and are involved in issues identification, program development and delivery, evaluation and interpretation of programs, and management of other volunteers. These volunteers represent the counties in the state serviced by Cooperative Extension and Research

## **2(A). A brief statement of the process that was used by the recipient institution to identify individuals and groups stakeholders and to collect input from them**

### **1. Method to identify individuals and groups**

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys
- Other (Meetings with various stakeholder groups)

### **Brief explanation.**

#### **AgriLife Extension and AgriLife Research**

The basis for Texas Extension's relevance in the State of Texas is grassroots involvement. Texas Extension engages the local Leadership Advisory Board in the identification and validation of new and emerging issues. Information from other stakeholders is obtained in various ways. Regular meetings are held with various commodity and interest groups. These groups provide input into programmatic decisions including development of new efforts, modification of existing efforts, and termination of programs that are no longer relevant. Finally, various subject matter groups employ the use of surveys and other needs assessment processes to gain information specifically about their subject area. Data from these processes are used to develop programs to address issues. For research, the above listed groups and organizations provide invaluable input into the stakeholder process. Also, research maintains an active contact list and engages stakeholders on a regular and ongoing basis.

#### **Cooperative Extension Program and Cooperative Agricultural Research Center**

Cooperative Extension used open listening sessions in 35 counties as a means of getting grassroots involvement in its program planning and data collection process. These sessions allow local clientele to give their opinion on issues of importance to their communities. Additionally, Leadership Advisory Boards and other program advisory committees and/or groups were used to provide input on program direction and implementation. Cooperative Extension staff also meet with

various commodity and interest groups that provided insight into issues facing the targeted audience.

**2(B). A brief statement of the process that was used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them**

**1. Methods for collecting Stakeholder Input**

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting with the general public (open meeting advertised to all)
- Survey of the general public
- Meeting specifically with non-traditional groups
- Survey specifically with non-traditional groups
- Meeting specifically with non-traditional individuals
- Survey specifically with non-traditional individuals
- Other (Modified Nominal Group Process)

**Brief explanation.**

**AgriLife Extension and AgriLife Research**

Both AgriLife Extension and AgriLife Research use multiple methods to reach stakeholder groups within the State of Texas. AgriLife Extension uses multiple sources of input from various stakeholders. These include local clientele, commodity/special interest groups, trend data monitored by specialists, various county committees, elected officials, and emerging issues. Teams of Extension and research faculty meet to analyze these issues, which lead to priority setting and development of programs to address the needs and issues raised by the various stakeholder groups and methods.

Methods of data collection include surveys, focus group sessions, data collected as a result of program evaluations, expert panels, meetings with stakeholders, and open forum type meetings to solicit input. All data from all sources is considered when decisions are made regarding the future directions of Research and Extension efforts.

**Cooperative Extension Program and Cooperative Agricultural Research Center**

Data was collected via numerous methods from the stakeholders mentioned in the previous section including meeting with advisory committees, holding open forums with clientele and other groups and collected needs assessment and/or surveys at educational programs across the state. Likewise, Extension staff members identify needs while conducting research and working with clientele.

**3. A statement of how the input will be considered**

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans



- To Set Priorities
- Other (Strategic plans)

### **Brief explanation.**

#### **AgriLife Extension and AgriLife Research**

The basis for AgriLife Research and AgriLife Extension's relevance in the State of Texas is grassroots involvement. AgriLife Extension has utilized Open Listening Sessions as part of the grassroots Texas Community Futures (TCFF) Process in the past. These sessions provide local clientele the opportunity to voice their opinion on issues of importance to their lives and the lives of others in their community. These sessions were last conducted in 2015.

Local Leadership Advisory Boards (LABs) lead efforts to raise new and validate current issues being addressed in local communities. The process allows for flexibility in approaches based on community resources. Face-to-face meetings and an online data collection effort are part of the options offered. Approximately 2,500 individuals serve on Leadership Advisory Boards across the state. In addition, another 10,000 citizens serve on program area committees, task forces, coalitions, and youth boards. These volunteers represent specific areas of the local program and are involved in issues identification, program development and delivery, evaluation and interpretation of programs, and management of other volunteers. These volunteers represent all 254 counties in the state.

Both AgriLife Extension and AgriLife Research utilize various methods to analyze and incorporate input from stakeholders. Teams of Extension and research faculty meet based on need to analyze these issues, which leads to priority setting and development of programs to address the needs and issues raised by the various stakeholder groups and methods. Strategic plans and roadmaps for AgriLife Research and AgriLife Extension have been developed to guide our efforts.

#### **Cooperative Extension Program and Cooperative Agricultural Research Center**

The Cooperative Extension Program used various methods to reach stakeholder groups within the State of Texas. Extension used multiple sources of input from stakeholders including local clientele, commodity/special interest groups, emerging issues, various county committees and elected officials. Extension staff analyzed these issues, which led to the priority setting and development of programs to address the needs and issues identified by stakeholders. Extension also used Leadership Advisory Boards (LABs) to validate issues raised in the local stakeholder input process. LABs serve as a conduit to local citizens and their needs. These boards are comprised of community opinion leaders charged with providing long-term visioning and advocacy for the local Extension program. Additional citizens serve on program area committees, task forces, coalitions, and youth boards. These volunteers represent specific areas of the local program and are involved in issues identification, program development and delivery, evaluation and interpretation of programs, and management of other volunteers. These volunteers represent the counties in the state serviced by the Cooperative Extension Program and Research Center.

### **Brief Explanation of what you learned from your Stakeholders**

#### **AgriLife Extension and AgriLife Research**

Information from key stakeholder groups both informs and validates the strategic plans, and research and programming efforts for both AgriLife Research and AgriLife Extension. This information allows both agencies to remain relevant and accountable for the public funds entrusted via partnerships with local, state, and federal governments.

#### **Cooperative Extension Program and Cooperative Agricultural Research Center**

Health issues such as chronic diseases and childhood obesity are major concerns within the targeted audience. Family financial stability, community economics, sustainable agriculture, parenting education and youth development are also issues of high importance.

**IV. Expenditure Summary**

<b>1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)</b>			
<b>Extension</b>		<b>Research</b>	
<b>Smith-Lever 3b &amp; 3c</b>	<b>1890 Extension</b>	<b>Hatch</b>	<b>Evans-Allen</b>
13326759	4462126	8671872	5170651

<b>2. Totaled Actual dollars from Planned Programs Inputs</b>				
	<b>Extension</b>		<b>Research</b>	
	<b>Smith-Lever 3b &amp; 3c</b>	<b>1890 Extension</b>	<b>Hatch</b>	<b>Evans-Allen</b>
<b>Actual Formula</b>	8540207	5032576	9209879	4903055
<b>Actual Matching</b>	8540207	2193367	14731884	3056508
<b>Actual All Other</b>	49797866	0	34448013	4763
<b>Total Actual Expended</b>	66878280	7225943	58389776	7964326

<b>3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous</b>				
<b>Carryover</b>	8162285	1738369	0	1871255

**V. Planned Program Table of Content**

S. No.	PROGRAM NAME
1	Economics and Management for Sustainable Agriculture
2	Livestock Production
3	Crop and Forage Production
4	Water and Natural Resource Management
5	Range Management
6	Climate Change
7	Sustainable Energy
8	Community Resource and Economic Development
9	Chronic Disease, Health, and Wellness
10	Childhood Obesity
11	Food Safety
12	Global Food Security, Hunger, and Nutrition Education
13	Fostering Strong Families
14	Life Skills for Youth (includes Character Education and Leadership)
15	Adult Leadership and Volunteer Development

**V(A). Planned Program (Summary)**

**Program # 1**

**1. Name of the Planned Program**

Economics and Management for Sustainable Agriculture

Reporting on this Program

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
601	Economics of Agricultural Production and Farm Management	0%	80%	0%	0%
602	Business Management, Finance, and Taxation	25%	10%	25%	0%
604	Marketing and Distribution Practices	25%	10%	25%	0%
605	Natural Resource and Environmental Economics	10%	0%	10%	0%
606	International Trade and Development	10%	0%	10%	0%
608	Community Resource Planning and Development	5%	0%	5%	0%
610	Domestic Policy Analysis	25%	0%	25%	0%
	<b>Total</b>	100%	100%	100%	0%

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	15.0	3.0	10.0	0.0
<b>Actual Paid</b>	27.3	3.5	7.2	0.0
<b>Actual Volunteer</b>	0.0	15.0	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
542961	326488	311825	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
542961	142294	508122	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
3166003	0	611939	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

**AgriLife Extension and AgriLife Research**

Numerous activities, events and experiences were conducted to address the needs of producers and other clientele in the area of economics and management. These include but are not limited to workshops, one-on-one intervention, marketing clubs, cooperatives, popular press articles, extension publications, and other methods as needed. These educational approaches focus on the identified needs of those who participate in our programs.

Work of AgriLife Research and AgriLife Extension was conducted jointly where research-based information was generated and then transferred to clientele. This work was conducted primarily on campus with dissemination efforts both on campus and at various research and extension centers across the state.

Collaborative efforts were also an important part of this area. Work with various commodity groups and other agencies were routinely conducted by both AgriLife Research and AgriLife Extension faculty. Examples of this work include cooperating with Grain and Livestock organizations on risk management and biofuels programming and the Texas FSA office on price forecasts for lending purposes for the coming year.

**Cooperative Extension Program**

Extension staff members held approximately 162 one-on-one consultations with clients where they worked on business plans, financial statements and farm loan applications. Also, there were several educational programs held including: the Ft. Bend Government Assistance Meeting with 41 small farmers present, the Houston County Farm Assistance Program with 33 small farmers in attendance, the Urban Gardening and Farmers Market Training with 34 in attendance, Urban Farm Business Planning Workshop with 46 in attendance, the Small Farm Business workshop with 31 in attendance and a Food Production Training with 54 in attendance. Additionally, 148 goat producers were trained on developing business plans which included 46 producers at the National Dairy Goat Conference and 102 producers at the North East Texas Goat Conference.

**2. Brief description of the target audience**

**AgriLife Extension and AgriLife Research**

The target audience for the economics and management program included all Texas producers. Specifically, commercially viable agricultural producers were targeted, but additional efforts were targeted to small scale operators, part-time producers, new/young landowners/producers, and commodity groups.

The target audiences were very diverse in knowledge, skills, attitudes, and aspirations to learn and adopt important strategies to be successful. Therefore, the methods used in this area varied depending on which audience was being addressed.

**Cooperative Extension Program**

Our programs will assist a diverse audience, with emphasis on the underserved, hard to reach, and have limited social and economic resources to improve their quality of life; this will include farmers and ranchers, private land and forest owners, military veterans and their families.

**3. How was eXtension used?**

The Cooperatives Community of Practice for eXtension is supported by Texas AgriLife Extension personnel. It provides a resource to individuals and groups interested in cooperative agricultural business practices. A focus for the community of practice is youth leadership, with the intent of drawing talented youth to careers in cooperatives. Such careers are typically located in rural communities and help to strengthen rural economies. In addition, several faculty members answer the ask an expert questions that come in through eXtension.

Clients were also directed to eXtension to search for information related to farm business management.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	86430	375801	31588	0

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

**Patent Applications Submitted**

Year: 2016  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2016	Extension	Research	Total
<b>Actual</b>	20	338	358

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- # of group educational sessions conducted.

<b>Year</b>	<b>Actual</b>
2016	3081

**Output #2**

**Output Measure**

- # of research-related projects.

<b>Year</b>	<b>Actual</b>
2016	49

**Output #3**

**Output Measure**

- # of one-on-one technical assistance/consultations.

<b>Year</b>	<b>Actual</b>
2016	100

**V(G). State Defined Outcomes**

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

O. No.	OUTCOME NAME
1	Percent of producers that report a savings in money or increased profit by best management practices adopted.
2	% of target audience that reports an increased knowledge of economics and management strategies.
3	Number of producers who conduct whole farm or ranch risk assessment evaluations.
4	% of producers who adopt farm financial management and marketing skills to sustain their agribusinesses



## **Outcome #1**

### **1. Outcome Measures**

Percent of producers that report a savings in money or increased profit by best management practices adopted.

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Condition Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	87

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Producers attending in-depth workshops are learning the information needed to improve their risk management skills, and increase their economic returns. This improvement in risk management skills, and increased economic returns should improve the long-run viability of the agricultural sector, and result in improved economic returns to related businesses and employment in the region as well.

#### **What has been done**

A 2.5 year post survey was mailed during summer 2016, to participants of the 2014 Master Marketer program held in Vernon, Texas, to determine knowledge gain, adoption of new practices, and economic impact. The survey was an in-depth 14-page survey that was followed up with reminder postcards and phone calls. The survey was done 2.5 years after the initial program to allow time for adoption of new practices and to identify economic impacts.

#### **Results**

Results from survey questions indicated; an increase in the use of a marketing plan from 25% pre-Master Marketer to 88% post-Master Marketer, an increase in determining production costs and incorporating those into the marketing plan from 27% pre-Master Marketer to 75% post-Master Marketer, an increase in using market fundamentals in developing their personal market outlook from 27% pre-Master Marketer to 93% post-Master Marketer, and knowing when to use forward cash contracting from 46% pre-Master Marketer to 92% post-Master Marketer. Master Marketer education had an average individual economic impact of \$20,447 or 4.2% of gross farm income for the Vernon class. At the QuickBooks Pro for Farmers and Ranchers Workshop, pre- and post-test results indicated a 69% increase in knowledge due to the workshop, and 82% of

participants said the information learned in the workshop would be worth over \$1000 to their operation.

#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
605	Natural Resource and Environmental Economics
610	Domestic Policy Analysis

#### Outcome #2

##### 1. Outcome Measures

% of target audience that reports an increased knowledge of economics and management strategies.

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

<b>Year</b>	<b>Actual</b>
2016	78

##### 3c. Qualitative Outcome or Impact Statement

###### **Issue (Who cares and Why)**

Producers attending in-depth workshops are learning the information needed to improve their risk management skills. This improvement in risk management skills, and increased economic returns should improve the long-run viability of the agricultural sector, and result in improved economic returns to related businesses and employment in the region as well.

###### **What has been done**

Pre-test and post-test instruments and retrospective post-tests were used to determine knowledge gained at in-depth workshops that spanned from 8 to 70 hours in length such as Master Marketer, Advanced Topics Series, Crops and Cattle Trails Conferences, Ranch Management University, and similar workshops.

### Results

The 28th Master Marketer program (approximately 70 hours of classroom training over a six-week period of time) was conducted in Abilene, Texas during January-March 2016. Pre-test and post-test scores of subject matter knowledge level indicated a 59.18% improvement in participant's scores from the beginning of the Master Marketer program (average pretest score 40.83%) to the end of the Master Marketer program (average posttest score 65%). In an exit evaluation, participants suggested that they were much more confident in how and when to use various risk management/marketing tools. If this increase in knowledge levels and confidence translates to improved marketing performance similar to preceding Master Marketer graduates, then an increase in annual income of approximately \$35,000 per year, on average, can be expected for each of the 53 graduates of this year's Spring program. If so, these returns would work out to over \$1.5 million per year for the graduates of the 2016 Master Marketer program in Abilene. At a Ranch Management University workshop in Spring 2016, participants showed that there was a 85% increase in knowledge as a direct result of the workshop. In addition, 100% of respondents anticipate a positive economic benefit as a direct result of the information presented at the workshop.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
605	Natural Resource and Environmental Economics

### Outcome #3

#### 1. Outcome Measures

Number of producers who conduct whole farm or ranch risk assessment evaluations.

#### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

#### 3a. Outcome Type:

Change in Action Outcome Measure

#### 3b. Quantitative Outcome

Year	Actual
2016	126

#### 3c. Qualitative Outcome or Impact Statement

### **Issue (Who cares and Why)**

The FARM Assistance model (financial simulation strategic planning tool) was used to complete 126 analyses for producers, for demonstrations or agent planning purposes. Survey respondents showed that as a result of participating in FARM Assistance, 92% claim a better understanding of the financial aspects of their own operations, and 95% claim an improved ability to assess the financial risks and potential impacts of strategic decisions they make. A comparison of various scenarios analyzed showed that strategic planning tools can have economic benefits.

### **What has been done**

Participants are able to analyze their own economic situation over a 10-year planning horizon using the FARM Assistance model. Producers were able to utilize their own financial, yield, and production information to analyze alternative strategic opportunities such as adding or reducing acreage, changing the crop/livestock mix, changing the machinery complement or purchase/lease arrangements, financing options, irrigation investments etc., to determine long run impacts on the operations financial situation for planning purposes.

### **Results**

The outcome of client participation is measured through participant evaluations. Client assessments of the FARM Assistance program over the last year indicate a very positive impact on management ability. As a result of participating in the FARM Assistance program, 92% claim a better understanding of the financial aspects of their operation and 95% claim an improved ability to assess the financial risks and potential impacts of strategic decisions they make. One of the objectives of the program is to help managers become more comfortable with formal financial analysis, and 92% indicated that they would be more likely to use a formal financial analysis (like FARM Assistance) to help make decisions in the future, and 92% of respondents indicated they would recommend FARM Assistance to another producer. Finally, in responding to anticipated economic value, respondents estimated an average \$27,115 annual benefit to their operation as a result of their FARM Assistance participation.

## **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
610	Domestic Policy Analysis

## **Outcome #4**

### **1. Outcome Measures**

% of producers who adopt farm financial management and marketing skills to sustain their agribusinesses

### **2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

For new, beginning and traditionally underserved small farm producers, obtaining adequate financing to operate their farms is a major concern. Many of these producers have access to land but are in need of funds for operating expenses as well as equipment upgrades. In order to obtain these funds, the producers need to obtain and/or enhance their basic farm business planning and record keeping skills that will allow them to apply for loans to operate their farm businesses.

**What has been done**

A series of educational programs focusing on farm planning, business management, recordkeeping and other risk management related topics were conducted by the Cooperative Extension Program. New, beginning and traditionally underserved small farm producers were presented information about loan and grant opportunities through various sources. Special emphasis was placed on introducing producers to funding available through the USDA Farm Service Agency. Cooperative Extension staff members provided one-on-one and hands-on assistance to farmers to help in the completion of farm loan applications.

**Results**

The Cooperative Extension Program staff conducted educational programs and consultations to assist local farm producers to complete applications for USDA Farm Service Agency loans. As a result of these efforts, a total of 69 new, beginning and traditionally underserved farm producers were assisted to apply for approximately \$5,873,000 in farm loans.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices

## **V(H). Planned Program (External Factors)**

### **External factors which affected outcomes**

- Economy
- Appropriations changes

### **Brief Explanation**

Budget reductions as a result of reduced state appropriations in 2011 resulted in a reduction in FTEs available to carry out educational activities from 2012-2016 and into the future. While remaining faculty picked up additional responsibilities, some educational opportunities were missed due to reduced faculty numbers.

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

### **Evaluation Results**

#### **AgriLife Extension and AgriLife Research**

Clientele/participants involved in Master Marketer, Advanced Topic Series, Crops and Cattle Trails Conferences, and FARM Assistance are evaluated in several ways, depending on the length of the training activity, whether we are trying to identify short-term knowledge gains, or adoption/change of practices and economic impacts over time. Pre-tests and post-tests are used at the beginning and end of programs to better identify knowledge gains. Retrospective post evaluation surveys are used to identify adoption/change of practices and economic impacts over time. Results indicate that producers are learning, and adopting/changing practices, and these changes are producing economic benefits.

#### **Cooperative Extension Program**

Participants were surveyed to obtain their increase in knowledge of financial management in agriculture. Prior to participating in educational programming conducted by the Cooperative Extension Program, 26.7% of the participants indicated that they had good knowledge of financial management. As a result of the educational programming, 93.3% of participants indicated that their knowledge was either good or excellent. Additionally, 87.5% of the producers indicated an increased knowledge of farm recordkeeping.

### **Key Items of Evaluation**

**V(A). Planned Program (Summary)**

**Program # 2**

**1. Name of the Planned Program**

Livestock Production

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
301	Reproductive Performance of Animals	10%	20%	10%	20%
302	Nutrient Utilization in Animals	25%	20%	25%	10%
303	Genetic Improvement of Animals	5%	10%	5%	10%
304	Animal Genome	0%	0%	0%	10%
305	Animal Physiological Processes	0%	0%	0%	20%
306	Environmental Stress in Animals	5%	0%	5%	0%
307	Animal Management Systems	20%	20%	20%	20%
308	Improved Animal Products (Before Harvest)	20%	0%	20%	0%
311	Animal Diseases	0%	10%	0%	0%
312	External Parasites and Pests of Animals	0%	10%	0%	0%
313	Internal Parasites in Animals	5%	10%	5%	10%
315	Animal Welfare/Well-Being and Protection	10%	0%	10%	0%
	<b>Total</b>	100%	100%	100%	100%

**V(C). Planned Program (Inputs)**

**1. Actual amount of FTE/SYs expended this Program**

Year: 2016	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	35.0	7.0	20.0	9.0
<b>Actual Paid</b>	27.4	3.2	26.6	7.5
<b>Actual Volunteer</b>	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
544950	303167	1488763	1500935
1862 Matching	1890 Matching	1862 Matching	1890 Matching
544950	132131	2176201	935666
1862 All Other	1890 All Other	1862 All Other	1890 All Other
3177600	0	3901693	4763

## V(D). Planned Program (Activity)

### 1. Brief description of the Activity

#### **AgriLife Extension and AgriLife Research**

Research as well as group and individual education will be ongoing across the 7 key subject matter/commodity areas. Methods of education include public meetings, individual support, printed and video/DVD materials and web-based materials. Collaboration with breed associations, commodity groups and corporations will target research and educational needs of a diverse livestock industry across the state, involving both youth and adults.

#### **Cooperative Extension Program and the Cooperative Agricultural Research Center**

This program is dedicated to developing sustainable farming/ranching operations focusing on increasing the health and productivity of livestock through optimizing nutrition, and reproduction. The purpose is to ensure that these agricultural operations are not only profitable but they are also friendly to the community and the environment.

Major programs offered

- Small Ruminants and Alternative Livestock and Poultry Production Programs.
- Beef Cattle and Forage Production
- Hay and forage production and utilization
  
- Cool Season Forage for Winter Grazing

The collaborative efforts of research staff are contained within two main research focus areas:

**Increasing the efficiency of artificial insemination and embryo transfer:** We are focusing our efforts in the areas of breeding and reproductive management. Technologies in these areas are moving rapidly and hold great promise to reduce production costs and increase genetic merit and farm profits. Studies will define factors that influence male fertility and cryopreservation of semen for use in AI. Studies in the female will center on defining the window of receptivity for early embryonic development and improvements in embryo transfer efficiencies.

**The role Residual Feed Intake on reproductive performance, milk production and offspring performance in Alpine goats.** Residual feed intake (RFI) is a measure of livestock feed efficiency. Animals with low RFI consume less feed at the same level of production as high RFI cattle. In order to measure RFI animals need to be fed individually. We installed an eight bunk GrowSafe feed intake and behavior monitoring system. We will validate this system for use in goats.

### 2. Brief description of the target audience



**AgriLife Extension and AgriLife Research**

The target audience is composed of beef cattle, horse, dairy, sheep, goat and swine producers/owners/users, commodity group leadership, associations and registries, and youth enrolled in 4-H and FFA livestock projects.

**Cooperative Extension Program and the Cooperative Agricultural Research Center**

Beginning Farmers/Ranchers; Limited Resource Farmers/Ranchers; Socially Disadvantaged Farmers/Ranchers, and Military Veterans. 4-H and Youth associated with this audience. Undergraduate students in the College of Agriculture and Human Sciences.

**3. How was eXtension used?**

The Texas AgriLife EDEN disaster management website is linked to the National EDEN website and the eXtension network. Animal Science faculty continues to update and develop educational materials dealing with management of livestock during and following catastrophic events such as wildfires, drought and floods. Additional programs were added covering topics of equine management and selection. Course of study in Beef Cattle Production have also been added to eXtension.

eXtension was also used by research scientists as reference material on targeted audience.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	139067	910984	92063	0

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

**Patent Applications Submitted**

Year: 2016  
 Actual: 2

**Patents listed**

- \* CONTROLLED RELEASE VACCINES AND METHODS FOR TREATING BRUCELLA DISEASES AND DISORDERS
- \* CONTROLLED RELEASE VACCINES AND METHODS FOR TREATING BRUCELLA DISEASES AND DISORDERS

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2016	Extension	Research	Total
<b>Actual</b>	10	270	280

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- # of group educational sessions conducted.

<b>Year</b>	<b>Actual</b>
2016	9531

**Output #2**

**Output Measure**

- # of research-related projects.

<b>Year</b>	<b>Actual</b>
2016	131

**Output #3**

**Output Measure**

- # of one-on-one technical assistance/consultations.

<b>Year</b>	<b>Actual</b>
2016	895

**Output #4**

**Output Measure**

- # of graduate/undergraduate students involved in research projects.

<b>Year</b>	<b>Actual</b>
2016	10

**V(G). State Defined Outcomes**

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

O. No.	OUTCOME NAME
1	% of livestock owners/producers that adopt or plan to adopt best management practices to improve quality and profitability.
2	% of livestock owners/producers/commodity group representatives that report increased knowledge of best management practices to improve quality and profitability.
3	% of livestock owners/producers that report a savings in money or increased profit by best management practices adopted.
4	% of producers who gain knowledge and skills to create and implement herd health program which will improve overall quality of their livestock and increase profitability and sustainability.

## **Outcome #1**

### **1. Outcome Measures**

% of livestock owners/producers that adopt or plan to adopt best management practices to improve quality and profitability.

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Action Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	82

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Best management practices to ensure quality, profitability, productivity and optimal utility help clientele make changes to improve livestock, management, resources and time to increase income and improve profit opportunities.

#### **What has been done**

Programs conducted include TAMU Beef Cattle Short Course, Texas Beef Quality Producer, Beef and Pork 101, Beef 706, Grassfed Beef Conference, Retail Beef Boot Camps, Pasture Management Workshops, Bull Selection Workshops, Low-Stress Livestock Handling, Stockmanship schools, Southwest Dairy Conference, Restocking Alternatives for Livestock, Mare/Foal Workshop, Farriers Conference. Youth programs included the 44th Annual Summer Horsemanship Schools, Camps for Beef Cattle, Horses, Sheep and Goats, Ambassador programs in beef and equine. In addition to specialist driven programs listed above Animal Science Extension faculty support producer education through delivery of educational programs at 167 county programs.

#### **Results**

From measures including beef/dairy cattle, sheep/goats, horses and meats, 65% to 98% reported intent to adopt at least one best management practice. 57% to 91% expected to increase income or profitability by adoption of best management practices. 96% indicated they intended to adopt one or more of the practices associated with low-stress livestock handling and effective stockmanship practices. 77% to 90% of respondents indicated they would implement changes to their selection criteria as they purchase breeding stock. 62% to 92% reported elimination of non-productive practices, 73% hay analysis, 81% reported use of cost/lb of nutrient strategies for

alternative feedstuffs and 91% use body condition scoring as a management tool.

#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
306	Environmental Stress in Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
313	Internal Parasites in Animals
315	Animal Welfare/Well-Being and Protection

#### Outcome #2

##### 1. Outcome Measures

% of livestock owners/producers/commodity group representatives that report increased knowledge of best management practices to improve quality and profitability.

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

<b>Year</b>	<b>Actual</b>
2016	86

##### 3c. Qualitative Outcome or Impact Statement

###### **Issue (Who cares and Why)**

Increased knowledge prompts adoption of best management practices to ensure quality, profitability, productivity and utility of livestock, management, resources and time. Knowledge of best management prompts time savings, increased confidence in management decisions and problem solving for producer and youth involved in the livestock industry.

###### **What has been done**

Programs conducted include TAMU Beef Cattle Short Course, Texas Beef Quality Producer, Beef

and Pork 101, Beef 706, Grassfed Beef Conference, Retail Beef Boot Camps, Pasture Management Workshops, Bull Selection Workshops, Low-Stress Livestock Handling, Stockmanship schools, Southwest Dairy Conference, Restocking Alternatives for Livestock, Mare/Foal Workshop, Farriers Conference. Youth programs included the 44th Annual Summer Horsemanship Schools, Camps for Beef Cattle, Horses, Sheep and Goats. Ambassador programs in beef and equine. In addition to specialist driven programs listed above Animal Science Extension faculty support producer education through delivery of educational programs at 167 county programs.

### Results

67% to 100% reported improved decision making ability. 66% to 100% reported increased confidence in management ability. 92% indicated knowledge gains of 63% to 88% for sire selection protocols, breeding mares and cows, loss of forage production potential, cattle handling, food safety control, natural resource management, financial management of ranches, livestock evaluation and general livestock and ranch management.

## 4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
306	Environmental Stress in Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
313	Internal Parasites in Animals
315	Animal Welfare/Well-Being and Protection

## Outcome #3

### 1. Outcome Measures

% of livestock owners/producers that report a savings in money or increased profit by best management practices adopted.

### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

### 3a. Outcome Type:

Change in Condition Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2016	66

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Animal management systems must go beyond striving to improve quality of life, quality of production and increased knowledge to achieve a level of sustainability. For production systems to be sustainable they must be profitable. To improve profitability income needs to increase and costs need to be lowered or controlled. A continued push was made through programming to encourage producers to look at enterprise diversification and adding stocking rate flexibility into their production systems.

#### What has been done

Economic benefit was measured from responses from participants in the TAM Beef Cattle Shortcourse, Small Landowner Conferences, Beef Quality Assurance programs, Southwest Beef Symposium, Beef 706, Reproductive Management Shortcourse, Cattle Handling and Dairy Programs.

#### Results

60% to 100% of the participants in these programs indicated they would benefit economically through adoption of management practices outlined in these programs. Participants in the small landowner programs indicated an expected increase in income of approximately \$10.00 per head. Participants in Quality Assurance programs indicated increased income from \$25 to \$100 per head. Of the Beef 706 participants 89% indicated they would benefit economically by an estimated \$54.00/head of animal owned. Reproductive management practices on beef and dairy operations indicated returns of \$50 to \$90 per head. Economic impact across the livestock sector is projected to be between and \$1.2 and \$22 million from adoption of management practices. Of those attending stockmanship trainings 87% indicated they would benefit financially through savings in facility design and construction costs or in saved time, labor and injury expense.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
306	Environmental Stress in Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
313	Internal Parasites in Animals
315	Animal Welfare/Well-Being and Protection

## **Outcome #4**

### **1. Outcome Measures**

% of producers who gain knowledge and skills to create and implement herd health program which will improve overall quality of their livestock and increase profitability and sustainability.

### **2. Associated Institution Types**

- 1890 Extension
- 1890 Research

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	0

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Surveys conducted by CEP have indicated that limited resource livestock producers' most pressing concerns related to livestock production revolve around providing proper nutrition without having the resources to buy feed, and control of profit reduced by external and internal parasites. Many producers fail to understand that they are in the forage business and that livestock are a way to harvest their forage. Producers also face the challenge of feeding their livestock during the winter months when native and improved forages are dormant. Training in winter pastures and hay management were offered to fill this need.

#### **What has been done**

- \* Conducted a series of workshops to address needs in the following areas: Fencing Workshop, Soil Health, Winter Pasture, Cover Crop, Brush Management.
- \* Conducted seven (7) on-farm demonstrations relating to horn fly control, parasite control in livestock and forage production.
- \* Assisted clients in identifying assistance within USDA.
- \* Collaborated with CARC Staff in conducting five (5) workshops related to Small Ruminant parasite control.
- \* Conducted annual Agricultural Field Day which attracted over 150 producers to campus. Animal health and reproduction workshops were conducted by the Cooperative Agricultural Research Center(CARC) to inform producers of the financial benefits of proper breeding and management practices.

#### **Results**



The following results were gathered from educational programs that were presented:

Fencing Workshop (Workshop conducted on campus; 47 attended)

\* 78% of the attendance polled said they will probably or definitely adopt one or more of the practices taught at the workshop.

\* 90.5 % of the respondents anticipate benefiting economically as a direct result of what they learned at the workshop.

Agricultural Field Day (3 sessions on Small Ruminant Management)

\* 80% of those surveyed reported an increased understanding of goat reproductive health and the importance of proper health management.

\* 80% of surveyed participants increased their understanding of the difference between goats grazing on brush and those on improved pasture.

\* 75% of surveyed participants said they definitely would adopt the practices of implementing proper deworming and vaccination management.

Soil Health Management (4 workshops conducted in various counties)

\* 80% of surveyed participants increased their knowledge on utilizing soil testing to determine nutrient levels and fertilizer rates.

\* 89% of those surveyed said they plan to adopt the use of soil testing on their pastures to improve grazing conditions.

Per Cooperative Agricultural Research Center (CARC post session evaluation).

\* 100% of the producers that received training in animal health indicated that they would utilize the FAMANCHA score as an indicator for the need to treat for internal parasites.

\* 75% of the producers attending a workshop on the economics of using artificial insemination wanted to receive more hands-on training.

\* 100% of the producers trained in artificial insemination practiced the technique at the farms/ranches.

#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
306	Environmental Stress in Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
311	Animal Diseases
312	External Parasites and Pests of Animals
313	Internal Parasites in Animals
315	Animal Welfare/Well-Being and Protection

## V(H). Planned Program (External Factors)

### External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Public Policy changes
- Government Regulations
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

### Brief Explanation

Livestock ownership, production and use in Texas continue to be influenced by fluctuating markets, natural disasters and significant climatic shifts in weather patterns. 2016 continued the ups and downs of livestock production in Texas. In many parts of the state historic record rainfall was recorded in the spring of 2016 while at the same time many areas experienced a very dry summer period. Weather related challenges continue to alter program delivery and adoption of some management practices. Production costs and incentives for livestock production, management, and use are influenced by economic changes. Input prices, agriculture valuation, and health care costs are all factors. Public policy changes and government regulations challenge educators to provide up-to-date, neutral information that helps livestock participants make decisions. Population shifts and use of available land for productive and meaningful livestock production bring opportunities and challenges to livestock owners/producers/users and the associations/corporations/groups that make up this diverse industry.

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

### Evaluation Results

Outcome measures include pre-post knowledge assessment, adoption of best management practices and elimination of non-beneficial practices, and change in confidence/competence. Changes in time and money spent/saved/invested for livestock production were measured in select programming areas.

**Output Programs:** Standard Customer satisfaction surveys were used in evaluating all output programs along with question aimed a measuring degree of change in understanding before and after program.

**Outcome Programs: Knowledge Gained** Pre and Post evaluations were conducted to measure knowledge gained as a result of the training. **Intention to adopt** program participation are evaluated on the likelihood of them adopting a practice or technology taught at an extension program. **Economic Benefit** Participation are asked if they anticipate an economical benefit for information obtain from the program.

**One-on-one follow-up** Agents and Specialist follow-up one-on-one with producers to determine level of adoption.

### Key Items of Evaluation

- Knowledge Gained

2016 Texas A&M University and Prairie View A&M University Combined Research and Extension Annual Report of Accomplishments and Results

- Intention to Adopt Practices
- Economic Benefit
- Level of Adoption.

**V(A). Planned Program (Summary)**

**Program # 3**

**1. Name of the Planned Program**

Crop and Forage Production

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	10%	20%	10%	20%
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	10%	0%	20%
202	Plant Genetic Resources	10%	20%	10%	20%
205	Plant Management Systems	30%	0%	30%	0%
206	Basic Plant Biology	0%	10%	0%	10%
212	Pathogens and Nematodes Affecting Plants	10%	0%	10%	0%
213	Weeds Affecting Plants	10%	20%	10%	20%
216	Integrated Pest Management Systems	30%	20%	30%	10%
	<b>Total</b>	100%	100%	100%	100%

**V(C). Planned Program (Inputs)**

**1. Actual amount of FTE/SYs expended this Program**

Year: 2016	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	50.0	5.0	85.0	6.0
<b>Actual Paid</b>	44.1	3.5	79.8	6.0
<b>Actual Volunteer</b>	0.0	30.0	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
877092	326488	4374179	1200748
1862 Matching	1890 Matching	1862 Matching	1890 Matching
877092	142296	6859023	748532
1862 All Other	1890 All Other	1862 All Other	1890 All Other
5114313	0	14205578	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

**AgriLife Extension and AgriLife Research**

Provide training and program materials to County Extension Agents to conduct educational programs at the county level. Technical assistance is provided to agents by specialists in the area of result demonstrations and applied research. Provide multi-county, regional and statewide educational programs via specialist faculty to various stakeholders. Coordinate and collaborate with state and federal agencies in crop and forage activities. Examples of coordinated research and Extension programming include:

**Cotton**

Cotton is one of the major row crops grown in Texas. Cotton is well adapted to the semi-arid environments of Texas and is considered the most consistent source of income by most farmers, especially in non-irrigated situations. Texas has become the major state in U.S. for cotton, with Texas accounting for over 50% of the total U.S. cotton acres annually with 5-6 million acres annually.

**Variety Testing**

Variety testing remains one of the most important decision farmers will make each year. Selecting the best yielding varieties can lead to yield increases over 20% from the best yielding to worst yielding commercial varieties. High yields lead to increased ginning and increase in related jobs for the state. Additionally, cotton fiber quality is critically important to increase farm income and maintain our export markets. Cotton fiber quality affects the price by 10% or more in the current international market.

**Managing Nitrogen Costs and Protecting Water Resources**

Nitrogen fertilizer is often one of the largest production costs that farmers incur each year. Correct rate, placement, and application timing of nitrogen can increase the nitrogen use efficiency and decrease the potential for accumulation in the soil, ground water, and surface water. Nitrogen is constantly cycling in the soil due to decomposition of organic matter, nitrogen fertilizer applications, leaching, and denitrification. However, soil samples collected in cotton and other crops have indicated an accumulation of nitrogen in soil, soil residual nitrogen. Previous research has proven that this soil residual nitrogen is available to the plant and should be credited to the recommended N fertilizer applications. Utilization of this soil residual nitrogen saves the farmer fertilizer expenses and reduces the likelihood of nitrate movement into surface and groundwater.

**New Landowner Program Impact - Ranch Management University**

Since 1994, urban-absentee landowners have dominated rural land ownership in Texas. This land ownership change has created the potential for environmental problems associated with natural resource management. Few of the new land owners have any formal training in the basics of the soil-plant-animal

interface. The solution was to develop an educational program to provide this new and growing segment of landowners with basic information regarding resource management. Faculty members from the Texas AgriLife Extension Service with department affiliations in Soil and Crop Sciences, Animal Science, Wildlife and Fisheries Sciences, and Agricultural Economics, developed the Ranch Management University Workshop for Novices. The main goals in developing the program were to: a) provide basic information regarding management of soil-plant-animal-water interface to people with little or no understanding regarding basic resource management; and b) introduce the Workshop participants to the educational resources available to them through the land grant university system, including the county extension agent in their counties; and c) use the workshop as a new county agent training vehicle at a heavily discounted price. The first Workshop was held in October of 2010, with subsequent Workshops having been held each April and October since then. Given the combination of learning environment, mix of classroom and field laboratory exercises, and non-threatening scientific presentations, Ranch Management University has become a popular and effective program helping ensure sustainability and proper management of valuable Texas natural resources for both landowners, managers, and new county extension agents.

### **Texas Well Owners Network**

TWON promotes protection of human health and the environment through education regarding best practices to protect water quality and enhance water conservation.

### **Cooperative Extension Program and Cooperative Agricultural Research Center**

This program provides research based educational information to small scale and limited resource farmers with a focus on fruit and vegetable crop production to improve the income situation of the target clientele. Major programs offered:

- Raised Bed and Container Gardening Programs (Urban Market)
- Soil Health & Care Programs
- Fruit, Nut and Berry Production Programs
- Small Acreage Vegetable Production Programs (High Tunnel & 43560 Initiative)

### **Specialty Crop Production**

CEP & CARC collaborated to conduct educational programs for County Agents and subject matter workshops/field days/ tours for crop producers. Cooperative Extension provided one-on-one technical assistance/consultations, and training programs that assisted clients to develop their farm plans. Leadership in scientific research and in the training of students and extension agents is provided by CARC in the production of medicinal plants with high accumulation of antioxidants and zero calorie sweeteners for the potential management of obesity and diabetes and for increasing the incomes of limited resource farmers. Similarly, CARC provides education and training to extension agents for the cultivation of high-value specialty, organic fruits, vegetables, and sweetpotato so as to increase the incomes of limited resource farmers in Texas. CARC established the medicinal and specialty plants research garden and greenhouses at the University farm to support the cutting edge projects on crops and forages.

## **2. Brief description of the target audience**

### **AgriLife Extension and AgriLife Research**

The target audience for this program consists of agricultural producers who produce food, fiber, and forages in the state. Specific focus is on those commodities listed in the program overview. In addition, these programs are interpreted to the urban public through various methods.

### **Cooperative Extension Program and Cooperative Agricultural Research Center:**

Beginning Farmers/Ranchers; Limited Resource Farmers/Ranchers; Socially Disadvantaged Farmers/Ranchers, and Military Veterans. 4-H and Youth associated with this audience.

## **3. How was eXtension used?**

Extension Unit personnel are routinely called upon to provide information via eXtension's "Ask the Expert".

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	56325	311720	7947	0

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

**Patent Applications Submitted**

Year: 2016  
 Actual: 5

**Patents listed**

- \* COMPOSITIONS, ORGANISMS AND METHODS FOR EXPRESSING A GENE PRODUCT IN PLANTS
- \* COMPOSITIONS, ORGANISMS AND METHODS FOR EXPRESSING A GENE PRODUCT IN PLANTS
- \* METHOD FOR PRODUCTION OR SORGHUM HYBRIDS WITH SELECTED FLOWERING TIMES
- \* TEXFIRST (PEACH TREE)
- \* FUNGAL ENDOPHYTES FOR IMPROVED CROP YIELDS AND PROTECTION FROM PESTS

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2016	Extension	Research	Total
<b>Actual</b>	0	773	773

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- # of group educational sessions conducted.

Year	Actual
2016	2928

**Output #2**

**Output Measure**

- # of research-related projects.

<b>Year</b>	<b>Actual</b>
2016	224

**Output #3**

**Output Measure**

- # of one-on-one technical assistance/consultations.

<b>Year</b>	<b>Actual</b>
2016	312



**V(G). State Defined Outcomes**

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

O. No.	OUTCOME NAME
1	% of crop and forage producers that adopt or plan to adopt best management practices to improved quality and profitability.
2	% of crop and forage producers that report increased knowledge of best management practices to improve quality and profitability.
3	Development of improved sweet potato germplasm for Texas small and limited resource farmers to increase their profitability.
4	Development of an alternative natural sweetener from plant "Lippia Dulcis" for Texas small farmers as an alternative agriculture enterprise.

## **Outcome #1**

### **1. Outcome Measures**

% of crop and forage producers that adopt or plan to adopt best management practices to improved quality and profitability.

### **2. Associated Institution Types**

- 1862 Extension
- 1890 Extension

### **3a. Outcome Type:**

Change in Action Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	80

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

AgriLife Extension and Research

Texas is the largest cotton producer in the US and is second in population. All agricultural commodities and the economic impacts these industries have on communities are important, as is the need to understand how to manage resources in an environmentally sound manner. Finally, water conservation and water quality may be the most important aspects as Texas continues to increase its population. Texas A&M AgriLife Extension is well-positioned to address these needs for the foreseeable future.

#### **Cooperative Extension Program**

The under-utilization of land resources is a major concern among small and limited resource farmers and ranchers. Many that have land resources have allowed it to go fallow for years and lack the resources (both financial and educational) to bring it back into production. We are seeing a major return to the land by many of these land owners as they retire or adult offspring develop interest in the land. Soil Health is a major issue among not only limited resource farmers and Ranchers but among the agriculture community as a whole. This issue effects both pasture/forage producers and crop producers (both grain and vegetable). Producers are looking for programs that are designed to provide scale appropriate instructional/experiential training to producers and encourage producers to grow high value crops for sale to local markets.

#### **What has been done**

AgriLife Extension and Research

Extension specialists from the Soil and Crop Sciences Extension unit delivered almost 719 face-to-face educational activities resulting in over 39,000 direct contacts for the calendar year 2016.

There were over 130,000 newsletters delivered, over 1.7 million listeners to TV and radio broadcasts, and over \$1.8 million raised to support extension educational activities.

#### Cooperative Extension Program

Agents and Specialist conducted six (6) field demos with producers in Strawberry, Grafted Cucumber, Watermelon and Asian Melon Trials. Agents also laid ground works on starting a pecan, citrus and pomegranate orchard demo.

Major workshops on growing Greens, Strawberries, Medicinal Plants and Watermelons were conducted at Agricultural Field Day. One-on-One technical Assistance/consultation was conducted by agents and specialist.

### Results

#### AgriLife Extension and Research

Extension personnel from the Soil and Crop Science Texas A&M AgriLife Extension Service unit have had a significant impact on the way citizens of Texas view agricultural production, natural resource management, and conservation of water. Positive impacts have increased financial returns for landowners and water conservation and quality in Texas has improved due to Extension efforts. With an ever increasing per capita demand for resources, Texas A&M AgriLife Extension Service personnel will play an increasingly important role in food and fiber production, conservation of limited water resources, and the overall well-being of Texas citizens and beyond.

#### Variety Testing

Variety testing remains one of the most important decision farmers will make each year. Selecting the best yielding varieties can lead to yield increases over 20% from the best yielding to worst yielding commercial varieties. High yields lead to increased ginning and increase in related jobs for the state. Additionally, cotton fiber quality is critically important to increase farm income and maintain our export markets. Cotton fiber quality affects the price by 10% or more in the current international market.

Educational contacts through 149 formal educational meetings are 12,800 annually

Over 50 on-farm variety evaluation trials across the state

Over 20 popular press articles and interviews over variety evaluation annually

Average yields and quality has increased over other past decade, resulting in an additional \$67/acre in value or a cumulative benefit of \$335 million for Texas.

Value added impacts associated with ginning the additional production is \$57 million and an additional 589 jobs.

#### Cooperative Extension Program

Small Acreage Vegetable Production Workshops (8 Workshops conducted for 180 producers)

\* 88% of respondents anticipate benefiting economically as a direct result of what they learned from this Extension activity.

\* 76% of respondents plan to adopt practices taught at the workshops.

\* 69% increased their understanding of practices taught at the workshops.

Watermelon Workshops (Series of 4 Workshops for a total of 75 participants)

\* 100% of respondents anticipate benefiting economically as a direct result of what they learned from this Extension activity.

\* 100% of respondents increased their understanding of practices taught at workshops.

\* 85% reported they would adopt practices taught at workshops.

## 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
202	Plant Genetic Resources
205	Plant Management Systems
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
216	Integrated Pest Management Systems

## **Outcome #2**

### **1. Outcome Measures**

% of crop and forage producers that report increased knowledge of best management practices to improve quality and profitability.

### **2. Associated Institution Types**

- 1862 Extension

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	85

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Texas is the largest cotton producer in the US and is second in population. All agricultural commodities and the economic impacts these industries have on communities are important, as is the need to understand how to manage resources in an environmentally sound manner. Finally, water conservation and water quality may be the most important aspects as Texas continues to increase its population. Texas A&M AgriLife Extension is well-positioned to address these needs for the foreseeable future.

#### **What has been done**

Extension specialists from the Soil and Crop Sciences Extension unit delivered almost 2700 face-to-face educational activities resulting in over 45,000 direct contacts for the calendar year 2016. There were over 117,000 newsletters delivered, over 1.2 million listeners to TV and radio broadcasts, and over \$1.3 million raised to support extension educational activities.

## **Results**

Extension personnel from the Soil and Crop Science Texas A&M AgriLife Extension Service unit have had a significant impact on the way citizens of Texas view agricultural production, natural resource management, and conservation of water. Positive impacts have increased financial returns for landowners and water conservation and quality in Texas has improved due to Extension efforts. With an ever increasing per capita demand for resources, Texas A&M AgriLife Extension Service personnel will play an increasingly important role in food and fiber production, conservation of limited water resources, and the overall well-being of Texas citizens and beyond.

#### Texas Well Owners Network

TWON promotes protection of human health and the environment through education regarding best practices to protect water quality and enhance water conservation.

Throughout 2016, knowledge was increased for 100% of the participants. Six-month follow-up surveys indicated that for participants with septic tanks that needed pumping, 55% had pumped their septic tanks within 6 months of the program. An additional 33% planned to have their tanks pumped soon. Thirty-three percent who needed to had plugged or capped their unused/deteriorated wells within 6 months of the training and 90% of well owners needing to remove hazardous material from their well house had done so.

The value of participating in the program as estimated by attendees was an average of about \$750 or a total of about \$650,000 for all 2016 participants. For 2016, 100% of participants with samples exceeding MCLs for fecal coliform bacteria and nitrate-nitrogen intend to adopt private well BMPs leading to improved water quality for 362 families and 362 direct points of contaminant conveyance to groundwater being eliminated.

For 2016, TWON conducted nine "Well Informed" (1 hr educational program) screenings with 447 samples and ten "Well Educated" (6 hr educational program) training with 417 participants in 28 counties. Overall, primary (health risk) or secondary water quality standards were exceeded in about 57% of 864 private water well samples. Specifically, E. coli has been detected in about 7.4% of screened samples, and nitrates above the maximum contaminant level of 10 ppm were found in 15% of samples.

#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
202	Plant Genetic Resources
205	Plant Management Systems
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
216	Integrated Pest Management Systems

**Outcome #3**

**1. Outcome Measures**

Development of improved sweet potato germplasm for Texas small and limited resource farmers to increase their profitability.

**2. Associated Institution Types**

- 1890 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Development of hybrid high yielding pest resistant sweetpotato lines for Texas small farmers as an alternative agricultural enterprise.

**What has been done**

A small scale field trial of 12 new purple-flesh sweetpotato hybrid lines was conducted in the 2016 growing season. We have also made substantial progress in comprehensive transcriptome sequencing of sweetpotato and its diploid and tetraploid relatives using Next-Generation-Sequencing technology in development of allele-specific molecular markers, and in development of a new method for genetic transformation of sweetpotato roots.

**Results**

Based on their performance, four of the new purple-flesh sweetpotato hybrid lines will be further evaluated in a larger scale field test for their yield and disease resistance.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources
206	Basic Plant Biology

**Outcome #4**

**1. Outcome Measures**

Development of an alternative natural sweetener from plant "Lippia Dulcis" for Texas small farmers as an alternative agriculture enterprise.

**2. Associated Institution Types**

- 1890 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Obesity and diabetes have become conjoined twin maladies afflicting the health of more than 20% of humanity worldwide due to possible high sucrose consumption. Natural non-calorie sweeteners are preferred to synthetic sweeteners.

**What has been done**

Field experiments conducted during the 2016 growing season of Phyla dulcis in different nutrient treatments revealed enormous variations in camphor and hernandulcin (natural sweetener) production.

**Results**

Plant system scientists discovered the best nutrient formulations to elevate hernandulcin synthesis while preventing camphor production in the biosynthetic pathway. US patent application was submitted for the unique nutrient formulæ.

Future Research Plan: Further agronomic studies will be conducted during the 2017-2021 growing seasons.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources

## **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
- Populations changes (immigration, new cultural groupings, etc.)

### **Brief Explanation**

Crop and forage production in Texas has been influenced by natural disasters such as hurricanes, floods, drought and wildfires. Production costs and incentives for production, management and use are influenced by economic changes. Higher fuel prices, fertilizer prices, equipment costs, and fees associated with technology in genetically modified crops are all factors. Public policy changes and government regulations challenge educators to provide up-to-date, neutral information that helps producers make economically viable decisions. Texas is facing a critical situation in meeting anticipated water demand as a result of population growth and unanticipated water demand due to drought and high temperatures. Population shifts and use of available land for productive and meaningful crop and forage production bring opportunities and challenges to producers/users and the associations/corporations/groups that make up this diverse industry.

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

### **Evaluation Results**

#### **Cotton**

Cotton is one of the major row crops grown in Texas. Cotton is well adapted to the semi-arid environments of Texas and is considered the most consistent source of income by most farmers, especially in non-irrigated situations. Texas has become the major state in U.S. for cotton, with Texas accounting for over 50% of the total U.S. cotton acres annually with 5-6 million acres annually.

#### **Variety Testing**

Variety testing remains one of the most important decision farmers will make each year. Selecting the best yielding varieties can lead to yield increases over 20% from the best yielding to worst yielding commercial varieties. High yields lead to increased ginning and increase in related jobs for the state. Additionally, cotton fiber quality is critically important to increase farm income and maintain our export markets. Cotton fiber quality affects the price by 10% or more in the current international market.

- Educational contacts through 149 formal educational meetings are 12,800 annually
- Over 50 on-farm variety evaluation trials across the state
- Over 20 popular press articles and interviews over variety evaluation annually
- Average yields and quality has increased over other past decade, resulting in an additional \$67/acre in value or a cumulative benefit of \$335 million for Texas.



Value added impacts associated with ginning the additional production is \$57 million and an additional 589 jobs.

### **Managing Nitrogen Costs and Protecting Water Resources**

Nitrogen fertilizer is often one of the largest production costs that farmers incur each year. Correct rate, placement, and application timing of nitrogen can increase the nitrogen use efficiency and decrease the potential for accumulation in the soil, ground water, and surface water. Nitrogen is constantly cycling in the soil due to decomposition of organic matter, nitrogen fertilizer applications, leaching, and denitrification. However, soil samples collected in cotton and other crops have indicated an accumulation of nitrogen in soil, soil residual nitrogen. Previous research has proven that this soil residual nitrogen is available to the plant and should be credited to the recommended N fertilizer applications. Utilization of this soil residual nitrogen saves the farmer fertilizer expenses and reduces the likelihood of nitrate movement into surface and groundwater. Previous surveys have found the following.

- Since 2007, over 19,000 producers have seen the presentations on crediting soil residual nitrogen
  - Over \$23/acre of average cost savings when nitrogen fertilizer is credited in cotton
  - Adoption of these recommendations reduces N application by millions of pounds annually

### **New Landowner Program Impact - Ranch Management University**

Since 1994, urban-absentee landowners have dominated rural land ownership in Texas. This land ownership change has created the potential for environmental problems associated with natural resource management. Few of the new land owners have any formal training in the basics of the soil-plant-animal interface. The solution was to develop an educational program to provide this new and growing segment of landowners with basic information regarding resource management. Faculty members from the Texas AgriLife Extension Service with department affiliations in Soil and Crop Sciences, Animal Science, Wildlife and Fisheries Sciences, and Agricultural Economics, developed the Ranch Management University Workshop for Novices. The main goals in developing the program were to: a) provide basic information regarding management of soil-plant-animal-water interface to people with little or no understanding regarding basic resource management; and b) introduce the Workshop participants to the educational resources available to them through the land grant university system, including the county extension agent in their counties; and c) use the workshop as a new county agent training vehicle at a heavily discounted price. The first Workshop was held in October of 2010, with subsequent Workshops having been held each April and October since then. Given the combination of learning environment, mix of classroom and field laboratory exercises, and non-threatening scientific presentations, Ranch Management University has become a popular and effective program helping ensure sustainability and proper management of valuable Texas natural resources for both landowners, managers, and new county extension agents.

### **Program Impacts:**

Post-post-surveys of respondents who attended the workshop at least 12 months prior to receiving the survey indicated the following:

- Survey respondents collectively manage **426,876 acres**
- Survey respondents expect an average economic benefit of **\$150 per acre** due to attending the workshop.
- The program has thus created a **\$63.8 million economic impact** for landowners, the

majority of who own land in Texas.

#### **Texas Well Owners Network (TWON)**

TWON promotes protection of human health and the environment through education regarding best practices to protect water quality and enhance water conservation.

- Throughout 2016, knowledge was increased for 100% of the participants. Six-month follow-up surveys indicated that for participants with septic tanks that needed pumping, 55% had pumped their septic tanks within 6 months of the program. An additional 33% planned to have their tanks pumped soon. Thirty-three percent who needed to had plugged or capped their unused/deteriorated wells within 6 months of the training and 90% of well owners needing to remove hazardous material from their well house had done so.

- The value of participating in the program as estimated by attendees was an average of about \$750 or a total of about \$650,000 for all 2016 participants. For 2016, 100% of participants with samples exceeding MCLs for fecal coliform bacteria and nitrate-nitrogen intend to adopt private well BMPs leading to improved water quality for 362 families and 362 direct points of contaminant conveyance to groundwater being eliminated.

- For 2016, TWON conducted nine "Well Informed" (1 hr educational program) screenings with 447 samples and ten "Well Educated" (6 hr educational program) training with 417 participants in 28 counties. Overall, primary (health risk) or secondary water quality standards were exceeded in about 57% of 864 private water well samples. Specifically, E. coli has been detected in about 7.4% of screened samples, and nitrates above the maximum contaminant level of 10 ppm were found in 15% of samples.

- The TWON team was a finalist for the 2016 Texas Environmental Excellence Award issued by TCEQ.

- TWON and other factsheets regarding wells and drinking water are available at <http://twon.tamu.edu/fact-sheets/> and through the AgriLife bookstore. (Boellstorff, Gholson, and Smith)

#### **Cooperative Extension Program**

**Output Programs:** Standard Customer satisfaction surveys were used in evaluating all output programs along with question aimed a measuring degree of change in understanding before and after program.

**Outcome Programs: Knowledge Gained** Pre and Post evaluations were conducted to measure knowledge gained as a result of the training. **Intention to adopt** program participations are evaluated on the likelihood of them adopting a practice or technology taught at an extension program.

**Economic Benefit** Participations are asked if they anticipate an economical benefit for information obtain from the program.

**One-on-one follow-up** Agents and Specialist follow-up one-on-one with producers to determine level of adoption.

### **Key Items of Evaluation**

**V(A). Planned Program (Summary)**

**Program # 4**

**1. Name of the Planned Program**

Water and Natural Resource 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
111	Conservation and Efficient Use of Water	50%	0%	50%	50%
112	Watershed Protection and Management	50%	0%	50%	50%
	<b>Total</b>	100%	0%	100%	100%

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	20.0	0.0	10.0	3.0
<b>Actual Paid</b>	27.0	0.0	17.2	4.0
<b>Actual Volunteer</b>	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
536995	0	879338	800499
1862 Matching	1890 Matching	1862 Matching	1890 Matching
536995	0	1621606	499022
1862 All Other	1890 All Other	1862 All Other	1890 All Other
3131212	0	4450441	0

**V(D). Planned Program (Activity)**

1. Brief description of the Activity

**AgriLife Extension, AgriLife Research, and Cooperative Agricultural Research Center**

Publish research findings generated through evaluation of best management practices to efficiently

manage available water resources, to limit off-site contaminant transport from production, processing, and landscaping systems, to utilize alternative water sources and to remove contaminants from impaired/alternative water sources.

Develop and conduct research and educational programs utilizing direct and indirect educational methods to support efficient utilization and conservation of water resources, to develop alternative water supplies, to implement best management practices on agricultural production and landscapes to protect water resources from contaminants, to promote proper management of surface and ground water resources, to enhance rainwater harvesting and to remove contaminants from impaired water supplies.

The work of AgriLife Research and AgriLife Extension is conducted jointly where research-based information is generated and then transferred to clientele.

Continue development of educational resources such as articles, fact sheets, bulletins, curriculum materials, short course manuals and other teaching materials.

#### **Cooperative Agricultural Research Center**

Assess irrigation water requirements for major crops in northern High Plains of Texas and citrus water requirements across some of the major citrus producing areas in the world under current and future climate scenarios; Analysis of potential future climate and climate extremes in the Brazos Headwaters Basin, Texas; Develop a web-based tool to calculate agricultural crops and urban landscape irrigation water requirement; evaluate land use effects on net ecosystem CO<sub>2</sub> exchange using satellite measurements; study the effect of torrential rain and drought on groundwater storage in Texas; Evaluate performance of different satellite soil moisture products over the state of Texas; monitor soil moisture using the electromagnetic induction sensor, EM-38; and study microbial decomposition of organic matter in lowland and upland systems.

Peer-reviewed articles and applied research outreach materials are some of the venues through which research is being communicated to different stakeholders within Texas and across the nation and globally.

## **2. Brief description of the target audience**

### **AgriLife Extension, AgriLife Research**

Programs focusing on the issue of water address target audiences including but not limited to producers, homeowners, landscape managers, industry practitioners, water resource managers, and others who identify themselves with this issue.

### **Cooperative Agricultural Research Center**

Assess irrigation water requirements for major crops in northern High Plains of Texas and citrus water requirements across some of the major citrus producing areas in the world under current and future climate scenarios; Analyze potential future climate and climate extremes in the Brazos Headwaters Basin, Texas; Develop a web-based tool to calculate agricultural crops and urban landscape irrigation water requirement; evaluate land use effects on net ecosystem CO<sub>2</sub> exchange using satellite measurements; study the effect of torrential rain and drought on groundwater storage in Texas; Evaluate performance of different satellite soil moisture products over the state of Texas; monitor soil moisture using the electromagnetic induction sensor, EM-38; and study microbial decomposition of organic matter in lowland and upland systems.

Peer-reviewed articles and applied research outreach materials are some of the venues through which research is being communicated to different stakeholders within Texas and across the nation and globally.

## **3. How was eXtension used?**

Responses to inquiries on eXtension were provided or reassigned to other specialists as needed and appropriate.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	87235	1014678	44636	0

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

**Patent Applications Submitted**

Year: 2016

Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2016	Extension	Research	Total
<b>Actual</b>	0	182	182

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- # of group educational sessions conducted.

Year	Actual
2016	3711

**Output #2**

**Output Measure**

- # research-related projects.

Year	Actual
2016	64

**V(G). State Defined Outcomes**

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

O. No.	OUTCOME NAME
1	% of participants who report an increased knowledge of best management practices related to water management.
2	% of participants who report the plan to or have adopted best management practices related to water management.

**Outcome #1**

**1. Outcome Measures**

% of participants who report an increased knowledge of best management practices related to water management.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research
- 1890 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	74

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

AgriLife Extension and Research

The School of Irrigation provides opportunities for landscape irrigation professionals to meet their continuing education requirements. The program directly supports 1,214 jobs in the landscape irrigation industry, with an estimated annual age base of \$29.2 million.

Cooperative Agricultural Research Center:

Research at the Cooperative Agricultural Research Center enables decision makers, farmers, ranchers, natural resource and environmental managers to make informed decisions and plan effective management practices that tackles surface and groundwater quantity and quality issues. Nine students actively participated in applied water-related research activities and gained practical water management skills. Several of these student are currently employed.

**What has been done**

AgriLife Extension and Research

Participants gain a better understanding of practices required to keep their home or commercial septic system workings and limit interferences with the enjoyment of their property. This course provides answers to the most frequently asked septic system questions, including when to pump out a tank and what can or cannot go down the drain.

Cooperative Agricultural Research Center

Field and lab experiments were conducted on effective water resources management practices through soil moisture monitoring and evaluation, groundwater monitoring and evaluation and hydrological modeling from field scale to watershed scale. A well-equipped testbed was

developed to monitor Carbon Dioxide and hydrometeorology at the University Farm. Research scientists and students presented findings of their research at local, national, and international workshops and conferences. The NRES research team also disseminated research findings through peer reviewed publications such as book, book chapters and journal articles. In addition, NRES team has participated in REAP, AgDiscovery, elementary and middle school day, academic demonstration programs at PVAMU to educate K-12 students from different schools and other stakeholders in the state.

**Results**

**AgriLife Extension and Research**

Documentation of programming impact for several face to face meeting indicating gain of knowledge by clients ranged from 74 to 96%. Additionally, 79% of the participants indicated a willingness to adopt the practice of pumping out their septic tank as necessary and 71% of the participants indicated a willingness to adopt the practice of performing operation and maintenance activities on their septic system.

**Cooperative Agricultural Research Center**

The NRES research team of CARC increased knowledge of researchers, students and other stakeholders on effective water resources management through hands on activities and laboratory and modeling experience. Nine graduate and undergraduate students were trained in conducting quality and problem solving research. The research team also increased knowledge and awareness on soil health, soil quality and nutrients monitoring and evaluation, irrigation water requirement estimation for different crops grown in Texas. In addition, NRES research team enhanced knowledge of youth, K-12 students and University students about natural resources and water management.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management

**Outcome #2**

**1. Outcome Measures**

% of participants who report the plan to or have adopted best management practices related to water management.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research
- 1890 Research

**3a. Outcome Type:**

Change in Action Outcome Measure



### 3b. Quantitative Outcome

Year	Actual
2016	75

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

The six-hour Homeowner Maintenance of Aerobic Treatment Units training is intended for homeowners wanting to understand more about the operation and maintenance of their aerobic treatment unit and spray field. Select counties allow homeowners to maintain their own system after completing this course.

#### What has been done

Two homeowner maintenance of aerobic treatment units programs were attended by 54 clients providing 324 contact hours. Participants gain a better understanding of practices required to keep their home or commercial septic system workings and limit interferences with the enjoyment of their property. This course provides answers to the most frequently asked septic system questions, including when to pumpout a tank and what can or cannot go down the drain.

#### Results

Documentation of programming impact for several face to face meeting indicating gain of knowledge by clients ranged from 77 to 90%. Additionally, 75% of the participants indicated a willingness to keep the disinfection component of the ATU operating properly and 81% of the participants indicated a willingness to adopt the practice of performing operation and maintenance activities on their aerobic treatment unit.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management

### V(H). Planned Program (External Factors)

#### External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Other (Other Program Areas)

#### Brief Explanation

- \* Success in securing funding through grants and contracts
- \* Weather patterns: both drought and flood impact interest in water management

strategies. Commodity and energy prices

\* Other emerging issues in communities (health, economics, etc.) can affect whether water management is a priority for individuals, businesses, families, communities. Regulatory and budgetary issues; ability to retain / recruit qualified staff

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

### **Evaluation Results**

Program evaluation surveys for all programs indicate a high level of participant satisfaction in the quality and content of programs.

High Plains Irrigation Conference attendees indicated increases in participant knowledge/understanding of subject matter addressed in the program: how crops use water (agronomic considerations of water management) (62% indicated increase in knowledge); practical irrigation scheduling tools (62%); monitoring and interpreting soil moisture (63%); variable rate irrigation technology (71%); issues in water law and agriculture (91%); irrigation in the context of integrated pest management and integrated crop management (62%); and irrigation technologies, best management practices and practical tips to maximize benefits of these technologies (60%). All respondents (100%) indicated that the information provided in the program would be useful in their irrigation decisions, and 67% indicated that they would implement changes in their irrigation practices as a result of information presented at the conference.

### **Key Items of Evaluation**

Program evaluation surveys for all programs indicate a high level of participant satisfaction in the quality and content of programs.

High Plains Irrigation Conference attendees indicated increases in participant knowledge/understanding of subject matter addressed in the program: how crops use water (agronomic considerations of water management) (62% indicated increase in knowledge); practical irrigation scheduling tools (62%); monitoring and interpreting soil moisture (63%); variable rate irrigation technology (71%); issues in water law and agriculture (91%); irrigation in the context of integrated pest management and integrated crop management (62%); and irrigation technologies, best management practices and practical tips to maximize benefits of these technologies (60%). All respondents (100%) indicated that the information provided in the program would be useful in their irrigation decisions, and 67% indicated that they would implement changes in their irrigation practices as a result of information presented at the conference.

**V(A). Planned Program (Summary)**

**Program # 5**

**1. Name of the Planned Program**

Range 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
112	Watershed Protection and Management	50%	0%	50%	0%
121	Management of Range Resources	50%	0%	50%	0%
	<b>Total</b>	100%	0%	100%	0%

**V(C). Planned Program (Inputs)**

**1. Actual amount of FTE/SYs expended this Program**

Year: 2016	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	17.0	0.0	15.0	0.0
<b>Actual Paid</b>	13.7	0.0	20.5	0.0
<b>Actual Volunteer</b>	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
272475	0	887863	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
272475	0	1400159	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1588800	0	3100025	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

**AgriLife Extension and AgriLife Research**

Primary activities in this program will focus on development and conducting of research and educational

programs to support proper management and restoration of native rangelands for clientele. Applied research and result demonstrations to support improved rangeland management will also be conducted. Training and support for County Extension Agent and Specialist training will be provided on appropriate and timely aspects of rangeland management. Emphasis will be placed on continued development of appropriate publications, websites, online courses, and other teaching materials.

Work of AgriLife Research and AgriLife Extension is conducted jointly where research-based information is generated and transferred to clientele.

**2. Brief description of the target audience**

**AgriLife Extension and AgriLife Research**

The target audiences for this program include federal and state agencies, youth and adults. The adult audiences specifically include traditional landowners, operators, absentee landowners, and "new", novice landowners that either just bought land or have made a career off the land and has returned to it.

**3. How was eXtension used?**

We have two training courses on the eXtension moodle site and are active in the eXtension ask the expert community.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	11966	64474	2251	0

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

**Patent Applications Submitted**

Year: 2016  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2016	Extension	Research	Total
<b>Actual</b>	0	183	183

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- # of group educational sessions conducted.

<b>Year</b>	<b>Actual</b>
2016	1020

**Output #2**

**Output Measure**

- # of research-related projects.

<b>Year</b>	<b>Actual</b>
2016	90

**Output #3**

**Output Measure**

- # of result demonstrations conducted.  
Not reporting on this Output for this Annual Report

**V(G). State Defined Outcomes**

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

O. No.	OUTCOME NAME
1	% of Land Managers who report increased knowledge leading to better decision-making for wise pesticide use.
2	% of livestock producers who report increased knowledge of rangeland monitoring, watershed management, weed and brush control.

**Outcome #1**

**1. Outcome Measures**

% of Land Managers who report increased knowledge leading to better decision-making for wise pesticide use.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	67

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Brush management is a major landowner-concern in Texas to maintain pasture productivity and wildlife habitat. Brush Busters provides landowners with do-it-yourself methods for brush maintenance.

**What has been done**

Five ESSM Extension Unit members conducted a 4-hour workshop during the 2016 Texas A&M Beef Cattle Short Course to demonstrate equipment needs and application methods for brush species featured in Brush Busters publications.

**Results**

Ninety landowners participated in the 2016 Texas A&M Beef Cattle Short Course Brush Busters Workshop. A retrospective-post evaluation was conducted with this workshop. Increase in understanding of the nine topics presented averaged 53% with a range of 27 to 88%. Participants represented 41 counties and reported owning or operating 57,775 acres for an average of about 963 acres per person. Total estimated acreage represented was 86,670. One-hundred percent of those returning the evaluation indicated that the information received would help them make better management decisions. One-hundred percent of these participants indicated that they planned to do some form of brush management in the near future.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
112	Watershed Protection and Management
121	Management of Range Resources

## **Outcome #2**

### **1. Outcome Measures**

% of livestock producers who report increased knowledge of rangeland monitoring, watershed management, weed and brush control.

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	45

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Although rains have been generally good across the state for the last two year, grazing management is as important as ever for preparation for the next drought and ranching survival.

#### **What has been done**

A 3.5-hour workshop was conducted during the 2016 Texas A&M Beef Cattle Short Course featured 9 short presentations dealing with carrying capacity, grazeable acres, land limitations, and brush management followed by demonstrations of rangeland apps. Presentations were made by three ESSM Extension Unit members and one County Extension Agent.

#### **Results**

2016 Texas A&M Beef Cattle Short Course Workshops Conducted by ESSM

Three hundred fifty-five landowners attended. A retrospective-post evaluation indicated an average increased understanding of ten teaching points evaluated of 71% with a range of 41 to 138%. Workshop participants represented 86 different Texas counties, Arkansas, Louisiana, and two Mexican states and reported owning or operating a total 202,572 acres (average ownership 1,282 acres). Based on this average and total attendance, 455,110 total estimated acres were represented. Ninety-nine percent of those returning evaluations indicated that information received would help in making better management decisions.



#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
121	Management of Range Resources

#### V(H). Planned Program (External Factors)

##### External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes

##### Brief Explanation

Range Management programs are potentially affected by external factors such as those listed above. Factors such as the economy and/or appropriation changes could have a positive or negative effect on efforts to provide research and education in this area.

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

##### Evaluation Results

Estimated economic benefit to clientele through 10 evaluated educational events involving Unit personnel was \$3.6 million on over 969 thousand acres. Additionally, 116 existing county-level applied research projects were evaluated in 89 counties and 83 new projects established in 75 counties during 2016. Two example evaluations are shown below.

##### Callahan, Brown, Coleman, and Eastland Forage Seminar

**Relevance:** To deliver the most accurate and reliable rangeland management knowledge, Callahan County hosted a major multi-county event at the beginning of the year to update and provide the latest scientific advances in forage production and management. **Response:** A 1-hr presentation was made during the Forage Seminar in Cross Plains on "Weed and Brush Management" at the Multi-County Forage Seminar on January 26<sup>th</sup> to 142 participants and 5 CEU's were given. **Results:** Of the 142 participants, 95 participants completed an evaluation. **Fifty-five percent** of respondents increased their understanding of managing brush as an integrated approach. **Eighty-seven percent** of respondents intend to adopt recommended practices and technology to manage brush encroachment. Overall, respondents anticipate an economic benefit of \$9.70/acre and with **179,198 acres** represented, total anticipated economic benefit is approximately **\$1,738,220**.

##### Technology Assisted Agricultural Symposium

**Relevance:** As travel budgets become more limited, specialists are faced with making difficult choices before traveling to replicate a program in every county. Additionally, clientele prefer to drive shorter distances and attend meetings in their home counties. **Response:** With new webinar technology available, the Corpus Christi Extension Specialists host an annual Agricultural Symposium at the Corpus Christ Research & Extension Center for a face-to-face audience and broadcasts the presentations to any county interested in participating. The last symposium was held on April 19<sup>th</sup> with a total

of 10 distance county offices/workshops and 1 face-to-face local county. This workshop included 6 Specialists and 8 topics/presentations. **Results:** 47 Participants (10 face-to-face, 37 distance). On average, responding participants owned 766 acres, or **36,000** acres represented overall. There was a **41%** increase in participant knowledge of timing for brush treatments depending on target species. **58%** of participants plan to adopt the brush buster's plant control techniques presented in the symposium (42% already adopted). There was a **98.5%** increase in knowledge about apps useful for managing property, crops, and livestock. **73%** of participants intend adopt the use of one or more apps presented in the symposium. Of those who responded, participants valued the program at \$29/ac on average. Of the approximate acreage represented at this meeting, the symposium would be valued at **\$1.04 million dollars**.

### **Key Items of Evaluation**

**V(A). Planned Program (Summary)**

**Program # 6**

**1. Name of the Planned Program**

Climate Change

Reporting on this Program

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	0%	0%	20%	0%
112	Watershed Protection and Management	0%	0%	20%	0%
132	Weather and Climate	100%	0%	0%	0%
133	Pollution Prevention and Mitigation	0%	0%	20%	0%
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	20%	0%
206	Basic Plant Biology	0%	0%	20%	0%
	<b>Total</b>	100%	0%	100%	0%

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	5.0	0.0	1.5	2.0
<b>Actual Paid</b>	3.3	0.0	3.1	0.0
<b>Actual Volunteer</b>	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
65633	0	287874	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
65633	0	229957	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
382704	0	366486	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

**AgriLife Extension**

Develop and conduct educational programs utilizing direct and indirect educational methods to increase knowledge of and support adoption of management practices capable of mitigating the effect of weather and climate change.

Drought has been the most destructive climatic event associated with climate change, and many AgriLife Extension faculty are involved in education on mitigation or remediation activities associated with drought.

Farmers and ranchers can enjoy huge savings on their fertilizer bills if they monitor plant nutrients during drought, as for the most part, producers applied plant nutrients with the expectation of a normal crop and, when drought severely limits crop production, significant quantities of nutrients remain in the soil for the next crop.

**AgriLife Research**

The research response to the issue of climate change is to generate reliable, verifiable data regarding carbon sequestration, carbon cycling, and interrelationships of cropping systems, livestock production and climate change. An example of this effort is using carbon dioxide from coal fired power generation as a feedstock for algae production. Research is also ongoing to develop and add value to co-products from algae production.

**2. Brief description of the target audience**

Research products and educational programs focusing on the issue of weather and climate change address target audiences including but not limited to producers, corporate businesses, landscape managers, water resource managers, decision makers, and others who identify themselves with this issue.

**3. How was eXtension used?**

The eXtension community of practice Livestock and Poultry Environmental Learning Center (LPELC) and web site were used to advertise events and to provide a portal for information delivery.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	280	311	0	0

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

**Patent Applications Submitted**

Year: 2016

Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2016	Extension	Research	Total
Actual	0	58	58

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- # of educational programs conducted.

Year	Actual
2016	4

**Output #2**

**Output Measure**

- # of research related projects.

Year	Actual
2016	9

**Output #3**

**Output Measure**

- # of graduate/undergraduate students involved in research projects.  
Not reporting on this Output for this Annual Report

**V(G). State Defined Outcomes**

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

O. No.	OUTCOME NAME
1	# of people reporting knowledge gained through participation in educational activities.
2	# of people reporting a willingness to adopt practices through participation in educational programs.
3	Change in Ag Practices to Increase Water Savings and Revenue

## **Outcome #1**

### **1. Outcome Measures**

# of people reporting knowledge gained through participation in educational activities.

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	0

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Future climate change is expected to have implications for animal agriculture. Adaptation strategies for livestock and poultry production exist to minimize the vulnerability and risk of climate change. Extension educators should have a basic understanding of climate change and the implications for agricultural production, and they should be aware of greenhouse gas mitigation options that exist for animal agricultural producers.

#### **What has been done**

A two-day Cattle and Climate Conversations workshop and tour on October 12-13, 2016 for Extension agents and NRCS field personnel in Denver, Colorado. This workshop was the final major deliverable of the USDA-NIFA Animal Agriculture and Climate Change Project - Southwest Region. Invited speakers presented topics including: understanding the roles and responsibilities of Cooperative Extension and NRCS for improving resiliency to climate variability, historic climate trends and future projections, and vulnerability of cattle production to climate change on U.S. rangelands.

#### **Results**

No results at this time.

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
132	Weather and Climate

**Outcome #2**

**1. Outcome Measures**

# of people reporting a willingness to adopt practices through participation in educational programs.

Not Reporting on this Outcome Measure

**Outcome #3**

**1. Outcome Measures**

Change in Ag Practices to Increase Water Savings and Revenue

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Introduction of high value vegetable crops in the Texas Panhandle is a far sighted response to the potential issues associated with Climate Change. Crop production in much of the Texas Panhandle is irrigated with water from the Ogallala Aquifer. However, water tables are drastically declining and in some locations are inadequate to irrigate throughout the season, especially for crops with high water requirements such as corn.

**What has been done**

Texas A&M AgriLife Research has made significant investment in revitalizing Texas vegetable production. Production of high value vegetable crops can be produced on significantly less land than a corn crop but result in a much greater economic return for the grower.

**Results**

Currently, farmers in the Texas Panhandle apply from 22 to 35 acre inches of irrigation water to produce an average of 225 bushels of corn, with expected revenue of \$855/acre at today's market price. With the same amount of water, farmers could produce approximately 140 cwt of tomatoes, and at prices near \$60/cwt they could dramatically improve their revenue to irrigation



ratio, with expected revenue close to \$8,400/acre. At this level of income, marginal land could be removed from production, less total acreage would have to be irrigated, irrigation water would be saved and overall farm sustainability and profitability increased. Furthermore, as a fringe benefit to this work, we will be helping to meet the public's demand for locally grown, better tasting, high quality produce.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
132	Weather and Climate

#### V(H). Planned Program (External Factors)

##### External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Other (changing programming areas)

##### Brief Explanation

Weather extremes undermined the growth of biomass sorghum so that corn grew out of phase with the sorghum. This calls for a repeat of the cultivation and peroxidase assays for another two years, for results verification purposes.

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

##### Evaluation Results

No results to report at this time.

##### Key Items of Evaluation

**V(A). Planned Program (Summary)**

**Program # 7**

**1. Name of the Planned Program**

Sustainable Energy

Reporting on this Program

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	100%	0%	10%	0%
111	Conservation and Efficient Use of Water	0%	0%	10%	0%
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	50%	0%
205	Plant Management Systems	0%	0%	10%	0%
402	Engineering Systems and Equipment	0%	0%	20%	0%
	<b>Total</b>	100%	0%	100%	0%

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	1.0	0.0	1.0	0.0
<b>Actual Paid</b>	1.2	0.0	9.4	0.0
<b>Actual Volunteer</b>	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
23866	0	395836	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
23866	0	771680	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
139165	0	1449813	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

**AgriLife Research**

Research involves cropping systems, novel dedicated energy crops, advanced plant breeding systems, micro- and macro-algae, novel oilseeds, logistics and conversion technologies. Our focus is on lignocellulosic and unique plant oil feedstocks for liquid motor fuels rather than on corn, soybeans, and other crops that can be used for food and feed. Drought tolerance and wide hybridization are emphasized in breeding research in order to increase adaptation and sustainability of alternative energy systems. Best management practices are needed to identify, collect, separate, transport and process these organic residuals. Development of best management practices will ensure to availability of quality organic residuals for entering bioenergy production.

Research also includes developing novel technologies to generate synthesis gas and/or electricity from dairy waste, municipal solid waste and sewage sludge.

**2. Brief description of the target audience**

The target audience includes traditional petroleum and natural gas energy companies, farmers, seed companies, start-up companies in bioenergy, electric generating companies, and the general public.

**3. How was eXtension used?**

The eXtension community of practice Livestock and Poultry Environmental Learning Center (LPELC) and web site were used to advertise events and to provide a portal for information delivery, including online courses.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	8461	42861	1350	0

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

**Patent Applications Submitted**

Year: 2016

Actual: 1

**Patents listed**

\* TRANSFORMATION OF GLYCEROL INTO HIGH ENERGY FUEL APPLICATIONS BY DEBARYOMYCES HANSENI

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2016	Extension	Research	Total
Actual	0	34	34

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- # of educational programs conducted.  
Not reporting on this Output for this Annual Report

**Output #2**

**Output Measure**

- # of research-related projects.

Year	Actual
2016	12

**V(G). State Defined Outcomes**

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

O. No.	OUTCOME NAME
1	# of people reporting knowledge gained through participation in educational activities.
2	# of people reporting a willingness to adopt practices through participation in educational programs.
3	Plant Breeding Efforts to Sustain Energy
4	Maximizing Value of Woody Plants

**Outcome #1**

**1. Outcome Measures**

# of people reporting knowledge gained through participation in educational activities.

Not Reporting on this Outcome Measure

**Outcome #2**

**1. Outcome Measures**

# of people reporting a willingness to adopt practices through participation in educational programs.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

The food-water-energy nexus (FEW Nexus) program area addresses the interconnected and complex issues of meeting increasing needs with limited natural resources. Competing interests (e.g. use of limited water for food crops vs. bioenergy crops or use of limited water resources to produce energy) present challenges at the local (farm level management) to global levels. Decision makers addressing these challenges include farmers, landowners, policy makers, natural resources agencies, business interests and even the general public. Informed decisions can involve economics (long term and short term; local and regional); technical knowledge (availability and reserves of water, for instance); practical / infrastructure issues, and many other factors.

**What has been done**

The final workshop of a multi-year series supported through a USDA-NIFA Animal Agriculture and Climate Change project was held in Denver, CO, primarily to educate County Extension Agents and USDA-NRCS personnel to aid them in supporting (informing and advising) agricultural and livestock producers in the FEW Nexus issues and strategies.

Youth programming of FEW nexus issues has been initiated through a new joint position through the Texas 4-H and Texas A&M AgriLife Extension Biological and Agricultural Engineering unit. Camps, workshops, and high quality educational materials are being developed to support 4-H and STEM education.

**Results**

The first major emphasis of the 4-H / STEM FEW Nexus programming is developing some high visibility youth programs.

A Renewable Energy (<http://betalab.tamu.edu/files/2016/06/b3e3stemflyer.pdf>) camp was held in College Station, Texas in summer 2016, with collaboration of a 4-H STEM specialist and faculty in the Department of Biological and Agricultural Engineering Bio Energy Testing and Analysis Laboratory. The half-day camp introduced students to environmentally friendly alternative technology and engineering principles used to create popular consumer products. Classroom and laboratory instruction addressed research for alternative energy, biologically derived consumer products and environmental sustainability.

A Texas 4-H Water Ambassadors program is rapidly gaining momentum with support from Groundwater Conservation Districts, trade associations, and other entities/organizations. The first Texas 4-H Water Ambassadors class will begin in 2017.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
111	Conservation and Efficient Use of Water
201	Plant Genome, Genetics, and Genetic Mechanisms
402	Engineering Systems and Equipment

**Outcome #3**

**1. Outcome Measures**

Plant Breeding Efforts to Sustain Energy

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
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### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Grazing lands underpin the US beef cattle, sheep and goat industries that produce livestock worth \$46 billion annually (USDA-NASS 2013). America's grazing lands also enable these livestock industries to competitively produce high-quality animal protein for a growing worldwide population and market. Unfortunately, global climate change is proliferating toxic/chemically defended plants on grazing lands (Morgan et al. 2007; Volder et al. 2013). Toxic/chemically defended plants decrease livestock health, growth, and reproduction (Ngugi et al. 1995; Panter and Stegelmeier 2011), and thereby threaten: 1) future food and fiber production from grazing lands, 2) the competitiveness of US agriculture, and 3) the socioeconomic sustainability of rural America.

#### What has been done

We are selectively breeding goats to either increase or decrease their consumption of *Juniperus* spp. a chemically defended invasive plant.

#### Results

This has resulted in a difference in the expected breeding value of high and low juniper consuming lines of about 20 percentage units. This difference is in part the result of differences in the way that monoterpenes, one of the aversive compounds in juniper, are metabolized (Campbell et al. 2010). This demonstrates the ability to genetically modify livestock to better utilize the future forage base that is expected as a result of climate change. Furthermore, livestock that can better utilize the forage resource will require less supplementation with feeds that require cultural energy inputs for their production, manufacturing and delivery.

### 4. Associated Knowledge Areas

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

#### Outcome #4

##### 1. Outcome Measures

Maximizing Value of Woody Plants

##### 2. Associated Institution Types



- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Widespread encroachment by woody plants has altered vegetation and grazing practices in southern US grasslands (e.g., Fuhlendorf et al. 2008, Taylor et al. 2012).

**What has been done**

Recognizing the need to add value to juniper and other woody plants to offset the high cost of mechanical removal a Wood to feed program was begun at the Texas A&M AgriLife Research Center to investigate harvesting juniper and processing it into feed for livestock (Whitney and Muir, 2010; Whitney et al., 2014; Stewart et al., 2014). Likewise, over the past five years, The Earth Partners LP has been developing scalable business models to develop and implement innovative business models that will enable large-scale land restoration through financeable bioenergy projects to fund the restoration and create environmental assets such as carbon and water.

**Results**

We worked with Earth partners to investigate the potential for creating multiple products from the control of encroaching woody plants. Adding value to the byproduct of mechanically controlling wood plant encroachment will make this rangeland management practice more economical. Furthermore, this has the potential to produce biofuel and feed in an energy efficient manner.

**4. Associated Knowledge Areas**

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

### **V(H). Planned Program (External Factors)**

#### **External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes

#### **Brief Explanation**

Drastically lower prices for petroleum energy has reduced economic incentives for alternative energy crops and systems. AgriLife Research is continuing research into sustainable energy to maintain momentum in this area of strategic importance to Texas and the United States.

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

#### **Evaluation Results**

See outcome indicators.

#### **Key Items of Evaluation**

**V(A). Planned Program (Summary)**

**Program # 8**

**1. Name of the Planned Program**

Community Resource and Economic Development

Reporting on this Program

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
504	Home and Commercial Food Service	5%	0%	0%	0%
602	Business Management, Finance, and Taxation	10%	60%	0%	0%
608	Community Resource Planning and Development	50%	20%	0%	0%
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	30%	0%	0%	0%
806	Youth Development	5%	10%	0%	0%
903	Communication, Education, and Information Delivery	0%	10%	0%	0%
	<b>Total</b>	100%	100%	0%	0%

**V(C). Planned Program (Inputs)**

**1. Actual amount of FTE/SYs expended this Program**

Year: 2016	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	25.0	9.0	0.0	0.0
<b>Actual Paid</b>	7.2	6.2	0.0	0.0
<b>Actual Volunteer</b>	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
143199	578350	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
143199	252064	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
834990	0	0	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

**AgriLife Extension**

Provided training and curriculum materials to County Extension Agents and volunteers for the purpose of conducting educational programs on community leadership, workforce preparedness, adult and youth entrepreneurship, emergency management, and nature based tourism at the county level. Specialists provided in-depth educational programs to targeted audiences relative to community and economic development strategies, based on local needs. They provided multi-county, regional and statewide educational programs on various topics to business owners and community stakeholders utilizing specialist faculty and other government and private sector partners. They coordinated and collaborated with state and federal agencies on rural development activities as well as worked with regional rural development centers on curriculum and professional development. They provided technical assistance to communities on analysis of various socioeconomic databases or surveys. They continued to foster working relationships with rural community colleges to obtain support and follow-up for local educational activities. They expand web-based information delivery relative to community resource and economic development topics.

**Cooperative Extension Program**

The Community and Economic Development Unit of the Cooperative Extension Program provided curriculum-based training and consulting in the areas of small business, housing, energy conservation, financial literacy and non-profit organization. Though services are open and available to all, the target is limited resource audiences primarily in rural counties of Texas. Activities included conducting educational programs, business development seminars, one-on-one consultations, assisting clients with writing business plans and maintaining social media sites.

**2. Brief description of the target audience**

**AgriLife Extension**

Primary target audiences for the program consisted of residents, elected and appointed officials, community leaders/potential leaders (including youth), individuals with specific workforce training needs, and existing and potential business owner/managers in and around the over 1,200 communities in all 254 counties of the state of Texas.

**Cooperative Extension Program**

Rural communities, low-income individuals, underrepresented groups, limited resource business owners

and small farm and potential small farm producers.

**3. How was eXtension used?**

The Cooperatives Community of Practice for eXtension is supported by Texas AgriLife Extension personnel. It provides a resource to individuals and groups interested in cooperative agricultural business practices. A focus for the community of practice is youth leadership, with the intent of drawing talented youth to careers in cooperatives. Such careers are typically located in rural communities and help to strengthen rural economies. The eXtension Tourism Community of Practice has been formally accepted and is under development. In addition, several faculty members answer the ask an expert questions that come in through eXtension.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	54981	522168	25650	0

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

**Patent Applications Submitted**

Year: 2016

Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2016	Extension	Research	Total
<b>Actual</b>	0	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- # of group educational sessions conducted.

Year	Actual
2016	3279

**Output #2**

**Output Measure**

- # of state or regional leadership conferences held for county officials or industry groups.

<b>Year</b>	<b>Actual</b>
2016	5

**Output #3**

**Output Measure**

- # of one-on-one technical assistance/consultations.  
Not reporting on this Output for this Annual Report

**Output #4**

**Output Measure**

- Estimated hours spent consulting individuals

<b>Year</b>	<b>Actual</b>
2016	4454

**Output #5**

**Output Measure**

- # of youth trained in entrepreneurship.

<b>Year</b>	<b>Actual</b>
2016	1330

**Output #6**

**Output Measure**

- # of volunteers involved in CED activities.  
Not reporting on this Output for this Annual Report

**V(G). State Defined Outcomes**

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

O. No.	OUTCOME NAME
1	Percent of landowners/managers participating in group educational meetings on effectively evaluating nature-based tourism resources that increased their knowledge.
2	Percent of participants of in-depth leadership educational programs who increase knowledge of community and individual leadership principles.
3	Number of participants in workforce development or continuing education training activities conducted who increase knowledge to support their current employment needs.
4	The number of participants who enroll in Individual Development Account programs.
5	Dollar amount of small business and home loans assisted with throughout the State of Texas.
6	Percentage of youth who start selling products or plan to sell products and services who received training on Entrepreneurship or financial literacy.
7	Dollar amount of small business and agri-businesses applying for financial assistance in support of their enterprise
8	Number of community gardens developed, farmers markets, community supported agriculture and/or income generated through the TASTE program.

## **Outcome #1**

### **1. Outcome Measures**

Percent of landowners/managers participating in group educational meetings on effectively evaluating nature-based tourism resources that increased their knowledge.

### **2. Associated Institution Types**

- 1862 Extension

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	80

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Natural resources owners and communities are looking for ways to generate additional income, and to attract positive growth opportunities, to maintain the economic viability of their enterprises and communities. Entrepreneurs are looking to diversification or nature tourism as strategies to expand nontraditional or other activities for economic development, and communities are looking for ways to enhance their community assets to attract positive growth. Entrepreneurs want information on what other successful operations are doing, and communities want to support local business.

#### **What has been done**

Educational activities made up of workshops, webinars, and tours were conducted statewide for natural resource owners, entrepreneurs, and community leaders. Technical assistance was provided to individual business owners relative to nature tourism, and rural and urban communities in park development.

#### **Results**

Landowners and Communities across Texas managing and developing nature based tourism operations frequently request to hear about example operations to better understand options. Comprehensive experiential curriculum developed for the education of youth at Long Acres Ranch provides a framework for application to TEKS objectives, enhances STEM education and will facilitate high quality learning opportunities for youth and adults. It contributes to the long-range goals of the Henderson-Wessendorf Foundation and a partnership with Extension WFSC. Technical assistance and continuing education assists communities and leaders in making evidence-based decisions. Impacts include increasing access and opportunities to experience parks and park-like places, improving citizen input, participation, and knowledge and increasing



understanding of local assets. Training and technical assistance in Crime Prevention through Environmental Design (CPTED) in rural communities in South Texas provided an affordable, community driven approach to addressing safety issues in local public spaces. Attendees reported knowledge gain in 8 areas: CPTED (in general) 94%; Landscaping and Safety 97%; Fencing and Safety 94%; Lighting for Safety 97%; Public Art & CPTED 77%; Parks and CPTED 91%; Comfort Station Design 81%; Traffic Calming 77% and Park Site Plans 83%.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
608	Community Resource Planning and Development

**Outcome #2**

**1. Outcome Measures**

Percent of participants of in-depth leadership educational programs who increase knowledge of community and individual leadership principles.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	80

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Issues identification processes at the local level continue to emphasize the importance of leadership to foster sustainable and vibrant communities. Community stakeholders must be prepared to build on local strengths through leadership and partner with others to create support for economic development and quality of life. This is particularly true given the importance of regionalism to development.

**What has been done**

The Texas Rural Leadership Program, Developing Critical Thinking Leaders, Texas Agricultural Life Leadership, Texas Event Leadership Program, and the Commissioners Court Leadership Academy are other curriculum-based programs that help develop leadership in various areas of Texas organizations and communities. The Stronger Economies Together and other CRED

programs work to bring community members together to enhance those skills and develop plans for communities to move forward.

**Results**

Through its V. G. Young Institute of County Government conducted educational schools, providing training related to the duties and responsibilities of the county officials. In 2016, 3,767 individuals took part in Extension and Extension supported programs, with 25,280 continuing education hours awarded. The Texas Rural Leadership Program (TRLP) has worked with AgriLife Extension agents and community leaders in 16 target counties to provide leadership training. The target communities are currently working on putting together projects that benefit their communities while using leadership training skills. In addition, a statewide conference was held in June 2016, with over 100 participants involved. The Texas Event Leadership Program (TELP) workshops served over 450 tourism industry professionals representing managers from Texas municipalities and for-profit businesses. TELP serves members of the Texas Association of Fairs and Events and Texas Festivals and Events Association. The Texas Forest Country (Deep East Texas Council of Governments region) is midway through the national Stronger Economies Together planning process facilitated by Texas A&M AgriLife Extension and Texas USDA-Rural Development, along with partners at the Texas A&M Forest Service, USDA-FSA, USDA-NRCS, Texas Department of Agriculture, Texas Farm Bureau, and the Texas Center for Rural Entrepreneurship.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
806	Youth Development

**Outcome #3**

**1. Outcome Measures**

Number of participants in workforce development or continuing education training activities conducted who increase knowledge to support their current employment needs.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	241537

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Local community leaders, resource owners, and other businesses need a well-trained workforce and the ability to provide greater knowledge and tools to potential employees to meet the challenges of increased globalization, increased international trade, and an increasingly competitive business environment. Communities are concerned about individual, community and regional economic viability, maintenance/improvement of quality of life, and sustainability/growth. Providing the existing labor force with the tools and training to remain competitive in today's ever more competitive labor environment, and providing job opportunities that will attract youth back to the community are of major importance.

#### What has been done

Educational activities made up of workshops, webinars, and online training materials were conducted/provided statewide for training new and existing labor force participants, to increase knowledge, to improve workforce skills, and to enhance/expand job opportunities. These efforts should increase job opportunities, earning potential and provide employers with a more efficient/competitive workforce.

#### Results

In 2016, county Extension agents and their community partners conducted 46 child care conferences reaching 3,767 child care providers and directors. 22,046 clock hours of training were provided to these professionals. Evaluation results indicate that 97% of participants acquired new information, 98% plan to utilize the information to improve their programs, and 98% consider themselves better equipped to work with children. In addition, child care professionals completed 325,940 online courses (601,302 clock hours). 98% of participants learned new information from the courses. During 2015, 701 food service employees participated in the Food Safety: It's Our Business Certified Food Manager program. Another 4,006 individuals completed the Food Safety: It's in Your Hands food handler's program either face-to-face or online. Also during 2016, 360 individuals completed the Cooking up a Cottage Food Business and Food Handlers for Cottage Food Businesses courses either face-to-face or online. An additional 137 individuals completed a Cottage Food or Farmers Markets for Consumers course online, and 957 individuals completed the Food Safety in the Classroom online course, which is approved for Continuing Education Units (CEUs).

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
504	Home and Commercial Food Service
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
806	Youth Development

**Outcome #4**

**1. Outcome Measures**

The number of participants who enroll in Individual Development Account programs.

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	25

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Adults and more often youth from underserved communities have limited opportunities and exposure to training that teaches them about the use of money, basic bookkeeping, budgeting, credit and home-ownership. More often than not, society neglects to provide free or low cost training in budgeting and simple accounting. School districts are not incentivized to provide the much needed training in financial literacy which leads to bad credit, increased debt, and lack of access to capital.

**What has been done**

CED staff, partners and students have initiated and conducted several curriculum trainings encouraging participants to save money and invest in themselves. Staff conducted a series of six (6) financial literacy seminars that discussed bank services, understanding credit, budgeting, saving, using credit card, borrowing basics, and home ownership. Programs like this certify eligible participant allowing them to participate in the Individual Development Account (IDA) savings match program. Monies deposited in the IDA will be matched 2 to 1 through federal funds. This money may be used to start a business, pay for tuition, or purchase a home.

**Results**

In 2016 we had 25 individuals to receive financial literacy training. Participants enrolled in the IDA program and though savings and matching are estimated to accumulate over \$250,000 to be used for higher education, home ownership and in some cases, purchase a car. This additional economic boost will create jobs as our clients buy homes and graduate from college with less debt. In addition, this makes them more likely to have better paying jobs and brings higher tax revenue into the State.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
602	Business Management, Finance, and Taxation
806	Youth Development

## **Outcome #5**

### **1. Outcome Measures**

Dollar amount of small business and home loans assisted with throughout the State of Texas.

### **2. Associated Institution Types**

- 1890 Extension

### **3a. Outcome Type:**

Change in Action Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	22930000

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

When it comes to receiving loans for small businesses and home purchases, limited resource individuals are the lowest percent of loan participants. Entrepreneurship and homeownership has been linked to economic prosperity yet minorities and low income individuals have a much more difficult time getting approved for financing to support these goals. Due to limited exposure to knowledge and resources, generations of minority business owners have been lacking what it takes to be successful and sustainable business owners. Statistics show that minority owned businesses are much more likely to fail, especially start-ups and micro businesses. Minorities across the nation also consistently lack in the area of homeownership. The lack of training and network are two reasons why there are minority owned businesses generating minimal income and failing at a much more alarming rate than those businesses owned by traditional entrepreneurs.

#### **What has been done**

Community & Economic Development staff has provided one-on-one technical assistance to home owners, first time home buyers, business owners to aspiring entrepreneurs through small business workshops, general consultation, USDA 504 and 502 loan/grant opportunities, business planning assistance, efficient business management, business opportunities, and loan package development with emphasis placed on working with economically depressed communities.

#### **Results**

As a result of the CED staff efforts 394 applications have been submitted for home loans and rehabilitation with 123 currently approve for funding renovations at the time of this report. A total

of \$3,105,000 has been invested in home repair. Of that, \$2,460,000 being a line of credit approved to limited resource clients at 1% for repair. 160 clients were assisted in 1st time home buyer and low interest mortgages totaling over \$19,200,000 in applications. \$625,000 in loans have been approved for small businesses with one of the loans saving 20 jobs within a small rural community. Total small business and home loan of \$22,930,000 in applications.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
602	Business Management, Finance, and Taxation
608	Community Resource Planning and Development

**Outcome #6**

**1. Outcome Measures**

Percentage of youth who start selling products or plan to sell products and services who received training on Entrepreneurship or financial literacy.

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Youth, specifically those from underserved communities, have limited opportunities and exposure to training that teaches them about the use of money, basic bookkeeping, budgeting, credit and home-ownership. Young people are more likely to prefer self-employment than adults, but at the same time their rate of self-employment is much less. This is accounted for by barriers related to lack of awareness, orientation of education and training, lack of experience, fewer financial resources, limited networks, and market barriers.

**What has been done**

CED staff, partners and students have initiated and conducted financial literacy trainings encouraging participants to save money and invest in themselves. Training include Individual Development Account (IDA) financial literacy training to youth, entrepreneurship training in school districts across the State of Texas, Agricultural entrepreneurship and literacy training, and partnering with local community organizations to provide youth entrepreneurship workshops and seminars.

**Results**

In, 2016 we had approximately 977 youth trained in Agribusiness and 353 youth trained in entrepreneurship. As a direct result of training, 29 youth have started selling products or services.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
608	Community Resource Planning and Development
806	Youth Development

**Outcome #7**

**1. Outcome Measures**

Dollar amount of small business and agri-businesses applying for financial assistance in support of their enterprise

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	106940000

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Due to limited exposure to knowledge and resources, generations of minority business owners have been lacking what it takes to be successful and sustainable business owners. Statistics show that minority owned businesses are much more likely to fail, especially start-ups and micro businesses. The lack of training and network is one of the reasons why there are Minority owned businesses generating minimal income and failing at a much more alarming rate than those businesses owned by the traditional entrepreneurs. Due to pervasive poverty, USDA has deemed 96 of the 254 counties in the State of Texas as Strike force counties needing special attention focused on economic development.

The unemployment rate for minorities continues to be significantly higher than unemployment in the majority population (exceeding 20% in some communities). Pervasive layoffs and continuing high unemployment numbers have forced a new wave of aspiring entrepreneurs who are ill-equipped to survive in an already tough marketplace flooded with displaced public and private sector individuals attempting to earn a living as business owners.

### What has been done

Community & Economic Development (CED) staff has provided trainings, workshops, and one-on-one technical assistance to aspiring entrepreneurs, small farmers, small businesses, and youth. The flagship program implemented was the Businesses In Development (BID) program, a 12-week training course conducted in various counties. The workshops focused on training new and existing businesses how to get and successfully execute State contracts for business. CED staff also provided one-on-one counseling to individuals to assist them in starting a business, maintaining their business, developing business plans, and applying for small business loans.

### Results

Participants in programs and one-on-one consultations reported an increase in knowledge, skills, and small business improvement through sustainability, increased capacity, job retention or expansion, and profitable business practices. As a result of the BID program, 267 HUB profiles were reviewed, 230 participated in courses and 89 new Historically Underutilized Businesses (HUBs) were established. Approximately \$106,940,000 in contracts were submitted to the State of Texas for approval.

Other areas of impact include:

- \* 4,454 Small Business Consulting Hours
- \* 310 Community and Economic Development Workshops
- \* 13 Videos developed for train-the-trainer trainings and online workshops.

## 4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities

## Outcome #8

### 1. Outcome Measures

Number of community gardens developed, farmers markets, community supported agriculture and/or income generated through the TASTE program.

### 2. Associated Institution Types

- 1890 Extension

### 3a. Outcome Type:

Change in Knowledge Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2016	0



### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

It has been established that limited resource communities (rural and urban) have need for specialized training in order to increase economic outcomes and their knowledge of the US food, fiber, and agriculture network. Unemployment and underemployment is problematic in rural and low income urban areas. Most individuals, families, college students, and communities have lost sight of the vital importance of a healthy agricultural economy and how by redirecting our efforts and integrating the S.T.E.M. disciplines into revamped curriculums, we can bring back small business ownership, jobs, and income into underperforming, fresh food-poor communities. Statistics show youth and adults in Liberty and Jefferson County suffer from the effects of poor diets and health disparities in much higher numbers than other communities. We realized that nontraditional skill sets and education were needed to improve health and economic outcomes.

#### What has been done

CED Staff and volunteers have conducted educational programs that develop and improve the professional skills of youth entrepreneurs, adult agri-business owners, and adult producers. Training included the benefits of growing, consuming, and selling crops in inner-city and rural settings with an emphasis on improving nutrition, health, business micro-ownership, and economic empowerment outcomes. The Teaching Agricultural Sustainability Through Economics (T.A.S.T.E.) initiative purposed participants to get Back To Their ROOTS by emphasizing healthier eating options, improved health, self-sufficiency, and economic sustainability through small crop production, business planning, and the introduction of modified Farmers Markets.

#### Results

Students gain food chain info, increase eco-sustainability knowledge, increase business ownership info & nutritional health knowledge residents/tribe learn plant and health nutrition, students learned of new careers opportunities, conservation, water quality, life skills, & NIFA careers. Action outcomes include, participants grow own garden for consumption, positive health outcomes participants interest in income producing businesses. As a result of this training we anticipate long term outcomes of improved economic opportunity, family sustainability through crop consumption & market sales, improved health outcomes through healthier eating, participants improve health from gardens, and increased income adds to local economy & tax base.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities

## **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
- Populations changes (immigration, new cultural groupings, etc.)

### **Brief Explanation**

Potential budget reductions as a result of reduced state appropriations in 2017 have resulted in positions vacated during 2016 going unfilled. A reduction in FTEs available to carry out educational activities in 2016, and into the future may be a problem if projected budget reductions become a reality and vacancies are not refilled. While remaining faculty picked up additional responsibilities, some educational opportunities were missed due to reduced faculty numbers, and lack of subject matter expertise in certain program areas.

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

### **Evaluation Results**

Overall, as a result of the Community and Economic Development staff's efforts, limited resources individuals across the State of Texas have experienced positive outcomes in small business creation, business expansion, home ownership, foreclosure prevention, financial literacy, emergency preparedness, and youth entrepreneurship. Businesses have received millions of dollars in contract opportunities, individuals have received hundreds of thousands of dollars for homeownership and rehabilitation, and hundreds of youth have been training in entrepreneurship.

### **Key Items of Evaluation**

Clientele/participants involved in Community Resource Economic Development programs are evaluated in several ways, depending on the length of the training activity, whether we are trying to identify short-term knowledge gains, or adoption/change of practices and economic impacts over time. Pre-tests and post-tests are used at the beginning and end of programs to better identify knowledge gains. Retrospective post evaluation surveys are used to identify adoption/change of practices and potential economic impacts over time. Results indicate that participants are learning, and adopting/changing practices, and these changes are producing potential economic benefits.

**V(A). Planned Program (Summary)**

**Program # 9**

**1. Name of the Planned Program**

Chronic Disease, Health, and Wellness

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
723	Hazards to Human Health and Safety	35%	15%	35%	0%
724	Healthy Lifestyle	65%	35%	65%	0%
802	Human Development and Family Well-Being	0%	50%	0%	0%
	<b>Total</b>	100%	100%	100%	0%

**V(C). Planned Program (Inputs)**

**1. Actual amount of FTE/SYs expended this Program**

Year: 2016	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	25.0	4.0	2.4	0.0
<b>Actual Paid</b>	42.0	4.0	19.0	0.0
<b>Actual Volunteer</b>	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
835325	373129	190242	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
835325	162622	771183	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
4870774	0	4504574	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

### **AgriLife Extension**

#### **Diabetes Programs**

AgriLife Extension's efforts related to diabetes education focus on partnering with local health care professionals and organizations to plan, implement and evaluate Do Well, Be Well with Diabetes, ¡Sí, Yo Puedo Controlar Mi Diabetes! (Sí, Yo Puedo), and Wisdom, Power and Control for underserved adults with type 2 diabetes. The purpose of these multiple session programs is to provide relevant diabetes self-management education aimed for diverse audiences. All programs align with the American Diabetes Association's standard of care. To this end, these interventions are satisfying diabetes self-care recommendations to reduce the risk for disease complications.

#### **Exercise and Wellness Programs**

A local coalition will recruit participants and provide leadership to implement Walk Across Texas! Teams of eight or classes of children at schools will be recruited to walk for eight weeks. Teams and classes are challenged to walk regularly for eight weeks, reporting their mileage on <http://walkacrosstexas.tamu.edu>, to achieve the goal of walking the approximate 830 miles across Texas on a map that allows comparisons of teams and class progress. Participants are personally recruited along with groups such as worksites, schools, churches, and clubs.

#### **Cancer Prevention Programs**

County agents will work with local volunteers, regional cancer prevention program specialists, and patient navigators to implement Friend to Friend, an evidence based program designed to increase the number of women in rural, frontier, and border counties who find breast and cervical cancer earlier, when treatments are most effective. Once a year, a Friend to Friend event will be provided in select counties. Each event will include a presentation by a local physician, a chance to meet and make appointments with nearby clinical sources of mammograms and Pap tests, and a discussion group for networking support and finding solutions for problems such as cost and transportation. Funding will be provided by the Cancer Prevention and Research Institute of Texas for transportation and clinical services to women needing assistance.

#### **Cooperative Extension Program**

Cooperative extension agents within the Cooperative Extension program targeted limited resource clientele to provide educational workshops on how to manage and prevent chronic illnesses. The prevalence and reduction of chronic illness and disease is the focus of health and wellness programming. Risk factors associated with high blood pressure, high cholesterol, excess weight, and lack of physical activity can lead to major life limitations and death. Self-management education is the cornerstone for diabetic care and vital for blood glucose control. The American Diabetes Association reported that 29.1 million Americans have diabetes but only 21.0 million are diagnosed and 8.1 million are undiagnosed. There are approximately 1.4 million Americans being diagnosed with diabetes each year. Unfortunately, about 208,000 American youth under the age of 20 are estimated to have diagnosed diabetes. African Americans and Hispanics than their White counterparts, with 46 deaths per 100,000 for African Americans and 19 per 100,000 for Whites.

## **2. Brief description of the target audience**

### **AgriLife Extension**

#### **Diabetes Programs**

The target audience for Do, Well, Be Well is adults with type 2 diabetes. Sí, Yo Puedo and Wisdom, Power Control are culturally tailored diabetes self-management education (DSME) programs for Hispanic/Latinos and African Americans, respectively. Across ethnicities these curricula are designed to provide DSME to persons with type 2 diabetes who need training to learn dietary and self-care management skills, such as eating more healthfully (limiting carbohydrate intake, reducing fat and sodium and increasing fiber in meal plan), increasing physical activity, taking prescribed medications, checking their blood glucose levels, and

regularly visiting their health care providers.

Exercise and Wellness Programs

Walk Across Texas! is open to anyone wanting to increase their physical activity level if they live in a community with a AgriLife Extension educator or have access to <http://walkacrosstexas.tamu.edu>.

Cancer Prevention Programs

Underserved rural women who are at risk for breast and cervical cancer.

**Cooperative Extension Program**

The target audience are individuals who are at the highest risk of chronic illness due to their diet and lack of physical activity to include the underserved and underrepresented population in Texas including African Americans and Hispanics.

**3. How was eXtension used?**

eXtension was used by the specialists to develop fact sheets as needed.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	172395	993149	198758	0

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

**Patent Applications Submitted**

Year: 2016  
 Actual: 1

**Patents listed**

\* COMPOSITIONS AND METHODS FOR DRUG- SENSITIZATION OR INHIBITION OF A CANCER CELL

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2016	Extension	Research	Total
<b>Actual</b>	2	42	44

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of group educational sessions conducted.

<b>Year</b>	<b>Actual</b>
2016	13550

**Output #2**

**Output Measure**

- Number participating in educational efforts.  
Not reporting on this Output for this Annual Report

**Output #3**

**Output Measure**

- Number of research-related projects

<b>Year</b>	<b>Actual</b>
2016	15

**V(G). State Defined Outcomes**

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

O. No.	OUTCOME NAME
1	Number of participants who report improved before meals blood glucose levels after attending 4 of the 5 Do Well, Be Well with Diabetes classes; 3 of 4 Cooking Well with Diabetes classes; and 5 of 6 ¡Si, Yo Puedo Controlar Mí Diabetes¡.
2	Increased number of miles walked per week at week one compared to week eight.
3	Number of people reporting knowledge gained through participation in cancer prevention educational activities.
4	Number of people reporting a willingness to adopt practices through participation in cancer prevention educational programs.
5	Number of individuals who gain knowledge in Health and Wellness while attending workshops and conferences.

## **Outcome #1**

### **1. Outcome Measures**

Number of participants who report improved before meals blood glucose levels after attending 4 of the 5 Do Well, Be Well with Diabetes classes; 3 of 4 Cooking Well with Diabetes classes; and 5 of 6 ¡Si, Yo Puedo Controlar Mí Diabetes¡.

### **2. Associated Institution Types**

- 1862 Extension

### **3a. Outcome Type:**

Change in Action Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	409

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Diabetes is not curable, but it is manageable. While the skills needed to effectively manage diabetes are well documented, diabetes education is not readily available. An estimated 14% or 2.7 million Texans 18 years or older are diagnosed with diabetes. People with diabetes who maintain their blood glucose, blood pressure and cholesterol numbers within recommended ranges can keep their costs, health risks, quality of life and productivity very close to those without the disease.

#### **What has been done**

Do, Well, Be Well, Sí, Yo Puedo Controlar Mí Diabetes and Wisdom, Power, Control are programs designed to educate about dietary and self-care management skills such as eating more healthfully (limiting carbohydrate intake, reducing fat and sodium and increasing fiber in meal plan), increasing physical activity, taking prescribed medications, checking their blood glucose levels, and regularly visiting their health care providers.

#### **Results**

600 people with diabetes registered for the Do Well, Be Well program in 2016. Over 66% of participants had never received diabetes education; 421 (70%) completed the five-week series and the Wrap-Up or post-test. Eighty-eight percent of participants learned how to manage their blood glucose through dietary management as a result of this series compared to 29 percent at entry. Additionally, 60 percent of participants at exit felt their ability to control their diabetes was very good or excellent compared to 43 percent at entry. The improved management of diabetes for these participants resulted in an estimated cost savings of \$32 million.



In 2016, a total of 831 enrolled in Sí, Yo Puedo and Wisdom, Power Control. Significant knowledge increases were observed among participants in their general understanding of diabetes and self-care. Moreover, participants reported improvements in self-efficacy as a result of attending the classes.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

#### Outcome #2

##### 1. Outcome Measures

Increased number of miles walked per week at week one compared to week eight.

##### 2. Associated Institution Types

- 1862 Extension

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2016	5

##### 3c. Qualitative Outcome or Impact Statement

###### **Issue (Who cares and Why)**

According to recent statistics, 32.4% of Texans are obese and 27.2% of American adults report no leisure time physical activity. Regular physical activity and controlling weight can significantly reduce the risk and impact of chronic diseases, such as heart disease, stroke, type 2 diabetes, cancer, high blood pressure, and depression. Regular physical activity is also associated with fewer physician visits, hospitalizations, and medications.

###### **What has been done**

AgriLife Extension implemented Walk Across Texas!, an award-winning program that helps people of all ages support one another to establish the habit of regular physical activity. For eight weeks, teams of up to eight people, school classes, or individuals, virtually walk 832 miles across the state of Texas.

###### **Results**

In 2016, Walk Across Texas! was implemented in 154 counties. Over 37,000 adults and youth registered statewide. Participants average mileage improved by 4.68 miles from week one to week eight. Over 20,000 youth participated in school teams, logging more than 942,000 miles. Moreover, 92% of participants reported that they or their families benefitted from participating in the program. Including the cost of lost wages, the total potential economic impact for the 2016 team participants is approximately \$186 million.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

#### Outcome #3

##### 1. Outcome Measures

Number of people reporting knowledge gained through participation in cancer prevention educational activities.

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2016	1798

##### 3c. Qualitative Outcome or Impact Statement

###### **Issue (Who cares and Why)**

Increasing access to breast and cervical screening and diagnostic services is a significant need in rural, frontier, underserved and border Texas counties for uninsured women. While mammography screening has improved nationally over the past 11 years, women in rural areas are less likely to be screened. Effective screening for breast cancer yields a 30% reduction in mortality for women 50 years and over. However, minority, underserved and low socioeconomic status women have not experienced the same reduction in mortality.

###### **What has been done**

AgriLife Extension implemented a peer-led, research-tested intervention to encourage un-/underinsured women in rural, frontier and border counties in Texas to comply with breast and cervical cancer screening guidance. At the end of the two-hour educational event, featuring a

clinician as a speaker, patient navigators and relevant providers/resources from the area make appointments for women on-site to follow-up with appropriate screenings.

**Results**

At the end of the event 82.8% of women correctly identified the need for a mammogram screening every year.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
723	Hazards to Human Health and Safety
724	Healthy Lifestyle

**Outcome #4**

**1. Outcome Measures**

Number of people reporting a willingness to adopt practices through participation in cancer prevention educational programs.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	2876

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Women living in rural areas of Texas are less likely than their urban counterparts to have had a mammogram or Papanicolaou (Pap) test within the past two years. Screening and diagnostic services tend to be ?disconnected? and not easy to locate or access in rural Texas, especially for underserved and older women. As a result, women in these rural areas tend to be diagnosed in later stages of breast or cervical cancer, making treatment more difficult and impairing their future quality of life.

**What has been done**

AgriLife Extension sought and obtained from the Cancer Prevention and Research Institute of Texas (CPRIT) funding support to deliver Friend to Friend, an evidence-based program that focuses on encouraging women in rural, frontier, and border counties to get regular mammograms and Pap tests for early detection of breast and cervical cancer when the disease is most curable.

**Results**

In 2016, AgriLife Extension agents in 34 counties across the state worked with regional cancer prevention program specialists to implement Friend to Friend events and communicate the importance of early detection to the women of their communities. The project served 6,345 women; provided 2,876 clinical services; identified 115 abnormal screening results; and diagnosed 23 cancer precursors or cancers.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
723	Hazards to Human Health and Safety
724	Healthy Lifestyle

**Outcome #5**

**1. Outcome Measures**

Number of individuals who gain knowledge in Health and Wellness while attending workshops and conferences.

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	2000

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Targeting the underserved and underrepresented audience within Texas, the Cooperative Extension Program Agents conducted education programs focusing on diabetes in San Antonio, Texas (Bexar County). A chronic illness such as diabetes occurs when the body does not make enough insulin, or the insulin it makes does not work properly. Diabetes and Hypertension are related in that if a person is diagnosed with diabetes more than likely they will be diagnosed with hypertension. Education workshops focusing on self-management emphasizes knowledge of risk

factors for prevention and controlling chronic illness and skills needed to effectively manage chronic illnesses are well documented.

**What has been done**

Nutrition Health and Wellness Programs were conducted in 62 sites with 577 adults. At each site the Agent conducted a series of 6 one-hour classes or one-time workshops. The educational sessions consisted of classes that promoted diabetes education, awareness and prevention, controlling diabetes through nutrition, risk factors and complications of the diabetes. Along with the educational monthly sessions, newsletters and informational materials focusing on diabetes health information were distributed to program participants. The training also focused on how to facilitate Diabetes Self-Management classes and other health related programs in their community.

**Results**

A pre-and-post evaluation was given to all 577 adults and the results achieved were: 83.30% increased their knowledge in understanding risk factors such as hypertension, obesity, lack of physical activity, age and hereditary influences can contribute to being diagnosed with type 2 diabetes; 75.02% increased their knowledge in understanding the relationship of good nutrition and health; 75.05% increased their knowledge in understanding the complications of diabetes such as nerve damage, periodontal disease, heart disease, renal failure and eye disease; 55.56% increased their knowledge in understanding that an inactive lifestyle is a risk factor for diabetes type 2; 45.60% increased their knowledge in understanding the warning signs of diabetes such as frequent urination, headache, nausea, poor circulation and cuts or wounds healing slower.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
802	Human Development and Family Well-Being

**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
- Populations changes (immigration, new cultural groupings, etc.)

**Brief Explanation**

External factors such as competing public priorities and competing programmatic challenges could have prevented the attendance at such programs offered throughout the state.

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

**Evaluation Results**

In 2016, Walk Across Texas! was implemented in 154 counties. Over 37,000 adults and youth registered statewide. Participants average mileage improved by 4.68 miles from week one to week eight. Over 20,000 youth participated in school teams, logging more than 942,000 miles. Moreover, 92% of participants reported that they or their families benefitted from participating in the program. Including the cost of lost wages, the total potential economic impact for the 2016 team participants is approximately \$186 million.

In 2016, AgriLife Extension agents in 34 counties across the state worked with regional cancer prevention program specialists to implement Friend to Friend events and communicate the importance of early detection to the women of their communities. The project served 6,345 women; provided 2,876 clinical services; identified 115 abnormal screening results; and diagnosed 23 cancer precursors or cancers.

Over 1,400 adults with diabetes registered for one of three AgriLife Extension led diabetes education programs in 2016. Six-hundred participants completed the Do Well, Be Well program. Over 66% of participants had never received diabetes education; 421 (70%) completed the five-week series and the Wrap-Up or post-test. Eighty-eight percent of participants learned how to manage their blood glucose through dietary management as a result of this series compared to 29 percent at entry. Additionally, 60 percent of participants at exit felt their ability to control their diabetes was very good or excellent compared to 43 percent at entry. The improved management of diabetes for these participants resulted in an estimated cost savings of \$32 million.

In 2016, a total of 831 enrolled in Sí, Yo Puedo and Wisdom, Power Control. Significant knowledge increases were observed among participants in their general understanding of diabetes and self-care. Moreover, participants reported improvements in self-efficacy as a result of attending the classes.

A combined 131 presentations on health and wellness topics, reaching 7,491 participants, were conducted in 2016. Evaluation results indicate that knowledge of health and wellness topics improved for participants. Moreover, 1,114 County Extension Agents were trained either virtually or in-person during 45 presentations.

#### Cooperative Extension Program

A summer Mobile Food Pantry was implemented within Falls County to feed youth healthy meals while they were out of school for the summer break. This mobile food bank allowed for 1,479 adults and youth to receive nutritious meals and the CEP Extension agent conducted 12 workshops on healthy recipes and the importance of physical activity.

### **Key Items of Evaluation**

In 2016, Walk Across Texas! was implemented in 154 Texas counties. Over 37,000 adults and youth registered statewide, which is a 17% increase from 2105. Participants average mileage improved by 4.68 miles from week one to week eight. Over 20,000 youth participated in school teams, logging more than 942,000 miles. Moreover, 92% of participants reported that they or their families benefitted from participating in the program. Including the cost of lost wages, the total potential economic impact for the 2016 team participants is approximately \$186 million.

#### Cooperative Extension Program

A six week weight management education program was conducted to educate the underserved and underrepresented audience to choose a healthful eating plan within their caloric requirements. This allowed them to learn how to maintain a healthy weigh, healthy eating habits, increase physical activity and motivation. This program allowed 12

participants in one Texas county lose more than 76 pounds.

**V(A). Planned Program (Summary)**

**Program # 10**

**1. Name of the Planned Program**

Childhood Obesity

Reporting on this Program

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
703	Nutrition Education and Behavior	50%	50%	50%	50%
724	Healthy Lifestyle	50%	50%	50%	50%
	<b>Total</b>	100%	100%	100%	100%

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	3.0	8.0	1.0	1.0
<b>Actual Paid</b>	1.4	8.0	0.0	0.5
<b>Actual Volunteer</b>	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
27844	746258	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
27844	325244	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
162359	0	0	0

**V(D). Planned Program (Activity)**

1. Brief description of the Activity

**AgriLife Extension**  
Balancing Food & Play



The curriculum contains three elements: lesson plans, take-home reading assignments, and student journals.

- \* Twenty lesson plans address physical activity, MyPlate, making healthy choices, and goal setting.
- \* The lessons incorporate higher-level thinking and learning skills (i.e., opportunities to design games, commercials, menus).
- \* Eight take-home reading assignments and parent letters encourage family engagement by providing the opportunity for shared family discussions.
- \* The reading assignments follow a fictional family as they learn about nutrition and physical activity, set goals, and learn to make healthy choices.
- \* Each student receives a 41-page journal. The journal allows opportunities for reflective learning and goal setting.
- \* The program evaluation includes child surveys regarding knowledge and behavior.

#### Extension Online Nutrition Training

Childcare providers will complete one or more of the four one-hour trainings available related to child nutrition.

#### WAT Youth Component

A local coalition will recruit participants and provide leadership to implement Walk Across Texas! Teams of eight or classes of children at schools will be recruited to walk for eight weeks. Teams and classes are challenged to walk regularly for eight weeks, reporting their mileage on <http://walkacrosstexas.tamu.edu>, to achieve the goal of walking the approximate 832 miles across Texas "virtually" on a map that allows comparisons of teams and class progress.

#### **AgriLife Research**

Research is conducted in collaboration with State and Federal Women, Infant and Children Program leaders to provide data and programs to improve dietary habits of children and their parents or care givers. Research also involves native American populations and the school lunch program.

#### **Cooperative Extension Program and Cooperative Agricultural Research Center**

Obesity is a health issue that a large portion of the population is dealing with. Statistics have shown that if you are obese as a child, you will probably continue to be obese as an adult. Poor health, obesity, poor nutrition and limited physical activity are significant health concerns that disproportionately affects minority and the underrepresented and under-served populations. The Family & Consumer Sciences unit strives to provide educational opportunities and resources through informal education workshops to those who are most at risk. Programs serve to increase knowledge, change behaviors, and increase physical activity. Topics focused on portion control, serving size, lifestyle changes, health consequences of excess weight, and the lack of physical activity. Education workshops were conducted with targeted audiences at community centers, senior activity centers, senior wellness centers, school programs, and faith based institutions. The prevalence of overweight/obesity has grave consequences for youth and adults. Health issues for children include bone and joint problems, sleep apnea and social and psychological issues.

#### **Choose Health: Food, Fun, and Fitness (CHFFF)**

CHFFF uses experiential learning to teach healthy eating and active play, targeting behaviors research shows to be most important for preventing childhood obesity and chronic disease. Topics include replacing sweetened drinks with low-fat milk and water, eating more vegetables, fruits, and whole grains, eating fewer high-fat and high-sugar foods, and playing actively 60 minutes a day. Choose Health: Food, Fun, and Fitness is aimed at 8-12 year olds and targets those behaviors research shows to be most important for preventing childhood obesity and chronic diseases such as heart disease and cancer.

The curriculum also supports key messages of the 2010 Dietary Guidelines for Americans as summarized by USDA in their new MyPlate initiative to help Americans build healthier diets: Drink water instead of sugary drinks; Switch to fat-free or low-fat (1%) milk; Make half your plate fruits and vegetables; Make at

least half your grains whole grains; Enjoy your food, but eat less; Avoid oversized portions.

Step Up and Scale Down

Step Up & Scale Down is a 12- lesson program developed to provide nutrition information to people who want to live healthier lifestyles. The program focuses on weekly motivation, support, hands on learning and accountability to assist them achieve their goals.

Balance Living

Balance Living is a series of five lessons focusing on time management, stress management, mindful eating, physical activity, and sleep are the major components addressed in this curriculum because these areas tend to be overlooked when life gets hectic or out of control. The goal of this series is for participants to gain knowledge and skills to live a more balanced life.

**2. Brief description of the target audience**

**AgriLife Extension**

Balancing Food & Play

Third grade students in Texas Schools

Extension OnLine Nutrition Training

Childcare providers, parents and other interested adults.

WAT! Youth Component

Youth in Texas Schools

**AgriLife Research**

Parents and others who care for children, school lunch program administrators, and native Americans.

**Cooperative Extension Program and Cooperative Agricultural Research Center**

Minority families and individuals

Senior adults

Single parents

Secondary education and college students

Persons coping with and at risk for chronic illnesses

**3. How was eXtension used?**

eXtension was not used in this program

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1087	0	4432	50301

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

**Patent Applications Submitted**

Year: 2016

Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2016	Extension	Research	Total
Actual	0	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- # of group educational methods conducted.

Year	Actual
2016	180

**Output #2**

**Output Measure**

- # of classes/workshops addressing nutrition and health.  
Not reporting on this Output for this Annual Report

**V(G). State Defined Outcomes**

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

O. No.	OUTCOME NAME
1	The percent of youth that reported engaging daily in 60 minutes or more of physical activity. (National Indicator Outcome 2,1d)
2	Percentage increase the number of children reporting decreased sweetened beverage intake. (National Indicator Outcome 1,2c)
3	The percent of youth that reported increasing their physical activity and/or reducing sedentary. (National Indicator Outcome 2,1c)
4	Number of participants who understand and use My Plate in meal buying and preparation, become aware of diet related diseases, understand the connection between diet and exercise, increase consumption of fruits and vegetables.
5	Number of participants modify recipes to decrease amount of calorie and adopt healthy eating habits.
6	Number of miles logged by youth WAT participants.

**Outcome #1**

**1. Outcome Measures**

The percent of youth that reported engaging daily in 60 minutes or more of physical activity.  
(National Indicator Outcome 2,1d)

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	74

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Children in particular are vulnerable to the deleterious consequences of excessive weight and the adoption of poor behaviors. Obesity and overweight often track into adulthood as do poor behavior choices learned or reinforced during childhood. As overweight or obese adults, these children will face higher healthcare costs and lower quality of life than their healthful weight peers. Therefore, educating children on nutrition and physical activity with the intent to reinforce positive lifestyles and the adoption of healthy behaviors can help prevent or slow the tendency toward unwanted weight gain.

**What has been done**

The Balancing Food & Play curriculum was designed to improve knowledge and behaviors related to:

- \* snacking on fruits and vegetables,
- \* drinking milk with meals and water with snacks,
- \* encouraging at least 60 minutes of physical activity each day, and
- \* limiting screen time to two hours or less per day.

**Results**

At the completion of Balancing Food & Play, students were more likely to correctly identify food and physical activity best practice recommendations.

Self-reported student behaviors related to physical activity, soda consumption, and screen time all of which are associated with obesity improved during the time that Balancing Food & Play was taught. The percentage of students who reported:

\* getting at least 60 minutes of physical activity increased from 57 percent to 74 percent;

#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
724	Healthy Lifestyle

#### Outcome #2

##### 1. Outcome Measures

Percentage increase the number of children reporting decreased sweetened beverage intake.  
(National Indicator Outcome 1,2c)

##### 2. Associated Institution Types

- 1862 Extension

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2016	42

##### 3c. Qualitative Outcome or Impact Statement

###### **Issue (Who cares and Why)**

Children in particular are vulnerable to the deleterious consequences of excessive weight and the adoption of poor behaviors. Obesity and overweight often track into adulthood as do poor behavior choices learned or reinforced during childhood. As overweight or obese adults, these children will face higher healthcare costs and lower quality of life than their healthful weight peers. Therefore, educating children on nutrition and physical activity with the intent to reinforce positive lifestyles and the adoption of healthy behaviors can help prevent or slow the tendency toward unwanted weight gain.

###### **What has been done**

The Balancing Food & Play curriculum was designed to improve knowledge and behaviors related to:

- \* snacking on fruits and vegetables,
- \* drinking milk with meals and water with snacks,
- \* encouraging at least 60 minutes of physical activity each day, and
- \* limiting screen time to two hours or less per day.

**Results**

At the completion of Balancing Food & Play, students were more likely to correctly identify food and physical activity best practice recommendations.

Self-reported student behaviors related to physical activity, soda consumption, and screen time all of which are associated with obesity improved during the time that Balancing Food & Play was taught. The percentage of students who reported:

\*drinking soda almost never or never increased from 34 percent to 42 percent; and

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
724	Healthy Lifestyle

**Outcome #3**

**1. Outcome Measures**

The percent of youth that reported increasing their physical activity and/or reducing sedentary. (National Indicator Outcome 2,1c)

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	93

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Children in particular are vulnerable to the deleterious consequences of excessive weight and the adoption of poor behaviors. Obesity and overweight often track into adulthood as do poor behavior choices learned or reinforced during childhood. As overweight or obese adults, these children will face higher healthcare costs and lower quality of life than their healthful weight peers. Therefore, educating children on nutrition and physical activity with the intent to reinforce positive lifestyles and the adoption of healthy behaviors can help prevent or slow the tendency toward unwanted weight gain.

**What has been done**

The Balancing Food & Play curriculum was designed to improve knowledge and behaviors related to:

- \* snacking on fruits and vegetables,
- \* drinking milk with meals and water with snacks,
- \* encouraging at least 60 minutes of physical activity each day, and
- \* limiting screen time to two hours or less per day.

**Results**

At the completion of Balancing Food & Play, students were more likely to correctly identify food and physical activity best practice recommendations.

Self-reported student behaviors related to physical activity, soda consumption, and screen time all of which are associated with obesity improved during the time that Balancing Food & Play was taught. The percentage of students who reported:

- \* limiting screen time to 2 hours or less increased from 75 percent to 93 percent.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
724	Healthy Lifestyle

**Outcome #4**

**1. Outcome Measures**

Number of participants who understand and use My Plate in meal buying and preparation, become aware of diet related diseases, understand the connection between diet and exercise, increase consumption of fruits and vegetables.

**2. Associated Institution Types**

- 1890 Extension
- 1890 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	0



### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Poor health, obesity, poor nutrition and limited physical activity are significant health concerns that disproportionately affects minority and low-income populations. The Expanded Food and Nutrition Education Program strives to provide educational opportunities and resources via informal nutrition education classes to those who are most at risk. According to the CDC, there are two main causes for the increase in childhood obesity rates: an increase in intake of energy-dense foods which are high in fat, salt, and lack the appropriate vitamins and nutrients, and a decrease in physical activity which can also be attributed to evolving forms of transportation and technology. According to a survey by UT School of Public Health, 23% of students reported drinking more than 2 sodas per day, and 22% reported that they ate fast food at least three times a week. Even more alarming is that 77% of students reported physical inactivity and more than 70% spent 2 or more hours watching TV every day.

#### **What has been done**

Cooperative Extension Program Agents and Nutrition Education Associates provide direct face-to-face nutrition education information to clients who enroll and attend a minimum of 6 classes. A variety of activities including games, physical fitness activities and food demonstrations are used to improve learning opportunities. All program participants are asked to complete a pre/posttest, nutrition survey and 24-Hour Food Recall. Curriculums developed by extension universities and funded by USDA/NIFA. The curriculums used are: Eating Smart-Being Active (adult curriculum) and Eating Smart during Pregnancy (adult/teen curriculum) developed by Colorado State University Cooperative Extension and Choose Health Food, Fun and Fitness (CHFFF) curriculum developed by Cornell University Cooperative Extension is used with youth program participants.

#### **Results**

The adult impact after participating in a series of 6 educational workshops are: 94% (432 of 463) of participants showed improvement in one or more nutrition practices (i.e. plans meals, makes healthy food choices, prepares food without adding salt, reads nutrition labels or has children eat breakfast. 73% (338 of 462) reported their children ate breakfast more often.

The youth impact after participating and graduating from a series of 6 educational classes include: 1,820 youth, of this number 1,415 graduated from the program as a result of attending a minimum of 6 classes. 91% (1,648 of 1,820) Children and youth improved their abilities to choose foods.

The youth impact after participating and graduating 15 pre and post test:

There was a 74.95% increase among students stating they would eat vegetables for snacks, a 42.88% of youth who stated they would eat fruits for a snack and 99.96% stated they would drink more water instead of soda and 85.72% stated they would exercise for 60 minutes every day.

As a result of the Healthy Cooking School and Todays Mom program, Sixty percent (60%) of moms reported that their knowledge of factors that affect their pregnancy was increased. As a result of the Learn Grow Eat Go (LGEG) curriculum 77% of the students reported engaging in at least 30 minutes of physical activity the day before. Forty-four percent of them reported that they spent less than 203 hours watching TV the day before.

## **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
703	Nutrition Education and Behavior
724	Healthy Lifestyle

## **Outcome #5**

### **1. Outcome Measures**

Number of participants modify recipes to decrease amount of calorie and adopt healthy eating habits.

### **2. Associated Institution Types**

- 1890 Extension

### **3a. Outcome Type:**

Change in Action Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	890

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Due to busy lives, many individuals and families consistently pick up quick meals, and this behavior is creating health issues for adults as well as children. Many of these foods are high in sodium and fats which can contribute to diabetes, hypertension and heart disease. Therefore preparing meals that are quick, easy and nutritious is the key to families sitting down and enjoying family mealtime. Having a balance diet to include fruits, vegetables, and controlling portion sizes are steps to preventing and managing obesity related diseases including diabetes, hypertension, cancer and heart disease.

#### **What has been done**

A series of education workshops targeting diabetes education was conducted for six weeks with over 150 participants.

A culminating diabetes conference was held with professional researchers, registered dietitians, certified diabetes educators, family practitioners, podiatrists, pharmacists, plant scientists, and extension staff providing workshops on health goals for diabetics, medication, exercise to lower A1C, medicinal plants used to prevent and treat chronic diseases, and container gardening. Family and Consumer Sciences Task Force meetings were conducted quarterly during the program year. Task force members assisted with marketing, promoting CEP programs and activities, and recruiting volunteers.

A Taste of African Heritage, brings the African Heritage Diet Pyramid to life, showing people how to eat and cook healthfully, traditionally, and enjoyably through hands-on experience.

### Results

Post Diabetes Conference 96% of respondents were mostly or completely satisfied with the event. The target audience age group ranged from 30 to 70 and older. Attendees included 90% female and 10% male.

98% of respondents plan to take actions or make changes based on the information from this activity.

80% of respondents anticipate benefiting economically as a direct result of what they learned from this Extension activity. In Travis County a post survey was completed by program participants (n=109). The survey addressed an increase in knowledge, motivation to change behavior, and lifestyle changes with the following results:

- \* 101 of 109 (93%) strongly agreed the information on weight/obesity met their expectations
- \* 94 of 109 (86%) strongly agreed they learned something new about the connection between their health and overweight/obesity
- \* 79 of 109 (72%) strongly agreed the information was helpful in making decisions about their lifestyle
- \* 74 of 109 (68%) strongly agreed they are motivated to change their behavior
- \* 67 of 109 (61%) strongly agreed the examples and discussions on overweight/obesity were relevant.

#### A Taste of African Heritage Dallas County

Only 10 of 39 (26%) of participants reported they consumed fruits and veggies up to 2 times per week and after the series of 6 education workshops 34 of 39 participants now consume fruits and veggies up to 7 times per week.

#### Waller County

- \* 14 of the 24 participants ate vegetable 3 to 4 times or more a week pre; 16 of the 24 participants ate vegetable 3 to 4 times or more a week post
- \* 15 of the 24 participants cooked with herbs and spices pretest; 14 of the 24 participants cooked with herbs and spices post test
- \* The biggest obstacle getting in the way of cooking and eating healthy; 7 participants stated cost; 10 participants stated time; 2 participants stated lack of motivation; 3 stated poor eating habits.

## 4. Associated Knowledge Areas

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

**Outcome #6**

**1. Outcome Measures**

Number of miles logged by youth WAT participants.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	942185

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

The prevalence of obesity in both adult and child populations exceeds Healthy People 2020 Goals. Lifestyle behaviors associated with obesity include: consuming too many foods of non-nutritional value, eating portion sizes that are too large, spending too much time sedentary, and getting too little physical activity.

**What has been done**

Local coalition recruited participants and provided leadership to implement Walk Across Texas! Teams of eight or classes of children at schools were recruited to walk for eight weeks. Teams and classes were challenged to walk regularly for eight weeks, reporting their mileage on <http://walkacrosstexas.tamu.edu>, to achieve the goal of walking the approximate 832 miles across Texas on a map that allowed comparisons of teams and class progress.

**Results**

Approximately 729 WAT! school teams were formed. 20,008 youth participated and collectively logged over 942,000 miles.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
724	Healthy Lifestyle

## **V(H). Planned Program (External Factors)**

### **External factors which affected outcomes**

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

### **Brief Explanation**

Any of a number of factors could affect the implementation, and subsequent number of participants in the programs such as changes in politics, priorities, and/or policy. For example, vacancies of county educators to provide leadership at the local level could impact outreach efforts. Likewise a change in either national, state or administrative priorities or policy could divert resources from child obesity programming.

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

### **Evaluation Results**

#### **Balancing Food and Play**

During 2016, Texas A&M AgriLife Extension Service agents in 8 counties recruited local third grade classroom teachers to participate in this program. They received permission to implement this school-enrichment program, and 549 students completed the curriculum. To date, 4,980 teacher manuals and 2,803 student journal masters have been downloaded from the website (<http://balance.tamu.edu>).

At the completion of Balancing Food & Play, students were more likely to correctly identify food and physical activity best practice recommendations.

Self-reported student behaviors related to physical activity, soda consumption, and screen time - all of which are associated with obesity - improved during the time that Balancing Food & Play was taught. The percentage of students who reported:

- getting at least 60 minutes of physical activity increased from 57 percent to 74 percent;
- drinking soda almost never or never increased from 34 percent to 42 percent; and
- limiting screen time to 2 hours or less increased from 75 percent to 93 percent.

#### **WAT! Youth Component**

- 37,870 adults and youth registered statewide.
- Average age of participants was 42 years old.
- Participants increased mileage 4.68 miles from week 1 to week 8.
- Approximately 20,008 youth participated in school teams; logging over 942,000 miles.
- Approximately 729 WAT! school teams

Over 150 school districts represented

**Key Items of Evaluation**

**V(A). Planned Program (Summary)**

**Program # 11**

**1. Name of the Planned Program**

Food Safety

Reporting on this Program

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
501	New and Improved Food Processing Technologies	0%	0%	0%	10%
502	New and Improved Food Products	0%	25%	0%	10%
503	Quality Maintenance in Storing and Marketing Food Products	0%	25%	0%	10%
701	Nutrient Composition of Food	0%	0%	0%	10%
702	Requirements and Function of Nutrients and Other Food Components	0%	0%	0%	20%
703	Nutrition Education and Behavior	50%	25%	50%	10%
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	0%	25%	0%	20%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	50%	0%	50%	10%
<b>Total</b>		100%	100%	100%	100%

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	5.0	4.0	3.0	10.0
<b>Actual Paid</b>	13.9	4.0	4.3	7.0
<b>Actual Volunteer</b>	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
276453	373129	294062	1400873
1862 Matching	1890 Matching	1862 Matching	1890 Matching
276453	162622	329264	873288
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1611994	0	1427317	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

**AgriLife Extension**

In 2016, new County Extension Agents were trained to become instructors for the Food Protection Management Program (FPM). Continuing education opportunities were provided/identified so that instructors could maintain their instructor qualification status per Agency guidelines. The FPM program was implemented in counties across the state that have a County Extension Agent who is able to teach the program. Program materials were available in both English and Spanish.

The Certified Food Manager (CFM) course was evaluated by assessing the pass rate on the CFM exam. The food handler's course was also offered by qualified instructors (CEA-FCS) in both English and Spanish and via the use of distance education (on-line). Pre and post knowledge surveys (to assess change in knowledge) were used to evaluate that course.

**Cooperative Extension Program and Cooperative Agricultural Research Center:**

The Cooperative Extension Program county agents target limited resource adults and youth and provided presentations on food safety. Limited resource clientele learned proper food handling procedures, personal hygiene while preparing produce and meat products to prevent cross contamination, how to prepare and store food properly. Agents and specialist within the Cooperative Extension Program were ServSafe trained and received certification. 6 CEP agents took the Certified Food Manager Course and were certified.

Educational training were conducted with restaurants, schools, and churches teaching staff members how to properly handle food. Educational methods used to conduct training included one-on-one consultations, on-site food demonstrations, train-the-trainer, educational programs and classes, taught a series of food safety classes to special interest groups, and educational displays at various sites.

The Cooperative Agricultural Research Center (CARC) provided information to the Cooperative Extension Program regarding conducting research based food quality and food products. Developed protocols to get the approval to carry out work on microbial pathogens in the laboratory. The tetracycline antibiotic assay of goat milk was completed and the results were published in two peer-reviewed journal articles. Work was carried out on to increase omega-3 fatty acids in goat meat by changing the feed and testing the quality of the meat produced. The part of the project that involved feeding of lactating goats with rations containing supplemented levels of omega-3 fatty acids from fish oil was completed and milk samples were collected at various stages of feeding. Currently, the collected milk samples are being analyzed by gas chromatography mass spectrometry to identify and quantify the profile of polyunsaturated fatty acids. This part of the project will be completed by the end of this year and the results will determine the effect of elevated levels of polyunsaturated fatty acids in animal feed on the quality of milk. Research with the antioxidant lutein in "high" and "low" oleic peanuts previously coated with milk proteins (the caseins) was



completed and the results showed that the coated peanuts were oxidized slower than uncoated peanuts. A research manuscript regarding the incorporation of the antioxidant lutein into emulsion-based delivery systems for maximum bioavailability will be submitted for consideration for publication to the International Journal of Food Science.

## 2. Brief description of the target audience

### **AgriLife Extension**

Individuals who are employed in the retail food service industry. This includes cooks and front-line food service employees, but most of the participants who complete CFM program are often managers or owners who are affiliated with foodservice establishments including restaurants, school food service, bed and breakfasts, prisons, and other establishments that prepare and serve food to individuals.

### **Cooperative Extension Program and Cooperative Agricultural Research Center**

Minority families and individuals

Senior adults

Single parents

Persons coping with and at risk for chronic illnesses

Youth

The primarily targeted audience is the underserved population living in the surrounding counties and the Northwest Houston Corridor. This population is dominated by Hispanics and African - Americans. Also, this area has been designated by the State of Texas as Prairie View A&M University's service area.

## 3. How was eXtension used?

eXtension was used by extension agents and specialists to gather educational materials.

### **V(E). Planned Program (Outputs)**

#### 1. Standard output measures

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	23537	82860	8101	0

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

##### Patent Applications Submitted

Year: 2016

Actual: 0

##### Patents listed

#### 3. Publications (Standard General Output Measure)

**Number of Peer Reviewed Publications**

2016	Extension	Research	Total
Actual	0	62	62

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of group educational sessions conducted.

Year	Actual
2016	1149

**Output #2**

**Output Measure**

- Number of research-related projects.

Year	Actual
2016	26

**Output #3**

**Output Measure**

- Number of on site demonstrations for adults and youth.

Year	Actual
2016	90

**Output #4**

**Output Measure**

- Number of research workshops/presentations.

Year	Actual
2016	2

**Output #5**

**Output Measure**

- Number of graduate/undergraduate students involved in research projects.

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

2016

4

**V(G). State Defined Outcomes**

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

O. No.	OUTCOME NAME
1	Percentage increase in knowledge as a result of completing the food handler's course.
2	FPM Pass/Fail Rate - percentage of participants who pass the DSHS Certified Food Manager exam on the first attempt. (National Indicator Outcome 3,2)
3	Number of new and different value-added caprine products added to the food base and accepted by the target audience.
4	Number of limited resource clientele who adopts safer food handling practices.

**Outcome #1**

**1. Outcome Measures**

Percentage increase in knowledge as a result of completing the food handler's course.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	18

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Each year the Centers for Disease Control and Prevention (CDC) estimate that 1 in 6 Americans (48 million) will become sick from a foodborne illness. Foodborne disease is a costly problem. More than half of all foodborne illnesses are attributed to improper handling of food prepared away from home. Because almost half of our food dollars is spent on food prepared outside the home, food safety is a top concern among consumers. Therefore, food safety education is a critical prevention component for reducing the risk for foodborne diseases.

**What has been done**

The food handler's program was offered in 106 counties across the state. This 2-hour program is targeted towards front-line food service workers and focuses on reducing cross contamination and time/temperature abuse as well as personal hygiene. At the county level, the food handler's program is offered in both English and Spanish. In addition, the food handler's program is available on-line (<http://foodsafety.tamu.edu/courses/food-handlers-course/>) and is available in English, Spanish and Mandarin.

**Results**

In 2016, more than 12,700 individuals completed the food handler's program either in a classroom format (n=8,739) or via on-line (n=4,812) education. Program evaluations from those completing the program demonstrated a significant increase in food safety knowledge (average score was 74 pre vs. 87 post).

**4. Associated Knowledge Areas**

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

**Outcome #2**

**1. Outcome Measures**

FPM Pass/Fail Rate - percentage of participants who pass the DSHS Certified Food Manager exam on the first attempt. (National Indicator Outcome 3,2)

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	62

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Each year the Centers for Disease Control and Prevention (CDC) estimate that 1 in 6 Americans (48 million) will become sick from a foodborne illness. Foodborne disease is a costly problem. More than half of all foodborne illnesses are attributed to improper handling of food prepared away from home. Because almost half of our food dollars is spent on food prepared outside the home, food safety is a top concern among consumers. Therefore, food safety education is a critical prevention component for reducing the risk for foodborne diseases.

**What has been done**

The certified food manager program is offered in a classroom format with hands-on activities that reinforce important concepts such as personal hygiene, handwashing, time/temperature control, food preparation and storage, and pest control. This program prepares individuals to take a national certified food manager exam (offered by the National Restaurant Association and/or Prometric). Passing a national CFM exam is required in order for one to have the CFM credential.

**Results**

In 2016, 968 individuals in 46 completed the certified food manager program. Subject material was delivered by trained Extension Agents using lecture, group discussion, and interactive, hands-on activities.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
703	Nutrition Education and Behavior
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

**Outcome #3**

**1. Outcome Measures**

Number of new and different value-added caprine products added to the food base and accepted by the target audience.

**2. Associated Institution Types**

- 1890 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

The overall objective of this project is to develop value-added caprine products with improved sensory and nutritional qualities to benefit limited resource farmers. This will be accomplished in part by development of nutritious value-added caprine meat and ice cream products from goats raised on the PVAMU Farm. This work will play a significant role in improving the efficiency of production and subsequent utilization of caprine products.

**What has been done**

Good quality goat meat sausages were produced from some animals. Goat meat sausages were produced without the addition of any omega-3 fatty acids as a control treatment. This product was subjected to sensory and textural analyses in CARC laboratory.

**Results**

The results of sensory and textural analyses indicated that the product was acceptable and will be in demand, if offered in the local markets. The next phase of this project is to develop goat meat sausages with supplemented levels of omega-3 fatty acids from fish oil. The results of the supplemented goat meat sausages will be compared with the control group. Goat milk soft and hard cheeses and goat milk ice cream will be manufactured from goat's milk once we have the infrastructure in place to produce these products.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
703	Nutrition Education and Behavior
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

#### **Outcome #4**

##### **1. Outcome Measures**

Number of limited resource clientele who adopts safer food handling practices.

##### **2. Associated Institution Types**

- 1890 Extension

##### **3a. Outcome Type:**

Change in Action Outcome Measure

##### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	780

##### **3c. Qualitative Outcome or Impact Statement**

###### **Issue (Who cares and Why)**

The Centers for Disease Control (CDC) estimates that foodborne illnesses affect millions of Americans each year: 76 million reported cases of foodborne illnesses or 1 in 6 Americans will become sick; 325,000 people are hospitalized; 5,000 deaths occur because of foodborne illnesses. Furthermore, one in six Texans (4,000,000 people) become sick with foodborne illnesses and 240 Texans die from foodborne illnesses. According to the CDC, there are four groups vulnerable to foodborne illnesses. These groups make up 20% of the population and include: young children, senior adults, pregnant women, and persons with weakened immune systems due to illness or hospitalization. Adults age 65 and older are at higher risk for hospitalization and death from foodborne illnesses.

###### **What has been done**

To address this issue, the Food Safety task force planned education programs in Harris County/Houston, TX. Partnerships for these programs included one Houston City Park (Judson Robinson), one Harris County Park (Finnigan Park) and Unity Childrens' Home. The Cooperative Extension Program Agent worked with various age groups to implement Four Steps in Food Preparation: Clean, Separate, Cook, and Chill. Throughout the summer, for 8 weeks, food safety programs were conducted with over 125 attendees. Formative assessments were done throughout the program to improve attendees attainment. At the conclusion of each program, food safety retrospective surveys were collected and analyzed.

###### **Results**



A post food safety survey was completed by participants (n=97). The survey addressed behaviors and increases in knowledge. An increase in knowledge is captured in whether the participant learned anything new about food safety and foodborne illnesses. Salient points from post food surveys include:

- \* 122 of 125 (98%) adopted correct handwashing practices
- \* 107 of 125 (86%) learned to cook and store food properly
- \* 113 of 125 (91%) learned the importance of using food thermometers.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

#### V(H). Planned Program (External Factors)

##### External factors which affected outcomes

- Government Regulations
- Competing Public priorities

##### Brief Explanation

###### AgriLife Extension

Changes to the CFM exams used with the program have led to the pass-rate being lower than desired; however the first-time pass rate seems to be on par with the national pass-rate based on personal conversations with exam providers. Other external factors include food safety knowledge/skills of participants, food service experience, and level of education. Language barriers of participants can also be an issue.

###### Cooperative Extension Program

External factors that may affect the outcomes of the defined programs include, but may not be limited to competing programmatic challenges, economic challenges, and/or program redirection. The changing face of Texas and understanding the importance of practicing safe food handling.

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

##### Evaluation Results

###### AgriLife Extension

Evaluation of the CFM program is based on customer satisfaction (how well participants liked the program and were satisfied with the instructor) as well as the pass-rate on the CFM exam. Customer satisfaction continues to be high in spite of a lower-than-anticipated pass rate on the CFM exam. For the food handler's program, we distribute a pre and post survey to assess change in food safety knowledge. The pre-survey is given right before the start of the program and the post survey is administered immediately after the program has been completed.

###### Cooperative Extension Program

CEP Extension agents used pre and post, surveys, retrospective, and post evaluations to determine knowledge gained and willingness to adapt behavior changes.

##### Key Items of Evaluation

A total of 9 workshops were conducted with 124 participants. The City of Austin Parks and Recreation Department is a community partner. The FCS committee meets quarterly and assists with marketing, promoting, and recruiting on behalf of the Cooperative Extension Program, Prairie View A&M University. A post food safety survey was completed by participants (n=97). The survey addressed behaviors and increases in knowledge. An increase in knowledge is captured in whether the participant learned anything new about food safety and foodborne illnesses. Salient points from post food surveys include:

- 88 of 97 (91%) adopted correct handwashing practices
- 88 of 97 (91%) learned to cook and store food properly
- 80 of 97 (82%) learned something new about food safety and foodborne illnesses.

**V(A). Planned Program (Summary)**

**Program # 12**

**1. Name of the Planned Program**

Global Food Security, Hunger, and Nutrition Education

Reporting on this Program

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
703	Nutrition Education and Behavior	40%	0%	100%	0%
704	Nutrition and Hunger in the Population	20%	0%	0%	0%
801	Individual and Family Resource Management	40%	0%	0%	0%
	<b>Total</b>	100%	0%	100%	0%

**V(C). Planned Program (Inputs)**

**1. Actual amount of FTE/SYs expended this Program**

Year: 2016	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	30.0	0.0	2.0	0.0
<b>Actual Paid</b>	49.7	0.0	1.0	0.0
<b>Actual Volunteer</b>	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
988468	0	99897	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
988468	0	64689	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
5763749	0	430147	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

**AgriLife Extension and Cooperative Extension Program**

Nutrition education was conducted using a variety of methods including group, individual, media, and newsletters. Group methods were single education events that focus on a very specific concept/behavior (e.g. washing fresh produce to reduce the risk of a foodborne illness) or a series of lessons that focus on broader concepts such as label reading or food resource management. Networking with agencies and organizations to expand outreach and identify new audiences also occurred.

**AgriLife Research**

Research will be conducted in Africa, Latin America and the Middle East in cooperation with the Gates Foundation, Howard G. Buffett Foundation, local extension services, local universities, Texas Department of Agriculture, Department of Defense and USAID. Examples of planned activities include the Texas Israeli Exchange, Iraq Trade and Development, and the Kurdistan Initiative.

**2. Brief description of the target audience**

**AgriLife Extension and Cooperative Extension Program**

The target audience for the Better Living for Texans program continues to be SNAP recipients and those eligible for benefits. This includes women receiving WIC benefits, children attending schools in which 50% or more of the children receive free or reduce meals; children and parents in Head Start programs; individuals receiving food at a food bank or food pantry; children who participate in the Summer Food Service Program; and individuals living in census tracts where 50% or more of the population is at 130% of the poverty level or below.

**AgriLife Research**

Target audiences include the United Nations, governments and non-governmental organizations in Africa, Latin America and the Middle East.

**3. How was eXtension used?**

eXtension was not used in this program

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	85839	460223	94315	0

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

**Patent Applications Submitted**

Year: 2016  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

<b>2016</b>	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Actual</b>	0	7	7

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- # of group educational sessions conducted.

<b>Year</b>	<b>Actual</b>
2016	8317

**V(G). State Defined Outcomes**

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

O. No.	OUTCOME NAME
1	% increase of BLT participants who enroll in Walk Across Texas will increase the number of miles walked at the end of the 8 week program.
2	Minimum amount of monthly out-of-pocket food expenses reported saved by program participants.
3	The percentage of participants who use the food label to determine the amount of food to eat either "always," "almost always," or "sometimes" will increase.
4	The percentage increase of participants who shop with a list "always" or "sometimes".
5	# of producers adopting best management practices on sustainable agriculture.
6	# eligible SNAP-ED participants who report an increase in accessibility of fresh fruits and vegetables from community gardens.
7	The percentage of participants who report filling ½ of their plate with vegetables and fruits will increase.

## **Outcome #1**

### **1. Outcome Measures**

% increase of BLT participants who enroll in Walk Across Texas will increase the number of miles walked at the end of the 8 week program.

### **2. Associated Institution Types**

- 1862 Extension

### **3a. Outcome Type:**

Change in Action Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	13

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

According to the Centers for Disease Control and Prevention, 30% of adults in Texas engage in no leisure physical activity; only 18% achieve current recommendations for aerobic and muscle strengthening activities. An estimated 30% and 38% of Texas adolescents are active daily and participate in daily physical education, respectively. Because of the documented benefits of regular physical activity, helping sedentary individuals adopt the habit of regular physical activity can be beneficial in improving health and reducing the risk of chronic disease.

#### **What has been done**

BLT participants (adults and youth) were encouraged to join Walk Across Texas (WAT), which is an 8-week program designed to help individuals adopt/improve the habit of regular physical activity. This program is designed to be implemented in teams (which allows for peer support and encouragement) and includes a variety of activities beyond that of traditional walking. Participants log their miles and over an 8 week period virtually walk across the state of Texas.

#### **Results**

At the beginning of the program, participants who reported their weekly mileage (n=3,056) were walking an average of 27.8 miles; at the end of 8 weeks, mileage had increased to 31.7 miles; a mean increase of 3.9 miles.

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
703	Nutrition Education and Behavior

**Outcome #2**

**1. Outcome Measures**

Minimum amount of monthly out-of-pocket food expenses reported saved by program participants.

Not Reporting on this Outcome Measure

**Outcome #3**

**1. Outcome Measures**

The percentage of participants who use the food label to determine the amount of food to eat either "always," "almost always," or "sometimes" will increase.

Not Reporting on this Outcome Measure

**Outcome #4**

**1. Outcome Measures**

The percentage increase of participants who shop with a list "always" or "sometimes".

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	95

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

An estimated 17% of Texas households face the challenge of food insecurity. Studies show that individuals who are food insecure have poor diet quality and may be at a higher risk for chronic disease (compared to those who are food secure). Adopting sound food resource management practices (which include shopping with a list) can help low-income households manage/stretch their food (and food dollars) and avoid impulse buys.

**What has been done**

BLT participants who completed the Fresh Start to a Healthier You series learned about food resource management practices that can help them stretch their food dollars. These practices



include planning a meal in advance, comparing prices, and shopping with a grocery list.

**Results**

More than 200,000 low-income adults and youth completed one or more program series offered through the Better Living for Texans program. In a survey of 7,485 adults who completed the Fresh Start to a Healthier You series, the percentage who reported shopping with a list always or sometimes was 74% when the program began. Immediately after the program ended, 90% reported intent to do so. Approximately one month after the program ended, 95% of those who could be contacted (n=3978) reported doing so.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
703	Nutrition Education and Behavior

**Outcome #5**

**1. Outcome Measures**

# of producers adopting best management practices on sustainable agriculture.

Not Reporting on this Outcome Measure

**Outcome #6**

**1. Outcome Measures**

# eligible SNAP-ED participants who report an increase in accessibility of fresh fruits and vegetables from community gardens.

Not Reporting on this Outcome Measure

**Outcome #7**

**1. Outcome Measures**

The percentage of participants who report filling ½ of their plate with vegetables and fruits will increase.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2016	70

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

USDA guidelines (MyPlate) recommend that individuals fill half of their plate with vegetables and fruits. A 2014 study commissioned by the Produce for Better Health Foundation found that per capita fruit and vegetable consumption has declined over the past 5 year. Helping individuals increase their vegetable and fruit consumption can help promote health and reduce the risk for chronic disease among all citizens, especially those who are low-income (the target audience for BLT).

#### What has been done

More than 200,000 low-income adults and youth completed one or more program series offered through the Better Living for Texans program. One program series is Fresh Start to a Healthier You, which focuses on improving vegetable and fruit consumption.

#### Results

In a survey of 7,485 adults who completed the Fresh Start to a Healthier You series, the percentage who reported filling half of their plates with vegetables and fruit rose from 27% (beginning of the program) to 52% immediately after the program ended. Thirty days later, a survey of 3,865 of those participants found that 70% had adopted this behavior.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
801	Individual and Family Resource Management

### V(H). Planned Program (External Factors)

#### External factors which affected outcomes

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

#### Brief Explanation

Our physical activity goal was not met but there are a number of external factors that impact the extent to which the target audience can be physically activity. These factors include weather as well as a lack of a safe place to be physically active. Time constrains (or perceived lack of time) can also be a factor, especially if individuals are working multiple

jobs.

For other BLT programs, factors that impact participation include language barriers (although our programs are offered in English and Spanish) and lack of transportation or child care.

Ability to adopt targeted behaviors are not only influenced by knowledge but also environmental, social, and policy-related factors.

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

### **Evaluation Results**

Individuals who enrolled in a program series were invited to complete a survey which assessed the extent to which they were following targeted behaviors. At the end of the series, participants were surveyed again to learn their intent to practice the targeted behaviors. Approximately 30 days later, participants were contacted and surveyed again to learn the extent to which the targeted behaviors were being followed. This allowed us to gauge intent to change behavior as well as the actual adoption of targeted behaviors.

**In addition to the results noted, we would like to highlight the following outcomes from other activities conducted within BLT:**

During the 2016 year, 512 participants in 6 counties built and/or maintained 29 community gardens and harvested more than 6,758 pounds of produce. A retrospective post survey of 182 participants demonstrated that availability and accessibility of produce among these participants increased as a result of this program. For example, 61% of the participants reported that vegetables were served at meals "often" or "almost always" when the program began; however, that percentage was increased to 85% after the program ended. The percent of participants who reported that cut-up vegetables were in the refrigerator for family members to eat "often" or "almost always" rose from 38% (beginning of the program) to 69% (after the program ended).

### **Key Items of Evaluation**

**V(A). Planned Program (Summary)**

**Program # 13**

**1. Name of the Planned Program**

Fostering Strong 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
801	Individual and Family Resource Management	50%	50%	0%	0%
802	Human Development and Family Well-Being	50%	50%	0%	0%
<b>Total</b>		100%	100%	0%	0%

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	15.0	8.5	0.0	0.0
<b>Actual Paid</b>	11.9	8.5	0.0	0.0
<b>Actual Volunteer</b>	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
236676	792899	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
236676	345572	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1380053	0	0	0

**V(D). Planned Program (Activity)**

1. Brief description of the Activity

## **AgriLife Extension**

### Parenting and Dependent Care Programs

AgriLife Extension's Family and Community Health (FCH) unit is committed to providing educational programs to support and strengthen Texas families. In the areas of parenting, child care, and dependent care, Extension offers a wide range of programs and resources to citizens across the state. Programs and resources include train-the-trainer workshops for professionals and volunteers, multi-session parent education workshops, 1-2 hour lectures, and internet resources (e.g., online child care courses, fact sheets, research briefs, trend data, links to websites), and newsletters.

### Family Financial Management Programs

AgriLife Extension's Family and Community Health Unit promotes the implementation of educational programs that strengthen the financial well-being of individuals and families. A variety of educational resources and programs are provided through local level programming by county Extension educators. These include implementation of train-the-trainer workshops for Extension educators and community-based volunteers and professionals, multi-session workshop series, classroom presentations, simulation activities, and online resources (online courses; fact sheets; research, trend and policy briefs; news releases; and reliable website links). Curricula and learning activities include the FDIC Money Smart Financial Education Curriculum, the Wi\$eUp Financial Planning program for Generation X and Y, the NEFE High School Financial Planning Program, and the Welcome to the Real World Financial Simulation Activity.

## **Cooperative Extension Program**

### Parenting

Within limited resource audiences effective parenting is an issue that this audience struggles with due to lack of income and knowledge of various methods of parenting. Parenting is without question a critical influence on a child's mental health, development, and positive family environment, yet less than 1% of parents have completed evidence-based parent education programs. Evidence-based parenting programs have numerous benefits including decreases in parental depression; increase parental confidence; and decrease in social, emotional, and behavioral problems in children.

### Financial Money Management

The current fluctuating economic conditions increases the need and heightens the consumer awareness for continued financial literacy education. Low-income is defined as a family income below 200% of poverty. Based on 2012 statistics, 38.1% of the Texas families were low-income working families, 48.9% were low-income minority working families and 42.2% were low-income working families with no high school degree/GED. Steady rates of unemployment, foreclosures, and credit delinquencies have contributed to increased interest among consumers in budgeting, saving and cutting back spending. Research studies indicate that people of all ages, incomes, and education levels lack the basic financial knowledge and skills to ensure long-term stability for themselves and their families.

## **AgriLife Extension and Cooperative Extension Program**

### Passenger Safety Programs

County Extension agents and law enforcement officers trained and certified as child passenger safety technicians will conduct child safety seat checkup events in under-served rural areas of Texas. In addition, child safety seat fitting stations have been established at county Extension offices and fire/EMS departments to allow families additional access to certified technicians. When needed, a replacement seat is issued at no charge to parents and caregivers at checkup events and fitting stations.

## **2. Brief description of the target audience**

### **AgriLife Extension**

#### Parenting and Dependent Care Programs

Target audiences for child care programming include adults and teens providing care for preschool and school-age children in family, center and school-aged settings. Target dependent care audiences include

adults and teens providing care for adults and children who are unable to provide some portion of care for themselves due to illness or age-related disabilities. Programs and resources are accessible to target audiences regardless of gender, marital status, family status, race/ethnicity, income level, or educational level. It is estimated that 70% of this audience falls under the category of "low-income."

Family Financial Management Programs

The Money Smart curriculum targets unbanked and less financially-sophisticated consumers as well as more limited resource audiences. Wi\$eUp targets Generation X and Y, with emphasis on women ages 22-35; however, in 2016 a modification of Wi\$eUp is resulting in "Wi\$eUp for Families" and reaches clientele in a 6-county area through a special grant. The NEFE High School Financial Planning Program and Welcome to the Real World Financial Simulation are for high school age youth.

**Cooperative Extension Program**

- Minority families and individuals
- Senior adults
- Single parents
- Limited resource families
- College students
- Individuals who have experienced job loss
- Teen parents

**AgriLife Extension and Cooperative Extension Program**

Passenger Safety Programs

Under-served residents of rural areas in Texas.

**3. How was eXtension used?**

AgriLife Extension provides lead support for eXtension's Ask an Expert - Family Caregiving subject matter area. Questions within the State of Texas and through the rest of the nation, asked via the Family Caregiving group, are either answered by AgriLife Extension or routed to another Cooperative Extension professional for response.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	375215	208814	37382	0

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

**Patent Applications Submitted**

Year: 2016  
Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

<b>2016</b>	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Actual</b>	0	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of group educational methods conducted.

<b>Year</b>	<b>Actual</b>
2016	5684

**V(G). State Defined Outcomes**

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

O. No.	OUTCOME NAME
1	Percentage of child care providers who increase their knowledge of child care best practices as a result of participating in child care provider training's.
2	Percentage of dependent care providers who increase their knowledge of dependent care best practices as a result of participating in depend care training's.
3	Percentage of parents who increase their knowledge of parenting practices as a result of attending parenting training's.
4	Percentage of fathers (father-figures) who increase the amount of time spent reading to their children.
5	Number of participants who increase knowledge on financial management.
6	Number of participants who reduced debt and increased savings.
7	Number of limited resource clientele who gained knowledge about improving their financial stability by reducing debt and increasing savings.
8	Number of car seats incorrectly installed on arrival and number installed correctly after instruction and/or new seat.
9	Number of car seats recommended for replacement for any reason.



## **Outcome #1**

### **1. Outcome Measures**

Percentage of child care providers who increase their knowledge of child care best practices as a result of participating in child care provider training's.

### **2. Associated Institution Types**

- 1862 Extension
- 1890 Extension

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	97

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

AgriLife Extension

Sixty-seven percent of children under age 5 receive some form of child care on a regular basis from persons other than their parents (U.S. Census Bureau, 2013). Researchers have found that quality matters when it comes to child care. Children who receive high-quality care develop better language, math, and social skills; exhibit fewer behavior problems; and tend to be better prepared for entrance into school (Vandell et al., 2010). Evidence indicates that professional preparation (i.e., more formal education and content-specific training in child development) is linked to higher quality care environments for children (Zaslow, Tout, Maxwell, & Clifford, 2004).

Cooperative Extension Program

Within limited resource homes many parents are dependent on their child being placed in child care due to their work schedules. Becoming educated and keeping abreast of how to care for children and being aware of abuse is key to responding to the needs of children.

#### **What has been done**

AgriLife Extension

In 2016, county Extension agents and their community partners conducted 46 child care provider training conferences throughout the state of Texas for 3,767 child care providers and directors. Over 22,046 clock hours of training were provided to child care professionals. In addition to the face-to-face conferences, early childhood educators in the U.S. completed 325,940 online courses in 2016 (601,302 clock hours).

Cooperative Extension Program

Workshops were conducted for parents on how to communicate, discipline strategies, and being

aware of behavior changes in their children.

**Results**

**AgriLife Extension**

Results from a 2016 evaluation study with over 2,100 participants indicate that over 90% of participants acquired new information (97%), plan to utilize the information to improve their programs (98%), and consider themselves better equipped to work with children (98%). Evaluation data collected from over 60,000 online participants indicate that they are very satisfied with the quality of the courses. Over 98% rated the online courses as Good, Very good, or Excellent. Ninety-eight percent of respondents stated that they learned new information from the courses, and 99% would recommend the online courses to others.

**Cooperative Extension Program**

Harris County evaluation results indicated:of 150 parents 89% improved their communication skills which resulted in stronger family relationships with their children; 92% stated their children discussed their daily activities; and 87% stated they understand how to discipline their children and recognize signs of abuse.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
802	Human Development and Family Well-Being

**Outcome #2**

**1. Outcome Measures**

Percentage of dependent care providers who increase their knowledge of dependent care best practices as a result of participating in depend care training's.

**2. Associated Institution Types**

- 1862 Extension
- 1890 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	98

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Caregiving continues to be an emerging social issue for the State of Texas and the United States. Estimates suggest that Texas has more than 5 million caregivers at any given time during the

year, providing more than 3.2 billion hours of care, valued at more than \$34 billion. AgriLife Extension's practical, personal education creates solutions for caregivers, both professional and non-professional, to help ease the burden of their caregiver journey.

### What has been done

#### AgriLife Extension

AgriLife Extension continues to sponsor and/or actively participate in eldercare conferences throughout the state. Conferences exist on a county or multi-county basis, often offering continuing education units to attendees. Additionally, AgriLife Extension offers professional development webinars related to caregiving for participants who cannot leave their caregiving duties for extended periods. These webinars are also converted to online courses for further reach via asynchronous learning.

#### Cooperative Extension Program

Four CEP county agents partnered with AgriLife in implementing Caregiver Conferences.

### Results

In 2016, AgriLife Extension caregiving programs reached more than 1,550 educational contacts, providing more than 3,500 contact hours. Specifically, AgriLife Extension provided primary leadership and/or speaker support for caregiving conferences that targeted professionals. AgriLife Extension also conducted online professional development webinars related to caregiving, allowing for synchronous and asynchronous learning: 33% of the total contacts and half of the total hours were online only.

## 4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being

### Outcome #3

#### 1. Outcome Measures

Percentage of parents who increase their knowledge of parenting practices as a result of attending parenting training's.

#### 2. Associated Institution Types

- 1862 Extension
- 1890 Extension

#### 3a. Outcome Type:

Change in Knowledge Outcome Measure

#### 3b. Quantitative Outcome

Year	Actual
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### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Parents contributions to their children's development are unparalleled, especially during their early childhood years. Research indicates that children who grow up with actively involved and nurturing parents reap numerous benefits, including better school performance, increased self-esteem, healthier relationships with peers, and greater access to financial resources. High quality parent education programs, according to researchers, can help young parents develop the skills they need to effectively raise their children (CDC, 2009).

#### What has been done

##### AgriLife Extension

The Texas A&M AgriLife Extension Service provides Texas parents with a wide variety of research-based information and resources to assist them in their efforts to raise healthy children. In addition to newsletters, fact sheets, and single-session parenting seminars, AgriLife Extension offers parents, grandparents, and other caregivers the opportunity to participate in face-to-face and online parenting programs designed to increase participants' knowledge of key parenting concepts and to improve parenting practices.

##### Cooperative Extension Program

A series of parenting workshops were conducted for parents at various schools, churches, and community centers as well as court-mandated parenting classes in Harris County. Parenting workshops were implemented with the women of Fort Bend County Jail. On a weekly basis, 15-25 women from Fort Bend County jail engaged in discussion and interactive media and materials that addressed crucial topics for parents. Partners for a Healthy Baby was introduced and implemented with 15 women and mothers of the Pregnancy Resource Center in Fort Bend County. Parents were taught how to manage their resources as parents such as making baby food, revamping their budget, and identifying their areas for support at home and within the community. Parenting Matters an eight-session curriculum addressed parenting issues facing families was implemented in Dallas covering following topics:  
Parenting Challenges / You're a Role Model: Be All You Can Be  
Taking Care of Yourself: To Better Take Care of Your Child  
What is Appropriate: Understanding Your Child's Behavior  
Effective Communication: A Key to Building a Healthy Parent-Child Relationship  
Guiding Your Child's Behavior: Avoiding Power Struggles  
Parenting Stress: When Children Try Your Patience  
Tapping Into Your Support System: Keeping it Together and Abuse & Parenting (Physical, Emotional, Verbal & Sexual).

#### Results

##### AgriLife Extension

In 2016, parents completed 7,357 online parenting courses focused on issues such as infant and toddler development, nutrition, health and safety, social-emotional development, dealing with challenging behavior, and how to build a solid foundation for children's early learning.

Statistically significant knowledge gains were achieved by parents on all online courses (N = 7,357). Pre-test average = 77.25 vs. post-test average = 87.24.

#### Cooperative Extension Program

In Harris county there were 661 parents who participated in a minimum of one and up to six classes of the Active Parenting program. In addition, parents received educational resources via 108 Strengthening Diverse Families Newsletters disseminated at programs and by emails to provide support to parents and grandparents. Furthermore, parents were reached via 82 Facebook social media posts with 626 followers. As a result of the Active Parenting Series within the Fort Bend County jail, many were able to take important lessons with them and share them with their families. At least 90% of participants reported gaining knowledge in the different parenting styles, developing mutual respect, and effective communication skills. At least ninety-percent of parents also reported an intention to adopt one or more parenting skills from the workshop as a result of taking the class.

Results of implementing the Parenting Matters program in Dallas County include: 836 contact hours; 418 parenting contacts; 35 separate Parenting Matter sessions conducted. 46 of 78 (60%) respondents completed the retrospective Parenting Matters Participant Survey provided.

The results follow:

44 of 46 (96%) stated the program would help them make better decisions

42 of 46 (91%) stated yes when asked if after completing the program they would take action or make changes in the parenting styles.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being

#### Outcome #4

##### 1. Outcome Measures

Percentage of fathers (father-figures) who increase the amount of time spent reading to their children.

##### 2. Associated Institution Types

- 1862 Extension

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2016	47

##### 3c. Qualitative Outcome or Impact Statement

### **Issue (Who cares and Why)**

Reading aloud to children is a simple, yet powerful, activity that has been shown to improve children's literacy development across a variety of domains. In a recent survey of fathers' involvement in their children's learning conducted by the National Center for Fathering and the National Parent Teacher Association, researchers discovered that 39% of fathers never read to their children. It is well established that fathers play a critical role in their children's development. Fathers who find time to read with their children are taking advantage of one of the best opportunities to care for, connect with, and contribute to their children's future.

### **What has been done**

Fathers Reading Every Day (FRED) is a family literacy program designed by the Texas A&M AgriLife Extension Service to increase parental involvement in children's early literacy development, with a specific focus on fathers. During the FRED program, fathers and father-figures of young children are presented with research-based information to help them begin daily reading activities with their children. FRED programs are held at public libraries, Head Start centers, elementary schools, churches, child care centers, and AgriLife Extension centers.

### **Results**

Results from a 2016 evaluation study involving more than 560 FRED participants show statistically significant increases in the amount of time that parents spent reading to their children, number of books read, level of involvement in their children's education, time spent together (in general), quality of time spent together, satisfaction with the parent-child relationship, and satisfaction with themselves as parents. Moreover, 52% indicated that the program increased their involvement in their children's education, 51% indicated that program improved their children's vocabulary, and 50% indicated that the program helped their children learn to read.

## **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
802	Human Development and Family Well-Being

### **Outcome #5**

#### **1. Outcome Measures**

Number of participants who increase knowledge on financial management.

#### **2. Associated Institution Types**

- 1862 Extension
- 1890 Extension

#### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2016	700

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

##### AgriLife Extension

In today's world, financial education is crucial yet less than a quarter of all students are prepared for the adult world (Hartford Financial Services Group study). Only 21% of students between the ages of 16 and 22 report having taken a personal finance course at school. When youth enter the workforce without a financial understanding or skills, they face challenges in handling their finances and managing debt. This can lead to serious financial stress and economic instability.

##### Cooperative Extension Program

The current fluctuating economic conditions increases the need and heightens the consumer awareness for continued financial literacy education. Low-income is defined as a family income below 200% of poverty. Based on 2012 statistics, 38.1% of the Texas families were low income working families, 48.9% were low-income minority working families and 42.2% were low-income working families with no high school degree/GED. Steady rates of unemployment, foreclosures, and credit delinquencies have contributed to increased interest among consumers in budgeting, saving and cutting back spending. Research studies indicate that people of all ages, incomes, and education levels lack the basic financial knowledge and skills to ensure long-term stability for themselves and their families. Taking control of ones finances is a crucial step in helping people move towards a more stable future. All individuals, whether living in rural or urban communities, are confronted with multifaceted issues that can and will affect their financial stability. Handling money is difficult, especially when there are few assets to go around. Empowering these individuals with limited means by giving them the formation they need to build financial capability is critical.

#### What has been done

##### AgriLife Extension

The Welcome to the Real World Simulation program includes both financial education and real-world expenditure decision-making opportunities through a two-hour hands-on activity that includes career and money management decision-points in which the student is faced with making budgeting and spending choices that are realistic and challenging within the income limits of an assigned job or career.

##### Cooperative Extension Program

Welcome to the Real World! is a financial education program designed to give teens the opportunity for real-world financial experiences without the real-world consequences. The program consists of two components: financial education and a real world expenditure decision making opportunity. In this simulation of the real world, participants are given a career or occupation with a monthly salary. They assume that they have completed basic educational requirements for their careers and are single and 25 years of age. They live on their own and are independent with no financial support from family or others. It is an active, hands-on, real-life simulation that gives young people the opportunity to explore career opportunities and make lifestyle and spending choices similar to those adults face on a daily basis. Youth are able to make a connection between education and career, and also understand the importance of

following a budget and strategies for handling credit and managing debt. In 2016, Welcome to the Real World! was implemented as a three-session series for teens at the Boys and Girls Club in Corpus Christi, and Health students at Veterans Memorial High School and W.B. Ray High School in Corpus Christi. For Nueces County adults, valuable information was provided from the Money Matters curriculum. In 2016, this workshop helped 39 adult participants to identify debt distress and make a plan to take control of their financial situations. Participants received and learned to utilize tools for creating a spending plan or budget.

## Results

### AgriLife Extension

Since 2013, more than 2,500 Texas youth have participated in the Welcome to the Real World financial simulation, with 700 youth in 2016 participating in 11 locations via their high schools or through senior 4-H leadership retreats. Eighty-one percent of the participants agreed or strongly agreed that it was a good way to learn money management. Participants were asked about their knowledge before and after the simulation concerning five financial practices, two of which were: how to use a register to track transactions (17.6% before, 36.4% after, 62% plan to adopt the practice); how to create and follow a spending plan [budget] (17.1% before, 47% after, 76.3% plan to adopt the practice). Seeing that students intended to adopt simple but important financial practices is a reflection of gaining financial knowledge and understanding. This two-hour exercise has helped to prepare them financially for the future.

### Cooperative Extension Program

In 2016, 197 Nueces County teenagers completed the Welcome to the Real World! program series. To evaluate program effectiveness, participants were given a retrospective post survey to complete at the end of the series. Data was collected and analyzed.

-114 surveys were collected

-71% of participants were Hispanic, 7% White, 3% Asian American, 7% African American, 6% Multi-Racial, and 5% Other

-80% of participants were satisfied with the activity as a way to learn about money management (40% mostly satisfied, 40% completely satisfied)

-64% of respondents indicated that they were surprised at the number of bills to be paid each month

-After the program, 78% of respondents reported being familiar (28% somewhat familiar, 50% familiar) with how to use a register to keep track of transactions as opposed to 29% before the program

-After the program, 83% of respondents reported being familiar (24% somewhat familiar, 59% familiar) with how to create and follow a spending plan (budget) as opposed to 39% before the program

-70% of respondents said to complete my education so that I can reach my career goals.

## 4. Associated Knowledge Areas

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



**Outcome #6**

**1. Outcome Measures**

Number of participants who reduced debt and increased savings.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	900

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Many families face the constant challenge of managing limited resources to meet everyday expenses. The complexity of the financial system and the lack of formal financial literacy education further burden families who are trying to make ends meet. The slow recovery from the recent recession has heightened consumer awareness of the need for financial literacy education. Growing unemployment, foreclosures, and credit delinquencies have contributed to increased interest among consumers in budgeting, saving, and cutting back on spending. Instability in the Texas oil industry will increase the need for financial literacy education.

**What has been done**

Several adult financial education initiatives are implemented through AgriLife Extension. Money Smart is a financial management program developed by the Federal Deposit Insurance Corporation (FDIC). It is taught by Extension educators in classes for clients in a variety of community organizations. Wi\$eUp ? Financial Planning for Generation X and Y Women, was developed by Texas A&M AgriLife Extension through funding from the U.S. Department of Labor Women's Bureau, and is offered as an online course as well as in community workshops.

**Results**

Since 2004, more than 1,380 Money Smart classes have resulted in more than 17,000 educational contacts. Results consistently show a statistically significant increase in participants' knowledge of the program's concepts after the class compared to their knowledge before the class. The largest increases in knowledge were reported for the modules dealing with checking accounts, credit management and credit reports. Knowledge scores increased on average by 35 percentage points for these modules.

Since its inception, Wi\$eUp has reached over 33,000 individuals across the U.S. and overseas. Its overarching goals were to enable participants to increase savings and to reduce debt. Evaluation measures taken before and after course completion, as well as three-months after completion demonstrated that participants were able to increase savings and to reduce their debt. In 2016, over 4,000 participated in the program.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
802	Human Development and Family Well-Being

**Outcome #7**

**1. Outcome Measures**

Number of limited resource clientele who gained knowledge about improving their financial stability by reducing debt and increasing savings.

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	900

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

The goal of money management is to prepare participants to make wise money decisions, increase awareness of the benefits of a budget, and to practice effective money management on a daily basis.

**What has been done**

A Program series was conducted in collaboration with Eagle Pass ISD who provided the location and assisted with facilitating the program in the classroom setting in Maverick Conty. The Money Management program is a six-lecture series offered to youth in a classroom setting at Memorial Junior High, Eagle Pas High School, and Parent Education Program for pregnant teens. Series Modules include: Explore careers; Investigate how career choices can be influenced by education and other factors; Make consumer choices related to future independent living; Learn skills needed to manage their finances; Evaluate their success in managing their monthly income and expenses; Explore alternatives to balance a budget.

Travis County Classes were conducted with seniors and persons with special needs. Community partners were A Resource Center for Independent Living (ARCIL) and City of Austin Parks and

Recreation Department. Money management outreach included 26 classes with 309 participants.

**Results**

Maverick County:

98% of the participants stated they learned the importance of paying themselves first.

86.% stated they would create and follow a spending plan (budget)

88% stated they would balance their income and expenses

Travis County:

A post survey was completed by 134 of 309 (43%) participants:

108 of 134 (81%) learned ways to manage their money and spending

106 of 134 (79%) understand the importance of tracking their spending

100 of 134 (75%) agree a budget can help them achieve financial goals

100 of 134 (75%) agree they would attend another money management class

79 of 134 (60%) on a scale of 1-10 (highest) rated money management sessions a 10.

Comments:

I've been applying the tools I learned in class to everyday spending and learned I wasted and spent a lot of unnecessary money especially for lunch.

The lesson was very informative. I am retired on a fixed income and this will help me.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
801	Individual and Family Resource Management

**Outcome #8**

**1. Outcome Measures**

Number of car seats incorrectly installed on arrival and number installed correctly after instruction and/or new seat.

**2. Associated Institution Types**

- 1862 Extension
- 1890 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	2227

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Traffic crashes were one of the leading causes of death for children age 14 and under in 2016. The total annual cost of motor vehicle occupant-related death and injury is \$7 billion for children ages 14 and under. Safety belts and child restraints are the single most effective tool in reducing these deaths and injuries. Unfortunately, in 2015 less than half of the children killed in vehicle crashes in Texas were known to be restrained. Minority children are at a greater risk of being unrestrained. Crash data from the National Highway Transportation Safety Administration shows that in 2015, 340 children under 5 were killed and 47,000 were injured in motor vehicle crashes.

#### What has been done

The Passenger Safety Project is funded through federal funds competitively awarded through the Texas Department of Transportation. Passenger Safety conducts the National Highway Traffic Safety Administration's National Child Passenger Safety Technician Training to certify technicians to assist parents with child safety seat education. In 2016, the project trained 50 participants as certified child passenger safety technicians. To date, 938 technicians have been trained, including 183 Extension agents and 243 law enforcement officers. Child safety seat checkup events are primarily conducted in under-served rural areas to educate parents on the correct usage of child safety seats.

Cooperative Extension Program:

Waller County

Child Passenger Safety Classes were taught throughout the year of 2016 and Waller County Checkup Event. Classes were held twice a month for expecting and new parents that are in need of child passenger safety education and car seats. The Child Passenger Safety Checkup Event offered parents to conveniently receive a child restraint seat inspection by a certified technician and or receive a seat.

#### Results

The proper use of child safety seats reduces the risk of injury and death, leading to reduced medical costs, avoidance of lost future earnings, and improved quality of life. These economic benefits are an estimated \$2,159 per child age 0 to 4 and \$2,606 per child age 4 to 7 for new seats distributed, and \$622 per child for seat misuse with an assumed 75% continued use. In 2016, 2,227 safety seats were inspected and 1,513 new seats distributed at no cost to families. The economic benefit is estimated at over \$2.92 million.

2,182 children were incorrectly restrained upon arrival (98% misuse rate); 2,227 children left events correctly restrained after instruction and/or a new seat.

Cooperative Extension Program:

Waller County:

There were 65 parents who were educated about car seat safety and provided car seats for 86 children at an estimate of \$74 per child restraint seat ages 0-4 and \$50 per child restraint seat for ages 4-7. The economic impact made was about \$5,332.00.

### 4. Associated Knowledge Areas

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

**Outcome #9**

**1. Outcome Measures**

Number of car seats recommended for replacement for any reason.

**2. Associated Institution Types**

- 1862 Extension
- 1890 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	1513

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Safety belts and child restraints are the single most effective tool in reducing deaths and injuries. According to data from 2015, less than half of the children killed in vehicle crashes in Texas were known to be restrained. Minority children are at a greater risk of being unrestrained. Recent crash data from the National Highway Transportation Safety Administration shows that in 2015, 340 children under 5 were killed and 47,000 were injured in motor vehicle crashes.

**What has been done**

The Passenger Safety Project is funded through federal funds competitively awarded through the Texas Department of Transportation. Passenger Safety conducts the National Highway Traffic Safety Administration's National Child Passenger Safety Technician Training to certify technicians to assist parents with child safety seat education. In 2016, the project trained 50 participants as certified child passenger safety technicians. To date, 938 technicians have been trained, including 183 Extension agents and 243 law enforcement officers. Child safety seat checkup events are primarily conducted in under-served rural areas to educate parents on the correct usage of child safety seats.

**Results**

The proper use of child safety seats reduces the risk of injury and death, leading to reduced medical costs, avoidance of lost future earnings, and improved quality of life. These economic benefits are an estimated \$2,159 per child age 0 to 4 and \$2,606 per child age 4 to 7 for new

seats distributed, and \$622 per child for seat misuse with an assumed 75% continued use. In 2016, 2,227 safety seats were inspected and 1,513 new seats distributed at no cost to families. The economic benefit is estimated at over \$2.92 million.

#### 4. Associated Knowledge Areas

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

#### V(H). Planned Program (External Factors)

##### External factors which affected outcomes

- Appropriations changes
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

##### Brief Explanation

Reaching audiences through face-to-face trainings is becoming a greater challenge. Due to various factors (e.g., competition for time, travel distances, economic issues), audiences appear to be more inclined to participate in online educational events. While participants attending face-to-face events seem to be declining, the number of online participants is dramatically increasing. This provides Extension with both opportunities and challenges to meet and exceed goals and objectives.

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

##### Evaluation Results

**Child Care:** The demand for face-to-face and online professional development training continues to rise. In 2016, county Extension agents and their community partners conducted 46 child care provider training conferences throughout the state of Texas for 3,767 child care providers and directors. Over 22,046 clock hours of training were provided to child care professionals through face-to-face trainings. What is remarkable is the growth in the demand for online learning. In 2016, early childhood educators in the U.S. completed 325,940 online courses (601,302 clock hours). This amounts to more than a 45% increase from 2015. High percentages of providers and directors learn new information (97%) and believe that the trainings help them become better equipped to work with young children (98%).

**Passenger Safety:** Before the inspection, 62% of participants expressed that they needed help installing their car seat, and only 23% of participants indicated that they understood how to install their car seat. After the inspection 98% of participants indicated they understood how to install their car seat.

**Parenting and Dependent Care Providers:** Parents completed over 7,000 online courses focused on various parenting/caregiving issues. Evaluation results indicate that parents improved their knowledge in multiple areas. Statistically significant knowledge gains were

found on all courses (pre = 77% vs. post = 87%). Moreover, dependent care providers attending trainings vastly improved their knowledge of best-practices in dependent care. According to evaluation data, 98% learned new information.

**Key Items of Evaluation**

**V(A). Planned Program (Summary)**

**Program # 14**

**1. Name of the Planned Program**

Life Skills for Youth (includes Character Education and Leadership)

Reporting on this Program

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
802	Human Development and Family Well-Being	0%	60%	0%	0%
806	Youth Development	100%	40%	0%	0%
	<b>Total</b>	100%	100%	0%	0%

**V(C). Planned Program (Inputs)**

**1. Actual amount of FTE/SYs expended this Program**

Year: 2016	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	100.0	10.0	0.0	0.0
<b>Actual Paid</b>	136.9	6.5	0.0	0.0
<b>Actual Volunteer</b>	0.0	94.0	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
2722763	606334	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2722763	264261	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
15876404	0	0	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**



### **AgriLife Extension**

This program is based on five learning experiences, of a minimum of 30 minutes each, tied to the work of the project for which they participate. Each project is experientially focused. Examples of activities include workshops, demonstrations, and hands-on experiences.

Numerous materials and support is provided by the Texas 4-H faculty to agents and specialists. These items are used for implementation of projects and for professional development of staff. Use of volunteers is significant in enhancing and extending efforts to reach and provide youth with positive experiences.

### **Cooperative Extension Program**

4-H Youth development takes place in 35 Texas counties facilitated by Agents with the Cooperative Extension Program in partnership with community volunteers and agencies. There were outreach activities such as speeches, presentations, experiments on wind energy and water conservation as well as literature dissemination at local health fairs and other community events. There were demonstrations and educational enrichment provided to youth in schools and after-school programs in life skills, healthy living, career exploration, and science. There were community clubs that develop and promote life leadership skills and service to others in a context with caring adults. There were special interest project clubs in areas such as gardening and robotics. Youth maintained record books. They received coaching and practiced in order to participate in contests such as food challenge, public speaking, and livestock shows on the county, district, state, and national levels. Special events like camps, conferences, and project-oriented days were also sponsored. Local extension websites, blogs, and Facebook were used to promote and highlight program successes.

## **2. Brief description of the target audience**

### **AgriLife Extension**

All youth of 4-H age are targeted for programs depending on location, issues identified by the local communities, and programs of interest.

### **Cooperative Extension Program**

Limited-resource youth, ages 5-19, and caring adults in urban and rural communities of 35 Texas counties throughout the State will be targeted for this program. Special recruitment efforts will be marketed to parents, adults and other agencies for support and collaboration to meet expected goals.

## **3. How was eXtension used?**

eXtension was not directly used. We do offer some volunteer development trainings on this topic and some introduction 4-H Youth Development Program overviews on the site. Specifically, the South Region 4-H Leaders have placed some information on this site for new employees and volunteers on the following topics:

- Overview of 4-H Youth Development
- Ages and Stages of Youth Development
- Volunteer Management
- Youth Protection Standards

## **V(E). Planned Program (Outputs)**

### **1. Standard output measures**

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	171710	0	418691	1603289

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

Year: 2016  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2016	Extension	Research	Total
Actual	20	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- # of group educational sessions conducted.

Year	Actual
2016	19450

**Output #2**

**Output Measure**

- # of youth that participate in educational activities and programs.

Year	Actual
2016	81751

**V(G). State Defined Outcomes**

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

O. No.	OUTCOME NAME
1	% of youth who increase knowledge of life skills concepts and practices.
2	% of youth who report they have adopted life skills concepts and practices.
3	% of youth who plan to pursue higher education interest or career interest as a result of their project work.
4	% of youth who report abilities (skills) changed as a result of participation in character education programs.
5	% of 4-H club participants increasing knowledge of leadership skills.
6	% of 4-H club participants applying leadership skills.
7	% increase knowledge of employability skills among limited resource youth.
8	% of limited resource youth aware of or interested in pursuing entrepreneurship, green jobs, and/or STEM careers
9	% of limited resource youth improving science skills.
10	% of limited resource youth adopting behaviors that lead to a healthy lifestyle.
11	% of limited resource youth providing service or volunteering.
12	% of 4-H club participants increasing knowledge in healthy living
13	% of 4-H club participants changing behaviors for healthier living
14	% of limited resource youth exercising leadership
15	% of youth who plan to adopt character practices as a result of participation in character education programs.
16	% of youth who report an increased knowledge of character education principles.

**Outcome #1**

**1. Outcome Measures**

% of youth who increase knowledge of life skills concepts and practices.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	50

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Life skill development is the cornerstone of 4-H. In today's world, it is critically important that youth have the opportunity to learn critical life skills so that they can be better citizens in the county, state, country, and world. The ones we specifically aim to address through 4-H are responsibility, decision making, respectfulness, team work, respectfulness, and many others.

**What has been done**

4-H programs during the year, aim to teach life skills. Some strategies include 4-H club work, project work, district events, regional programs, summer camps, and statewide impact programs and camps.

Texas 4-H Youth Development includes over 57,000 youth in over 1,900 clubs in Texas. Through this experience, youth learn leadership, citizenship, and life skills through club meetings and project experiences.

**Results**

Outcomes are measured at the county, district, regional, and state level. A snapshot of state results is below. These data were derived from over 3,000 youth participating in Texas 4-H Roundup. Through a qualitative assessment, the five themes for life skill development (in rank order) are noted below:

- \* Networking
- \* Self-esteem / confidence
- \* Teamwork
- \* Public Speaking

\* Responsibility

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

#### Outcome #2

##### 1. Outcome Measures

% of youth who report they have adopted life skills concepts and practices.

##### 2. Associated Institution Types

- 1862 Extension

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2016	20

##### 3c. Qualitative Outcome or Impact Statement

###### **Issue (Who cares and Why)**

Life skill development is the cornerstone of 4-H. In today?s world, it is critically important that youth have the opportunity to learn critical life skills so that they can be better citizens in the county, state, country, and world. The ones we specifically aim to address through 4-H are responsibility, decision making, respectfulness, team work, respectfulness, and many others.

###### **What has been done**

4-H programs during the year, aim to teach life skills. Some strategies include 4-H club work, project work, district events, regional programs, summer camps, and statewide impact programs and camps.

For 2016, the results are from Texas 4-H Congress. This program brings together over 250 4-Hers from across the state.

###### **Results**

Below are the results from retrospective on-site survey completed by senior 4-H members on their adoption of practices during the 2016 Texas 4-H Congress (n = 218).

\* 36% increase in the ability to get along with others.

- \* 20% increase in learning to trust each other.
- \* 12% increase in personal confidence
- \* 10% increase in the ability and openness to meet new people
- \* 9% increase in being sensitive to other people's feelings
- \* 9% increase in being open minded to other people's opinions
- \* 7% increase in being to open to change

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

#### Outcome #3

##### 1. Outcome Measures

% of youth who plan to pursue higher education interest or career interest as a result of their project work.

##### 2. Associated Institution Types

- 1862 Extension

##### 3a. Outcome Type:

Change in Condition Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2016	50

##### 3c. Qualitative Outcome or Impact Statement

###### **Issue (Who cares and Why)**

Career development and workforce development have been a significant priority for the Texas 4-H Youth Development Program. Over the last few years, this has become more of a priority for the program. Specifically, several grants have been received to focus on career development.

###### **What has been done**

Significant effort in 2016 was placed on career development in the southern part of the state through a program entitled, Crossroads. Crossroads is an event for 13-18 year old youth to explore a chosen career path. Five career paths were selected last year, based on evaluation data from a previous year. A corresponding college major is matched with the career path.

###### **Results**

Participants were delivered a post only survey to evaluate the event. Overall, 82% of the youth stated they were mostly or completely satisfied with the event.

Specific results are below:

- \* 92% of youth learned something they did not know before about different career opportunities available.
- \* 80% of youth plan to take action and share with others the information learned at Crossroads.
- \* 76% of youth learned something new about degree opportunities that could be offered to them.
- \* 71% of youth gained new ideas of what they can do to better prepare for their college education.
- \* 58% of youth said their participation in Crossroads have influenced their future career choice.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

#### Outcome #4

##### 1. Outcome Measures

% of youth who report abilities (skills) changed as a result of participation in character education programs.

##### 2. Associated Institution Types

- 1862 Extension

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2016	50

##### 3c. Qualitative Outcome or Impact Statement

###### **Issue (Who cares and Why)**

How others are treated, character education, ethical decisions, and anti-bullying are all significant programs in Texas 4-H Youth Development. Currently, this topic is one of the three most important educational content areas the Texas 4-H Program addresses.

###### **What has been done**

Character education is a significant part of our youth livestock program. A statewide assessment is conducted on every 4-Her and FFAer that participates in the program. Over 25,000 youth participate in Quality Counts Education annually. Quality Counts is the character education program ALL youth who show livestock at major shows must complete. The total program has

yielded over 90,000 passing exam grades since 2011.

**Results**

In 2016, the online testing for the Quality Counts revealed the following results regarding youth character and proper handling of livestock.

\* 84% - 4,199 of an estimated 5000 students answered correctly regarding proper handling of medication with livestock.

\* 81% - 4,035 of an estimated 5000 students answered correctly regarding transportation of livestock and ensuring their safety.

\* 80% - 4,010 of an estimated 5000 students answered correctly regarding safety of livestock through the prevention of biosecurity issues.

\* 76% - 3,819 of an estimated 5000 students answered correctly regarding proper food handling practices.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
806	Youth Development

**Outcome #5**

**1. Outcome Measures**

% of 4-H club participants increasing knowledge of leadership skills.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	30

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Leadership development happens best locally. Youth leadership programs that are conducted and evaluated locally provide the most meaningful outcomes because this development is happening ?on-going? throughout the year vs one shot camps and statewide programs.



**What has been done**

To best ascertain leadership development, leadership evaluations are conducted through various programs and experiences. For 2016, leadership was measured through the Texas 4-H Leaders 4 Life program. Throughout the year youth utilize available resources to develop their skills in the areas of public speaking, service learning, and parliamentary procedure by participating in the Leaders 4 Life program.

**Results**

Through the Leaders 4 Life Evaluation, youth revealed the following knowledge increases:

- \* 41.3% - 16 most used motions in parliamentary procedure
- \* 37.7% - The purpose and principles of parliamentary procedure
- \* 33.0% - The precedence and basic rules of motions
- \* 30.0% - Different leadership styles
- \* 27.3% - The roles and duties of all 4-H officers
- \* 19.0% - The importance of goal setting and accomplishing goals
- \* 18.3% - How to be a team player

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
806	Youth Development

**Outcome #6**

**1. Outcome Measures**

% of 4-H club participants applying leadership skills.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	50

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Leadership development happens best locally. Youth leadership programs that are conducted and evaluated locally provide the most meaningful outcomes because this development is

happening ?on-going? throughout the year vs one shot camps and statewide programs.

### **What has been done**

To best ascertain leadership development, leadership evaluations are conducted through various programs and experiences. For 2016, leadership was measured through the Texas 4-H Leaders 4 Life program. Throughout the year youth utilize available resources to develop their skills in the areas of public speaking, service learning, and parliamentary procedure by participating in the Leaders 4 Life program.

### **Results**

Results: (10 To 12 Lines Max)

Through the Leaders 4 Life Evaluation, youth revealed the following knowledge increases:

- \* 82 of 83 (98.8%) believe that what they learned has given them the ability to make better leadership decisions.
- \* 80 of 82 (97.6%) are more confident in serving in a leadership role.
- \* 79 of 81 (97.5%) is able to identify and utilize resources to get a task accomplished.
- \* 80 of 83 (96.4%) can define leadership and leadership qualities.
- \* 76 of 79 (96.2%) can use creativity to brainstorm and come up with the best solution to a problem.
- \* 77 of 81 (95.1%) know how to be an effective communicator and good listener.
- \* 77 of 81 (95.1%) have developed or improved their teamwork skills.
- \* 77 of 81 (95.1%) have set personal goals to help them fulfill their personal vision.
- \* 76 of 81 (93.8%) can effectively participate in a business meeting using correct parliamentary procedure.
- \* 76 of 82 (92.7%) have or plan to implement a community service project.
- \* 75 of 82 (91.5%) know their leadership styles.
- \* 72 of 79 (91.1%) are a better manager of conflict and knows how to apply different management styles to conflict.
- \* 72 of 82 (87.8%) have a personal vision.

## **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
806	Youth Development

### **Outcome #7**

#### **1. Outcome Measures**

% increase knowledge of employability skills among limited resource youth.

#### **2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	267

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

The United States continues to face a critical shortage of well trained professionals for research and other careers in food and agricultural sciences. According to the national census, the demographics of America are evolving toward a new minority majority. Despite this trend, there currently exists underrepresentation of limited-resource and minority individuals in Science, Technology, Engineering, Agriculture, and Math (STEAM) careers. According to research by Dr. Ann Stiles of Project Grad Houston, pre-college programs facilitated by universities play a critical role in predicting college attendance and increasing a young person’s likelihood to be career ready.

**What has been done**

There were 97 participants in grades 8 through 12 involved in residential college preparatory programs exploring agricultural/STEM careers through the AgDiscovery, Career Awareness & Youth Leadership Laboratory (CAYLL), and the Research Extension Apprenticeship Programs(REAP) funded by the USDA. Two scholarships are awarded to 4-H-ers annually. As part of the ongoing support provided to 4-H scholarship recipients (who are predominately first-generation college students), a Career Spotlight event introducing 170 youth and young adults to internships and potential employers was held.

**Results**

Youth are more likely to enroll in higher education and explore career opportunities which result in increased wage earners that contribute to the economic stability of their communities. As a result of attending the pre-college programs, 91% (n=58) of CAYLL participants are more likely to enroll in post-secondary education and there was a 62.5% increase (n=8) among AgDiscovery participants who had an excellent understanding of the college application process. In addition, 47% (n=55) of CAYLL participants improved networking skills. There were two 4-H participants awarded \$30,000 in scholarship money courtesy of the San Antonio Livestock Show and Exposition. Six 4-H scholarship recipients received summer internships at the Texas 4-H Camp.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
802	Human Development and Family Well-Being
806	Youth Development

## **Outcome #8**

### **1. Outcome Measures**

% of limited resource youth aware of or interested in pursuing entrepreneurship, green jobs, and/or STEM careers

### **2. Associated Institution Types**

- 1890 Extension

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	3106

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Increased employment trends in the 21st century are in Science, Technology, Engineering, and Math (STEM) careers and green jobs as indicated by the Workforce Investment Act. Unfortunately, findings from the first report of the STEM Workforce Data Project confirm that there have persistently not been enough people to fill these positions in the United States, which is called the skill gap or broken worker pipeline. So even though unemployment is extremely high, these positions remain vacant.

#### **What has been done**

There were 3,106 youth from more than seven counties reached with hands-on STEM activities. Projects include robotics, photography, food science and goats. In addition, there were pre-college programs that focused on careers in Agriculture and STEM-related disciplines. A mobile Ag Awareness Field Day was held in Harris County.

#### **Results**

Youth increased their awareness of agriculture degrees and STEM careers. Elementary students (n=413) indicate a 29% increase in the awareness of STEM careers related to Agriculture. Results for retrospective post-tests are as follows: 75% (n=40) of pre-college respondents increased their awareness of STEM majors/careers, while 71% (n=41) of them increased their interest in STEM careers. All AgDiscovery participants surveyed (n=8) better understood the academic and career opportunities in agriculture and biological sciences. At least 65% of 4-H participants (n=48) have interest in science careers after involvement in a robotics club, while there was a 31% increase among youth involved in a photography project interested in technology careers. Of the youth ambassadors surveyed (n=94), 95% report considering and 85% report interest in a health-related career as a result of participating in 4-H programs.

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
802	Human Development and Family Well-Being
806	Youth Development

## **Outcome #9**

### **1. Outcome Measures**

% of limited resource youth improving science skills.

### **2. Associated Institution Types**

- 1890 Extension

### **3a. Outcome Type:**

Change in Action Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	2570

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Increased employment trends in the 21st century are in Science, Technology, Engineering, and Math (STEM) careers and green jobs as indicated by the Workforce Investment Act. Unfortunately, findings from the first report of the STEM Workforce Data Project confirm that there have persistently not been enough people to fill these positions in the United States, which is called the skill gap or broken worker pipeline. So even though unemployment is extremely high, these positions remain vacant.

#### **What has been done**

2,570 youth from more than sixteen counties were reached with hands-on STEM activities under this initiative. Projects included gardening and robotics, Ag in the Classroom, Egg-to-Chick, and Youth Water education (including water stream trailer). There was a Minority Adventures in Ag field day hosted in Dallas County and Mobile Ag Awareness Days in Harris County.

#### **Results**

Youth increased their ability to make better scientific decisions. Results of the 107 responses on pre and post-tests from the Cass County Science, Engineering, and Technology programs indicate a 35% increase in the respondents (n=59) increased their ability to question and test hypothesis using the scientific method. Of the youth surveyed in Brazos County robotics projects (n=48), 90% make better scientific decisions as a result of their participation.

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
802	Human Development and Family Well-Being
806	Youth Development

### **Outcome #10**

#### **1. Outcome Measures**

% of limited resource youth adopting behaviors that lead to a healthy lifestyle.

#### **2. Associated Institution Types**

- 1890 Extension

#### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

#### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	4386

#### **3c. Qualitative Outcome or Impact Statement**

##### **Issue (Who cares and Why)**

According to Feeding America, data from 2011 indicate that Texas (at 18.5%) is among the top three food insecure states in the nation. Twenty-two percent of Texas children under age eighteen are food insecure the highest rate of any state in the country. Texas is also ranked seventh in the nation with a child obesity rate of 20.4 percent. According to the 2011 Youth Risk Behavior Survey conducted by the Centers for Disease Control and Prevention, Texas youth continue to engage in behaviors that do not contribute to a healthy lifestyle.

##### **What has been done**

The Youth Voice: Youth Choice healthy living programs mobilized directly 124 underserved youth ambassadors and 113 enrolled and episodic adult leaders to take action around nutritional deficiencies, healthy food choices, and physical activity in nine counties. The six-lesson educational series reached 4,197 youth and came from the Choose Health: Food, Fun, and Fitness curriculum. Community events and health fairs were also key program components with outreach efforts resulting in additional contacts for 11,958 youth and 13,202 family members.

##### **Results**

There were 4,386 Healthy Living Common Measure surveys administered as part of the Youth Voice: Youth Choice Healthy Living programs. Ninety-six of these common measures were collected from teen ambassadors. As a result of 4-H healthy living programs, 93% of participants and 98% of youth ambassadors drink more water. Ninety percent of participants and 94% of youth ambassadors eat more fruits and vegetables, 86% of participants and 84% of youth ambassadors eat more whole grains, 84% of participants and 81% of youth ambassadors

encourage family and friends to eat meals together, while 81% participants and 71% youth ambassadors eat less junk food.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
806	Youth Development

### Outcome #11

#### 1. Outcome Measures

% of limited resource youth providing service or volunteering.

#### 2. Associated Institution Types

- 1890 Extension

#### 3a. Outcome Type:

Change in Action Outcome Measure

#### 3b. Quantitative Outcome

Year	Actual
2016	328

#### 3c. Qualitative Outcome or Impact Statement

##### **Issue (Who cares and Why)**

Since its inception, 4-H has placed emphasis on the importance of young people being engaged, well-informed citizens. The core areas of citizenship are civic engagement, service, civic education, and leadership. The opportunity to value and practice service has been identified as one of the eight essential elements of positive youth development. Giving back to others in meaningful ways helps learn about themselves as well as gain exposure to the larger community.

##### **What has been done**

Youth have been engaged civically, provided community service, and have taken part in service learning. There were 38 adult volunteers and 328 youth involved in community service from seven counties. This included peer education around healthy living, community garden celebrations, preparing meals for the homeless, church clean ups, neighborhood beautification and junior master gardener certification volunteer hours contributed toward school gardens. These efforts directly reached 147 people.

##### **Results**

Communities benefit as youth positively contribute as responsible citizens and willing public servants. Of the 600 youth enrolled in 4-H clubs through the Cooperative Extension Program, 55% of them donated 102.5 community service hours. Ninety-six percent of youth ambassadors

(n=94) can apply knowledge in ways that solve real-life problems through community service.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
806	Youth Development

#### Outcome #12

##### 1. Outcome Measures

% of 4-H club participants increasing knowledge in healthy living

##### 2. Associated Institution Types

- 1862 Extension

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2016	25

##### 3c. Qualitative Outcome or Impact Statement

###### **Issue (Who cares and Why)**

The percentage of the food budget spent on away-from-home food has increased steadily since the 1960s, which, consequently, consists of larger portions, higher calories and costs. This trend, coupled with the childhood obesity epidemic, reveals a need to teach youth nutrition and how to prepare healthy, nutritious meals and snacks. Through the 4-H food and nutrition project, youth focus on nutrition, food purchasing, food preparation, cooking skills, food safety, and related career opportunities.

###### **What has been done**

The 4-H Food & Nutrition Project has historically been one of the most popular projects offered by the Texas 4-H Youth Development Program. Through learning experiences, youth gain knowledge and skills related to nutrition, menu planning, food preparation, healthy substitutions, and food safety.

The 4-H Food Challenge is an experience in which youth work in teams to develop a recipe with ingredients provided, plan and prepare the dish, and give a presentation to a judging panel. Throughout the food challenge, youth are applying the food preparation skills, and nutrition and food safety concepts learned throughout their project experiences.



**Results**

Through the 4-H Food Challenge, youth revealed the following knowledge increases:

- \* 40.3% - for My Plate
- \* 37.0% - for Food nutrients and their functions
- \* 36.7% - for How to alter a recipe according to dietary needs
- \* 33.3% - for How to figure cost analysis
- \* 31.3% - for The purpose of different cooking methods
- \* 30.7% - for How to plan and prepare a recipe
- \* 27.7% - for How to read nutrition fact labels
- \* 25.0% - for The importance of food safety
- \* 20.7% - for Kitchen safety

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
802	Human Development and Family Well-Being
806	Youth Development

**Outcome #13**

**1. Outcome Measures**

% of 4-H club participants changing behaviors for healthier living

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	50

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

The percentage of the food budget spent on away-from-home food has increased steadily since the 1960s, which, consequently, consists of larger portions, higher calories and costs. This trend, coupled with the childhood obesity epidemic, reveals a need to teach youth nutrition and how to prepare healthy, nutritious meals and snacks. Through the 4-H food and nutrition project, youth focus on nutrition, food purchasing, food preparation, cooking skills, food safety, and related career opportunities.

**What has been done**

The 4-H Food & Nutrition Project has historically been one of the most popular projects offered by the Texas 4-H Youth Development Program. Through learning experiences, youth gain knowledge and skills related to nutrition, menu planning, food preparation, healthy substitutions, and food safety.

The 4-H Food Challenge is an experience in which youth work in teams to develop a recipe with ingredients provided, plan and prepare the dish, and give a presentation to a judging panel. Throughout the food challenge, youth are applying the food preparation skills, and nutrition and food safety concepts learned throughout their project experiences.

**Results**

Youth participants have also revealed the following changes in behavior based on what they learned and as a result of participating in the 4-H Food Challenge.

- \* 93.3% have used what they have learned to plan or prepare a recipe at home.
- \* 85.4% have made healthier food choices.
- \* 84.1% have changed the way they handle and prepare food.
- \* 77.6% have altered a recipe according to dietary needs.
- \* 68.9% regularly read nutrition fact labels.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
802	Human Development and Family Well-Being
806	Youth Development

**Outcome #14**

**1. Outcome Measures**

% of limited resource youth exercising leadership

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	310

**3c. Qualitative Outcome or Impact Statement**

### **Issue (Who cares and Why)**

Since its inception, 4-H has placed emphasis on the importance of young people being engaged, well-informed citizens. The core areas of citizenship are civic engagement, service, civic education, and leadership. Youth voice and self-determination are essential elements of positive youth development. Civic engagement provides a foundation that helps youth understand the big picture of life and find purpose and meaning. By connecting to their communities and community leaders, youth expand their role in decision making processes.

### **What has been done**

There were 124 youth from 9 counties trained as healthy living ambassadors and 116 youth from 14 counties serving as club officers. There were 12 youth and 4 adult volunteers who attended conferences for additional leadership training at the National Youth Summit on Healthy Living (where a delegation from Brazos County served as presenters), National 4-H Conference, and National 4-H Congress. There were also 58 youth participants who attended the annual Youth Leadership Laboratory.

### **Results**

Participants acquired life skills in decision making, self-esteem, self-pride, the importance of fulfilling responsibilities and benefits of team work. Ninety-four percent of youth ambassadors (n=94) taught others, 95% acted as mentors to others, 97% are confident in helping others, and 96% have more self-confidence. There was a 61% increase in the ability to lead group discussions, a 57% increase in the ability to work as a team member, 63% increase in the ability to speak before a group, a 65% increase in the ability to plan programs, and 58% increase in the ability to teach others for youth ambassadors. As a result Youth Leadership, 91% of participants surveyed (n=55) increased their ability to apply leadership skills. Of the 600 youth enrolled in 4-H clubs through the Cooperative Extension Program, 20% of these limited resource youth exercise leadership as club officers. Communities benefit as youth positively contribute to communities as responsible citizens and willing public servants.

## **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
806	Youth Development

### **Outcome #15**

#### **1. Outcome Measures**

% of youth who plan to adopt character practices as a result of participation in character education programs.

#### **2. Associated Institution Types**

- 1862 Extension

#### **3a. Outcome Type:**

Change in Action Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2016	50

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

How others are treated, character education, ethical decisions, and anti-bullying are all significant programs in Texas 4-H Youth Development. Currently, this topic is one of the three most important educational content areas the Texas 4-H Program addresses.

#### What has been done

Character education is a significant part of our youth livestock program. A statewide assessment is conducted on every 4-Her and FFAer that participates in the program. Over 25,000 youth participate in Quality Counts Education annually. Quality Counts is the character education program ALL youth who show livestock at major shows must complete. The total program has yielded over 80,000 passing exam grades since 2011.

#### Results

In 2016, one specific was conducted to teach character education through livestock projects.

Results are below from 127 participants:

Youth indicated the following positive behavior changes:

- \* 100% will keep records on their project so I can determine growth of my project, medication and feeding history, and other important information.
- \* 100% will respect others in the show ring and follow all the rules.
- \* 100% will help other youth with their projects.
- \* 100% will set personal goals for me and my projects.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

#### Outcome #16

##### 1. Outcome Measures

% of youth who report an increased knowledge of character education principles.

##### 2. Associated Institution Types

- 1862 Extension

### 3a. Outcome Type:

Change in Knowledge Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2016	50

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

How others are treated, character education, ethical decisions, and anti-bullying are all significant programs in Texas 4-H Youth Development. Currently, this topic is one of the three most important educational content areas the Texas 4-H Program addresses.

#### What has been done

Character education is a significant part of our youth livestock program. A statewide assessment is conducted on every 4-Her and FFAer that participates in the program. Over 25,000 youth participate in Quality Counts Education annually. Quality Counts is the character education program ALL youth who show livestock at major shows must complete. The total program has yielded over 80,000 passing exam grades since 2011.

#### Results

In 2016, the online testing for the Quality Counts revealed the following results regarding youth character and proper handling of livestock.

\* 84% - 4,308 of an estimated 5000 students answered correctly the question regarding goal setting.

\* 83% - 4,154 of an estimated 5000 students correctly answered the question regarding citizenship and caring for others.

\* 81% - 4,055 of an estimated 5000 students answered correctly the question regarding sportsmanship, honor and respect.

\* 80% - 4,015 of an estimated 5000 students answered correctly the question regarding following and obeying the rules.

## 4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being

**V(H). Planned Program (External Factors)**

**External factors which affected outcomes**

- Appropriations changes
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

**Brief Explanation**

All outcomes were met.

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

**Evaluation Results**

See outcome measures.

**Key Items of Evaluation**

**V(A). Planned Program (Summary)**

**Program # 15**

**1. Name of the Planned Program**

Adult Leadership and Volunteer Development

Reporting on this Program

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	0%	40%	0%	0%
806	Youth Development	100%	60%	0%	0%
	<b>Total</b>	100%	100%	0%	0%

**V(C). Planned Program (Inputs)**

**1. Actual amount of FTE/SYs expended this Program**

Year: 2016	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	20.0	11.0	0.0	0.0
<b>Actual Paid</b>	22.4	6.5	0.0	0.0
<b>Actual Volunteer</b>	0.0	201.0	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
445507	606334	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
445507	264261	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
2597746	0	0	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

### **AgriLife Extension**

The following activities will be used to implement this program:

\*Provide training for Extension professionals on the ISOTURE volunteer management model and key concepts related to volunteer administration.

\*Provide training and guidance to Extension specialists in the role and support of program development related to volunteerism.

\*Provide orientation and training directly to volunteers in preparation for their service resulting in a positive experience.

### **Cooperative Extension Program**

Specialists facilitated project training for adult leaders in healthy living, clothing & textiles and robotics. Agents conducted quarterly training in their counties on enrollment and chartering, best financial practices, etc. for club managers and advisory council members. Adult leaders from Brazos County attended and presented at the National Youth Summit on Healthy Living, while youth ambassadors from various counties attended three national conferences and a state healthy living summit to assist in their development. Staff attended state and national 4-H extension agent conferences.

## **2. Brief description of the target audience**

### **AgriLife Extension**

The following groups are included in the target audience for this program:

- \* Youth and adult volunteers who have a need or interest in a Texas Extension program.
- \* Extension educators
- \* Youth and adults who have an interest in community development and partnerships.

### **Cooperative Extension Program**

The target audience includes underserved youth, families, and community organizations to recruit and train volunteers. One recent challenge posed by NIFA's Director of Youth & 4-H has been to combine professional and volunteer development. Additional audiences include Extension faculty, young professionals, students, and the unemployed who may be limited-resourced or commit to serve those who are.

## **3. How was eXtension used?**

eXtension was not used in this program

## **V(E). Planned Program (Outputs)**

### **1. Standard output measures**



2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	51824	268745	47390	0

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

Year: 2016  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2016	Extension	Research	Total
Actual	0	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- # group educational sessions conducted.

Year	Actual
2016	2968

**Output #2**

**Output Measure**

- # of volunteers and staff that participate in professional /volunteer leadership development and service-learning.  
 Not reporting on this Output for this Annual Report

**Output #3**

**Output Measure**

- # of community service and service-learning hours provided by volunteers and participants.  
 Not reporting on this Output for this Annual Report

**Output #4**

**Output Measure**

- # service or volunteer hours.  
Not reporting on this Output for this Annual Report

**V(G). State Defined Outcomes**

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

O. No.	OUTCOME NAME
1	% of participants who report an increased knowledge of leadership development practices.
2	% of participants who plan to or adopt leadership development practices.
3	# of counties who implement a volunteer management plan.
4	% positive attitude toward serving others as volunteers.

## **Outcome #1**

### **1. Outcome Measures**

% of participants who report an increased knowledge of leadership development practices.

### **2. Associated Institution Types**

- 1862 Extension

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	91

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Leadership has been a long-standing issue for both youth and adults. It is important for young people to develop and gain leadership life skills in order to grow into successful, contributing members of society in adulthood.

#### **What has been done**

Youth leadership programs have traditionally focused on youth developing knowledge and skills to serve in leadership roles through traditional 4-H program experiences and through Leaders 4 Life program. Adult leadership development programs are held for community members to learn about leadership, gain skills needed to serve in community leadership positions and acquire knowledge of community and economic development, as well as knowledge, skills and responsibilities specific to their volunteer role. Extension's adult volunteer programs also focus on developing the volunteers as leaders within their communities through training and service.

#### **Results**

Evaluations are conducted at the county, district, regional and state level for various leadership programs including, but not limited to, youth ambassador programs, Texas rural leadership program, as well as volunteer trainings.

A sampling of some results is:

Knowledge Gained:

\* 96% can better define leadership and leadership qualities.

\* 91% learned their personal leadership style.

Skill Development/Application:

- \* 98% learned skills to help them make better leadership decisions.
- \* 96% improved their teamwork skills.
- \* 95% gained skills needed to be an effective communicator.
- \* 95% have set personal goals to help them fulfill their personal vision.
- \* 91% are better managers of conflict and know how to apply different management styles to conflict.

#### 4. Associated Knowledge Areas

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

#### Outcome #2

##### 1. Outcome Measures

% of participants who plan to or adopt leadership development practices.

##### 2. Associated Institution Types

- 1862 Extension

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2016	91

##### 3c. Qualitative Outcome or Impact Statement

###### **Issue (Who cares and Why)**

There is a strong need to develop and maintain sustainable communities using appropriate community and economic development tools and programs. One educational response is to develop adults and youth in counties to be leaders of tomorrow. It is the responsibility of AgriLife Extension and the 4-H Youth Development Program to provide volunteers with high-quality, educational opportunities and resources so they are best equipped to lead programs. These adult volunteer experiences are provided face-to-face and through online training and development.

###### **What has been done**

Leadership development programs have been implemented in a variety of ways for youth and adults. The youth leadership programs were focused on youth developing knowledge skills to serve in leadership roles through traditional 4-H program experiences and through Leaders 4 Life

program. Adult leadership development programs were held for community members and Extension volunteers to learn about leadership, gain skills needed to serve in community leadership positions and acquire knowledge of community and economic development.

**Results**

Evaluations are conducted at the county, district, regional and state level for various leadership programs. A snapshot of some results from leadership development programs include:

- \* 98% increased their confidence in serving in a leadership role.
- \* 96% can define leadership and leadership qualities.
- \* 96% increased their ability to complete and follow through on obligations.
- \* 92% increased their ability to delegate responsibility.
- \* 91% learned how to effectively apply their personal leadership style.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
806	Youth Development

**Outcome #3**

**1. Outcome Measures**

# of counties who implement a volunteer management plan.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

The Texas 4-H Youth Development Program has over 25,000 adult volunteers that help lead the program. However, as an agency and as a 4-H Program, we are not taking full advantage of their skill set to grow the 4-H Program. To assist and promote growth of the program at the local level, a plan was initiated for counties to have project plans, in support of two major projects ? Ag/Youth Livestock and FCS. These include project planning, implementation, as well as the use of

volunteers through coalitions.

**What has been done**

In the development of program plans, County Extension Agents were required to develop project coalitions to support the Ag/Youth Livestock and Youth FCS programs in the 250 county programs in Texas. This approach includes the development of coalitions to support program development efforts for these two major project areas.

**Results**

It is noteworthy to share that last year Extension utilized more than 87,000 volunteers, who contributed more than 4.3 million hours. Each year, new Extension faculty participate in training to learn more about their role as a volunteer manager and key concepts and tools available in working with volunteers.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
806	Youth Development

**Outcome #4**

**1. Outcome Measures**

% positive attitude toward serving others as volunteers.

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	294

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

The opportunity to value and practice service has been identified as one of the eight essential elements of positive youth development. It is also a critical component for successful volunteer recruitment and retention. Giving back to others in meaningful ways helps youth and adult leaders learn about themselves as well as gain exposure to the larger community.

**What has been done**

Teen volunteers and adult leaders have been able to serve others as project leaders, contest judges, coaches, mentors, club managers, ambassadors, and/or committee members. State Healthy Living Summit. Quarterly Training. Robotics and Clothing & Textiles training.

**Results**

At least 68% (n=94) of those surveyed are definitely encouraged to volunteer more, while an additional 27% say they may be encouraged to volunteer more. There were 98% of respondents who believe they can make a difference in their community through service and 96% gained skills through serving their community that will help them in the future.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
806	Youth Development

**V(H). Planned Program (External Factors)**

**External factors which affected outcomes**

- Economy
- Appropriations changes
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

**Brief Explanation**

N/A

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

**Evaluation Results**

Various evaluations are conducted for individual volunteer and leadership development programs facilitated by the Texas A&M AgriLife Extension Service. Evaluation results specific to these programs are summarized and included in each program report; however, individual reports are available for each program. The evaluations include after only, retrospective post and before-after.

**Key Items of Evaluation**



## VI. National Outcomes and Indicators

### 1. NIFA Selected Outcomes and Indicators

<b>Childhood Obesity (Outcome 1, Indicator 1.c)</b>	
0	Number of children and youth who reported eating more of healthy foods.
<b>Climate Change (Outcome 1, Indicator 4)</b>	
0	Number of new crop varieties, animal breeds, and genotypes with climate adaptive traits.
<b>Global Food Security and Hunger (Outcome 1, Indicator 4.a)</b>	
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.
<b>Global Food Security and Hunger (Outcome 2, Indicator 1)</b>	
0	Number of new or improved innovations developed for food enterprises.
<b>Food Safety (Outcome 1, Indicator 1)</b>	
0	Number of viable technologies developed or modified for the detection and
<b>Sustainable Energy (Outcome 3, Indicator 2)</b>	
0	Number of farmers who adopted a dedicated bioenergy crop
<b>Sustainable Energy (Outcome 3, Indicator 4)</b>	
0	Tons of feedstocks delivered.