

2017 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 pose 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 report 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 in identifying and addressing 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.

According to the 2012 USDA census, 40% of Texas farms are less than 50 acres in size. Many of them are operated by socially disadvantaged and traditionally underserved agricultural producers. Often, these producers find it difficult to sustainably manage their farming/ranching operations due to limited knowledge of farm management and marketing. Assisting these producers is crucial because their economical contributions are vital to Texas economy. Research-based technical assistance and educational programs provided these producers with needed business skills on how to adopt efficient agri-business and marketing practices to improve the economic viability of their businesses. Themes of some of the programs and workshops that were conducted included: i) Land Loss Prevention, ii) USDA Loan programs, iii) AgrAbility Battleground to Breaking Ground, iv) Risk Management, and v) Business Planning. Program delivery focuses on increased community awareness by way of mass marketing, social networking, and information delivery both group and one-on-one via our network of extension staff. It also leverages our efforts by partnering with USDA and Community Based partners. Fifty eight percent of the individuals surveyed who attended the Battle Ground to Breaking Ground Workshop were U.S. Military Veterans or family members of military veterans. Agriculture and Natural Resources Extension Agents and Specialists executed a variety of delivery methods and reached 1400 socially disadvantaged and traditionally underserved agricultural producers; and assisted 321 with farm loan applications and business planning. As a result of these efforts, a total of 84 new, beginning and traditionally underserved producers were assisted and applied for \$5,456,250 in farm loans. Additional outreach programs focused on fruit and vegetable crop production to improve their economic sustainability. On-farm demonstrations concentrated on year-round specialty crop production using seasonal high tunnels, small plots, raised beds and container gardening. Due to the increased economic loss and devastation created by feral hogs, workshops have been continuously in demand. As a result of individual and group training, 770 feral hogs have been trapped yielding a potential estimated saving of \$154,000 in land, crop, and agricultural damage to farmers and ranchers.

Staff within the Community & Economic Development Unit provided workshop training and one-on-one technical assistance to individuals seeking funding to support small business development and homeownership. Staff continues to assist Hurricane Harvey victims through home loan and rehab applications, federally supported program applications such as the Small Business Administration (SBA), Federal Emergency Management Agency (FEMA), and Disaster Supplemental Nutrition Assistance Program (D-SNAP). Records show that 309 applications were submitted for home loans and rehabilitation 91 of which were approved for funding renovations totaling \$507,456. About 166 applicants received

assistance as a 1st time home buyer with low-interest mortgages totaling \$519,613. Additionally, \$1,036,000 in loans have been approved for small businesses and \$2,063,069 in small business and non-Harvey related home loans. Adults and more often youth from underserved communities have limited opportunities such as professional trainings that teach them the use of money, basic bookkeeping, budgeting, credit, and home-ownership. Records indicate that 392 youth were trained in entrepreneurship. As a direct result of this training, 57 youth have started selling products and providing services or plan to start a business. Thirty adults completed a financial literacy training. This training certified eligible enrollees allowing them access the Individual Development Account (IDA) savings match program. Participants enrolled in the IDA program accumulated more than \$36,000 to use for their higher education and home ownership. Extension agents in Liberty and Zavala Counties implemented the Businesses In Development (BID) program, a 12-week state contract training course. Workshops focused on training new and existing businesses on how to obtain and successfully execute State contracts. As a part of the BID program, 1,275 hours of training were conducted, 24 courses were taught, 198 HUB profiles were reviewed, 34-course participants and 30 new Historically Underutilized Businesses (HUBs) were established. Approximately \$425,320 in State contracts were submitted to the State of Texas for approval.

The National 4-H Science mission mandate is designed to address the following: unsolved worldwide social problems, a shortage of scientists and people understanding science in the United States, underrepresentation of women and minorities in science careers, and a need for a more diverse pool of trained scientists to frame and solve problems and educate others. Employment trends in the 21st century include Science, Technology, Engineering, and Math (STEM) careers and green jobs as indicated by the Workforce Investment Act. CAHS 4-H program reached 4,378 youth from more than sixteen counties. These youth were involved in hands-on STEM activities. Projects include gardening, photography, and robotics. Programs also included Hatching in the Classroom and Learn! Grow! Eat & Go! Minority Adventures in Ag field day was hosted in Dallas County and Mobile Ag Awareness Days took place in Harris County. Outreach efforts included organizing National Youth Science Day events (4-H2O, Eco-Bots, Rockets to the Rescue and Incredible Wearables) in various counties.

The 4-H and Youth Development unit engaged youth and adult volunteers in outdoor exploration, 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 achieved. Minorities Underrepresentation of minorities in STEM careers is 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; 40% of the participants reported improvement in their science skills. The Agribotics program increased 4-H youth enrollment in clubs and in competitions at the Houston Livestock Show and Rodeo, and in 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 met former astronauts while visiting Houston NASA Space Center. Junior Master Gardener Programs engaged 534 youth contacts in Cass and Travis Counties as part of 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 severe crisis facing families in Texas. Thus, the numbers of diabetes-related deaths and people enduring devastating health complications also continue to exert social and financial impact on health care. Planned programs serve to increase knowledge, change behaviors, and increase physical activities in the underserved communities. Topics addressed portion control, serving sizes, lifestyle changes, health consequences of weight management, and physical activity. Classes were conducted with targeted audiences at community centers, senior activity centers, senior wellness centers, school programs, and faith-based institutions. A series of 6 one-hour educational sessions provided unbiased information and interactive meetings entitled: Eating Smart and Being Active. To reinforce knowledge of participants, newsletters and educational materials on diabetes and youth nutrition were distributed monthly. The Eating Smart and Being Active program engaged about 3,900 session enrolled adults in Harris County. Choose Health Food Fun and Fitness; another signature nutrition

series implemented to teach youth the importance of healthy food choices. Data indicates that 2,594 youth received completion certificates for attending at least 6 classes. A total of 532 students were involved in various school nutrition outreach activities. Upon completion of these classes, 87% of the participants stated that they now understand that junk food or unhealthy snacks should be limited and eaten in moderation; 69% of the participants understand that drinking soda or high sugared beverages can cause weight gain and 97% of the participants stated that they now understand the warning signs of diabetes, therefore, they can make behavioral changes which will make a positive impact on their overall health.

There were 554 adults who graduated from the interactive 6-week series. This program also reached 2,199 through indirect teaching methods, and another 2,623 were contacted via indirect methods: health fairs, career events, and other means. PVAMU-CEP childcare conference trained 60 childcare providers. The childcare providers were able to receive up to 5 hours of continuing education credits amounting to 250 clock hours towards their license requirements. Step Up and Scale Down is a 12-lesson interactive program that provides nutrition information to people who desire to live healthier lifestyles. The program focuses on weekly motivation, group support teams, hands-on learning, and accountability to assist them achieve their goals.

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 sweet potato genomics and crop improvement that have facilitated the selection of high-yielding insect resistant purple and orange-colored sweet potato new lines; zero calorie sweetener 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 ethnic specialty organic fruits and vegetables that enjoy extensive markets in highly diverse urban areas 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. 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 afflicts the primary health of hundreds of millions in the U.S and globally. CARC plant research scientists developed a growing media mixture designed for optimal growth of cowpeas; the cowpea yield grown in this media showed was 3 times that of the yield cowpea grown on local soils. This project has armed CARC with original research-based scientific knowledge for confidently popularizing, encouraging, training and supporting cowpea cultivation by limited resource farmers, urban gardeners, and stakeholders. Using these special mineral mixes can substantially reduce cultivated lands and improve crop production.

The Food System of CARC addresses research-based food quality, food products, and food safety. 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 detection and monitoring of antibiotics residuals in goats milk and its byproducts. The tetracycline antibiotic assay of goat milk was completed, and 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. 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 to detect, 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 had a slower oxidization rate than the 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. Cooperative Agricultural Research Center Animal Scientists

evaluated and compared fresh and cooled goat semen processed with commercially available semen extenders, with or without animal protein, and utilizing computer-assisted sperm analysis. Semen diluents containing soy lecithin had a less detrimental effect on the straightness and linearity of the tracks of goat sperm than the diluents containing animal protein. Animal protein free semen diluents, containing soy lecithin, were found to be better suited for processing fresh and cooled goat sperm.

The Natural Resources and Environmental Systems (NRES) evaluated the performance of different cover crops treatments (legumes, grain, and legume-grain mixtures) grown in southeast Texas. Some of these treatments had positive impacts by reducing weed pressure and improving soil health. Scientists of the NRES in collaboration with other research scientists, faculty, and extension personnel have been working on a farm to table leafy green project. They studied the impact of organic amendments type and rates on crop nutrient uptake and leaching, soil carbon dioxide emission, water dynamics within and below the rootzone, seed germination, crop growth, crop nutrient content composition, crop yield, and quantifying the economic benefits of growing such crops under south east Texas' conditions. Results of the workshop's evaluation revealed that 81% of participants increased their level of understanding of seed germination and postharvest quality of collard greens. Seventy three percent of participants indicated that they would definitely increase leafy green vegetable consumption. Sixty percent of participants responded that they would definitely use conservation practices. Two thirds of participants were mostly to completely satisfy with the workshop (ongoing). Research scientist from the CAHS Water Team are finalizing the development of irrigation scheduling and water management tools for rural and urban users (ongoing). These Water Team members have also been evaluating different empirical methods for estimating daily reference evapotranspiration for use across Texas. These members also assessed irrigation water requirements for citrus across some of the major citrus producing areas in the world including Texas, Florida, and California under current and future climate scenarios. Results of this work indicated that future evapotranspiration and irrigation requirements are expect to vary substantially; thus, additional research should be conducted to explore potential mitigation and adaptation measures. Work has been done to: i) evaluate the performance of the Multi-Radar Multi-Sensor System over the Lower Colorado River, ii) evaluate the effect of land-use change on hydrologic response of a semi-urbanized watershed using physically based distributed model, and iii) develop a quantitative measurement methodology to determine the concentration of Manganese Oxide (MnOx) on two soils cape positions (Upland-Lowland, and Riparian Buffer-Wetland Boundary-Wetland). Additional members of the Water Team evaluated the effects of drought on crop production. Results showed that drought had a greater impact on winter wheat and corn, and lesser impact on cotton and sorghum production across Texas. Results also indicated that drought impact on crop production may be reduced by replacing water-demanding crops such as corn with drought-tolerant crops such as sorghum and expanding irrigation hectarage during drought periods. It may be beneficial for Texas agricultural production to increase the hectarage of sorghum and other grains especially during drought periods.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	381.0	74.5	148.9	34.0
Actual	415.8	63.0	198.3	32.9

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

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

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	6794348	4235988	8302423	5348159
Actual Matching	6794348	1756359	11836028	2342332
Actual All Other	50673693	0	32005988	0
Total Actual Expended	64262389	5992347	52144439	7690491

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	8733226	1167919	0	2148621

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 & Natural Resources 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 and Hunger
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%
	Total	100%	100%	100%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	15.0	4.0	10.0	0.0
Actual Paid	22.1	4.0	11.6	0.0
Actual Volunteer	0.0	38.0	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
361123	267255	477239	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
361123	110811	660258	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
2693335	0	377733	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 were not limited to workshops, one-on-one intervention, marketing clubs, cooperatives, popular press articles, extension publications, and other methods as needed. These educational approaches focused on the identified needs of those who participated 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 both on and off campus with dissemination efforts both on campus and at various research and extension centers across the state.

Collaborative efforts are also an important part of this area. Work with various commodity groups and other agencies are 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

One thousand four hundred socially disadvantaged and traditionally underserved agricultural producers were reached in program. One hundred fifty producers were helped with farm loan application assistance and/or business planning. As a result of these efforts, a total of 84 new, beginning and traditionally underserved farm producers were assisted to apply for \$5,456,250 in farm loans.

2. Brief description of the target audience

AgriLife Extension and AgriLife Research

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

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

Cooperative Extension Program

Our programs assisted a diverse audience, with emphasis on the under-served, 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?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	85954	535739	26854	0

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

Patent Applications Submitted

Year: 2017

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	0	89	89

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of group educational sessions conducted.

Year	Actual
2017	3380

Output #2

Output Measure

- # of research-related projects.

Year	Actual
2017	52

Output #3

Output Measure

- # of one-on-one technical assistance/consultations.
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 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	% producers that reports an increased knowledge on farm financial management plans and marketing plans to sustain their agribusinesses.
5	Number of producers receiving financial assistance thru USDA/FSA and other traditional Ag lenders.

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

Year	Actual
2017	80

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

AgriLife Extension & AgriLife Research

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

AgriLife Extension & AgriLife Research

A 2.5 year post survey was mailed during summer 2017, to participants of the 2015 Master Marketer program held in Amarillo, 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

AgriLife Extension & AgriLife Research

Results from survey questions indicated: an increase in the use of a marketing plan from 47% pre-Master Marketer to 93% post-Master Marketer, an increase in determining production costs and incorporating those into the marketing plan from 67% pre-Master Marketer to 93% post-Master Marketer, and an increase in building profit and growth needs into price targets from 33% pre-Master Marketer to 67% post-Master Marketer. The evaluation also showed an increase in participants using market fundamentals in developing their personal market outlook from 54%

pre-Master Marketer to 100% post-Master Marketer, an increase in their ability to manage price and production risk from a 4.3 pre-Master Marketer to a 6.3 (on a 7-point scale with 7 being excellent) post-Master Marketer, and knowing when to use forward cash contracting from 67% pre-Master Marketer to 92% post-Master Marketer. The 2015 Master Marketer education had an average individual economic impact of a 6.8% increase in gross farm income \$162,141/year for graduates of the Amarillo class.

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
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

Year	Actual
2017	85

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

AgriLife Extension & AgriLife Research

Low agricultural prices and reduced agricultural incomes over the last several years have increased farmers and ranchers awareness of a need for better risk management practices. Producers attending in-depth workshops learned 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

AgriLife Extension & AgriLife Research

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 40 hours in length such as Ranch Management University, Advanced Topics Series, Beef Cattle Replacement Selection and Economics of Rebuilding the Cow Herd Workshops, Cotton and Grain Risk Management and Marketing Workshops, Ranchers leasing Workshops, QuickBooks Pro for Farmers and Ranchers Workshops, Training Socially Disadvantaged Farmers, and similar workshops.

Results

AgriLife Extension & AgriLife Research

At Ranch Management University workshop in Spring and Fall 2017, participants showed that there was an (88% increase for the Spring class, 89% increase for the Fall class) in knowledge/understanding as a direct result of the workshops. In addition, 100% of respondents anticipate a positive economic benefit as a direct result of the information presented at the workshops. Over 550 ranchers participated in 8 multi-disciplinary Beef Cattle Replacement Selection and Economics of Rebuilding the Cow Herd Workshops. Evaluations indicated participants suggested knowledge improvements of from 39% to 134% across the 8 workshops. Economic benefits were estimated by participants of an average of \$10.53/cow, or \$685/operation. At the QuickBooks Pro for Farmers and Ranchers Workshop, pre- and post-test results indicated an 87% 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

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
2017	96

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

AgriLife Extension & AgriLife Research

The FARM Assistance model (financial simulation strategic planning tool) was used to complete 96 analyses for producers, for demonstrations or agent planning purposes. Survey respondents showed that as a result of participating in FARM Assistance, 89% claim a better understanding of the financial aspects of their own operations, and 96% 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

AgriLife Extension & AgriLife Research

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

AgriLife Extension & AgriLife Research

The outcome of client participation is measured through participant evaluations. Client assessments (over the last 2 years) of the FARM Assistance program indicate a very positive impact on management ability. As a result of participating in the FARM Assistance program, 89% claim a better understanding of the financial aspects of their operation and 96% 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 93% indicated that they would be more likely to use a formal financial analysis (like FARM Assistance) to help make decisions in the future. 96% of respondents indicated they would recommend FARM Assistance to another producer. Finally, in responding to anticipated economic value, respondents estimated an average \$27,833/person annual benefit to their operation as a result of their FARM Assistance participation.

4. Associated Knowledge Areas

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

Outcome #4

1. Outcome Measures

% producers that reports an increased knowledge on farm financial management plans and marketing plans to sustain their agribusinesses.

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	92

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

According to the 2012 USDA census 40% of the Texas farms are less than 50 acres in size. Many of them are operated by socially disadvantaged and traditionally underserved agricultural producers. Often, these producers find it difficult to manage their farming/ranching operations. These difficulties stem from their inability to obtain adequate financial resources as well as a lack of knowledge in the areas of farm management and marketing. Assisting this audience is important because they are a vital part of the Texas economy.

What has been done

Research based technical assistance and education was provided to assist our target audience in adopting efficient agri-business and marketing practices to improve the economic viability of their operations through enhanced financial literacy and improved risk management education programs. Programs were conducted on the following topics: Land Loss Prevention, AgrAbility Battleground to Breaking Ground Workshop, and Risk Management Education Training Series.

Results

Risk Management Education for Urban Producers Training Series: (7 part-training series) 52 participants completed at least 5 of the 7 sessions. Eighty five percent of the participants reported increase in knowledge of legal risk. All participants reported increase in knowledge of both marketing and production risks. Ninety two percent of the participants reported increase in knowledge of financial risk. Eighty five percent of the participants plan to adopt practices taught during the series.

Business Planning Webinar Training Series (4 Part Training Series) 7 participants. All the respondents reported an increase in knowledge about business planning. Eighty six percent of the respondents anticipate benefiting economically from the training. Seventy one percent of the respondents indicated that they have or will develop business plans. Battle Ground to Breaking Ground Workshop.

Fifty eight percent of the participants were U.S. Military Veterans or represented family members of military veterans. All the respondents anticipated benefit economically from information presented at the workshop. All the respondents would recommend the Battle Ground to Breaking Ground Workshop to others.

4. Associated Knowledge Areas

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

Outcome #5

1. Outcome Measures

Number of producers receiving financial assistance thru USDA/FSA and other traditional Ag lenders.

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	84

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

According to the 2012 USDA census 40% of the Texas farms are less than 50 acres in size. Many of them are operated by Socially Disadvantaged and traditionally underserved agricultural producers. Often, these producers find it difficult to manage their farming/ranching operations. These difficulties stem from their inability to obtain adequate financial resources as well as a lack of knowledge in the areas of farm management and marketing. Assisting this audience is important because they are a vital part of the Texas economy.

What has been done

Various workshops were conducted on USDA loan programs. Also conducted business planning webinar training series. The program delivery focuses on increased community awareness by way of mass marketing, social networking, and information delivery both group and one-on-one via our network of Extension staff. It also leverages our efforts by partnering with USDA and Community Based partners.

Results

The Cooperative Extension Program staff conducted educational programs and one-on-one consultations to:

One thousand four hundred socially disadvantaged and traditionally underserved agricultural producers were reached in program. One hundred fifty producers were helped with farm loan

application assistance and/or business planning.

Sessions on business and financial resource training were conducted at:

Texas Organic Farmers and Gardeners Conference (49 participants)

Minority Landowners Conference (120 Participants)

2 workshops were held in Rosenberg

USDA and state Governmental Assistance Program (70 participants)

Microloan Program Workshop (36 Participants)

As a result of these efforts, a total of 84 new, beginning and traditionally underserved farm producers were assisted to apply for \$5,456,250 in farm loans.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

Spring 2017 wildfires, and a summer 2017 hurricane redirected some program activities. In addition, budget reductions as a result of anticipated and actual reduced state appropriations in 2017 resulted in a reduction in FTEs available to carry out educational activities from 2016-2017 and that impact will carry into the future. While faculty picked up additional responsibilities, some educational opportunities were missed due to redirected efforts and reduced faculty numbers.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

AgriLife Extension & AgriLife Research

Clientele/participants involved in Master Marketer, Ranch Management University, Advanced Topic Series Workshops, Beef Cattle Replacement Selection and Economics of Rebuilding the Cow Herd Workshops, Cotton and Grain Risk Management and Marketing Workshops, Ranchers leasing Workshops, QuickBooks Pro for Farmers and Ranchers Workshops, Training Socially Disadvantaged Farmers, 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 selected

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.

Battle Ground to Breaking Ground Workshop (Workshop conducted on campus 37 attended - Tour conducted of campus day one 32 attended)

Of the twenty-nine participants surveyed who attended the Battle Ground to Breaking Ground Workshop: 58% of the participants were U.S. Military Veterans or represented family members of military veterans.

100% of the respondents anticipated benefit economically from information presented at the workshop.

100% of the respondents would recommend the Battle Ground to Breaking Ground Workshop to others.

Key Items of Evaluation

AgriLife Extension & AgriLife Research

Clientele/participants involved in Master Marketer, Ranch Management University, Advanced Topic Series Workshops, Beef Cattle Replacement Selection and Economics of Rebuilding the Cow Herd Workshops, Cotton and Grain Risk Management and Marketing Workshops, Ranchers leasing Workshops, QuickBooks Pro for Farmers and Ranchers Workshops, Training Socially Disadvantaged Farmers, 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 selected 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.

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%	20%	5%	0%
307	Animal Management Systems	20%	0%	20%	20%
308	Improved Animal Products (Before Harvest)	20%	10%	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%	0%	5%	10%
315	Animal Welfare/Well-Being and Protection	10%	0%	10%	0%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	35.0	7.0	20.0	9.0
Actual Paid	29.4	3.7	23.0	9.0
Actual Volunteer	0.0	37.0	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
480409	247211	1353359	1463022
1862 Matching	1890 Matching	1862 Matching	1890 Matching
480409	102500	1595171	640758
1862 All Other	1890 All Other	1862 All Other	1890 All Other
3582988	0	2875385	0

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 Cooperative Extension Program conducted Artificial Insemination Workshops, Agricultural Field Day five (5) sessions related to Livestock and Forage Management, Integrated Parasite Management, Livestock Demonstrations, Horn Fly Demos Four(4) demonstrations using the CO2 Vet Gun and One using ear tags. Cooperative Agricultural Research Center Animal Scientists evaluated and compared fresh and cooled goat semen processed with commercially available semen extenders, with or without animal protein, utilizing computer-assisted sperm analysis. Semen diluents containing soy lecithin had less detrimental effect on the straightness and linearity of the tracks of goat sperm than the diluents containing animal protein. Animal protein free semen diluents, containing soy lecithin, were found to be better suited for processing fresh and cooled goat sperm.

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. There are now nine courses now on eXtension Online Campus. Online certification course for Beef Quality Assurance Certification, Beef Literacy,, Beef Cattle Production, Cattle Nutrition-Feeds and Feeding, Cattle Value-Feeder Calf to Boxed Beef, Creating Value through Low-Stresss Livestock Handling, Market Cow Management, Master Cattle Transporter and Beef Health-Herd Management Calendar. One course of study in Beef Cattle Production ANSC 302 also utilizes eXtension. In addition, there are two online training courses in Horse Evaluation and Judging.

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	603247	1259227	135360	0

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

Patent Applications Submitted

Year: 2017
 Actual: 3

Patents listed

- * CONTROLLED RELEASE VACCINES AND METHODS FOR TREATING BRUCELLA DISEASES AND DISORDERS
- * SYSTEM AND METHOD FOR MONITORING AND ANALYZING ANIMAL HEALTH DATA
- * MONOCLONAL ANTIBODY AGAINST NOVEL EPITOPES OF FOOT-AND-MOUTH DISEASE VIRUS PROTEIN 3ABC AND USES THEREOF

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	0	172	172

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of group educational sessions conducted.

Year	Actual
2017	11275

Output #2

Output Measure

- # of research-related projects.

Year	Actual
2017	128

Output #3

Output Measure

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

Year	Actual
2017	150

Output #4

Output Measure

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

Year	Actual
2017	12

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 implement herd health best management practices.

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

Year	Actual
2017	81

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

AgriLife Extension & AgriLife Research

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

AgriLife Extension & AgriLife Research

Programs conducted include TAMU Beef Cattle Short Course, Texas Beef Quality Producer, Beef and Pork 101, Beef 706, Grassfed Beef Conference, Pasture Management Workshops, Bull Selection Workshops, Low-Stress Livestock Handling, Stockmanship schools, Southwest Dairy Conference, Vector Borne Disease, Mare/Foal Workshop. Youth programs included the 45th 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 153 county programs.

Results

AgriLife Extension & AgriLife Research

From measures including beef/dairy cattle, sheep/goats, horses and meats, 67% to 98% reported intent to adopt at least one best management practice. 59% to 92% expected to increase income or profitability by adoption of best management practices. 94% indicated they intended to adopt one or more of the practices associated with low-stress livestock handling and effective stockmanship practices. 78% to 92% of respondents indicated they would implement changes to their selection criteria as they purchase breeding stock. 60% to 91% reported elimination of non-productive practices, 73% indicated they would utilize hay analysis, and 91% use body condition

scoring as a management tool.

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 #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

Year	Actual
2017	87

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

AgriLife Extension & AgriLife Research

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

AgriLife Extension & AgriLife Research

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

and Pork 101, Beef 706, Grassfed Beef Conference, Pasture Management Workshops, Bull Selection Workshops, Low-Stress Livestock Handling, Stockmanship schools, Southwest Dairy Conference, Vector Borne Disease, Mare/Foal Workshop. Youth programs included the 45th 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 153 county programs.

Results

AgriLife Extension & AgriLife Research

69% to 100% reported improved decision making ability. 65% to 100% reported increased confidence in management ability. 89% indicated knowledge gains of 63% to 93% 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
-------------	---------------

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

AgriLife Extension & AgriLife Research

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

AgriLife Extension & AgriLife Research

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

Results

AgriLife Extension & AgriLife Research

62% to 100% of the participants in these programs indicated they would benefit economically through adoption of management practices outlined in these programs. Participants in Quality Assurance programs indicated increased income from \$22 to \$125 per head. Of the Beef 706 participants 90% indicated they would benefit economically by an estimated \$43.00/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 \$1.3 and \$23 million from adoption of management practices. Of those attending stockmanship trainings 86% 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 implement herd health best management practices.

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Livestock production is a major part of Texas agriculture. Of the states 248,809 farms, 136,132 (nearly 55%) raise cattle, sheep and goats. A significant portion of these operations are on small farms of less than 50 acres and are operated by Socially Disadvantaged and Traditionally Underserved agricultural producers. It is important that these producers learn proper livestock and forage management techniques to ensure a proper management of their agricultural enterprises.

What has been done

In collaboration with the Corporative Agriculture Research Center and other supporting organizations, i.e. USDA and Texas Dept. of Agriculture, outreach programs were conducted at the counties level and on PVAMU campus to address critical issues facing limited resource farmers and ranchers. Programing was conducted in the areas of spring and winter pasture management, and beef cattle selection. CEP agents conducted eight (8) on-farm demonstrations relating to horn fly control, parasite control in livestock and increase forage production.

Collaborated with CARC Staff in conducting two (2) workshops related to small ruminant parasites control and artificial insemination in goats.

Livestock related topics such as hay utilization and Integrated Parasite Management (IPM) were presented at our annual Agricultural Field Day which attracted over 150 producers to campus.

Results

Artificial Insemination Workshop (Workshop conducted on campus limited to 10 attendees). Seventy Seven three percent of the attendees polled said they will probably or definitely adopt one or more of the practices taught at the workshop.

Seventy five percent of the respondents anticipate benefiting economically as a direct result of what they learned at the workshop.

Agricultural Field Day (five (5) sessions were conducted related to Livestock and Forage Management)

Eighty percent of those surveyed reported an increased understanding of goat reproductive health and the importance of proper health management.

Eighty percent of surveyed participants increased their understanding of the difference between goats grazing on brush and those on improved pasture.

Seventy five percent of surveyed participants said they definitely would adopt the practices of implementing proper deworming and vaccination management.

Integrated Parasite Management (Workshops conducted on campus 53 attended) Ninety percent of the participants reported an increase in knowledge of pastures, lots and facility management to control internal parasite.

Ninety six percent of the participants reported that they will adopt the practices of proper management of pastures, lots and livestock.

Eighty three percent of the participants anticipated benefiting economically as a direct result of what they learned from the workshop.

Horn Fly Demos (Four (4) demo were conducted using the CO2 Vet Gun and One using ear tags)

Ninety percent reduction in Horn Fly count following initial treatment over the demonstration period (August 2017-November 2017).

Under normal conditions reduce fly count lasted for four to five weeks until fly count exceeded treatment through hold levels. Rainfall during treatment period appears to be the key limiting treatment factor.

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)
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. 2017 continued the ups and downs of livestock production in Texas. In many parts of the state historic record rainfall was recorded in the spring and early summer of 2017 while at the same time many areas experienced a very dry (if not record breaking dry) fall 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.

Key Items of Evaluation

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.

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%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	50.0	5.0	85.0	6.0
Actual Paid	48.6	5.2	74.0	9.0
Actual Volunteer	0.0	52.0	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
794145	347431	3975123	1463022
1862 Matching	1890 Matching	1862 Matching	1890 Matching
794145	144055	5486292	640760
1862 All Other	1890 All Other	1862 All Other	1890 All Other
5922899	0	8929852	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.

Cooperative Extension Program and Cooperative Agricultural Research Center

Cooperative Extension Program collaborated with the Cooperative Agricultural Research Center to conduct educational programs for County Agents; and subject matter workshops/field days/ tours for crop producers and future producers on relevant production issues and technologies spanning high tunnels, organic and container gardening. For example, we conducted workshops on container gardening and vegetable production during Our Colleges Annual Ag Field Day and followed it up with another workshop on container gardening at Waco for the Heart of Texas Urban Gardening Coalition. We also gave workshop presentations on-campus on high tunnel production of high value specialty vegetables and medicinal plants. We also supported Cooperative Extension to provide one-on-one technical assistance and training to individual clients and groups. We also conducted on-farm research with selected farmers to address relevant organic production challenges.

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

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?

SCSC 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

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	95623	1188015	63166	0

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

Patent Applications Submitted

Year: 2017
 Actual: 11

Patents listed

- * WHEAT LINES AND IMPROVED FOOD COMPOSITIONS
- * SORGHUM HYBRIDS WITH DELAYED FLOWERING TIMES
- * COMPOSITIONS, ORGANISMS AND METHODS FOR EXPRESSING A GENE PRODUCT IN PLANTS
- * MANIPULATING PHB GENES FOR PLANT BIOMASS ACCUMULATION AND YIELD
- * COMPOSITIONS, ORGANISMS, SYSTEMS, AND METHODS FOR ALTERING COLD, DROUGHT, AND SALT TOLERANCE IN PLANTS
- * VIS-NIR EQUIPPED SOIL PENETROMETER
- * GRASSES WITH ENHANCED STARCH CONTENT
- * METHODS, COMPOSITIONS, AND SYSTEMS FOR CULTURING AND CHARACTERIZING FASTIDIOUS PLANT MICROBES
- * COMPOSITIONS AND METHODS OF INSECT CONTROL
- * WHEAT, TAM 204
- * TAM 114, WHEAT

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	0	657	657

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of group educational sessions conducted.

Year	Actual
2017	5728

Output #2

Output Measure

- # of research-related projects.

Year	Actual
2017	237

Output #3

Output Measure

- # of one-on-one technical assistance/consultations.
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 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	# of farmers who gained knowledge on specialty/alternative cash crops investigated by research.
4	# of farmers who adopted or planning to adopt specialty/alternative cash crops investigated by research.

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
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	80

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

AgriLife Extension & AgriLife 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

Texas farms had sales of approximately \$726,000,000 according to the 2012 Census of Agriculture. Many of these producers are small, socially disadvantaged or traditionally underserved farmers. It is important that these audiences be provided with research based educational information that is scale appropriate to ensure that their operations continue to be profitable while providing a safe and secure products to consumers.

What has been done

AgriLife Extension & AgriLife Research

Extension specialists from the Soil and Crop Sciences Extension unit delivered almost 513 face-to-face educational activities resulting in nearly 40,000 direct contacts for the calendar year 2017. There was over \$4.75 million raised to support extension educational activities.

Cooperative Extension Program

Researched based scale appropriated educational programing and demonstrations were presented by CEP agents and specialists to address the needs of small and limited resource

farmers. These programs focused on fruit and vegetable crop production to improve the income of the targeted clientele. The programs also concentrated on year round specialty crop production on limited acreage using seasonal high tunnels, small plots, raised beds, and container gardening.

Results

AgriLife Extension & AgriLife 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.

Cooperative Extension Program

Seventy five percent of the participants surveyed stated that they will adopt practices such as utilizing high tunnels for fall vegetable production, high value crops, and grafted vegetable production. Nineteen percent report one or more practices already adopted.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

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

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Texas farms had sales of approximately \$726,000,000 according to the 2012 Census of Agriculture. Many of these producers are small, socially disadvantaged or traditionally underserved farmers. It is important that these audiences be provided with research-based educational information that is scale appropriate to ensure that they continue to be profitable with providing safe and secure products to consumers.

What has been done

Research-based scale-appropriate educational programming and demonstrations were presented by CEP agents and specialists to address the needs of small and limited resource farmers. These programs focused on fruit and vegetable crop production to improve the income situation of the targeted clientele. The programs also concentrated on year-round specialty crop production on limited acreage using seasonal high tunnels, the 43560 initiative (grossing \$1 per square foot), small plots, raised beds and container gardening.

Results

Ninety-one percent of the 99 respondents who attended the 15 workshops conducted reported an increased level of understanding and knowledge in practices at the workshop such as utilizing high tunnels for Fall Vegetable production, High Value crops, Medicinal Plant Production.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

of farmers who gained knowledge on specialty/alternative cash crops investigated by research.

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Cooperative Extension Program

The CAHS Specialty Crops Project Team has determined that growing high value specialty fruits and/or vegetables can be an effective and sustainable means for small acreage producers in Texas to diversify their farm operations and increase their incomes. As an integrated project, research and extension will be working with local farmers to evaluate options of growing a select group of high value specialty crops in Texas.

Cooperative Agricultural Research

Because the grain is dry, requiring minimal processing, and has long shelf life, it is a potentially favorite crop for production by limited resource farmers and urban gardeners. The market price for the dry grain is about \$0.40/lb, substantially higher than soybeans. The set-back is the low grain yield. Therefore, College of Agriculture and Human Sciences (CAHS) embarked on the research project on cowpea to optimize, double, and maximize its grain yield through the permutation of its biochemical pathways. CAHS has the expertise and biotechnology to double crop (medicinal plants, soybean, corn, peanut, vegetables) biomass yields.

What has been done

Cooperative Extension Program

Evaluated and determined suitable varieties of three high value fruits, five vegetables, one root crop and one herb for Texas conditions.

Provided hands-on training programs covering farm planning, developmental and diversification; production of the crops; marketing and useful USDA programs and services for project participants

Promoted production of the crops in Texas counties nearby the big urban areas in Texas.

Cooperative Agricultural Research

CAHS researchers developed a growing media in raised beds designed for optimal of cowpeas. Two popular varieties (California 5, and purple hull) were tested; they were fertilized with special mineral fertilizer mixes prepared by the researchers.

CARC plant research scientists developed a growing media mixture designed for optimal growth of cowpeas; the cowpea yield grown in this media showed was 3 times that of the yield cowpea grown on local soils. This project has armed CARC with original research-based scientific knowledge for confidently popularizing, encouraging, training and supporting cowpea cultivation by limited resource farmers, urban gardeners, and stakeholders. Using these special mineral mixes can substantially reduce cultivated lands and improve crop production.

Results

Cooperative Extension Program

Two hundred nine participants surveyed who attended 10 workshops conducted reported an increased level of understanding and increased knowledge in practices of producing specialty crops such as Grafted vegetables, Medicinal Plant Production and Sorrel.

Cooperative Agricultural Research

the cowpea yield grown in this media showed was 3 times that of the yield cowpea grown on local soils. This project has armed CARC with original research-based scientific knowledge for confidently popularizing, encouraging, training and supporting cowpea cultivation by limited resource farmers, urban gardeners, and stakeholders. Using these special mineral mixes can substantially reduce cultivated lands and improve crop production.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources
206	Basic Plant Biology

Outcome #4

1. Outcome Measures

of farmers who adopted or planning to adopt specialty/alternative cash crops investigated by research.

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	30

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The CAHS Specialty Crops Project Team has determined that growing high value specialty fruits and/or vegetables can be an effective and sustainable means for small acreage producers in

Texas to diversify their farm operations and increase their incomes. As an integrated project research and extension will be working with local farmers to evaluate options of growing a select group of high value specialty crops in Texas.

What has been done

Evaluated and determined suitable varieties of three high value fruits, five vegetables, one root crop and one herb for Texas conditions.

Provided hands-on training programs covering farm planning, developmental and diversification; production of the crops; marketing and useful USDA programs and services for project participants. Promoted production of the crops in counties with higher poverty rates adjacent to large urban areas in Texas.

Results

Thirty farmers have been recruited to be involved in the project by growing specialty crops.

4. Associated Knowledge Areas

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

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

New Technologies and Techniques in Crop Production

Every year, farmers across the state face new challenges for crop production. To meet the needs of these producers, numerous row-crop tours and update meetings are held by AgriLife Extension to educate growers on the latest technologies and techniques that can help overcome these obstacles. At one such event held in Colorado County in June, attendees were presented with the latest information on weed management and crop variety selection. Fifty-five of the 91 attendees completed surveys to help gauge their increase in understanding and intention to adopt recommended practices.

- 63% indicated an increase in their understanding of the value and limitations of new transgenic crop technologies.
- 68% indicated an increase in their understanding of management strategies for herbicide resistant weeds.
- 67% reported intent to adopt AgriLife Extension recommendations for choosing crop varieties for next year.
- 78% indicated an intent to adopt AgriLife Extension recommended practices for managing herbicide resistant weeds.

Respondents reported an average anticipated economic benefit of \$6.42 per acre. Given the acreage managed by these respondents, this represents a total economic benefit of \$438,546.

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 155 formal educational meetings are in excess of 9,000 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.

Corn Herbicide Research and Extension Efforts

On the Texas High Plains, irrigated crop production is transitioning from irrigation at 100% of the crop water demand to limited irrigation as well as to dryland production. As production potentials decline with decreased irrigation, production inputs such as herbicides are reassessed in order to maximize net returns. Because intensive herbicide programs can cost producers more than \$100 per acre, under limited irrigation and dryland production, producers often minimize herbicide expenses by using lower application rates,

generic herbicides, and relying on standard triazine and growth regulator chemistries. However, under heavy weed pressure, water and nutrient resources are partitioned by weed species resulting in reduced economic yield further reducing the potential net return. Results from the 2016 Texas Panhandle Corn Herbicide efficacy trials have been presented to over 600 producers at 10 Extension programs in 2017. Compared to non-treated controls, Bushland corn herbicide trials indicate optimizing herbicide management can increase grain production by 250 bushels per acre. This translates to an increase in 8 million bushels, which potentially generates an additional \$303 million for regional corn farmers if applied to all High Plains corn acres.

Key Items of Evaluation

See above

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Water & Natural Resources Management

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	0%	45%	0%	25%
111	Conservation and Efficient Use of Water	50%	20%	50%	25%
112	Watershed Protection and Management	50%	5%	50%	25%
125	Agroforestry	0%	25%	0%	0%
132	Weather and Climate	0%	5%	0%	25%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	20.0	3.0	10.0	8.0
Actual Paid	24.0	3.0	18.4	7.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
392170	200441	1043899	1137907
1862 Matching	1890 Matching	1862 Matching	1890 Matching
392170	83108	1335402	498369
1862 All Other	1890 All Other	1862 All Other	1890 All Other
2924889	0	3669186	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

AgriLife Extension and AgriLife Research

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 and Extension Program

The Natural Resources and Environmental Systems (NRES) evaluated the performance of different cover crops treatments (legumes, grain, and legume-grain mixtures) grown in southeast Texas. Some of these treatments had positive impacts by reducing weed pressure and improving soil health. Scientists of the NRES in collaboration with other research scientists, faculty, and extension personnel have been working on a farm to table leafy green project. They studied the impact of organic amendments type and rates on crop nutrient uptake and leaching, soil carbon dioxide emission, water dynamics within and below the rootzone, seed germination, crop growth, crop nutrient content composition, crop yield, and quantifying the economic benefits of growing such crops under south east Texas' conditions. Results of the workshop's evaluation revealed that 81% of participants increased their level of understanding of seed germination and postharvest quality of collard greens. Seventy three percent of participants indicated that they would definitely increase leafy green vegetable consumption. Sixty percent of participants responded that they would definitely use conservation practices. Two thirds of participants were mostly to completely satisfied with the workshop (ongoing). Research scientist from the CAHS Water Team are finalizing the development of irrigation scheduling and water management tools for rural and urban users (ongoing). These Water Team members have also been evaluating different empirical methods for estimating daily reference evapotranspiration for use across Texas. These members also assessed irrigation water requirements for citrus across some of the major citrus producing areas in the world including Texas, Florida, and California under current and future climate scenarios. Results of this work indicated that future evapotranspiration and irrigation requirements are expect to vary substantially; thus, additional research should be conducted to explore potential mitigation and adaptation measures. Work has been done to: i) evaluate the performance of the Multi-Radar Multi-Sensor System over the Lower Colorado River, ii) evaluate the effect of land-use change on hydrologic response of a semi-urbanized watershed using physically based distributed model, and iii) develop a quantitative measurement methodology to determine the concentration of Manganese Oxide (MnOx) on two soils cape positions (Upland-Lowland, and Riparian Buffer-Wetland Boundary-Wetland). Additional members of the Water Team evaluated the effects of drought on crop production. Results showed that drought had a greater impact on winter wheat and corn, and lesser impact on cotton and sorghum production across Texas. Results also indicated that drought impact on crop production may be reduced by replacing water-demanding crops such as corn with drought-tolerant crops such as sorghum and expanding irrigation hectarage during drought periods. It may be beneficial for Texas agricultural production to increase the hectarage of sorghum and other grains especially during drought periods.

Peer-reviewed articles and applied research outreach materials are some of the venues through which research findings were disseminated to different stakeholders within Texas and across the nation and globally. The work of Cooperative Agricultural Research Center (CARC) and Cooperative Extension Program (CEP) was conducted jointly where research-based information was generated and then transferred to clientele. Continue development of extension resources such as articles, fact sheets, bulletins, and peer-reviewed articles.

2. Brief description of the target audience

AgriLife Extension and AgriLife Research

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

Cooperative Agricultural Research and Extension Program

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.

3. How was eXtension used?

SCSC 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

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	179097	1429251	88727	0

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

Patent Applications Submitted

Year: 2017

Actual: 4

Patents listed

- * METHOD AND SYSTEM FOR REDUCTION OF IRRIGATION RUNOFF
- * METHODS FOR TREATING SELENOCYANATE IN WASTEWATER
- * HYBRID ACTIVATED IRON-BIOLOGICAL WATER TREATMENT SYSTEM
- * ACTIVATED HYBRID ZERO-VALENT IRON TREATMENT SYSTEM AND METHODS FOR GENERATION AND USE THEREOF

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	0	256	256

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of group educational sessions conducted.

Year	Actual
2017	5447

Output #2

Output Measure

- # research-related projects.

Year	Actual
2017	72

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.
3	% of participants who report an increased knowledge of best management practices related to cover crops, nutrient management, micro irrigation and water capture.
4	% of participants who adopted best management practices related to cover crops, nutrient management, micro irrigation and water capture.
5	% of participants who report an increased knowledge of best management practices related to soil and water management.
6	% of participants who report the plan to or have adopted best management practices related to soil and water management.

Outcome #1

1. Outcome Measures

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

Not Reporting on this Outcome Measure

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

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	80

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

AgriLife Extension & AgriLife Research

Water quantity and water quality are the most critical issues facing Texas and its citizens. The Texas A&M AgriLife Extension Soil and Crop Science Extension Unit has several programs designed to help educate citizens regarding water conservation practices and methods to reduce bacterial contamination of Texas waterbodies.

What has been done

AgriLife Extension & AgriLife Research

Extension specialists from the Soil and Crop Sciences Extension unit delivered almost 350 face-to-face educational activities resulting in over 40,000 direct contacts for the calendar year 2017. There was approximately \$1.48 million raised to support extension educational activities.

Results

AgriLife Extension & AgriLife 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 the conservation of water and

aspects impacting water quality. Positive impacts have increased the public's awareness regarding water conservation and quality in Texas. With an ever increasing per capita demand for resources, Texas A&M AgriLife Extension Service personnel will play an increasingly important role in how Texans use our limited water resources, and the overall well-being of Texas citizens and beyond.

4. Associated Knowledge Areas

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

Outcome #3

1. Outcome Measures

% of participants who report an increased knowledge of best management practices related to cover crops, nutrient management, micro irrigation and water capture.

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Research at the NRES of the CARC enables decision-makers, farmers, ranchers, natural resource and environmental managers to make informed decisions and plan effective management practices to deal with cover crops, nutrient management, and irrigation issues. Eight students actively participated in applied research activities and gained practical skills on monitoring and measuring soil CO₂ flux, the fate of nutrients uptake and leaching, irrigation water uptake and drainage, developing irrigation scheduling tools, and estimating irrigation water requirements of different crops. Several of these students are currently employed.

Cover crops are known for their benefits to farmers and ranchers since they can improve soil quality and health, suppress weeds, reduce pollution and erosion among other environmental benefits. However, information on the most suited cover crop for southeast Texas is lacking.

Thus, this study evaluated the performance of four different cover crops.

Measurement of greenhouse gas flux such as CO₂ from soil and the atmosphere is important to understand the critical drivers of climate change and environmental quality. It is not clear which

agricultural practices have more or less contributions to the climate change and environmental quality. Measuring CO₂ flux for particular agricultural practices will help decision makers to use the findings in climate mitigation policies and environmental quality assessment. The irrigation scheduling tool will help increase irrigation water use efficiency in agricultural crops and urban landscape in Texas, eliminating over and under irrigation applications.

What has been done

Field experiments were conducted to evaluate the performance of four different cover crops grown in southeast Texas. The study monitored crop growth parameters, weed pressure, and soil CO₂ flux. Water allocation model was used to estimate current and future water requirements of different crops. Alpha version of irrigation scheduling tool was developed. A well-equipped testbed was developed to monitor CO₂ and hydrometeorology at the University Farm. Research scientists and students presented their research findings at local, national, and international workshops and conferences. The NRES research team also disseminated research findings through peer reviewed journal articles. In addition, NRES team has participated in the Research Extension Apprentice Program (REAP), Youth Leadership Laboratory (YLL), Jr. Youth Leadership Lab, AgDiscovery, Research Experiences for High School Students, Research Experiences for Undergraduate Students, College of Agriculture Summer Jump Start Program to educate K-12 students from different schools, undergraduate students and other stakeholders in the state.

Results

The NRES research team increased knowledge of researchers, students and other stakeholders on performance of cover crops grown in southeast Texas, spatial and temporal variations of CO₂ in different cover crops, potential impact of climate change on irrigation requirements of different crops, and effective water resources management through hands-on activities and laboratory and modeling experience. Eight graduate and undergraduate students were trained in conducting quality and problem-solving research. The research team also increased knowledge and awareness on soil health and nutrients monitoring and evaluation, irrigation water requirements for different crops grown in Texas. In addition, NRES research team enhanced knowledge of youth, K-12 students and University students about cover crops, nutrient management, micro-irrigation and water use efficiency.

4. Associated Knowledge Areas

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

Outcome #4

1. Outcome Measures

% of participants who adopted best management practices related to cover crops, nutrient management, micro irrigation and water capture.

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

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

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Research at the NRES of the CARC enables decision-makers, farmers, ranchers, natural resource and environmental managers, and individuals focused on ecological conditions in seasonally wet and wetland soil ecosystems to make informed decisions and plan effective management practices to deal with soil quality and soil health, surface and groundwater quantity and quality issues. A greater portion of groundwater resource is used for irrigation in agriculture. The impact of land-use change which alters the permeability of the soil particularly in semi-arid and drought-prone areas has a major impact on groundwater recharge. Study on the impact of land-use and climate changes on groundwater storage in different climate zones in Texas will help to determine the pumping rate and groundwater availability for irrigation and municipal use. Climate change, land-use change, and urbanization also affect runoff responses of watersheds. Physically based distributed models will help to understand the impacts of land-use and potential climate change on watershed runoff responses.

The delineation of the wetland boundary has both an economic and land-use importance to society, because of the importance of the ecological functions of wetland ecosystems. Determination of the wetland boundary can be an ill-defined process in soil systems that have limited expression of iron redoximorphic features, so a new method was focused on the

occurrence of manganese in seasonally wet and wetland systems.

Six students actively participated in applied soil and water management related research activities and gained practical water management skills. Several of these students are currently employed.

What has been done

Field and lab experiments were conducted on effective water resources management practices through soil moisture monitoring and evaluation, groundwater monitoring and evaluation, soil samples collection from different soilscapes and analysis, hydrological modeling from field scale to watershed scale, and analysis of groundwater levels, precipitations and other climate variables at different climate zones. Research scientists and students presented their research findings at local, national, and international workshops and conferences. The NRES research team also disseminated research findings through peer-reviewed publications. In addition, NRES team has participated in the Research Extension Apprentice Program (REAP), Youth Leadership Laboratory (YLL), Jr. Youth Leadership Lab, AgDiscovery, Research Experiences for High School Students, Research Experiences for Undergraduate Students, College of Agriculture Summer Jump Start Program to educate K-12 students from different schools, undergraduate students and other stakeholders in the state.

Results

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. Six graduate and undergraduate students were trained in conducting quality and problem-solving research. The research team also increased knowledge to understand the impact of land-use change and climate variability on groundwater storage, streamflow, and other hydrological processes; performance of Multi-Radar Multi-Sensor Precipitation; Hurricane Harvey and potential mitigation measures to reduce flooding; and delineating wetland boundaries using Manganese Oxide (MnOx) levels. 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

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

Outcome #6

1. Outcome Measures

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

2. Associated Institution Types

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

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	50

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

One of the most negative environmental impacts resulting from urbanization is water pollution and stream erosion resulting from increased urban stormwater. Urbanization causes increased volumes, flow rates and contaminant loadings of stormwater. Recent development in stormwater management involves low impact development (LID) approaches to stormwater management such as rain gardens, green roofs, rainwater harvesting, and porous pavements in urban areas that address water quality as well as water quantity.

What has been done

Several large green infrastructure projects were designed, constructed and implemented. Presentations and practitioner training related to these projects included a 50-space permeable pavement parking lot; 10,000 gallon capacity rainwater harvesting systems, and other runoff reduction structures in public greenspaces.

Results

Research indicates these systems are expected to reduce runoff by 50-70%, Nitrate by 50-80%, TSS by 50-90% and e. coli by 70% from their respective watersheds. The projects had economic impacts resulting from reduced need for detention, and decreased erosion and stream pollution. In addition, Green Infrastructure Businesses benefited from these projects including engineering firms and Landscape Architecture firms who will design such projects, to construction companies that learned how to build such systems and could benefit further in the future.

4. Associated Knowledge Areas

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

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.

In late August 2017, the Texas Gulf Coast was struck by Hurricane Harvey. Historic flooding was experienced in Houston and other areas, resulting in many private water wells being inundated with flood waters. Our TWON team performed the following activities:

- Delivered information on water well safety following flooding (through webpages, press releases, interviews, newsletters, etc.)
- Provided and facilitated private water well testing through county Extension offices
- Worked with the Joint Field Office (JFO) in Austin to develop a consensus well disinfection protocol
- Developed a well disinfection educational program
- Well testing and well disinfection class efforts continue

Because templates had already been developed, TWON was able to issue press releases regarding private water well safety as the hurricane was occurring. Through collaboration with and expansion of an ongoing project in Louisiana being conducted by Virginia Tech University, TWON was able to offer free private water well testing immediately following the hurricane.

Lone Star Healthy Streams

Bacteria is the leading cause of water pollution in the state of Texas. According to the 2014 Texas Water Quality Inventory and 303(d) List, 589 waterbodies were impaired in Texas; of these, approximately 43% of the impairments were due to excessive bacteria.

Bacteria impairment is a serious problem. When found in water, fecal bacteria can act as indicator species and can suggest the presence of pathogenic organisms like bacteria,

viruses, or parasites that can cause waterborne illnesses including typhoid fever, dysentery, and cholera. In addition to the potential health risks, elevated bacteria levels can also cause unpleasant odors, cloudy water, and increased oxygen demand.

Across the state, water quality management agencies and local stakeholders are helping combat bacteria pollution through management strategies and watershed plans that help restore water quality. One vital component of this approach, however, is educating citizens about bacteria, its common sources, and methods that can be used to help minimize or prevent bacteria from entering our waterways.

In response to this critical educational need, the Lone Star Healthy Streams (LSHS) program was created to inform, and thereby engage landowners in actively managing their land and utilizing effective conservation practices that specifically help reduce bacterial loading to Texas streams and rivers. During 2017, 10 workshops were held across the state in impaired watersheds with 160 stakeholders attending and indicating a 97% customer satisfaction with the program.

Geronimo and Alligator Creek Watershed Protection Plan

Goal: To effectively coordinate the implementation of the Geronimo and Alligator Creeks Watershed Protection Plan (GACWPP). Geronimo Creek is listed for non-support of the water quality standard for contact recreation in the Texas Integrated Report of Surface Water Quality. The goal of the GACWPP is to restore water quality in the creeks.

- Total Contacts: 7,656
- Contact Hours: 4,025

Programs conducted

- 5th Annual Geronimo and Alligator Creeks Clean Up Event- 198 volunteers removed 1,950 pounds of trash and debris from the creek banks and area roadways.
- Two Homeowner Maintenance of Septic System workshops- 110 homeowners were certified to maintain their aerobic septic systems, which will help protect area creeks from pollution.
- Lone Star Healthy Streams- 49 landowners were educated regarding methods to protect Texas waterways from bacterial contamination originating from livestock operations and feral hogs that may pose a serious health risk to Texas citizens.
- Healthy Lawns Healthy Waters- 40 homeowners were shown ways to improve and protect water quality of area rivers and creeks, by enhancing their awareness and knowledge of best management practices, in regard to lawn and turf management.
- Texas Well Owner Program- 120 private water well owners were taught about their local groundwater sources, septic system maintenance, well maintenance, water conservation, water quality, and water treatment for their water well.
- Low Impact Development Workshop- 38 decision makers were introduced to the concept of low impact development practices and structures, in order to reduce impacts of stormwater runoff from urban areas.
- Soil Testing Campaign- 28 landowners submitted soil samples for lab analysis of nutrient concentrations. Results were returned and interpreted, in order for landowners to properly apply the correct type of fertilizer in the most appropriate manner, which will protect surface water quality of area creeks and rivers.

Texas Watershed Stewards

Texas Watershed Stewards (TWS) is a science-based training program designed to educate stakeholders about watersheds, types and sources of water pollution, water law, state and

federal water agencies and organizations, best management practices (BMPs) that minimize or prevent water impairment, and community-driven watershed planning. The program was developed through a collaborative effort between the Texas A&M AgriLife Extension Service and the Texas State Soil and Water Conservation Board, in cooperation with other state and federal water and natural resource management and planning agencies, including the Texas Commission on Environmental Quality, local Soil and Water Conservation Districts, Texas Water Development Board, state River Authorities, Texas Forest Service, Texas Department of Agriculture, United States Department of Agriculture, Natural Resources Conservation Service, and others. TWS is delivered as an intensive, one day, seven hour or four hour training, that utilizes a variety of teaching aids (PowerPoint slides, videos, hands-on stations) and group participation to engage participants in the learning process. Most importantly, the program empowers citizens to become actively involved in local watershed planning efforts to improve and protect their water resources.

Implementation of the TWS program has facilitated initiation of new water quality improvement projects, increased stakeholder involvement in existing watershed protection efforts, and has motivated individual citizens to take greater personal responsibility for protection of their water resources.

Program effectiveness was evaluated using pre- and post-tests at TWS events to determine changes in knowledge and understanding, as well as intentions to adopt appropriate Best Management Practices (BMPs). A 6-month follow-up evaluation was employed to assess actions taken and to verify BMP adoption. Overall, knowledge gained by individuals participating in the training was an impressive 33.8%. Additionally, over 64% of participants reported an intention to adopt BMPs to help protect their watershed, and 97% believed the TWS program enabled them to be a better steward of their watershed. Results of the 6-month, follow-up evaluation showed that 83% of respondents have adopted one or more BMPs. Over 85% of respondents indicated they now more closely monitor individual actions that might impact water quality, and 83% have either adopted or maintained management practices that have a positive impact on water quality. Finally, an overwhelming 98% of respondents were satisfied with the TWS training materials, and 81% have used those resources since the training.

Ten Texas Watershed Steward workshops were delivered in impaired watersheds of Texas during the 2017 calendar year, reaching 319 stakeholders through 1,276 contact hours.

Key Items of Evaluation

See above

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%
	Total	100%	0%	100%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	17.0	0.0	15.0	0.0
Actual Paid	16.0	0.0	17.3	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
261447	0	501751	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
261447	0	708491	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1949926	0	4268196	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

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	37118	156184	4721	0

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

Patent Applications Submitted

Year: 2017
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	0	106	106

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of group educational sessions conducted.

Year	Actual
2017	1173

Output #2

Output Measure

- # of research-related projects.

Year	Actual
2017	88

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

Year	Actual
2017	53

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 Texas A&M AgriLife Extension Range Specialists conducted a 4-hour workshop during the 2017 Texas A&M Beef Cattle Short Course to demonstrate equipment needs and application methods for brush species featured in Extension Brush Busters publications.

Results

One-hundred ninety-seven landowners participated in this workshop. A retrospective-post evaluation was conducted with this workshop. Increase in understanding of the nine topics presented averaged 64% with a range of 35 to 96%. Participants represented 50 counties and reported owning or operating 283,877 acres. One-hundred percent of those returning the evaluation indicated that 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

KA Code	Knowledge Area
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

Year	Actual
2017	41

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 2017 Texas A&M Beef Cattle Short Course featuring presentations dealing with Wildfire Prevention & Mitigation, Using Drones to Manage Your Operation, the Legal Way, Controlling Noxious Brush & Weeds, Preparing for Drought (Grazing management), Replanting a Pasture: Is it economically feasible, or just risky?, and Financial Risk Reduction Program Opportunities. Presentations were made by four Texas A&M AgriLife Extension Range Specialists and FSA personnel.

Results

One-hundred eighty-seven landowners participated in this workshop. A retrospective-post evaluation indicated an average increased understanding of 9 teaching points evaluated of 58% with a range of 35 to 126%. Total estimated acres represented was 186,439. Ninety-six percent of those returning the evaluation indicated that information received would help them make better management decisions. Intent to adopt management practices was: drone-use (21%), fireproof structures (30%), fuel mitigation (42%), stocking rate adjustments for cow-size and productivity (39%), and weed and brush management (51%).

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Texas A&M AgriLife Extension Range Specialists provide support to County Programs in a variety of ways including applied research/demonstration support, problem solving and presentations at county educational events. During 2017, these specialists made 278 presentations with 15,358 face-to-face contacts supporting adult educational events. Twenty-three educational events were conducted for youth with 1060 face-to-face contacts.

Additionally, 166 existing county-level applied research projects were evaluated in 129 counties and 86 new projects established in 75 counties during 2017. Eighteen group trainings involved 219 Extension-faculty. The Texas Range Facebook Page had 106 educational posts, 149,277 views, and 1509 followers. Six new and two revised Extension publications, 15 papers/proceedings/posters, and 15 videos were completed. Clientele-estimated economic benefit through 18 evaluated educational events involving Range Specialists was \$40.4 million on over 2.9 million acres.

Below is an example educational event evaluation.

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 18, 2017 with a total of 12 distance county offices/workshops and 1 face-to-face local county. This workshop included 5 Specialists and 8 topics/presentations. Results: 82 Participants (7 face-to-face, 75 distance). On average, responding participants owned 726 acres, or 59,532 acres represented overall. There was a 57% increase in participant knowledge of the uses for and rules behind using drones for ranch work. 34% of participants plan to use drones in the future for their ranching operation (only 4% already adopted). 40% of participants increased their knowledge about establishment and maintenance costs associated with pasture seeding options. 60% of participants intend to consider potential cost returns presented in the symposium before seeding a pasture. Participants valued the program at over \$3.4

2017 Texas A&M University and Prairie View A&M University Combined Research and Extension Annual Report of Accomplishments and Results
million.

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%
	Total	100%	0%	100%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	5.0	0.0	1.5	0.0
Actual Paid	0.5	0.0	3.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
8170	0	78968	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
8170	0	183260	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
60935	0	472578	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 to mitigate effects of weather and climate change.

AgriLife Research

The primary research response to this pressing issue is to generate reliable, verifiable data regarding carbon sequestration, carbon cycling, and interrelationships of cropping systems, livestock production and climate change. Nitrogen use in agriculture is the main cause for increasing N₂O concentrations globally. N₂O is also the single most ozone depleting chemical of the 21st century. Our mitigation research addresses a novel idea that certain genotypes of food crops such as sorghum could possess the ability to suppress nitrification in soils through secretion of nitrification inhibitors, thus reducing N₂O emissions from agricultural soils. Our research with livestock production systems includes investigations of the impact of ionophores, condensed tannins and saponins fed in combination with distillers grains to suppress methane emissions. AgriLife Research will leverage and share research findings by joining other states in climate monitoring networks such as AmeriFlux and/or Drought-Net.

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?

Articles and courses from the USDA-NIFA project, "Animal Agriculture and Climate Change (AACC)", (completed February 2017) are available at <http://articles.extension.org/pages/60702/animal-agriculture-and-climate-change>. This page include self-study topics, articles, classroom materials, blog entries, case studies and other resources.

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

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

Patent Applications Submitted

Year: 2017

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	0	55	55

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of educational programs conducted.

Year	Actual
2017	0

Output #2

Output Measure

- # of research related projects.

Year	Actual
2017	23

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.

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

Year	Actual
2017	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

Deliverables/products included meetings and publications:

Refereed Journal Publications

Smith, D., Welch, M., Bennett, K., Padgham, J. & Mohtar, R. (2017). Building a WEF Nexus Community of Practice (NCoP). *Curr Sustainable Renewable Energy Rep* (2017) 4:168-172. DOI 10.1007/s40518-017-0080-6.

Article (in review) submitted to *Journal of Extension* April 1, 2017: Cummins, G., Smith, D., Callison, C. & Mukhtar, S. Real-time continuous response assessment to evaluate the

effectiveness of extension education products and messaging.

Article (in review) submitted to Journal of Human Sciences and Extension July 27, 2017:
Wandersee, C., Telg, R., Smith, D., & Mukhtar, S. (2017). Cattle Producers and Climate Change Conversations: Assessing Workshop Effectiveness in Preparing Communicators to Discuss a Contentious Scientific Topic.

Bulletin/Technical/Special Reports

Smith, D. & Mukhtar, S. Final Report: National Facilitation of Extension Programming in Climate Change Mitigation and Adaptation for Animal Agriculture to University of Nebraska - Lincoln project leads February 28, 2017.

Conference Proceedings and Meeting Papers

Smith, D., Mukhtar, S., Cummings, G. & Callison, C. (2017). Continuous Response Measurement: A Tool to Assess the Effectiveness of Agricultural GHG Mitigation Messaging among Extension Educators. Proceedings of the 2017 Waste to Worth Conference. Cary, NC.

Results

Key Findings from the Cattle and Climate Conversations Workshop Assessment

- o A statistically significant increase was found in levels of comfort for facilitating the application of university research, hosting programs, and delivering presentations on climate-change based information.
 - o Reported belief in climate change and the causes were mixed with most attendees indicating they believed climate change was occurring as a result of natural changes in the environment and human activities.
 - o Attendees (n = 14) indicated they should be a neutral source of factual information.
 - o About half of the attendees (n =14) said they might consider changing their approach to communicating climate change with livestock producers as a result of attending the conference.
 - o Historic Climate Trends and Future Projections, presented by Dr. Nolan Doesken, received a mean benefit score of 3.52, the highest level of perceived benefit of all workshop sessions.
 - o The workshop had a mean benefit score of 3.00, indicating a high level of perceived benefit from the workshop.
- Seven attendees indicated that their communication style had changed a moderate amount, and four had made small changes in their communication style about climate change by the second survey to assess implementation of new communication strategy.
- o Facilitated discussion analysis revealed most attendees preferred not to address the topic of climate change directly, but preferred to focus on other terminology including "climate variability."

4. Associated Knowledge Areas

KA Code	Knowledge Area
132	Weather and Climate

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Key Findings from the Cattle and Climate Conversations Workshop Assessment

- o A statistically significant increase was found in levels of comfort for facilitating the application of university research, hosting programs, and delivering presentations on climate-change based information.
- o Reported belief in climate change and the causes were mixed with most attendees indicating they believed climate change was occurring as a result of natural changes in the environment and human activities.
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- o Seven attendees indicated that their communication style had changed a moderate amount, and four had made small changes in their communication style about climate change by the second survey to assess implementation of new communication strategy.
- o Facilitated discussion analysis revealed most attendees preferred not to address the topic of climate change directly, but preferred to focus on other terminology including "climate variability."

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%
	Total	100%	0%	100%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	1.0	0.0	1.0	0.0
Actual Paid	1.0	0.0	5.4	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
16340	0	298427	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
16340	0	537355	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
121870	0	537356	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

AgriLife Extension

Agricultural producers and the energy industry have a keen interest in the role that agriculture will play in contributing to renewable energy for America, and are looking to AgriLife Extension to help define which second generation crops will fit this market and how they will be produced. Texas is a major livestock feeding state and faces a feed grain deficit at current production levels, making second generation crops the only practical feed stocks for bioenergy. AgriLife Extension has responded through applied research and demonstrations of candidate oilseed and lignocellulosic feedstock crops; holding workshops and field days for agricultural producers; and by meeting with commercial interests from the energy sector to interpret potential for a variety of plant based bioenergy options. As crop-based bioenergy other than the traditional ethanol from feed grains is still in its infancy, actual adoption of second generation bioenergy is limited. Research involved the development of cropping system BMPs, testing and development of novel dedicated oilseeds and lignocellulosic bioenergy crops, advanced plant breeding systems, micro- and macro-algae, logistics and conversion technologies. Our focus is on second generation oilseeds and lignocellulosic feed stocks rather than on corn, soybeans, and other crops that can be used for food and feed. Drought and salinity tolerance, adaptation to marginal growing conditions and wide hybridization are emphasized in research in order to increase adaptation and sustainability of alternative energy systems. Organic residuals at livestock production systems offer a concentrated source of feedstock for the bioenergy production. Demonstration of identification, selection, harvesting and transportation of quality organic residuals for entering bioenergy production is critical to ensuring a sufficient energy resource.

AgriLife Research

Research involves cropping systems; novel dedicated energy crops including but not limited to, high biomass sorghum, switchgrass, energy canes, other perennial grasses, micro- and macro-algae, and oilseeds; modeling; logistics; conversion technologies; economic and environmental assessments; and bioproducts.

Our focus is on highly productive lignocellulosic and unique plant oil (including algae) feedstocks for both liquid motor fuels and process heat 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 incorporated to identify, collect, separate, transport and process biomass ensuring advantageous life cycle benefits from bioenergy. Research also includes developing novel fluidized bed technologies to generate process heat and synthesis gas and/or electricity from crop residues, dairy waste, municipal solid waste, forest waste, and sewage sludge.

2. Brief description of the target audience

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

3. How was eXtension used?

eXtension was not used.

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	22	0	23	0

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

Patent Applications Submitted

Year: 2017

Actual: 2

Patents listed

* MOISTURE DISPLACEMENT AND SIMULTANEOUS MIGRATION OF SURFACE-FUNCTIONALIZED ALGAE FROM WATER TO AN EXTRACTION SOLVENT USING IONIC POLYELECTROLYTES

* CONVERSION OF LIGNIN INTO BIOPLASTICS AND LIPID FUELS

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	0	22	22

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of educational programs conducted.

Year	Actual
2017	4

Output #2

Output Measure

- # of research-related projects.

Year	Actual
2017	16

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.

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.

Not Reporting on this Outcome Measure

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

AgriLife Research

Factors that affected outcomes of sustainable energy research included the following:

- Shifting federal priorities (reduced incentives) for bioenergy and alternative energy production
- Reduction in federal grant programs for bioenergy research
- Increased production of oil and gas with a global decline in price making bioenergy less economically competitive
- Decreased corporate investments in bioenergy research

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Nothing to report.

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%
	Total	100%	100%	0%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	25.0	10.0	0.0	0.0
Actual Paid	7.8	9.0	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
127455	601323	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
127455	249326	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
950589	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

AgriLife Extension

Provide 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 will provide in-depth educational programs to targeted audiences relative to community and economic development strategies, based on local needs. Provide 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. Coordinate and collaborate with state and federal agencies in rural development activities as well as work with regional rural development centers in curriculum and professional development. Provide technical assistance to communities in analysis of various socioeconomic databases or surveys. Continue to foster working relationships with rural community colleges to obtain support and follow-up for local educational activities. 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 provide 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 include 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 consist 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?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	72929	310228	57425	0

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

Patent Applications Submitted

Year: 2017
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of group educational sessions conducted.

Year	Actual
2017	3533

Output #2

Output Measure

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

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

2017

2

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

Year

Actual

2017

2245

Output #5

Output Measure

- # of youth trained in entrepreneurship.

Year

Actual

2017

392

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

Year	Actual
2017	75

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, and provide nature based amenities that help enhance community growth and vitality prospects and attract new business opportunities.

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 recreational and nature tourism opportunities, rural and urban communities in park development and watershed development planning and enhancement.

Results

The Texas Community Watershed Program, TCWP staff in partnership with Texas Brigades, Texas Sea Grant, Texas Parks and Wildlife Department, Fishing's Future, and other organizations held the second annual Coastal Brigade youth camp in Galveston, Texas to empower our next generation of conservation leaders. Coastal Brigade engaged 36 Texas teens in an intensive 5-days hands-on conservation and leadership camp. In 2017, 159 volunteers donated 1228 volunteer hours to the stormwater wetland program, and 3,788 wetland plants were planted in demonstration sites. 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. Sessions were

conducted at the Fort Worth Pros in Parks Series, National Extension Health Conference, International Trails Conference, American Trails monthly webinar, the Texas Municipal League, and the TRAPS North Region training. Workshops and publications explained the economic impact analysis of recreational fishing for 4 Texas Bay systems and found impacts of 2,691 jobs, labor income of \$94.1 million, contribution to state GDP of 146.9 million and economic activity of \$256.9 million.

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
2017	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, Texas Friendly Hospitality, and the Commissioners Court Leadership Academy are 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 2017, 5,599 individuals took part in Extension and Extension supported programs, with 33,593 continuing education hours awarded. The Texas Rural Leadership Program (TRLP) has worked with AgriLife Extension agents and community leaders to provide leadership training. The target communities are currently working on putting together projects that benefit their communities while using leadership training skills. The Texas Friendly Ambassador program (youth) has been revised and made available statewide to high school teachers, and was presented to teachers at a statewide Conference. Texas Friendly Hospitality Workshops (adult) were conducted in Athens and Laredo. The Texas Forest Country (Deep East Texas Council of Governments region) has completed 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. The regional team received a grant for \$450,000 from the T.L.L. Temple Foundation to begin implementation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Year	Actual
2017	454338

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 2017, county Extension agents and their community partners conducted 26 child care conferences reaching 1,934 child care providers and directors. 11,111 clock hours of training were provided to these professionals. Evaluation results indicate that 98% of participants acquired new information, 99% plan to utilize the information to improve their programs, and 99% consider themselves better equipped to work with children. In addition, child care professionals completed 441,709 online courses (797,418 clock hours). 98% of participants learned new information from the courses. During 2017, 559 food service employees participated in the Food Safety: It's Our Business Certified Food Manager program. Another 8,248 individuals completed the Food Safety: It's in Your Hands food handler's program either face-to-face or online. Also during 2017, 122 individuals completed the Cooking up a Cottage Food Business online. An additional 186 individuals completed a Cottage Food or Farmers Markets for Consumers course online, and 1590 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

Year	Actual
2017	30

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 lead to bad credit, increased debt, and lack of access to capital.

What has been done

In 2017, CED specialist staff, with the assistance of student workers, graduate assistants, the local credit union and non-profit partners, have worked together to deliver a series of curriculum trainings encouraging participants to save money and invest in themselves. Staff conducts a series of six (6) financial literacy seminars that discuss bank services, understanding credit, budgeting, saving, using credit card, borrowing basics, and home ownership. This financial literacy training, certify eligible participants allowing them to participate Individual Development Account (IDA) savings match program. Monies deposited in the IDA accounts are matched 2 to 1 by our partnering agencies. This money may be used to start a business, pay for tuition, or purchase a home.

Results

Approximately 30 individuals have completed the financial literacy training. Participants enrolled in the IDA program and though savings and matching are estimated to accumulate over \$36,000 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

KA Code	Knowledge Area
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

Year	Actual
2017	2488389

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

When it comes to access to capital, limited resource individuals are the lowest percent of loan participants. Entrepreneurship and homeownership was 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. Likewise, minorities across the nation also lack in the area of homeownership when compared to non-minority groups. Unemployment, salary inequities, access to home loans, and education are just a few items that affect homeownership. With the addition of hurricane Harvey, one of the worst Texas storms in United States recorded history, access to capital among limited resource clientele became more of a necessity.

What has been done

Staff within the Community & Economic Development Unit has provided workshop training and one-on-one technical assistance to individuals seeking funding to support small business development and homeownership. Staff has also and continues to, assist hurricane Harvey victims through home loan and rehab applications, federally supported program applications such as the Small Business Administration (SBA), Federal Emergency Management Agency (FEMA), Disaster Supplemental Nutrition Assistance Program (D-SNAP), and will as working with local organizations, and businesses to provide supplies, clothes, and gift cards.

Results

As a result of the CED staff efforts 309 applications have been submitted for home loans and rehabilitation with 91 currently approved for funding renovations for a total of \$507,456. In 2017, 166 clients were assisted in 1st time home buyer and low interest mortgages totaling over

\$519,613. \$1,036,000 in loans have been approved for small businesses. \$2,063,069 in total small business and non-Harvey related home loans.

HURRICANE HARVEY RECOVERY EFFORTS

25 Homes gutted and repaired through volunteer efforts

819 Applications assisted with

10,451 Individuals assisted

\$95,600 in assistance received

\$272,000in disaster food vouchers

\$330,000in resources distributed (food, water, gift cards, supplies, etc)

\$18,630,000in Potential rehab funding through applications assisted with and resources provided.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Year	Actual
2017	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 and youth entrepreneurship trainings encouraging participants to save money, invest in themselves and start a business. Training include Individual Development Account (IDA) financial literacy training to youth, entrepreneurship training in school districts across the State of Texas, and partner with local community organizations to provide youth entrepreneurship workshops and seminars.

Results

In, 2017 we had approximately 392 youth trained in entrepreneurship. As a direct result of training, 57 youth have started selling products and/or services or plan to start a business.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Year	Actual
2017	1036000

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 to be 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 networking 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.

What has been done

In 2017, CED staff in Liberty and Zavala counties conducted the Businesses In Development (BID) program, a 12-week state contracting training course. The workshops focused on training new and existing businesses on how to get and successfully execute State contracts for business. CED staff also provided one-on-one counseling to individuals in an effort 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 approximately 1275 hours of training has been delivered, 24 courses were presented, 198 HUB profiles were reviewed, 34 course participants, and 30 new Historically Underutilized Businesses (HUBs) established. Approximately \$425,320 in State contracts were submitted to the State of Texas for approval with many being approved.

Other areas of impact include:

- 2245 Small Business Consulting Hours
- 89 Community and Economic Development Workshops
- 2283 Contacts
- 36 Businesses started
- 158 Debt repayment plans
- 53 credit reviews
- 735 Business loan applications assisted with

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.

Not Reporting on this Outcome Measure

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

Anticipated and actual budget reductions as a result of reduced state appropriations in 2017 have resulted in positions vacated during 2016 and 2017 going unfilled. A reduction in FTEs available to carry out educational activities in 2016/17, and into the future may be a problem if projected budget reductions result in vacancies that 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. In addition, the impacts from a natural disaster (Hurricane Harvey) redirected may planned educational activities in the affected counties.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

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.

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 gained access to 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

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%
	Total	100%	100%	100%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	25.0	4.0	2.4	0.0
Actual Paid	42.1	4.0	33.0	0.0
Actual Volunteer	0.0	1458.0	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
687932	267255	145643	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
687932	110811	1028075	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
5130742	0	9954253	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

AgriLife Extension and Cooperative Extension Program

Diabetes Programs

Partner with local health care professionals to plan, implement and evaluate Do Well, Be Well with Diabetes, ¡Si, Yo Puedo Controlar Mi Diabetes! or Wisdom, Power and Control for underserved people with type 2 diabetes.

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 as well as groups like worksites, schools, churches and clubs using free media time.

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, 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 40-49 selected 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 like 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

Extension Agents targeted limited resource clientele to provide them educational workshops on how to manage and prevent Type 2 Diabetes. It has been reported by the American Diabetes Association that diabetes mortality rates are more than double among African Americans and Hispanics than those for their White counterparts, with 46 deaths per 100,000 for African Americans and only 19 per 100,000 for Whites. Self-management education is the cornerstone for diabetic care and vital for blood glucose control.

2. Brief description of the target audience

AgriLife Extension and Cooperative Extension Program

Diabetes Programs

The target audience is all people 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.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	742084	1447424	526865	0

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

Patent Applications Submitted

Year: 2017
 Actual: 4

Patents listed

- * LV PEPTIDE, ANTI-LV ANTIBODY AND METHODS THEREOF
- * ADENOVIRUS-VECTORED MULTIVALENT VACCINE
- * SUBSTITUTED BENZOFURAN DERIVATIVES AS NOVEL ANTIMYCOBACTERIAL AGENTS
- * USE OF ELESCLMOL IN THE TREATMENT OF DISORDERS OF MITOCHONDRIAL COPPER METABOLISM

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	0	41	41

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of group educational sessions conducted.

Year	Actual
2017	26623

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

Year	Actual
2017	26

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; 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; 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

Year	Actual
2017	351

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 2.8 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

In 2017, 1,394 individuals with diabetes registered for diabetes management education programs across Texas. Participants completing the Do Well Be Well with Diabetes program significantly increased their knowledge of how to manage their blood glucose through dietary management (pre = 50%, post = 88%). Moreover, participants in this program reported significant increases in their confidence levels related to being able to manage the disease (pre = 47%, post = 84%). The improved management of diabetes for these participants resulted in an estimated cost savings of \$37 million.

In 2017, 805 individuals with diabetes enrolled in Sí, Yo Puedo and Wisdom, Power, Control, two culturally competent diabetes self-management education programs. Results indicate that the programs significantly enhanced participants' engagement in diabetes self-care behaviors,

improved self-confidence about diabetes self-care, and increased diabetes knowledge.

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
2017	4

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

According to the most recent available data, Texas ranks 8th as the state with the highest adult obesity rates and 15th with the highest rates of childhood overweight and obesity (10- to 17- year olds). Chronic diseases account for 70% of deaths and 86% of health care costs. Regular physical activity and controlling weight can significantly reduce the risk and impact of some chronic diseases.

<https://stateofobesity.org/states/tx/>

<https://www.cdc.gov/diabetes/pdfs/data/statistics/national-diabetes-statistics-report.pdf>

<https://health.gov/paguidelines/guidelines/chapter2.aspx>

What has been done

In response to the issue, Texas A&M AgriLife Extension Service has continued to support the implementation of Walk Across Texas! in adult and youth audiences across the State of Texas. Community-based programs that develop a strong network, like Walk Across Texas!, help to motivate and maintain individual's physical activity. Local County Extension Agents have partnered with groups and organizations to implement the WAT! program using a variety of best practice approaches. While each program is different, the overall goal is the same, to establish the habit of physical activity in participants.

Results

In 2017, adults and youth from 155 Texas counties participated in the WAT! program. Over 17,000 adults (with 905 of those participating individually) and 30,000 youth participated on nearly 3,000 teams. Collectively, WAT! participants logged over 4.8 million miles. Upon completion of the program, adult participants increased their weekly mileage by 3.96 miles statewide from week one to week eight. The estimated potential lifetime health care cost savings are \$70,815 for females and \$55,385 for males. When avoidance of lost wages is included, the potential lifetime economic benefit for 2017 participants who completed the program is \$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
2017	618

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

In follow-up evaluation after the events 55% of women were screened for breast cancer; 43% were screened for cervical cancer.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Year	Actual
2017	618

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 2017, AgriLife Extension agents in 23 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 618 women; provided 1,091 clinical services; identified 49 abnormal screening results; and diagnosed 8 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
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Approximately 29.1 million people in the United States have been diagnosed with Diabetes. African Americans are almost twice as likely to be diagnosed with diabetes as non-Hispanic whites. In addition, they are more likely to suffer complications from diabetes, such as end-stage renal disease and lower extremity amputations. Although African Americans have the same or lower rate of high cholesterol as their non-Hispanic white counterparts, they are more likely to have high blood pressure. African American adults are 80 % more likely than non-Hispanic white adults to have been diagnosed with diabetes by a physician. About 208,000 American youth under age 20 are estimated to have diagnosed with diabetes.

Chronic diseases are responsible for 7 of 10 deaths each year, and treating people with chronic

diseases accounts for 86% of our nations health care costs. Areas of focus for the Cooperative Extension Program includes diabetes and hypertension. Diabetes can cause serious health complications including heart disease, blindness, kidney failure, and lower-extremity amputations. Diabetes is the seventh leading cause of death in the United States. High blood pressure is a common and dangerous condition. About 1 of 3 U.S. adults or about 70 million people have high blood pressure. Only about half (52%) of these people have their high blood pressure under control. This common condition increases the risk for heart disease.

What has been done

Dallas County

The Prairie View A&M University/Cooperative Extension Program (PVAMU-CEP) in Dallas, and the advisory committee, recognized A Taste of African Heritage (ATOAH) and the Garden 2 Table (G2T) nutrition education/healthy lifestyle programs as vital to address obesity in limited resource families in Dallas. Both programs were presented as group educational methods. ATOAH was implemented by a group of trained PEER Volunteers from The Diabetes Health and Wellness Institute who worked with 45 limited resource participants. G2T was a collaborative effort between all Dallas County Extension personnel and The Methodist Health Systems (Dallas and Charlton sites) who hosted 199 participants.

Maverick County

Nutrition programs were delivered throughout the year in diverse locations of Maverick County. Curriculums used were, Live it! Real Live Nutrition for Teens. This is a nine lesson program that provides technical and educational information to limited resources families and individuals to help them understand the importance of nutrition and diet. In addition, it heightens awareness of the relationship between high calorie food consumption and lack of exercise to health status. This program was offered to youth of high school age. Another curriculum utilized was, Choose Health: Food, Fun, and Fitness (CHFFF). This is a comprehensive nutrition and fitness curriculum composed of six hands-on lessons for 8-12-year-olds (3rd-6th graders). Developed by Cornell University's Division of Nutritional Sciences in collaboration with Cornell Cooperative Extensions 4-H Youth Development Program, 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.

Travis County

The Cooperative Extension Program, Prairie View A&M University conducted obesity education programming in targeted areas. Programs serve to increase knowledge, change behaviors, and increase physical activity. Classes were conducted with targeted audiences at community centers, senior activity centers, senior wellness centers, school programs, and faith based institutions. A total of 113 workshops were conducted with 1609 participants. Contact was in the form of educational programs, health fairs, and invited guest on community radio program, Health Talk were used to disseminate health and wellness programs. Community partners include the City of Austin, senior activity centers, faith based institutions, and a senior wellness clinic. Media outlets include community radio, newsletters, and monthly health posts to the Travis County FCS Facebook site

Results

Dallas County

Sixty six percent of participants increased whole grains consumption after participating in the class. Seventy two of participants increased veggie consumption after participating in the class.

Seventy seven percentage of participants increased fruit consumption after participating in the class.

Garden 2 Table (G2T): Medicinal Plants 5% had low knowledge before the session and 95% had excellent knowledge after the session (90% positive change), . 15 Foods That Cure 6% had low knowledge before the session and 94% had excellent knowledge after the session (88% positive change).Building an Oasis in the Food Desert 8% had low knowledge before the session and 92% had excellent knowledge after the session (84% positive change).Building Backyard Gardens 20% had some knowledge before and 80% excellent knowledge after (60% positive change).North Texas Fruits and Veggies 26% had low knowledge before and 74% had excellent knowledge after (48% positive change).Safe-Handling of Fruits and Veggies 72% had some knowledge before and 100% had excellent knowledge after (28% positive change).

Maverick County

636 out of 653 (97.4%) of the students who participated in the Heroes for Health program reported that they learned the foods that they should eat every day to be healthy.

615 out of 653 (94.2%) of the students who participated in the Heroes for Health program reported that they learned what makes up a balanced diet.

632 out of 653 (96.8 %) of the students who participated in the Heroes for Health program reported that they learned how to make healthy food choices.

553 out of 653 (84.7%) of the students who participated in the Heroes for Health program reported that they eat more fruits and vegetables.

456 out of 653 (96.8%) of the students who participated in the Heroes for Health program reported that they eat more whole grains.

435 out of 653 (66.6%) of the students who participated in the Heroes for Health program reported that they eat less junk food.

606 out pf 653 (92.8%) of the students who participated in the Heroes for Health program reported that they drink more water.

482 out of 653 (73%) of the students who participated in the Heroes for Health program reported that they encourage my family and friends to eat meals together.

A post survey was completed by participants (n=250). There is a correlation between disease, family history, ethnicity, physical inactivity, and smoking. Lifestyle choices influence prevention and management of chronic disease. Whereas diabetes is a serious health issue, the majority of participants reported blood pressure and cholesterol as a diagnosed medical condition, followed by overweight/obesity. The majority of participants, 203 of 250 (81%) receiving health and wellness programming were African American with an immediate family member (80%) with one or more health issues. This is a targeted group because of risk factors for chronic illness and disease and other comorbidities.

Whereas, participants are aware of the connection between nutrition and physical activity (94%) and resoundingly support nutrition and physical activity are important for good health and well-being (100%), responses to the item, has your doctor told you:

159 of 250 (64%) have high blood pressure

143 of 250 (57%) are overweight/obese

125 of 250 (50%) have high cholesterol

74 of 250 (30%) have diabetes

13 of 250 (5%) are smokers

Respondents report the following changes:

231 of 250 (92%) will eat meals that include a variety of foods from MyPlate.

231 of 250 (97%) will pay attention to portion sizes

243 of 250 (97%) will increase fruit and vegetable consumption

236 of 250 (94%) will read labels when making decisions about food purchases.

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

- 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

V(I). Planned Program (Evaluation Studies)

Evaluation Results

In 2017, adults and youth from 155 Texas counties participated in the WAT! program. Over 17,000 adults (with 905 of those participating individually) and 30,000 youth participated on nearly 3,000 teams. Collectively, WAT! participants logged over 4.8 million miles. Upon completion of the program, adult participants increased their weekly mileage by 3.96 miles statewide from week one to week eight. The estimated potential lifetime health care cost savings are \$70,815 for females and \$55,385 for males. When avoidance of lost wages is included, the potential lifetime economic benefit for 2017 participants who completed the program is \$186 million.

Of the 618 individual who participated in cancer prevention education activities, 55% of women were screened for breast cancer and 43% were screened for cervical cancer (based on follow-up surveys).

In 2017, 1,394 individuals with diabetes registered for diabetes management education programs across Texas. Participants completing the Do Well Be Well with Diabetes program significantly increased their knowledge of how to manage their blood glucose through dietary management (pre = 50%, post = 88%). Moreover, participants in this program reported significant increases in their confidence levels related to being able to manage the disease (pre = 47%, post = 84%). The improved management of diabetes for these participants resulted in an estimated cost savings of \$37 million.

805 individuals with diabetes enrolled in Sí, Yo Puedo and Wisdom, Power, Control, two

culturally competent diabetes self-management education programs. Results indicate that the programs significantly enhanced participants' engagement in diabetes self-care behaviors, improved self-confidence about diabetes self-care, and increased diabetes knowledge. Given the high rates of diabetes among Hispanic/Latinos, Sí, Yo Puedo, and Wisdom, Power, Control, have been demonstrated to be effective programs to address this concern.

A combined 87 presentations, reaching 4,146 were conducted in 2017. Evaluation results indicate that knowledge of health and wellness topics improved for participants. Also, 1,290 County Extension Agents were trained either virtually or in-person during 51 presentations.

Key Items of Evaluation

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%	0%	50%
724	Healthy Lifestyle	50%	50%	100%	50%
Total		100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	8.0	1.0	1.0
Actual Paid	0.3	8.0	1.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
4902	534510	15298	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
4902	221623	9457	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
36561	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

AgriLife Extension

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.

Walk Across Texas! (WAT!) Youth Component

The youth component of Walk Across Texas! is designed to help support and establish the habit of regular physical activity in students and young people. Youth teams, with support from school staff and parents, have a goal to virtually walk 832 miles across Texas. Youth teams combine and report their mileage during the eight-week program on the Walk Across Texas! website (<http://walkacrosstexas.tamu.edu/>). Progress is tracked on the website and can be compared to other youth teams within the school, district, and / or state.

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

The Cooperative Extension Program provides a series of educational programs designed to equip parents with better meal preparation skills and persons coping with and at risk for chronic illnesses. Education programs are provided through a series of nutrition educational workshops and programs to special interest groups, on-site food demonstrations, educational displays, fact sheets, newsletters and social media (FaceBook). Parents and caregivers learn the importance of balancing meals based upon MyPlate guidelines and implementing physical activity.

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

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	15613	63452	54589	0

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

Patent Applications Submitted

Year: 2017

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	0	3	3

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of group educational methods conducted.

Year

Actual

2017

2348

Output #2

Output Measure

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

Output #3

Output Measure

- Number of research-related projects

Year

Actual

2017

2

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

Year	Actual
2017	67

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Lifestyle behaviors associated with obesity include spending too much time sedentary and getting too little physical activity. The 2017 State of Obesity Report indicates that in Texas 33% of youth ages 10-17 are overweight or obese and only 23.8% of youth participate in 60 minutes of physical activity every day. As overweight or obese adults, these children will face higher healthcare costs and lower quality of life than their healthful weight peers.

What has been done

The Balancing Food & Play curriculum was designed to improve knowledge and behaviors related to encouraging at least 60 minutes of physical activity each day. Moreover, AgriLife Extension continues to support the implementation of the Walk Across Texas program with youth audiences throughout Texas.

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 improved during the time that Balancing Food & Play was taught. The percentage of students who reported getting at least 60 minutes of daily physical activity increased from 55 percent to 67 percent. In 2017, youth in 38 Texas counties participated in the WAT! program. Over 30,000 youth participated on 600 youth teams. Collectively, these youth teams logged over 1.4 million miles.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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
2017	41

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. Research indicates that U.S. youth consume an average of 7.3% of their total daily calories from sugar-sweetened beverages. 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 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 limiting consumption of sugar sweetened beverages.

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 soda consumption improved during the time that Balancing Food & Play was taught. The percentage of students who reported drinking soda almost never or never increased from 37 percent to 41 percent.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Year	Actual
2017	81

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Lifestyle behaviors associated with obesity include spending too much time sedentary and getting too little physical activity. The 2017 State of Obesity Report indicates that in Texas 33% of youth ages 10-17 are overweight or obese and only 23.8% of youth participate in 60 minutes of physical activity every day. As overweight or obese adults, these children will face higher healthcare costs and lower quality of life than their healthful weight peers.

What has been done

The Balancing Food & Play curriculum was designed to improve knowledge and behaviors related to 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 and screen time improved during the time that Balancing Food & Play was taught. The percentage of students who reported getting at least 60 minutes of daily physical activity increased from 55 percent to 67 percent; and limiting screen time to 2 hours or less increased from 74 percent to 81 percent.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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.

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Number of participants modify recipes to decrease amount of calorie and adopt healthy eating habits.

Not Reporting on this Outcome Measure

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
2017	1413165

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

According to the most recent available data, Texas ranks 15th as the state with the highest rates of childhood overweight and obesity (10- to 17- year olds). The high rates of childhood overweight and obesity is a concern because of its link to negative health outcomes. Incorporating more moderate to vigorous activity in youth has been shown to improve fitness, weight, and school performance.

<https://stateofobesity.org/states/tx/>

<https://activelivingresearch.org/blog/2015/01/infographic-active-kids-learn-better>

What has been done

In response to the issue, Texas A&M AgriLife Extension Service has continued to support the implementation of Walk Across Texas! in youth audiences across the State of Texas. Local County Extension Agents have partnered with schools and other youth audiences to implement the WAT! program using a variety of best practice approaches. While each program is different, the overall goal is the same, to establish the habit of physical activity in youth.

Results

In 2017, youth in 38 Texas counties participated in the WAT! program. Over 30,000 youth participated on 600 youth teams. Collectively, these youth teams logged over 1.4 million 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, of the three programs such as changes in politics, priorities, and/or policy. For example, the Texas legislature cut funding for the Texas A&M AgriLife Extension Service; this could result in fewer county educators to provide leadership at the local level. 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

During 2017, Texas A&M AgriLife Extension Service agents in 12 counties recruited local third grade classroom teachers to participate in this program. They received permission to implement this school-enrichment program, and 870 students completed the curriculum. To date, over 5,000 teacher manuals and 2,818 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 daily physical activity increased from 55 percent to 67 percent;
- drinking soda almost never or never increased from 37 percent to 41 percent; and
- limiting daily screen time to 2 hours or less increased from 74 percent to 81 percent.

Key Items of Evaluation

In 2017, youth in 38 Texas counties participated in the WAT! program. Over 30,000 youth participated on 600 youth teams. Collectively, these youth teams logged 1.4 million miles.

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
502	New and Improved Food Products	0%	25%	0%	50%
701	Nutrient Composition of Food	0%	10%	0%	20%
703	Nutrition Education and Behavior	50%	50%	50%	10%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	50%	15%	50%	20%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	5.0	4.0	3.0	8.0
Actual Paid	12.0	4.0	6.9	7.9
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
196085	267254	152832	1284208
1862 Matching	1890 Matching	1862 Matching	1890 Matching
196085	110812	105955	562445
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1462444	0	320129	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

AgriLife Extension

During 2017, 6 new County Extension Agents for Family and Community Health were trained to become instructors for the Food Protection Management Program, enabling them to offer the Certified Food Manager and the Food Handler programs. Additional training was provided/identified so that existing instructors (n=80) could maintain their instructor qualification status per Agency guidelines. The program was implemented in counties across the state that have a County Extension Agent who is able to teach the program. Program materials for the Certified Food Manager program were available in both English and Spanish. Food Handler programs were offered face-to-face in both English and Spanish and online in English, Spanish, and Mandarin.

The Certified Food Manager (CFM) course was evaluated by assessing the pass rate on the CFM exam. The food handler's course was evaluated by assessing change in knowledge (pre vs. post).

Cooperative Extension Program and Cooperative Agricultural Research CenterThe Cooperative Extension Program county agents provided presentations on food safety for limited resource adults and youth. 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. Three CEP agents took the Certified Food Manager course and were certified. Educational training was 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. CARC provided information to agents on how to protect vegetables and fruits from being contaminated in home gardens as well as during preparation. Also CARC assisted in following activities:

- Provided one-on-one consultations
- Conducted on-site food demonstrations
- Provided train-the-trainer opportunities
- Conducted educational programs and classes
- Carried out summer workshops for: 1) Research Extension Apprentice Program; 2) Ag Discovery Summer Program; and 3) 4-H Program
- Teach a series of food safety classes to special interest groups
- Exhibit educational displays at various sites
- Conduct research activities centered around:
 - Developing methods for enhancing the quality of food and food products.
 - Developing technologies and techniques for producing value-added caprine products
 - Developed instrumentation in the Food Quality Laboratory to analyze foods for physical and chemical characteristics including: 1) Water Activity; 2) Color; 3) Moisture Content; 4) pH; 5) Brix; 6) Rheology/Viscosity; 7) milk protein, fat, and moisture content
 - Completing the development of a food sensory and rheology laboratory
 - Examining strategies for mitigating the transmission of natural food borne pathogens.
 - Examining methods for the reduction of natural and introduced toxicants (e.g. antibiotics in milk and Salmonella) in foods and feed.
 - Examining nutrient quality enhancement of food and food products.
 - Examining mechanisms involved in nutrient utilization and diseases.

- Evaluating strategies for minimizing the transfer of microbial pathogens during food handling.
- Evaluating strategies for translating nutrition knowledge into better food selection.

2. Brief description of the target audience

AgriLife Extension

Individuals who are employed in the retail food service industry. This includes cooks, managers, and 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?

FACT Sheets were used by CEP from eXtension to provide limited resource clientele additional food safety information.

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	492166	105223	50052	0

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

Patent Applications Submitted

Year: 2017
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	0	91	91

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of group educational sessions conducted.

Year	Actual
2017	1151

Output #2

Output Measure

- Number of research-related projects.

Year	Actual
2017	30

Output #3

Output Measure

- Number of on site demonstrations for adults and youth.
Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Number of research workshops/presentations.
Not reporting on this Output for this Annual Report

Output #5

Output Measure

- Number 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	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.
5	Number of limited resource clientele who gain knowledge on the handling and availability of value added fruit & vegetable.

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

Year	Actual
2017	16

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

AgriLife Extension

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 and 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

AgriLife Extension

The food handler's program was offered in 80 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

AgriLife Extension

In 2017, 8,248 individuals completed the food handler's program either in a classroom format (n=4,341) or via on-line (n=3,907) education. Program evaluations from those completing the program face-to-face demonstrated a significant increase in food safety knowledge (average score was 72 pre vs. 87 post). We also noted a change in knowledge among those participants who completed the course via online (average score pre was 75 vs. post average of 87).

4. Associated Knowledge Areas

KA Code **Knowledge Area**
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
2017	67

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

AgriLife Extension

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

AgriLife Extension

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

AgriLife Extension

In 2017, 559 individuals across the state 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

KA Code	Knowledge Area
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 Extension
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The interest in goat milk, meat and associated products is increasing here in Texas and the United States. This increase is due to personal preference reasons from different ethnic groups, who consume goat-based products, and as well as all consumers who are looking for alternative foods for personal and health reasons. The two factors that are being addressed in our research efforts are: i) to understand current consumer attitudes about the consumption of goat meat and goat milk and ii) to identify and enhance the health benefits of consuming goat products, specifically functional lipids present in goat milk such as essential omega-3 fatty acids and other functional lipid-based compounds. The total amounts of polyunsaturated fatty acids in human diet have numerous health benefits for prevention of chronic diseases including cardiovascular disease, inflammatory diseases, and neurological disorders. The levels of poly-unsaturated fatty acids are typically very low in milk usually less than 0.5% of total fatty acids. Hence, there is a need to increase the level of poly-unsaturated fatty acids in milk and milk products either naturally or directly added as a GRAS supplement to milk to increase their consumption. The carotenoids in human body function as biological antioxidants shielding cells from the destructive effects of free radicals especially the highly reactive unpaired oxygen atoms. The fact that milk proteins (the caseins) bind strongly to carotenoids make them good candidates for the development of nutraceutical foods and beverages.

What has been done

A. Caprine Consumption Pattern Survey.

One of the objectives of this study was to examine the current and projected consumption patterns of Caprine products in Texas and identify target areas and population for the distribution of value added caprine products. The outcomes initially established for this project were (a) an enhanced understanding of the fundamental properties of caprine tissues; (b) a greater exposure to caprine products by the creation of new meat and dairy products; and (c) education of the American consumer of specific attributes of caprine products (e.g., lean fat content, less cholesterol).

B. Enhancing the Nutritional Benefits of Consuming Goat Milk.

The regular dairy goat ration was supplemented with fish oil to naturally increase the amounts of poly-unsaturated fatty acids in goat milk. The objective was to improve the nutritional quality of goat milk to positively impact health and wellbeing of consumers. These poly-unsaturated fatty acids have numerous health benefits for humans. During 2017, we assessed the quantities of these polyunsaturated fatty acids in goat milk samples that were collected.

C. Examining Nutrient Quality Enhancement of Food and Food Products by Components in Goat Milk.

The chemical stability of lutein-arabinogalactan with bovine and caprine casein emulsion systems, was evaluated. Lutein is a carotenoid with many benefits to human health.

Results

A. Caprine Consumption Pattern Survey

Data on the consumption patterns of goat products in Texas are still being analyzed and will be completed and submitted to peer reviewed journal titled: Cultural Analysis and Demographics of Caprine Consumption among Texas Residents.

One manuscript focusing on the benefits of Caprine Products titled: Caprine Products: A Healthy Alternative for Consumers, is in progress.

One Information Fact Sheet Got Goat? has been completed and in review by extension peers.

B. Enhancing the Nutritional Benefits of Consuming Goat Milk

The level of supplemented fish oil in regular ration of lactating goats was not sufficiently high to make a significant difference in the quantities of polyunsaturated fatty acids, particularly the quantities of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) which are essential for human health. There was a time effect for the experiment and as the goats were fed the supplemented ration for longer periods, the total quantity of some polyunsaturated fatty acids increased in goat milk.

C. Examining Nutrient Quality of Food and Food Products by Components in Goat (Caprine) Milk
Our studies confirm that the aqueous solubility of lutein is improved after binding with bovine and caprine caseins. The chemical stability of lutein was largely dependent on casein type. Significant increases occurred in the chemical stability of lutein with the pattern: caprine (alphas1-II)-casein greater than caprine (alphas1-I)-casein greater than bovine casein. Addition of arabinogalactan to the low-fat, dairy-like beverage increases the chemical stability of lutein during storage. Therefore, caprine (alphas1-II)-casein alone and in combination with arabinogalactan could have important applications in the beverage industry as a carrier system of the carotenoid lutein.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Food quality and safety involves purchasing, preparing, and storing food using procedures that prevent the spread of bacteria and reduce the risk of foodborne illness. Every year more than 76 million people get sick from food poisoning. County Health Department provides food handler training for food service employees. Extension provides all clients with proper food handling procedures, teaching the effectiveness of personal hygiene, preparing food properly, and storing food properly allows clients to handle food safely and can prevent contamination which causes food borne illness.

What has been done

The Extension Health Coordinator and agents became certified in Food Protection Management courses to educate limited resource clientele and business on proper best food safety practices. Educational programs were conducted throughout 15 Texas counties for youth and adults. These educational programs were conducted with community outreach organizations in schools, churches, schools, restaurants, and day cares.

Food safety classes were conducted in two out of five household's zip codes 78723 and 78752 with individuals age 65 years and older. Topics include food safety basics (clean, separate, cook, chill), hand washing, reading food labels, and shopping for food safety. A total of 17 workshops were conducted. Food safety information was posted to the Travis County Family Consumer Sciences Facebook site. The City of Austin Parks and Recreation Department is a community partner.

Results

A post food safety survey was completed by participants (n=126). The survey addresses changes in knowledge of food handling practices and changes after a food safety program. Salient points include:

123 of 126 (98%) knowledge of food safety practices increased after the program 115 of 126 (91%) always wash their hands with warm water before preparing food 115 of 126 (91%) always wash utensils and surfaces in hot soapy water that have touched raw poultry or meat before using again

88 of 126 (70%) always refrigerate or freeze foods within 2 hours after serving 108 of 126 (86%) always separate raw meat, poultry, and fish from vegetables, fruits, and prepared products 79 of 126 (63%) always thaw frozen meat in the refrigerator 106 of 126 (84%) always check the sell-by or expiration dates.

When asked if certain practices were more often than before the program, 91 of 126 (72%) indicated that they were already washing utensils and surfaces, freezing food within 2 hours, and thawing food properly. This suggests good food safety practices are being used by this population.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #5

1. Outcome Measures

Number of limited resource clientele who gain knowledge on the handling and availability of value added fruit & vegetable.

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Fruits and vegetables provide health benefits and are important for the prevention of illnesses. Fruits and vegetables contain a variety of nutrients including vitamins, minerals and antioxidants. Eating the recommended amount of fruits and vegetables each day can reduce the risk of chronic diseases. Properly storing fruits and vegetable is important within the shelf life and washing properly for insects and chemicals. Texas had several disasters to strike during the 2017 calendar year this workshop was incorporated in ta disaster preparedness workshop for feeding your family.

What has been done

Cameron County conducted workshops to address how to keep your food safe during disasters to include fruit and vegetables. Food Safety - "Feeding Your Family When Disaster Strikes", "Common Pantry Pests-The Impact of Household Insects on Your Food", "Understanding the Dates on Food Labels",and "Packing a Safe and Healthy Lunch for School".

Results

2,690 individuals attended workshops and programs which addressed the issues listed above. Of significance, 100% of the participants of the "Feeding Your Family When Disaster Strikes" workshops, indicated that they plan to apply the knowledge they gained to prepare for a natural disaster, felt that the information they learned was useful and relevant to them, and plan to share what they learned with friends and family. Client Testimony- "As a result of the workshop, I will now prepare a food disaster kit and check the temperature of my refrigerator more often."

4. Associated Knowledge Areas

KA Code	Knowledge Area
502	New and Improved Food Products
701	Nutrient Composition of Food
703	Nutrition Education and Behavior
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

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 was higher in 2017 (67% pass rate) compared to 2016 (62% pass rate) and appears 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 are an issue where we only have English-speaking instructors.

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.

Key Items of Evaluation

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.

V(A). Planned Program (Summary)

Program # 12

1. Name of the Planned Program

Global Food Security and Hunger

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
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%
	Total	100%	0%	100%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	30.0	1.0	2.0	0.0
Actual Paid	54.6	0.0	4.7	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
892187	0	259884	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
892187	0	186312	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
6654121	0	601320	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, social media, and newsletters. Group methods were focused on a series of lessons that emphasized increasing fruit and vegetable intake, adopting targeted food safety skills, or improving physical activity. County Extension Agents also marketed nutrition education and physical activity programs to partner agencies and organizations in an effort to expand outreach and identify new audiences.

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 is SNAP recipients, applicants, and those eligible for benefits. These audiences include: 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; and children who participate in the Summer Food Service Program.

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

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	154887	491914	106233	0

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

Patent Applications Submitted

Year: 2017
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	0	62	62

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of group educational sessions conducted.

Year	Actual
2017	9894

Output #2

Output Measure

- # of research-related projects

Year	Actual
2017	19

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Minimum amount of monthly out-of-pocket food expenses reported saved by program participants.
2	# of producers adopting best management practices on sustainable agriculture.
3	# eligible SNAP-ED participants who report an increase in accessibility of fresh fruits and vegetables from community gardens.
4	BLT participants who enroll in Walk Across Texas will increase the number of miles walked by 15% at the end of the 8 week program.
5	The percentage of participants who shop with a list "always" or "sometimes" will increase by 20%.
6	BLT participants will report an increase in vegetable and fruit consumption by at least ½ cup total.
7	The percentage of participants who shop with a list "all of the time" or "most of the time" will increase?

Outcome #1

1. Outcome Measures

Minimum amount of monthly out-of-pocket food expenses reported saved by program participants.

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

of producers adopting best management practices on sustainable agriculture.

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

eligible SNAP-ED participants who report an increase in accessibility of fresh fruits and vegetables from community gardens.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	601

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

AgriLife Extension

Low-income individuals and families often have diets that are less nutritious compared to those with higher incomes. The consumption of vegetables and fruits tends to be less than what is currently recommended in both low and higher income households. Although SNAP can help increase one's ability to purchase healthy foods, those healthy foods have to be within reach. Nearly every county in Texas has one or more food deserts, defined as a community where healthy foods are high in cost and limited in availability.

What has been done

AgriLife Extension

The Growing and Nourishing Healthy Communities program aims to increase the availability of healthy foods, specifically fresh produce, through the use of community gardens. Funded by the Supplemental Nutrition Assistance Program, the Growing and Nourishing Healthy Communities program teaches participants how to grow their own produce. To participate in the program, individuals must (1) qualify for SNAP benefits; (2) have an interest in learning how to grow vegetables; (3) agree to help build and maintain the community gardens; and (4) complete a series of educational classes to increase their gardening skills.

Results

AgriLife Extension

In 2017, 601 participants from 12 counties enrolled in the program, maintained 47 community gardens, and grew more than 9,900 pounds of vegetables with support from Extension educators and Master Gardeners. Locations of the gardens varied but were in areas accessible to the participants. Extension educators taught the gardening class series, which included topics such as how to select the right garden location, planting and watering techniques, controlling insects, and composting. As produce was harvested, participants learned how to prepare it through hands-on food demonstrations. Pre and post-surveys indicate participants had an increase in gardening knowledge, as well as an increase in the availability of vegetables and fruits in the home. The percent of participants who reported serving vegetables "often" or "almost always" at meals rose from 65% (pre) to 85% (post). In addition, the percent of participants serving fruit at meals "often" or "almost always" also rose from 37% (pre) to 67% (post).

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population
801	Individual and Family Resource Management

Outcome #4

1. Outcome Measures

BLT participants who enroll in Walk Across Texas will increase the number of miles walked by 15% 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

Year	Actual
2017	8

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

2,641 BLT participants participated in Walk Across Texas (WAT), a team-based program designed to help individuals adopt/improve the habit of regular physical activity. An additional 865 participants joined Walk and Talk, a form of WAT that encourages participants to walk in groups while discussing issues related to food and nutrition, including vegetable and fruit consumption. For both programs, participants logged their miles and over an 8-week period to virtually walk across the state of Texas.

Results

Participants completing Walk Across Texas increased their average mileage by 2.5 miles per week (29.6 miles pre vs 32.1 post). Those completing Walk and Talk averaged 1.2 miles more per week (23.8 pre vs. 24.5 post)

4. Associated Knowledge Areas

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

Outcome #5

1. Outcome Measures

The percentage of participants who shop with a list "always" or "sometimes" will increase by 20%.

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

BLT participants will report an increase in vegetable and fruit consumption by at least ½ cup total.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	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

During 2017, more than 7,000 adults completed the Fresh Start to a Healthier You! program series, which focuses on improving vegetable and fruit consumption.

Results

In a survey of 6,537 adults who completed the series, the percentage who reported filling half of their plates with vegetables and fruit rose from 37% (beginning of the program) to 58% immediately after the program ended. Thirty days later, 71% were following this behavior.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population
801	Individual and Family Resource Management

Outcome #7

1. Outcome Measures

The percentage of participants who shop with a list "all of the time" or "most of the time" will increase?

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	70

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

An estimated 1 out of 7 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 7,940 low-income adults in 95 counties across Texas completed A Fresh Start to a Healthier You program series in 2017. In a sample of 6,537 of those adults who completed the pre, post and follow-up surveys the percentage who reported shopping with a list "all of the time or most of the time was 36% when the program began. Immediately after the program ended, 60% reported intent to do so. Approximately one month after the program ended, 70% reported doing so.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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 continues to be a challenge and improvements were less than in years past but there are a number of external factors that impact the extent to which the target audience can be physically active. 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 for one of the programs, A Fresh Start to a Healthier You! 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. For the Growing and Nourishing Healthy Communities program, we utilize a pre and post survey but also measure the amount of fresh produce harvested.

Key Items of Evaluation

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 for one of the programs, A Fresh Start to a Healthier You! 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. For the Growing and Nourishing Healthy Communities program, we utilize a pre and post survey but also measure the amount of fresh produce harvested.

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%
Total		100%	100%	0%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	15.0	8.5	0.0	0.0
Actual Paid	9.9	8.5	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
161770	567916	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
161770	235474	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1206517	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

Provided one-on-one consultations
Conducted educational programs and classes
Exhibited educational displays at various sites

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

Money Smart: unbanked, less financially-sophisticated consumers.
Wi\$eUp: Generations X and Y, with emphasis on women ages 22-35.
Welcome to the Real World Financial Simulation: 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

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	72234	572767	59165	0

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

Patent Applications Submitted

Year: 2017
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of group educational methods conducted.

Year	Actual
2017	11955

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

Year	Actual
2017	98

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. 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. 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.

Cooperative Extension Program

On a weekly basis, child care providers in the U.S. care for 11 million children younger than age five whose parents are in the workforce. It is estimated that there are over 15,500 child care facilities in Texas with the capacity to care for more than 1 million children. Approximately 60,000 child care workers who are employed in child care centers alone.

What has been done

AgriLife Extension

In 2017, county Extension agents and their community partners conducted 26 child care conferences reaching 1,934 child care providers and directors. 11,111 clock hours of training were provided to these professionals. In addition, child care professionals completed 441,709 online courses (797,418 clock hours). 98% of participants learned new information from the courses.

Cooperative Extension Program

In 2017 the CEP Fort Bend County Family and Consumer Sciences extension agent partnered with the Gingerbread Kids Academy to host the Baby Steps Program through Parental

Involvement Childcare Conference. This conference was designed to address topics and provide continuing education units to childcare providers in the areas of child behavior, after-school programs, observation and assessment.

Results

AgriLife Extension

Results from a 2017 evaluation study with over 1,500 child care providers and directors indicate that 98% of participants acquired new information, 99% plan to utilize the information to improve their programs, and 99%, consider themselves better equipped to work with children. A recent evaluation study with more than 111,000 online participants who completed a series of health and safety courses found statistically significant knowledge increases on all courses (75% pre-test average vs. 89% post-test average, p < .05). Participants indicate that they are highly satisfied with the courses, with 89% rating them as "Very good" or "Excellent," 97% stating that they learned new information from the courses, and 99% reporting that they would recommend the online courses to others.

Cooperative Extension Program

CEP childcare conference involved over 60 childcare providers. The childcare workers were able to receive up to 5 hours of continuing education credits amounting to over 250 clock hours towards the child care providers requirement and 100% of the 60 participants stated that the workshops/trainings allowed them to become more knowledgeable in child care practices and 97% stated that they learned how to more effectively deal with stress while 98% increased their knowledge in child safety measures.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	94

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 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.

Results

In 2017, AgriLife Extension caregiving programs reached more than 3,150 educational contacts, providing more than 3,000 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: 80% 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
2017	88

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

AgriLife Extension

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.

Cooperative Extension Program

Tens of thousands of infants and children believed to be in imminent danger of abuse or neglect, even death, are not being seen promptly by state child abuse investigators and thousands of them have not been checked on at all. An article published in the Dallas Morning News on September 9, 2016, stated, "Over the last two months, on any given day, more than 3,400 children who were on the radar of Child Protective Services had not been seen once by a caseworker, according to state data of face-to-face interactions analyzed by The Dallas Morning News. Additionally, that same article reported, "On March 3, the worst day in recent months, 5,917 children statewide classified as needing immediate contact had not been seen within 24 or 72 hours, the mandatory deadlines for Priority 1 and 2 cases, respectively. And, "Last week in Dallas County, child abuse investigators still had not laid eyes on 588 of those children, or about 10 percent of abuse calls.

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

In 2017, Prairie View A&M University Cooperative Extension Program (PVAMU-CEP) in Dallas County under the guidance of its advisory committee, implemented the "Parenting Matters" program (PM) to respond to the need for parenting program services in Dallas County. Subsequently, Parenting Matters (PM) was implemented three different occasions at two sites (Hope Christian Womens Job Corp and the DeSoto Wraparound Services). PMs eight-session curriculum (occasionally condensed to six) addressed parenting issues facing families in Dallas. PVAMU-CEP-FCS department (Dallas) recognizes/thanks Hope Christian Womens Job Corp and The DeSoto Wraparound Services for successful collaborative efforts. And, as usual, the PVAMU/CEP Advisory Committee-Task Force cooperated in all phases of the parenting program.

Results

AgriLife Extension

In 2017, parents completed 5,697 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 = 5,697). Pre-test average = 68% vs. post-test average = 88%.

Cooperative Extension Program
HOPE

As a result of implementing the PM program in 2017 some of the following highlights, impacts and statistics were captured: 336 parenting contact hours served; 171 parenting contacts made and 19 separate PM sessions conducted .

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
2017	45

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 2017 evaluation study involving more than 650 FRED participants show statistically significant increases in the amount of time that parents spent reading to their children, number of books read, and the level of involvement in their children's education.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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
2017	1664

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

AgriLife Extension

Effective financial planning and management skills contribute to overall family and financial wellness over the lifespan when financial knowledge and decision-making capability are increased. In today's world, financial education is crucial. However, many young people are leaving high school lacking the fundamentals of financial literacy. Numerous studies conducted on American youths' understanding of basic financial concepts consistently reveal that young people don't possess adequate financial knowledge to be financially proficient in adulthood.

Cooperative Extension Program

According to a 2008 nationwide survey conducted by the Jump\$tart Coalition for Personal Financial Literacy, high school seniors, on average, correctly answered only 48.3 percent of questions about personal finance and economics. That was even lower than the 52.4 percent in the previous survey in 2006 and marked the worst score out of the six surveys conducted so far.

According to a 2011 Teens and Money Survey, 86 percent of teens say that they would rather learn about money management in a class before making mistakes in the real world. As per the, Bureau of Labor Statistics Maverick County Data: Unemployment rate in Maverick County is 11.4% and 30.5% of households in Maverick County are living below the poverty line vs. 17.6% in the state of Texas.

What has been done

AgriLife Extension

AgriLife Extension's financial management programs include both financial education for adults and real-world expenditure decision-making opportunities for youth 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

Program series was conducted in collaboration with Eagle Pass ISD who provided the location for the program and assisted with facilitating the program in the classroom setting. The Money Management program is a six lecture series offered to youth in a classroom setting at the Eagle Pass ISD 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.

Results

AgriLife Extension

Evaluation data from adult participants indicate that they found the workshop series to be helpful. After completing the workshops, 100% planned to organize their financial files; over 90% planned to track their spending; over 80% planned to prepare a written budget and develop a financial record-keeping system; over 90% planned to examine their use of credit and reduce overall debt; over 50% planned to establish a savings set-aside account and over 70% planned to identify ways to reduce expenses and increase savings. Youth outcomes were also very positive. 79% of youth agreed or strongly agreed that From the Classroom to the Welcome to the Real World was helping in their financial decision making. More specifically, 71% of youth increased their knowledge of how to keep track of financial transactions, 68% increased their knowledge of how to create and follow a spending plan, and 46% plan to create and follow a spending plan.

Cooperative Extension Program

Program series was conducted in collaboration with Eagle Pass ISD who provided the location for the program and assisted with facilitating the program in the classroom setting. The Money Management program is a six lecture series offered to youth in a classroom setting at the Eagle Pass ISD 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.

Out of 44 participants, 26 (59.1%) participants increased their knowledge of how to create a budget, 4 participants gained no knowledge and 14 participants did not respond to this question; 23 (52.3%) participants increased their knowledge of balancing income and expenses, 7 participants gained no knowledge and 14 participants did not respond to this question; 18 (40.9%) participants increased their knowledge of the relationship between education ?careers and potential earnings, 10 participants gained no knowledge and 16 participants did not respond to

this question; 20 (45.5%) participants increased their knowledge of the effects of student loan debt on future budget, 9 participants gained no knowledge and 15 participants did not respond to this question. 24 (54.5%) participants increased their knowledge about the importance of paying yourself first (saving), 6 participants gained no knowledge and 14 participants did not respond to this question; 27 (87.1%) participants increased their knowledge of how to use a register to keep track of transactions, 4 participants gained no knowledge and 13 participants did not respond to this question.

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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	1557

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Effective financial planning and management skills contribute to overall family and financial wellness over the lifespan when financial knowledge and decision-making capability are increased. Managing credit and debt effectively avoids financial problems and setting financial savings goals enhances future financial security. Student loan debt can cost young people more than just the principal and interest. It can mean postponing major milestones of adulthood. Nearly half of people aged 18-29 have put off major life events like getting married, purchasing a car or home because of student debt.

What has been done

The Wi\$eUp curriculum, originally developed by AgriLife through funding from the U.S. Department of Labor - Women's Bureau, was adapted for the new audience and began to be implemented in 2017. As part of the From the Classroom to the Real World program, students learn in the classroom that saving money can help to become financially secure and provide a

safety net in case of an emergency. During the Welcome to the Real World simulation students with cares requiring post-secondary education make a student loan payment equal to the amount required to pay off their student loan in 10 years.

Results

After completing the Wi\$eUp workshops, over 90% planned to examine their use of credit and reduce overall debt; over 50% planned to establish a set-aside savings account and over 70% planned to identify ways to reduce expenses and increase savings; over 60% planned to examine if they were making best use of their employer-provided insurance benefits. Results from Welcome to the Real World showed that 58% increased their knowledge of the importance of Paying Yourself First (savings) and 46% intend to make deposits into their savings account on a regular basis.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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.

Not Reporting on this Outcome Measure

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
2017	2267

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 2017. The total annual cost of motor vehicle occupant-related death and injury is \$214 million 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 2016, 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 2016, 1,233 children under 14 were killed 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 2017, the project trained 56 participants as certified child passenger safety technicians. To date, 1004 technicians have been trained, including 193 Extension agents and 256 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 2017, 2,267 safety seats were inspected and 1,584 new seats distributed at no cost to families. The economic benefit is estimated at over \$3 million.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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
2017	1584

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Safety belts and child restraints are the single most effective tool in reducing these deaths and injuries. Unfortunately, in 2016, 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 2016, 1,233 children under 14 were killed 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 2017, the project trained 56 participants as certified child passenger safety technicians. To date, 1004 technicians have been trained, including 193 Extension agents and 256 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.

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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: Results from a 2017 evaluation study with over 1,500 child care providers and directors indicate that 98% of participants acquired new information, 99% plan to utilize the information to improve their programs, and 99% consider themselves better equipped to work with children. A recent evaluation study with more than 111,000 online participants who completed a series of health and safety courses found statistically significant knowledge increases on all courses (75% pre-test average vs. 89% post-test average, $p < .05$). Participants indicate that they are highly satisfied with the courses, with 89% rating them as "Very good" or "Excellent," 97% stating that they learned new information from the courses, and 99% reporting that they would recommend the online courses to others.

Passenger Safety: 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 2017, 2,267 safety seats were inspected and 1,584 new seats distributed at no cost to families. The economic benefit is estimated at over \$3 million.

Parenting and Dependent Care Providers: Parents completed over 5,600 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 = 68% vs. post = 88%). Moreover, dependent care providers attending trainings vastly improved their knowledge of best-practices in dependent care. According to evaluation data, 94% learned new information.

Key Items of Evaluation

In 2017, child care professionals completed 441,709 online courses (797,418 clock hours). A recent evaluation study with more than 111,000 online participants who completed a series of health and safety courses found statistically significant knowledge increases on all courses (75% pre-test average vs. 89% post-test average, $p < .05$). Participants indicate that they are highly satisfied with the courses, with 89% rating them as "Very good" or "Excellent," 97% stating that they learned new information from the courses, and 99% reporting that they would recommend the online courses to others.

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
806	Youth Development	100%	100%	0%	0%
	Total	100%	100%	0%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	100.0	10.0	0.0	0.0
Actual Paid	130.1	7.0	0.0	0.0
Actual Volunteer	0.0	200.0	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
2125890	467696	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2125890	193920	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
15855333	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 36 Texas counties facilitated by Extension Agents with the Cooperative Extension Program in partnership with community volunteers and agencies. There are outreach activities such as presentations and experiments on geospatial technology (drones/fitness trackers) and water quality (4H20) as well as literature dissemination at local health fairs and other community events. There are demonstrations and educational enrichment provided to youth in schools and afterschool programs in life skills, healthy living, workforce development, and science exploration and discovery. There are community clubs that develop and promote life leadership skills and service to others in a context with caring adults. There are special interest project clubs in areas such as gardening and robotics. Youth maintain record books and practice in order to participate in contests such as food challenges, photography, robotics and livestock shows on the county, district, state, and national levels. Special events like camps, summits, and project-oriented days are 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 36 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?

The Cooperative Extension Program, 4-H and Youth Development, was awarded an eXtension Issue Corps on Diversity and Inclusion (<https://www.extension.org/diversity-inclusion-issue-corps-accepted-projects-by-institution/>). The project focused on mobilizing communities toward civic engagement and improving police and community relations. In collaboration with the College of Juvenile Justice personnel, 4-H staff attended a designathon and participated in a series of webinars and professional development activities.

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	132494	1307274	405610	0

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

Year: 2017
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of group educational sessions conducted.

Year	Actual
2017	19519

Output #2

Output Measure

- # of youth that participate in educational activities and programs.
 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 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 in limited resource youth more likely to pursue enrollment in post-secondary education.
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 4-H club participants increasing knowledge in healthy living
12	% of 4-H club participants changing behaviors for healthier living
13	% of limited resource youth applying citizenship (leadership or services) skills
14	% of youth who plan to adopt character practices as a result of participation in character education programs.
15	% 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

Year	Actual
2017	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 58,000 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 are noted below:

- *Self-esteem/confidence
- *Teamwork
- *Communication/Public Speaking
- *Responsibility
- *Decision Making

Below are results from retrospective on-site survey completed by more than 600 4-H members on knowledge and understanding as a result of participating in a 4-H Leadership Lab.

25.0% increased their understanding of their personal strengths and things they need to work on to be a better leader.

21.3% increased their understanding of the strategies to work with others.

21.3% increased their knowledge of what makes a good public speaker.

20.7% increased their knowledge of teamwork.

20.0% increased their understanding of the role of communication in a team setting.

19.7% increased their understanding of the responsibilities of being a leader.

18.0% increased their understanding of the importance of goal setting.

17.7% increased their understanding of the importance of cooperation with others when working on a team.

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
2017	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.

Results

Below are results from retrospective on-site survey completed by more than 600 4-H members on changes made as a result of participating in a 4-H Leadership Lab.

92.1% feel like what they learned provides them with the ability to make better leadership decisions.

90.4% plan to implement the activities or ideas learned with others in their county.

88.1% are more confident in serving in a leadership role in the county.

87.6% are more comfortable working in a team.

86.8% are more confident in recognizing leadership qualities in others.

86.1% are more confident in their abilities.

85.3% are more comfortable speaking with others.

84.6% are more confident in making decisions.

72.9% are more confident with public speaking.

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
2017	79

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 and their associated higher education opportunities. 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

As a result of participating in Crossroads:

96% plan to take action and share with others the information learned at Crossroads.

92% learned something they did not know about the different career opportunities available.

89% gained new ideas of what they can do to better prepare for their college education.

87% learned something new about degree opportunities that could be offered to them.

85% said their participation in Crossroads has influenced their career choice.

81% gained ideas of what they can do now to plan for their chosen career.

79% indicated participation in Crossroads influenced their future college 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
2017	76

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.

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.

What has been done

Focused on quality assurance and character education, Quality Counts is designed to teach young people the importance of displaying good character in carrying out livestock projects, and in every aspect of their lives. Quality Counts helps youth exhibitors learn the importance of using proper livestock management practices so that food quality and safety are preserved.

Results

The most recent results of 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
2017	41

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 2017, 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 Leaders 4 Life evaluation, youth revealed the following knowledge increases:

- 40.7% - How to build an agenda for business meetings
- 37.7% - Purpose and principles of parliamentary procedure
- 37.3% - Five methods of decision making
- 34.7% - Different communication strategies
- 34.3% - Different leadership styles
- 31.0% - Visioning
- 31.0% - Precedence and basic rules of motions

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Year	Actual
2017	100

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 anticipated behavior changes.

100% believe that what they learned has given them the ability to make better leadership decisions.

95.2% are more confident in serving in a leadership role.

92.9% know how to be an effective communicator and good listener.

92.7% can effectively participate in a business meeting using correct parliamentary procedure.

90.7% can define leadership and leadership qualities.

90.5% have developed or improved their teamwork skills.

87.5% have a personal vision.

86.8% have or plan to implement a community service project.

82.9% have set personal goals to help them fulfill their personal vision.

82.5% is able to identify and utilize resources to get a task accomplished.

80.0% know their leadership styles and how to use them effectively in leadership roles.

79.5% can use creativity to brainstorm and come up with the best solution to a problem.

76.2% are a better manager of conflict and knows how to apply different management styles to conflict.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #7

1. Outcome Measures

% increase in limited resource youth more likely to pursue enrollment in post-secondary education.

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	108

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The United States of America 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 persons likelihood to be career ready.

What has been done

There were 108 participants in grades 6 through 12 from across Texas involved in residential college preparatory programs exploring agricultural science through the AgDiscovery, Career Awareness & Youth Leadership Laboratory (CAYLL), Jr. Youth Leadership Lab and the Research Extension Apprenticeship Programs funded by the USDA. Five scholarships to attend college were awarded to program participants.

Results

A sample of participants was surveyed. Results indicate that 84% (n=74) are more aware of STEM majors, 87% (n=36) are more interested in pursuing a STEM degree, and 80% (n=15) are more likely to enroll in college. For Youth Leadership Lab, in particular, participants awareness of STEM college majors increased by 18% (n=29), going from 79% to 97%. Youth who are more likely to enroll in higher education result in increased wage earners that contribute to the economic stability of their communities. There were five 4-H participants that were awarded \$75,000 in scholarship money, courtesy of the San Antonio Livestock Show and Exposition. Those five students are now enrolled as undergraduates at Prairie View A&M University.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Year	Actual
2017	2275

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The National 4-H Science mission mandate is designed to address the following: unsolved worldwide social problems, a shortage of scientists and people understanding science in the United States, underrepresentation of women and minorities in science careers, a need for a more diverse pool of trained scientists to frame and solve problems and educate others. The general population in the US lack a basic understanding of scientific methods and content (science literacy) (4-H Science Logic Model, 2010). 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. Even 27% of agriculture employment opportunities will be in STEM by 2020, according to the United States Department of Agriculture (2015).

What has been done

There were 2,275 youth from more than six counties reached with hands-on STEM activities through a Mobile Ag Awareness Field Day, Career Fair, College Prep Campus Tour, Minorities in Agriculture Adventure in STEM, Lockheed Martin Pathway to STEM Careers, Careers in Ag series, College Preparation residential camps, and a delegation to Tomorrows Agriculture Annual Professional Symposium High School Program. Projects included 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. A Career Spotlight event introducing 75 youth and young adults to internships and potential employers was held. Workshops included Your Dream Job, Dos and Do Nots of Interview Attire, Resumes and Cover Letters. A panel discussion introduced attendees with

potential employers such as Monsanto, Texas Parks and Wildlife Department, Cooperative Extension Program and Texas A&M AgriLife. In addition for opportunities to submit online applications and participate in onsite interviews.

Results

A sample of participants was surveyed. Results indicate that 93% (n=169) have increased awareness in entrepreneurship, STEM and Agriculture careers. While 57% had an interest in pursuing STEM careers. For Youth Leadership Lab, specifically, participants awareness of STEM and agriculture careers increased by 34-35%, rising to 95% from 62% and 100% from 66% (n=29). Eighty percent (n=20%) of Career Smart Spotlight survey respondents agree they were introduced to 2 or more employers, while one student was placed in an internship as a result of the program. Two high school students from Dallas and Cameron Counties, who began exploring agriculture careers at Youth Leadership Lab in 2015 and 2016 respectively, gained summer youth employment with the United States Youth Conservation Corps (YCC). The student remarked, I am so grateful for this experience because of the different things it taught me and for opening my eyes to a part of nature I would never had a chance to experience in my home town. My favorite part about the internship was camping. I had a chance to swim in a river where the water was clear, and I also went kayaking and white water rafting. This was my first time seeing wildlife up close. One youth member from Cass County enrolled as a Firefighter Cadet after participating in a Career Awareness program. His mother was appreciative of the leadership skills, job skills, responsibility, and teamwork the program developed in her son.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Year	Actual
2017	4378

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

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, 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 4,378 youth from more than sixteen counties reached with hands-on STEM activities. Projects include gardening, photography and robotics. Programs include Hatching in the Classroom and Learn! Grow! Eat & Go! There was a Minority Adventures in Ag field day hosted in Dallas County and Mobile Ag Awareness Days in Harris County. Outreach efforts included National Youth Science Day experiments (4-H2O, Eco-Bots, Rockets to the Rescue and Incredible Wearable) in various counties.

Results

Youth participants improved their science skills. A sample of participants was surveyed. Findings indicate that 84% are to question and test using scientific method (n=69). In photography and robotics, 84% also improved their technology skills (n=40).

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Year	Actual
2017	5421

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 Heroes 4-Health program included six lesson educational series reached 4,430 youth and came from the Choose Health: Food, Fun, and Fitness curricula, supplemented by other curriculum such as Junior Master Gardener, Yoga 4 Kids and Learn! Grow! Eat & Go! Youth participated in Food Challenge and Walk Across Texas. Community events such as garden and health fairs were also key program components with outreach efforts resulting in additional 1,056 contacts.

Results

There were 4,386 Healthy Living Common Measure surveys administered as part of the Youth Voice: Youth Choice Healthy Living programs, some of the results are still being analyzed. As a result of 4-H healthy living programs, 91% (n=1,041) of participants drink more water. Ninety percent (n=1235) of participants eat more fruits and vegetables, 82% (n=701) of participants eat more whole grains, 80% (n= 672) of participants encourage family and friends to eat meals together, while 78% (n= 701) of participants eat less junk food.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #11

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
2017	41

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% - My Plate
- 37.0% - Food nutrients and their functions
- 36.7% - How to alter a recipe according to dietary needs
- 33.3% - How to figure cost analysis
- 31.3% - The purpose of different cooking methods
- 30.7% - How to plan and prepare a recipe
- 27.7% - How to read nutrition fact labels
- 25.0% - The importance of food safety
- 20.7% - Kitchen safety

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #12

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

Year	Actual
2017	69

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

KA Code	Knowledge Area
806	Youth Development

Outcome #13

1. Outcome Measures

% of limited resource youth applying citizenship (leadership or services) skills

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	942

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

There were 942 youth who applied leadership skills, provided service to their communities, and improved in decision-making. The Youth Voice: Youth Choice healthy living programs mobilized directly 115 underserved youth ambassadors and 51 adult leaders to provide leadership and take action around nutritional deficiencies, healthy food choices, and physical activity in eleven counties. This included peer education around healthy living. There were 3 international, 30 national, and 111 state delegates to conferences such as National Youth Summit on Healthy Living, State Healthy Living Summit, National 4-H Conference, Citizenship Washington Focus, Youth Voice: Youth Choice Grant Orientation, Global 4-H Summit, National 4-H Congress, and Tomorrows Agriculture Professional Symposium High School program. Youth participated in photography, robotics, goat judging and food contests on the county, district, and state level. 4-H members in Travis, Cass, and Waller counties also served their communities through service. For example, 4-H youth put on a Great Green Salad event at a First Responders Appreciation Luncheon in Cass County. Youth also participated in Take A Stand, a bullying prevention program, in two counties.

Results

Peer teaching and contests allow youth to demonstrate how their project has improved their confidence, motivation, decision-making, communication, and problem-solving skills. More than 30 participants received Best in Show or Grand Champion awards. One 4-H State Goat Judging

winner from last year returned to judge this years event, received a livestock judging scholarship, and is currently competing with a collegiate team at South Plains College in Levelland, Texas. Two 4-H State Goat Judging winners from 2016 and 2017 traveled to Mexico to lead inaugural youth goat workshops to inspire positive youth development through animal projects there. A sample of participants were surveyed, findings indicate the following: 100% (n=12) report they had an opportunity to teach others, act as a mentor, and confidently help others, 93% improved their leadership skills (n=15), 77% (n=44) make better decisions, 76% (n=71) can compromise to solve a conflict, 67% (n=30) now have a plan for reaching their goals, 67% (n=30) can stand up for the things that are important to them. Communities benefit as youth positively contribute to as responsible citizens and willing public servants. Other outputs include 385 bags (backpacks with school supplies and sewing project carrying bag), two gardens, one float and care packages being donated. Bags were donated to limited resource youth, include those in Child Protective Services custody. The gardens were installed at a fire station and senior adult apartment complex. The Wildflower Trail Parade float was built for a community event. According to a sample of teen ambassadors, 100% (n=12) gained leadership skills through serving their community.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #14

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
2017	100

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

The most recent results available for one specific that was conducted to teach character education through livestock projects. Results are below from 120 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 #15

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
2017	80

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

The most recent results available for the online testing for the Quality Counts Program 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
806	Youth Development

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

The state defined outcomes provide a comprehensive set of evaluation data for review.

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	40%	40%	0%	0%
806	Youth Development	60%	60%	0%	0%
	Total	100%	100%	0%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	20.0	11.0	0.0	0.0
Actual Paid	17.4	7.0	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
284323	467696	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
284323	193919	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
2120544	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

There has been training provided by and to 4-H staff, adult leaders, and youth ambassadors. Forty trainings for over 200 adult and youth volunteer leaders in 10 counties and on campus. These include orientations to 4-H, club manager, club chartering, record book, and financial management trainings. Project trainings include photography, food challenge, robotics, public speaking, clothing & textiles.

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 partnering with 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 that will be targeted 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

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	10944	62426	10203	0

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

Year: 2017
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # group educational sessions conducted.

Year	Actual
2017	1258

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	% 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

Year	Actual
2017	83

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. When developing volunteers, we are also developing leaders, who in turn then help develop youth into leaders.

What has been done

Extension provides a variety of leadership development opportunities for volunteers, including those through the Master Volunteer Programs, as well as the 4-H Youth Development Program. These 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.

Results of one leader training are highlighted below.

83% learned how they could educate citizens.

79% learned the impact for Texans of Extension programs.

79% learned how to best serve as an Extension volunteer.

74% feel equipped to teach others.

71% learned how their leadership style can engage others.

In 2017, Master Wellness volunteers provided 5,463 hours of service reaching 27,511 Texans.

This allowed us to extend Extension's outreach and education related to health, nutrition, food safety and family well-being in the communities where they live and work. More than 8,000 Master Gardeners provide more than 600,000 hours of educational service to their local communities.

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
2017	44

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. Adult leadership development programs were held for community members and Extension volunteers focused on various subject matters to learn about leadership, gain skills needed to serve in community leadership positions and acquire knowledge of community and economic development.

Results

Results of one leadership training are below, indicated the volunteers plan to adopt the leadership development practices.

- 41.45% - ability to provide youth development practices at the local level
- 44.14% - ability to serve as a leader in my county
- 25.21% - ability to use information in which I was trained
- 24.65% - ability to provide a safe environment for all youth

4. Associated Knowledge Areas

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

Outcome #3

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

Year	Actual
2017	0

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

There has been training provided by and to 4-H staff, adult leaders, and youth ambassadors. Forty trainings for over 200 adult and youth volunteer leaders in 10 counties and on campus.

These include orientations to 4-H, club manager, club chartering, record book, and financial management trainings. Project trainings include photography, food challenge, robotics, public speaking, clothing & textiles. For example, there was the inaugural Spanish ? Speaking Duds to Dazzle Training in Cameron County and a number of adult leaders facilitated the first Brazos Valley Agribotics Competition. Grant orientation and trainings included Heroes 4-Health and Growing U. Curriculum trainings included the Learn! Grow! Eat & Go and Choose Health: Food, Fun, & Fitness.

Six 4-H staff attend National Extension Conference on Volunteerism. Two staff presented on Effective Strategies for Engaging Limited Resource and Minority Volunteers in 4-H Programs. Another staff person served on the planning committee. Four staff also conducted presentations at the State & National AAFCS conference on Sew On: Engaging Adult Volunteers in Skills to Lead 4-H Projects.

Results

There were 4-H Scholarship recipients who volunteered at Prairie View A&M University and San Antonio Livestock Exposition. They assisted with college events such as college days for youth, Future Farmers of America leadership development events. They volunteered at the rodeo in San Antonio in efforts that raise scholarship money for youth. They also gave their time by presenting at the Career Smart Spotlight. Staff and adult leaders assisted with Hurricane Harvey Relief Efforts. This included passing out supplies, taking in distressed animals from nearby counties, assisting crowdsourcing rescue efforts, etc. There was also an Open House during National 4-H Week. The activities included a Volunteer Signing Day, where 7 volunteers made a commitment to serve as leaders. They received youth protection and other training.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

V(I). Planned Program (Evaluation Studies)

Evaluation Results

To date, all 4-H volunteers have completed the online volunteer orientation and ensuring a safe environment training.

It is also noteworthy to share that last year Extension utilized more than **85,000** 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.

Key Items of Evaluation

VI. National Outcomes and Indicators

1. NIFA Selected Outcomes and Indicators

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