

2019 Annual Report of Accomplishments and Results

WYOMING

University of Wyoming – AES and CES

I. Report Overview

The NIFA reviewer will refer to the executive summary submitted in your Plan of Work. Use this space to provide updates to your state or institutions as needed.

1. Executive Summary (Optional)

The Wyoming economy has suffered significant reduction in revenue due to reduced gas, oil, and coal productions. This reduced revenue has caused the University to implement a hiring freeze. Statewide the extension workforce has gone from 34 area educators in range, agriculture and horticulture, nutrition and food safety, and community development in 2015 to 16 area educators in 2019. The reduced workforce has impacted the level of programming outputs as well as forced educators to consider alternative ways to deliver programs statewide. The hiring freeze also resulted in the elimination of the Energy Specialist position. This has increased the workload in other program areas reducing the resources available for programming in sustainable energy. Educators in 4-H remains consistent due to funding provided by county partners. External factors, which affect the 4-H program, remain consistent and include high turnover of staff and financial support from the county partner.

The chart below highlights the number of programs taught and the participant reach in the planned programs.

Planned Program Title	Number of Programs Taught	Adults Reached	Youth Reached
4-H Youth Development	1,309	49,038	54,950
Community Development Education	287	7,037	1,394
Sustainable Managements of Rangeland Resources	225	7,836	2,391
Global Food Security and Hunger, Crop, Livestock and Horticulture Systems	538	9,237	3,436
Climate Change	10	495	1
Sustainable Energy	2	188	8
Childhood Obesity, Nutrition, and Health	174	2,449	2,424
Food Safety	48	16,563	427

II. Merit and Scientific Peer Review Processes

The NIFA reviewer will refer to your Plan of Work. Use this space to provide updates as needed or activities that you would like to bring to NIFA’s attention.

Process	Updates
1. The <u>Merit Review Process</u>	No update to report
2. The <u>Scientific Peer Review Process</u>	No update to report

III. Stakeholder Input

The NIFA reviewer will refer to your Plan of Work. Use this space to provide updates as needed or activities that you would like to bring to NIFA’s attention.

Stakeholder Input Aspects	Updates
1. Actions taken to seek stakeholder input that encouraged their participation with a brief explanation	No update to report
2. Methods to identify individuals and groups and brief explanation.	No update to report
3. Methods for collecting stakeholder input and brief explanation.	No update to report
4. A Statement of how the input will be considered and brief explanation of what you learned from your stakeholders.	No update to report

IV. Planned Program Table of Contents

No.	Program Name in order of appearance
1.	4-H and Youth Development
2.	Community Development Education
3.	Sustainable Management of Rangeland Resources
4.	Global Food Security and Hunger, Crop, Livestock and Horticulture Systems
5.	Climate Change
6.	Sustainable Energy [not reporting]
7.	Childhood Obesity, Nutrition, and Health
8.	Food Safety

V. Planned Program Activities and Accomplishments

Please provide information for activities that represent the best work of your institution(s). See Section V of the Guidance for information on what to include in the qualitative outcomes or impact statements. Add additional rows to convey additional accomplishments. You may expand each row as needed.

No.	Title or Activity Description	Outcome/Impact Statement	Planned Program Name/No.
1.	Virtual program delivery of 4-H Livestock Programs	More than 25 livestock programs reached more than 1,200 4-H youth, volunteers, parent, and extension educators via virtual delivery across seven states in 2019. Species included beef, sheep, goats and swine, and topics included selection, nutrition, health, and show box management. At least one online workshop was offered to 4-H members via Zoom each month October through July. Virtual deliver helped overcome identified barriers to 4-H participation such as transportation, cost and lack of family support.	4-H and Youth Development (1)
2.	Teen volunteer camp training	Most Wyoming counties host or co-host summer 4-H camps that reach about 1,265 youth. Teen counselors plan, lead, organize, teach, and evaluate camps and are group and cabin leaders, friends and mentors. 4-H professionals developed the first Wyoming 4-H Counselor Camp, a statewide training weekend at which 21 teen counselors from six counties participated. Addressed were teamwork and leadership; child and adolescent development; camper behavior management; risk management; teaching; facilitation; understanding organization and camp environment.	4-H and Youth Development (1)
3.	Chicks teach K-4 STEM skills	Agriculture literacy met academic content standards in Goshen County. Using a research-based curriculum, eight teachers and more than 150 students from kindergarten to fourth grade followed the life cycle of embryonic chicken eggs to chicks to developing chickens. Community donations and guidance by 4-H members and UW Extension educators	4-H and Youth Development (1)

		supported the hands-on approach to science, technology, engineering and math (STEM). Teachers reported students were engaged, full of questions, and thinking like scientists. They noted improvements in developing research questions and hypotheses, measuring skills, and recording observations.	
4.	EVOLVE model builds citizen skills and healthy Wyoming communities	EVOLVE (Extension Volunteer Organization for Leadership, Vitality and Enterprise) builds skills and community connections to increase confidence and comfort levels so graduates become active leaders in their communities, at work and homes. A local steering committee of community residents guides the institutes. Thirteen EVOLVE programs have been offered since moving from a single county-based program to a model replicated across the state. Community-based experiences are an important element of the program. Participants reported more board service and higher levels of civic engagement.	Community Development Education (2)
5.	Elder Financial Exploitation: Family Risk and Protective Factors	Elder financial exploitation is a widespread and growing problem. Many researchers have focused on identifying the problem, but less attention has been paid to how and why exploitation occurs. The goal of this project is to better understand these phenomena—particularly within the family unit—with an eye toward prevention and intervention. During the current reporting period, 11 local, regional, and national workshops/presentations were given. Workshop participant responses indicated an increase in overall knowledge of elder financial abuse of 46%, and an increase in knowledge related to individual risk factors of 45%. These dissemination efforts improved the ability of seniors, social service representatives, healthcare professionals, members of the legal and law enforcement fields, and other community members, to recognize and address the issues of elder family financial exploitation.	Community Development Education (2)

2019 Annual Report of Accomplishments and Results (AREERA)

6.	Financial literacy classes help Wyoming residents	Wyoming’s boom and bust cycles may leave some citizens scared about their financial situations. A financial literacy education curriculum was prepared and presented for at-risk clients and the general public in northeast Wyoming. Topics addressed included budgeting, spending, saving, retirement and estate planning. Approximately 451 people were reached in 20 financial literacy classes.	Community Development Education (2)
7.	Greater sage-grouse predation studied on Carbon County ranch	One proposed gap in knowledge about greater sage-grouse is the interaction between greater sage-grouse and birds of prey, such as ravens. Predator species and survival of 12 mock sage grouse nests on a Carbon County ranch were assessed. No ravens were seen when placing the nests the first year, but were noted the second year. In year one, of the six nests depredated prior to the end of the expected hatch period, three were depredated by common ravens, and three were depredated by common magpies. In year two, of the 11 nests depredated, six were depredated by common ravens, and two were depredated (and another nest suspected depredated) by common magpies.	Sustainable Management of Rangeland Resources (3)
8.	UW weed scientist, collaborators target invasive plant mayhem	University of Wyoming Extension specialists and educators have provided technical assistance to partnerships across the state and region to help thwart the advance of invasive plants. The Western Governors Association has made reducing the impact of invasive plants one of its main priorities. To counter encroachment of two new invasive winter annual grasses to the state – medusahead and ventenata – UW led creation of the Northeast Wyoming Invasive Grass Working Group that has, over the past three years, responded to over 22,500 acres of these two new invaders.	Sustainable Management of Rangeland Resources (3)

2019 Annual Report of Accomplishments and Results (AREERA)

9.	Watershed, sediment monitoring plans written for Shoshone River	The 2016 sediment release and need for future repairs to the Willwood Dam south of Powell prompted a working group to develop a watershed plan and sediment monitoring plan for the Shoshone River between the dam and Buffalo Bill Dam. Potential sediment sources to the Shoshone River and its tributaries were identified and the impacts prioritized. The plan also identified potential projects and funding sources that might be voluntarily applied with landowners and agencies to reduce sediment loading.	Sustainable Management of Rangeland Resources (3)
10.	Women expand farm and ranch skills	According to the 2012 USDA Census of Agriculture, 6,431 women in Wyoming are either sole owners or active in farm and ranch decision making. UW Extension partnered with Annie’s Project, a national program for women in agriculture, and Farm Credit Services of America to offer six-week workshops in Niobrara and Converse counties. Women reported putting to use new skills in managing risk, livestock handling, estate planning, drought management, economics, and marketing. Their actions directly influence their properties’ productivity, profitability and sustainability.	Sustainable Management of Rangeland Resources (3)
11.	Wild Horse & Burro Management	Wyoming ranks in the top three states with the greatest number of wild horses. This burgeoning horse population is putting increasing pressure on native plant communities, native wildlife populations, and multiple use of public lands. The latest GPS tracking technology is being used to obtain near-real-time spatial data to determine horse movement on rangeland sites. This research will provide tangible data for resource managers making difficult decisions regarding wild horses in Wyoming.	Sustainable Management of Rangeland Resources (3)
12.	Ranchers see decision support tools trump most rules of thumb	During workshops on economic tools, ranchers would relay rules of thumb they used to make decisions. Some seemed to make sense from an economics perspective, many did not. Tools from the Wyoming Ranch Tools website (https://uwyoextension.org/ranchtools) walked producers	Global Food Security and Hunger, Crop, Livestock and Horticulture Systems (4)

		through calculations that illustrated many of the weaknesses. The point was to convince producers to use decision support tools and not rules of thumb to make more informed decisions. Eight workshops were in Wyoming and 24 more in other regional states. Over 750 producers have attended.	
13.	Wyomingites help pollinators thrive	To help stem hive losses and decline of native bees and pollinators, UW Extension hosts Wyoming Bee College, a two-day conference in Cheyenne that attracts beekeepers of all levels and pollinator enthusiasts. The event has evolved to focus on animal husbandry approaches to beekeeping. Besides the need for pollinators in agriculture and horticulture, bee products provide income for Wyoming businesses. Bee College has grown from 127 attendees and three educational tracks in 2014 to 300 attendees, including 25 youths, eight volunteers, and five tracks.	Global Food Security and Hunger, Crop, Livestock and Horticulture Systems (4)
14.	Livestock producers improve range cow nutrition	Beef cattle producers want to provide cows with the nutrients they need to stay healthy and perhaps do better – increased conception rates, for example – but at the lowest possible cost. A UW Extension workshop taught ranchers how to understand nutrient needs throughout cows’ life cycle, what the rangeland forage provides, and how to develop a supplement program that addresses the nutrient shortfalls in the forage. Producers from Big Horn, Campbell, Converse, Johnson, and Sheridan counties attended. Producers reported changing practices that lowered costs, boosted profits.	Global Food Security and Hunger, Crop, Livestock and Horticulture Systems (4)
15.	Reproductive performance in domestic ruminant	Our research investigates the implications of maternal obesity on offspring health, growth efficiency, glucose-insulin dynamics and reproductive function. These studies show strong evidence that optimization of maternal nutrition and the associated uterine environment contributes to the birth of healthy, growth-efficient offspring, which is vital to livestock production efficiency. In addition, recent data demonstrate that the	Global Food Security and Hunger, Crop, Livestock and Horticulture Systems (4)

		negative metabolic effects of maternal obesity are observed in children and grandchildren. Results will be used to inform management practices to improve offspring health and livestock production efficiency.	
16.	Food, Feed, Fuel, and Fiber: Security Under a Changing Climate	Climate change is a major concern in the agricultural community. Many of the related issues are extremely complex and the magnitude of change is uncertain and difficult to predict--especially at the local scale. To engage local producers we've implemented a number of on-farm participatory research projects including integrating cover crops and livestock into intensive irrigated cropping systems, and working with dryland winter wheat producers to increase organic matter and nutrient status in depleted soils. These efforts have improved awareness of the effects of increased climate variability on production, and on innovative combinations of practices to increase cropping system resilience.	Climate Change (5)
17.	Nutrition program graduates report healthy changes	Cent\$ible Nutrition Program (CNP) educators provide nutrition and physical activity education to income-qualifying adults and youth in every county and on the Wind River Reservation. CNP also partners with local agencies and organizations on community-level programs that make the healthy choice the easy choice for people with limited resources. More than 80 percent of graduates from CNP cooking classes saved on food costs (\$66.55 monthly on average) and more than 90 percent increased their score on the USDA Healthy Eating Index.	Childhood Obesity, Nutrition, and Health (7)
18.	Kids cook up healthy habits	Preparing food in small group settings contributes to personal and social development. Besides being a basic life skill, cooking can instill feelings of accomplishment and pleasure. 249 Weston and Crook county 5- to 14-year-olds learned to cook through UW Extension cooking classes taught in kitchens at Newcastle, Upton, and Hulett high schools, with parents, community coordinators, and summer interns assisting. The Cooking with	Childhood Obesity, Nutrition, and Health (7)

2019 Annual Report of Accomplishments and Results (AREERA)

		Kids program is countering grim statistics on childhood obesity, fast food calories, and diet quality.	
19.	Evaluating value, usage, and promotion of indigenous plants/foods of Wyoming and the mountain west	The American Indian and Alaska Natives diet has shifted significantly from indigenous foods to a “westernized” diet contributing to a variety of health risks, especially related to chronic conditions such as obesity, cardiovascular disease, and type 2 diabetes. Insights into dietary patterns and nutritional quality of foods can provide useful information for research and intervention projects targeting improved dietary patterns and health outcomes among affected groups. Our goal is to help build an understanding of the use and value of indigenous plants and foods by identifying nutrient composition and contribution to dietary patterns, and by promoting knowledge and understanding of indigenous plants and foods among tribal members (especially youth). Initial nutrient profile comparisons to reference foods have been made for biscuitroot, sego lily bulbs, yampah root, and whitebark pine nuts. Ongoing participation of the Restoring Shoshone Ancestral Food Gathering community group on the Wind River Indian Reservation has been key to identification of plant types, locations, and collection of traditional plants and grassroots efforts to improve use and understanding of traditional foods.	Childhood Obesity, Nutrition, and Health (7)
20.	ServSafe manager trainings	Wyoming Nutrition and Food Safety (NFS) Educators, in cooperation with the Wyoming Department of Agriculture CHS, offered ServSafe® manager trainings. Twelve of 17 (82%) individuals passed the standardized test and received national certification provided by the National Restaurant Association Educational Foundation.	Food Safety (8)
21.	Food Safety Works	This is a training for food service workers that covers the basic requirements for safe food handling. The Wyoming Food Safety Fundamentals training is for retail and other foodservice personnel. This class provides detailed information about and practical tips for reducing	Food Safety (8)

		<p>the risk of foodborne illness. Through an evaluation, 100% (42) of the participants improved their food safety knowledge. A high percentage of participants indicated through verbal feedback that they would make at least one change related to food safety within the four core practices: clean, separate, cook, and chill.</p>	
<p>22.</p>	<p>Enteric diseases of food animals: Enhanced prevention, control and food safety</p>	<p>Major foodborne pathogens cause 9.4 million illnesses, 56,000 hospitalizations, and 1,400 deaths in the U.S. each year. The annual cost of foodborne illness is estimated to be a staggering \$15.6 billion. Our goal is to reduce the burden of foodborne illness by improving our understanding of the persistence, resistance, and dissemination of foodborne pathogens in natural environments (including wildlife), food animals, and food processing facilities. To further this goal, we’re seeking to improve diagnostics of foodborne pathogens as well as bacteria that indicate the presence of pathogens. Through collaborative efforts, our lab has developed a method to predict types of antimicrobial resistance as well as host sources of <i>Escherichia coli</i> based on differential fatty acid abundance. For example, following linear regression analysis of fatty acid abundance, resistance to the important fluoroquinolone antimicrobials nalidixic acid and ciprofloxacin could be predicted with 79% and 81% accuracy, respectively. The host source was predicted with 63% accuracy. Improved detection methods will benefit producers and regulatory agencies in developing mitigation strategies to reduce the threat of dissemination of foodborne pathogens and antimicrobial resistant bacteria.</p>	<p>Food Safety (8)</p>