

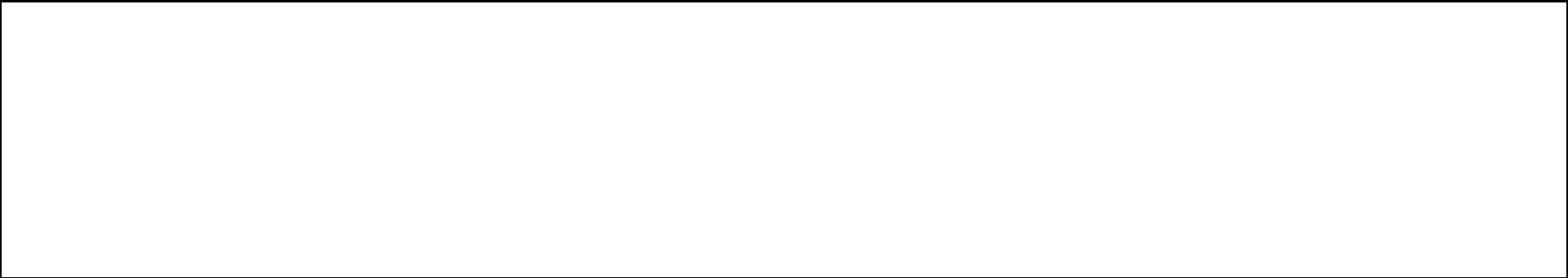
**FY 2020 Annual Report of Accomplishments and Results**

[West Virginia]
[West Virginia University Extension Service]
[West Virginia Agricultural and Forestry Experiment Station]

**I. Report Overview**

The NIFA reviewer will refer to the executive summary submitted in your FY 2020 Plan of Work located in the Institutional Profile. Use this space to provide updates if needed.

<b>1. Executive Summary (Optional)</b>
<p>The West Virginia University Extension Service and the West Virginia Agricultural and Forestry Experiment Station continue to meet the needs of West Virginians as identified under our broad six critical issues including: Food Access, Security and Safety/Sustainable Agriculture, Climate Change and Natural Resources Management, Health Disparities, Community Revitalization, Strengthening Youth and Families, and Nutrition and Obesity Prevention. The West Virginia University pillars of health and wellness, education, and prosperity continue to guide our efforts toward addressing our critical issues. Our Extension and Research professionals were quick to adapt to the challenges of the COVID-19 pandemic in 2020. Many of our Extension programs were moved to virtual platforms to accommodate the needs of West Virginians. We provided supplemental online educational programs in the areas of horticulture, pest management, youth development, and food production and preservation. In FY 2020, WVU Extension Service virtual programs reached about 292,868 West Virginians directly through online platforms such as Zoom and Microsoft Teams. This number excludes our direct and indirect contacts on social media such as reach, views, shares, and other reactions. Our field research, in consultation with our colleagues in the Northeast Association of State Experiment Station Directors and WVU health professionals, moved forward during the 2020 growing season. We were able to contribute our quota to reducing the rate of COVID-19 infection in WV. This is exemplified in one of our rapid response programs that educated West Virginians on community health and safety. This program reached 50,000 individuals across counties in WV.</p>



**II. Merit and Scientific Peer Review Processes**

The NIFA reviewer will refer to your 2020 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 ONLY
1. The <u>Merit Review Process</u>	No updates
2. The <u>Scientific Peer Review Process</u>	No updates

### III. Stakeholder Input

The NIFA reviewer will refer to your 2020 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 ONLY
<p><b>1. Actions taken to seek stakeholder input that encouraged their participation with a brief explanation.</b></p>	<p>The new Dean of WVU Extension Service, Dr. Jorge Atilas, currently conducted a 55-county virtual summer tour to meet stakeholders and learn how Extension could best serve their needs.</p>
<p><b>2. Methods to identify individuals and groups and brief explanation.</b></p>	<p>Due to COVID-19, we relied on Extension agents to identify and engage key stakeholders in their respective counties. Dean Atilas also visited virtually and critically observed some of these programs as part of our continued efforts toward learning the needs of the communities we serve.</p>
<p><b>3. Methods for collecting stakeholder input and brief explanation.</b></p>	<p>We collected stakeholder inputs through comments on our digital platforms, interactions with county agents, post-program evaluations, and focus groups integrated into our virtual programs.</p>
<p><b>4. A Statement of how the input will be considered and brief explanation of what you learned from your stakeholders.</b></p>	<p>From virtual interactions and post-program evaluation findings, stakeholders showed the desire for online program delivery mode. However, there are individuals and families with limited or no access to internet. WVU Extension will continue to deliver programming in a hybrid format to ensure that stakeholders are served through the different means they prefer. Based on stakeholder inputs on community needs, we initiated collaborative workgroups to develop programs that will address needs identified across different audiences. Our current initiative that aims to educate West Virginians on financial literacy is a noteworthy example.</p>

**IV. Critical Issues Table of Contents**

No.	Critical Issues in order of appearance in Table V. Activities and Accomplishments
1.	Food Access, Security and Safety/Sustainable Agriculture
2.	Climate Change and Natural Resources Management
3.	Health Disparities
4.	Community Revitalization
5.	Strengthening Youth and Families
6.	Nutrition and Obesity Prevention

**V. Activities and Accomplishments**

Please provide information for activities that represent the best work of your institution(s). In your outcome or impact statement, please include the following elements (in any order): 1) the issue and its significance (e.g., who cares and why); 2) a brief description of key activities undertaken to achieve the goals and objectives; 3) changes in knowledge, behavior, or condition resulting from the project or program’s activities; 4) who benefited and how. Please weave supporting data into the narrative.

No.	Project or Program Title	Outcome/Impact Statement	Critical Issue Name or No.
1.	<b><i>Grow This: West Virginia Garden Challenge improves Food Access for West Virginians (WVU Extension Service)</i></b>	<b>Relevance:</b> West Virginia consistently leads the nation in prevalence of chronic illnesses like obesity, heart disease and Type 2 diabetes (West Virginia Department of Health and Human Resources, 2018). Contributing to these poor health outcomes are the state’s elevated rates of poverty and food insecurity. The United States Department of Agriculture in 2018 reported that over 15% of West Virginia households are classified as food insecure, nearly 6% are incredibly low food secure, and over 17% of the population lives below the poverty line, compared with 11.8% national average (U.S. Census Bureau, 2018). To address these challenges, WVU Extension Service, launched the <i>Grow This: West Virginia Garden Challenge</i> .	Food Access, Security and Safety/Sustainable Agriculture

		<p><b>Response:</b> This program focused on increasing awareness of and interest in home gardening for food production and low-cost activity that could improve health and wellness of participants. The program targeted limited-resource population that often combat food insecurity issues. In 2018 and 2019, the <i>Grow This Challenge</i> used both social media and in-person community events to educate and engage individuals in gardening. The program engaged beginning gardeners in planting one crop at a time to build their production efficacies. Registered participants received a mail-in samples of seeds along with a growing guide. Throughout the growing season, information was consistently posted through social media to aid participants with planting, growing, managing pests, and a variety of other gardening topics. Participants were then invited to share and celebrate their garden successes through garden challenges. In 2020, the program transitioned online to adapt to the challenges COVID-19 posed to in-person interactions. Ask-the-Expert segment, through video interviews, was added to give participants opportunities to ask and receive answers to their production questions. Recipe Kits were also sent out to low-income families in select counties taking part in the <i>Grow This Challenge</i>. The kits were distributed to over 14,000 individuals across 22 counties in West Virginia. Over the past three years, 93,288 individuals have taken part in the <i>Grow This Challenge</i>.</p> <p><b>Result:</b> A total of 444 individuals responded to the post-participation survey. As a result of taking part in the <i>Grow This Challenge</i>, respondents indicated they ate, shared, and preserved the produce from their gardens. 46% of the respondents ate more vegetables therefore increasing their diet quality, 29% reported increased food security and food self-reliance, and 17% of respondents reduced their grocery bills. One participant said, “during this crisis we have been having issues of there not being much food on the shelves in the store so we want to grow some vegetables of our own to eat and possibly can for later.” The <i>Grow This Challenge</i> has extended beyond the state of West Virginia. The program was replicated in Oregon and the debut had more than 975 sign-ups within the first two days of advertisement.</p>	
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		WVU Extension Service would continue to expand partnerships and programming to combat food insecurity in the state.	
2.	<b>Miscellaneous insect and insecticide studies. (WVAFES)</b>	A potential treatment for hemlock Woolley adelgid (imidacloprid) does not negatively impact soil insect abundance.	Food Access, Security and Safety/Sustainable Agriculture
3.	<b>Plant-parasitic nematode management as a component of sustainable soil health programs in horticultural and field crop production systems. (WVAFES)</b>	Application of manures improved yields, particularly in organic wheat. Parasitic nematode abundance was low and unchanged by manure application.	Food Access, Security and Safety/Sustainable Agriculture
4.	<b>Mycotoxins: Biosecurity, food safety and biofuels bioproducts. (WVAFES)</b>	Fungal strains have been developed that have novel combinations of ergot alkaloid biosynthesis genes. Analyses of both grass and dung samples for levels of ergot alkaloids have supported the research of other investigators on the multistate project working to understand the biology and ecology of mycotoxigenic fungi. Three papers were published.	Food Access, Security and Safety/Sustainable Agriculture
5.	<b>Improving parasite resistance in Texel sheep. (WVAFES)</b>	Following allowance by NSIP of weaning and post-weaning fecal egg count breeding values for Texel lambs, over 500 fecal samples were processed for producers across the country. Six manuscripts were published.	Food Access, Security and Safety/Sustainable Agriculture

<p>6.</p>	<p><b>WVU Extension Service Educates Local Producers on Market Readiness</b></p>	<p><b>Relevance:</b> West Virginia saw 39% more direct-to-consumer sales from 2007-2012. Institutional buyers increasingly source food from local producers/aggregators (WV Food Charter, 2012). These trends have created new locally accessible and higher-value market opportunities for consumers and local producers, respectively. Earlier WV Extension programs on risk-management and business planning have helped producers capitalize on these opportunities. However, as these new opportunities arise, producers are faced with compliance issues to new requirements/specifications and liability concerns of different direct-market buyers. These new requirements impact producers' profitability and access to direct markets. Producers requested more training and support to help overcome these challenges and to create a better business model for their farming enterprise.</p> <p><b>Response:</b> We used the success/lessons learned from earlier Extension programs to create a tailored program to help producers and Agricultural Service Providers (ASP) better manage marketing and legal risks associated with direct markets for local foods in WV. We took a whole-farm planning approach to this project. We currently focus heavily on marketing and legal risks and indirectly address production, financial, and human resource risks. A team of expert educators developed implementation and evaluation plans for the program. We created a 'one-stop-shop' for 'Market Ready' education, resources, and industry contacts. The <i>Market Ready Program</i> is delivered through the interactive, 'safe harbor', facilitated learning format that participants consistently report they prefer. This project complements other state-wide risk management initiatives, and targets aspiring, beginning, or mid-level producers selling dairy, fruits, meats, vegetables, and other value-added products.</p> <p><b>Result:</b> In 2019/2020, we worked directly with producers on 'Market Readiness'- an aspect of the <i>Market Ready Program</i>. As a result, 28 producers transitioned into and/or expand sales to more lucrative, locally accessible direct markets. They also reported increased confidence in their ability to legally market their products, thereby</p>	<p>Food Access, Security and Safety/Sustainable Agriculture</p>
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		<p>reducing financial, marketing risks, and legal risks; improving profitability and viability; and commanding a greater share of the consumer food dollar spent in WV. 15 ASP have incorporated project materials into farmer trainings to better help other producers realize the same benefits, thereby expanding the reach and impact of the <i>Market Ready Program</i>. Upon completion, small, limited-resource producers will better manage the marketing and legal risks they face as they look to develop supplier relationships with direct market buyers.</p>	
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7.	<b>Control of Salmonella spp. In poultry products by physical and chemical treatments. (WVAFES)</b>	The project evaluated thermal inactivation of Campylobacter Jejuni in reconstructed chicken patties. Greater set-up temperature reduced C. Jejuni > 5 log.	Food Access, Security and Safety/Sustainable Agriculture
8.	<b>Functional characterization of novel nodule specific GRF transcription factors during symbiotic nitrogen fixation in <i>Medicago Truncatula</i>. (WVAFES)</b>	Two GRF transcription factor genes are expressed exclusively in legume nodules and these are regulated by distinct gene networks.	Food Access, Security and Safety/Sustainable Agriculture
9.	<b>Influence of ovary, uterus, and embryo on pregnancy success in ruminants. (WVAFES)</b>	This project seeks to understand the role of oocyte specific genes on pregnancy success. This year the promoter region of the bovine ZNFO gene was characterized, expression of ASIP gene in ovarian cells and early embryos was characterized, and lncRNAs associated with oocyte quality were identified. The project resulted in the publication of one peer reviewed paper.	Food Access, Security and Safety/Sustainable Agriculture
10.	<b>Genetic and Developmental Underpinnings of the Morphological Diversification of Evolutionary Novelty in Insects. (WVAFES)</b>	This project seeks to understand the underpinnings of biological plasticity. This helps explain the possibilities for plasticity in selection for domestication and improvement of animals. This work led to the publication of one peer-reviewed paper.	Food Access, Security and Safety/Sustainable Agriculture
11.	<b>Evaluation of the Safety and Health Benefits of Apple Pomace and Development into Food Products for Human Consumption. (WVAFES)</b>	This project seeks to identify the nutritional and health benefits of incorporating apple pomace, a co-product of juice production, into human food.	Food Access, Security and Safety/Sustainable Agriculture
12.	<b>Biological Improvement of Chestnut through Technologies that Address Management of the Species, its Pathogens and Pests. (WVAFES)</b>	This project seeks to develop disease resistant chestnuts and to evaluate biological controls of chestnut blight. The project completed work on a Super donor 2.0 control project and developed an outreach piece for the American Chestnut Foundation.	Food Access, Security and Safety/Sustainable Agriculture
13.	<b>Value-Added Ingredients and Foods from Repurposed Underutilized resources. (WVAFES)</b>	This project seeks to characterize methods to separate protein and lipid fractions from insects, removing the potential problematic chitin found in whole ground insect powders. The project submitted one peer-reviewed paper for publication.	Food Access, Security and Safety/Sustainable Agriculture

14.	<b>Feed Manufacture Effects on Pellet Quality, Hygienics and Nutrient Availability. (WVAFES)</b>	This project seeks to improve the efficiency, sanitation and nutrient delivery of feed manufactured for poultry (the #1 animal protein consumed in the United States and #1 agricultural receipt in WV). This year the project resulted in six peer-reviewed publications.	Food Access, Security and Safety/Sustainable Agriculture
15.	<b>Characterization and Modification of Volatile Organic Compound Traits in Horticultural Crops to Improve Biotic Interactions and Fruit Flavor. (WVAFES)</b>	This project has an overarching goal of identifying and characterizing volatile organic compounds from crops and to use them to enhance interaction with beneficial insects and herbivores or to contribute to flavors of foods. The work resulted in one peer-reviewed publication.	Food Access, Security and Safety/Sustainable Agriculture
16.	<b>The Genetic Bases for Resistance and Immunity to Avian Disease. (WVAFES)</b>	This project seeks to understand the genetic underpinnings of disease resistance in birds. The work identified a genomic location associated with alloantigen A on chromosome 26 (in chicken). This work resulted in two peer-reviewed publications.	Food Access, Security and Safety/Sustainable Agriculture
17.	<b>WVU Extension Service improves Livestock Producers' Profitability</b>	<p><b>Relevance:</b> According to Growing West Virginia's Agricultural Economy Survey, 67% of agricultural commodity producers identified as livestock producers. However, producers reported having difficulty in connecting their products to a ready market. Less profit could significantly reduce the production of agricultural commodities in WV.</p> <p><b>Response:</b> To promote livestock production sustainability, WVU Extension educated producers on livestock management practices including but not limited to nutrition and grazing management, breeding practices, and herd health. Producers also received guidance on navigating market and profit making.</p> <p><b>Result:</b> As a result of great management practices taught by Extension personnel, livestock producers continue to expand their knowledge on nutrition, management, and health of their herds for maximum profit. In a statewide effort, 72 beef producers made an estimated \$1,508,371 in sales. Consider the following nutrition management testimony from</p>	Food Access, Security and Safety/Sustainable Agriculture

		one livestock producer: “best haylage I’ve ever put up; cows don’t leave anything in the feeder.”	
18.	<b>WVU Extension Service <i>Master Gardeners Program</i> Serviced Communities during COVID-19</b>	<p><b>Relevance:</b> Extension <i>Master Gardener Program</i> (EMG) offers an outlet for people interested in gardening to learn more about horticulture. This year, due to the COVID 19, the observed increase in gardening interest has been obvious. Home-bound people have turned to horticulture and gardening not only to produce their own food but to cope with stress, anxiety, and even depression.</p> <p><b>Response:</b> WVU Extension Service provided services to the communities throughout the state by offering educational programs that would fulfill the need for increased understanding and knowledge of horticulture, promote science and prepare the public to be better stewards of the land, natural ecosystems, and environment. WVU Extension Agents, Extension Program Assistants, and Master Gardeners worked collaboratively to service communities in 2020. To maintain program continuity, WVU Extension Master Gardener was offered online for the first time in 2020.</p> <p><b>Result:</b> Master gardeners donated about 16,162 hours totaling about \$439,606.40 worth of volunteer hours. Master gardeners produced and donated food across 131 projects and 46 counties. Master gardeners donated 5,000 lbs. of food to a local community in Wood county. In many instances where households lost their incomes, gardening eased the economic burden and provided families with fresh produce.</p>	
19.	<b>Ecology and Management of Urban Wildlife in the Mid-Atlantic Region. (WVAFES)</b>	PhD student continues research on the role of white-tailed deer and raccoons in the demographics of black-legged ticks on Fort Drum military installation in upstate New York.	Climate Change and Natural Resources Management

20.	<b>Conservation Genetics of Fish and Wildlife Populations. (WVAFES)</b>	The project developed a panel of markers for rapid Walleye strain identification, developed and optimized a panel of genetic markers for lake sturgeon and analyzed the Candy Darter population genetic structure throughout West Virginia.	Climate Change and Natural Resources Management
21.	<b>Natural Resource Integrity: Water and Energy Systems. (WVAFES)</b>	This project addresses energy and natural resource related questions at a regional and national scale and resulted in publication of two peer-reviewed manuscripts.	Climate Change and Natural Resources Management
22.	<b>Investigating Hydrology and Water Quality of Mixed-Land-Use Watersheds of West Virginia. (WVAFES)</b>	This project is at a watershed scale, including 22 monitoring sites, resulting in a high-resolution monitoring structure. The project resulted in six peer-reviewed manuscripts.	Climate Change and Natural Resources Management
23.	<b>Seeing Green in Our Woodlands: Promoting plant education to improve forest health, economics, and conservation (WVAFES)</b>	This project completed landowner training allowing landowners to make their own woodland plan online, developed online training programs for forestry and conservation professionals and collaborated with the U.S. Forest Service to produce West Virginia Forest Health Forum (to be presented FY 21).	Climate Change and Natural Resources Management
24.	<b>Renewable Energies: New Uses for Former Mine Lands in West Virginia. Design Principles and Recommendations for Minimizing Landscape Impacts. (WVAFES)</b>	This project created the first ever landscape characterization of Southern West Virginia coalfields. Engaged community in providing insight into how community perceived the value of reclamation and developed a report on Gary Hollow, McDowell Co., WV to be preserved in the Library of Congress. The project resulted in one peer-reviewed publication.	Climate Change and Natural Resources Management
25.	<b>Spatial Decision Support: Optimizing Drone Data Acquisition for Natural Resource Management. (WVAFES)</b>	This project seeks to better understand better approaches to UAV technologies to be cost effective and sustainable. The project has collected data from pipeline operations to develop modeling using pixel-wise segmentation and deep convoluted neural network approaches to reduce both the time and cost of modeling UAV collected data. The work resulted in the publication of three peer-reviewed publications.	Climate Change and Natural Resources Management

26.	<b>Carbon Dynamics and Hydro morphology in Depressional Wetland Systems (WVAFES)</b>	This project tracks data about vernal pools (inland wetlands of significant ecological and functional diversity) in the Northeast U.S. as part of a Multistate Project.	Climate Change and Natural Resources Management
27.	<b>Securing Appalachia's Fresh Food and Water Production: Implications &amp; Opportunities of a Changing Climate. (WVAFES)</b>	This project aims to improve understanding of the Appalachian water-food nexus to improve sustainable water resource management. the project resulted in one peer-reviewed publication.	Climate Change and Natural Resources Management
28.	<b>WVU Extension Service Summer Program Alleviates Food Insecurity in an Underserved Community</b>	<p><b>Relevance:</b> Poor rural communities sometimes have sparse resources, money can be hard to come by, and food and educational materials for youth are not readily available. The global pandemic presents another layer of challenge to underserved communities. The pandemic further limits their access to basic needs. This is the situation for low-income families in Pendleton County, WV especially during the pandemic.</p> <p><b>Response:</b> WVU Extension Service developed a summer feeding program, using a different program delivery method to help provide nutrition education and improve access to food for low-income families. The program team targeted the wellbeing of the whole family by providing recipes for healthy and nutritious meals and reading materials for children in the household on new and interesting topics. Food and reading materials were provided through a community supported agriculture (CSA) type box. A community survey was created to determine the severity of need for each family that applied for the program. Out of 50 families, 40 families were serviced based on need.</p> <p><b>Result:</b> The serviced families reported adding more fruits and vegetables to their diets after learning how to prepare them through the recipes provided. From the pre-and post- survey results, participants were less likely to eat froze meals after taking part in the program. Participants increased their water intake and decreased sugar drinks</p>	Health Disparities

		intake. More families prepared meals at home rather than eating out. One participant said, <i>“Loved it! Vegetables were wonderful and so were the recipes that were provided! My children and I loved it! Loved everything about this program!”</i> About \$3048.70 worth of fresh fruits and vegetables were provided to the 40 families. 177 adults and children were reached, and 300 books were provided to children in the households to increase their reading skills through the summer. 250lbs of dry goods were donated to families in addition to the fresh fruits and vegetables.	
29.	<b>Assessing the Potential of Evidence-Based Design to Improve the Delivery of Health Care in Rural Settings. (WVAFES)</b>	This project seeks to identify real and perceived impacts of health care facilities in rural settings on patient participation. By using Evidence-Based Design the project seeks to understand and quantify impacts of the physical environment. The fiscal challenges of the Affordable Healthcare Act on rural hospitals have driven growth in outpatient facilities and a need to use design to encourage visitation. This work resulted in the publication of one peer-reviewed paper.	Health Disparities
30.	<b>WVU Extension Service Virtual Dining with Diabetes Program</b>	<p><b>Relevance:</b> In comparison with all states in the nation, West Virginia ranks the least healthy state on the prevalence of diabetes (CDC, 2019). People who are diabetic are at higher risk of other illnesses. The outbreak of COVID-19 in 2020 puts individuals living with diabetes at a higher risk of COVID-19 health complications. Also, low-income families have been found to have higher prevalence of diabetes compared to other income brackets.</p> <p><b>Response:</b> To prevent gaps in diabetes educational outreach in WV due to COVID-19, WVU Extension adapted the traditional dining with diabetes program to an online delivery mode. This effort enabled us to reach individuals who are either prediabetic or diabetic. Program participants were taught how they could manage diabetes through healthy eating and exercise.</p>	

		<p><b>Result:</b> Program participants reported learning how they could manage their diabetes by eating healthy. Participants reported: <i>“I have learned which oils are good for me and how to make healthy meals,” “I feel that I am more educated in how I am to take care of my diabetes and plan to lower my A1C, cholesterol, and triglycerides by following a better diet plan,”</i> and <i>“I can cook and still have a tasty, pleasant and satisfying meal. I understand carbs better and that exercise is very important. I have lost some weight.”</i></p>	
<p><b>31.</b></p>	<p><b>WVU Extension Service Revitalizes Wheeling City</b></p>	<p><b>Relevance:</b> A 2017 study on WV’s urban tree canopies from WVU’s Arboriculture and Urban Forestry Program exposed that Wheeling’s tree canopy, while covering an impressive 43% of the land area, was imbalanced, with lower income areas having significantly less tree cover. Low levels of urban forest cover contribute to increased storm-water issues, decreased air quality, and general decreased quality of life in associated neighborhoods. Trees in city parks are aging out and few younger trees are present to fulfill their roles of water absorption, carbon sequestration, air filtration, and shade. As older trees are dying, no new shade trees are available to take their place.</p> <p><b>Response:</b> WVU Extension Service aided Wheeling’s Complete Streets planning committee in garnering community interest and ensuring sound tree planting strategies for a street scape upgrade. We used iTree analysis of satellite imagery to identify public areas with low levels of canopy cover or prominent levels of erosion and flooding. Through a partnership with the WV Division of Forestry and the Wheeling Parks and Recreation Department, planting sites were designated in 26 city parks. Furthermore, we organized an online tree adoption program to recruit interested volunteers who would plant and water 140 trees through the summer. Due to COVID-19 restrictions, trees were distributed to interested volunteers through a drive-through. We offered educational programming via a printed instruction sheet and online video to help people learn how to properly plant and care for</p>	<p>Community Revitalization</p>



		<p>their saplings. Later in the year, a hands-on training taught Master Gardeners how to train young trees.</p> <p><b>Result:</b> The adoption program reduced the expected tree mortality of planted saplings by 15%. As the trees grow, so will their impacts of improved air quality, reduced storm flow, and increased shade. In the fall, 6 Master Gardeners provided a free pruning service which improved the long-term health of 20 trees in two city parks. By adding to and improving the health of Wheeling’s urban canopy cover and creating a relationship between people and their public spaces, the people of Wheeling have a greater sense of place and connection to their city. Over time, the City of Wheeling would experience lower expenses related to the care of dangerous trees and damaged infrastructure, while also seeing an improvement to the quality of life, and mental and physical health of its citizens through improved air, water quality, and increased walkability. In the long term, it is hoped these changes help to increase retention of Wheeling's population and provide a greener future.</p>	
32.	<b>Considering the Everyday: Vernacular Cultural Landscapes in Central Appalachia. (WVAFES)</b>	The goal of this project is to identify, analyze and document cultural landscapes in Central Appalachia. In the past year, the project published one paper and submitted two abstracts.	Community Revitalization
33.	<b>Regional Location of Knowledge-Based Economic Activities: Implications for Rural Economies of Appalachia. (WVAFES)</b>	The objective of this project is to measure knowledge-based economic activities and study their spatial distribution in Appalachia. The project resulted in a capstone project and a refereed book chapter.	Community Revitalization
34.	<b>Rural America and the Economic Impacts of Energy, the</b>	This project examines drivers of growth or decline in rural communities at a resolution that can often be masked by county or larger level datasets. The project published one peer reviewed paper.	Community Revitalization

	<b>Environment, Entrepreneurship, and Health Care. (WVAFES)</b>		
35.	<b>Outdoor Recreation, Parks and Other Green Environments: Understanding Human and Community Benefits and Mechanisms. (WVAFES)</b>	The project organized and supported design of a wellness and therapeutic landscape at the Otter Creek community health care office, supported community health through design work for the town of Clay, WV and developed community site plans in 16 other communities. This work resulted in one peer-reviewed publication.	Community Revitalization
36.	<b>Enhancing Rural Economic Opportunities, Community Resilience and Entrepreneurship. (WVAFES)</b>	This project seeks to understand factors that increase rural resilience through entrepreneurship, energy, healthcare, and other factors. This work resulted in one peer-reviewed publication.	Community Revitalization
37.	<b>Trans-disciplinary Approach to Community Planning and Development for Heritage and Recreation Tourism. (WVAFES)</b>	This project brings together a diverse array of disciplines to work in a trans-disciplinary fashion to address community design needs. The project has secured external funding to work both in the ‘Mon Forest Towns’ and with the Community Development Hub and with USDA Rural Development. This work resulted in one peer-reviewed publication.	Community Revitalization
39.	<b>Agricultural and Rural Finance Markets in Transition (WVAFES)</b>	This project seeks to understand the dynamics between agricultural lenders and farmers and the subsequent impact it has on farming operations. the work resulted in one peer-reviewed publication.	Community Revitalization
40.	<b>WVU Extension Service Virtual Summer Program Improves Kids’ Reading Proficiency</b>	<b>Relevance:</b> Many West Virginia children struggle to succeed in school while dealing with family burdens related to substance use disorder, persistent poverty, food insecurity, and low educational attainment. According to the Annie E Casey Foundation, in 2019, 25% of WV children lived in poverty and 70% of 4 <sup>th</sup> graders were not proficient in reading. In 2020, school closures in the spring and sporadic closures in the fall due to COVID-19 meant that children were expected to learn from home. WV ranks 47 <sup>th</sup> in broadband access so many children did not have the ability to connect on-line with their teachers or their classmates. Families and children were adversely impacted by the stress of school closures and the uncertainty of the pandemic. In addition to loss of learning during the 2020-2021 school year, low-income children tend to lose learning during the summer when compared to their peers in middle- and upper-income families. The	Strengthening Youth and Families

		<p>COVID-19 slide and the summer slide widened the reading achievement gap between children from low-income families and those in middle- and upper-income families.</p> <p><b>Response:</b> We realized that not all children had access to the same resources and that counties in our service area had different pandemic restriction, so we planned a multipronged approach to providing reading enrichment and instruction to the children. We enrolled 2,391 children in the program and 1901 participated in activities on at least one day.</p> <p>WVU Extension Service personnel created an extensive collection of educational videos that were available on our YouTube channel and broadcast on West Virginia’s PBS station, WVPBTV. Weekly take-home activity boxes that included one new book were created by the local Energy Express team each week and made available for parents to pick up for their children. AmeriCorps members, acting as reading mentors, provided outdoor pop-up activities in various locations. To provide quality online reading instruction, we contracted with Scholastic Lit Pro and made it available to all enrolled children asynchronously for the six-week period. Lit Pro has a built-in assessment tool to measure student reading levels which was made available to all children in the program as a pre- and posttest.</p> <p><b>Result:</b> Pre- and posttest scores were available for 239 children. Sixty-four percent significantly improved reading proficiency at the end of the 6-week program compared to the beginning. At least half of the children in first through fourth grades experienced the equivalent of 3-month gain in reading proficiency. Children who were eligible for free- and reduced-price school lunch were more likely to experience gains than children who were not eligible. In the summer of 2020, we demonstrated that a virtual program can effectively prevent the summer slide in reading proficiency in low-income children.</p>	
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<p>41.</p>	<p><b>WVU Extension Service Responds to COVID by developing Virtual 4-H Special Interest Clubs for Youths</b></p>	<p><b>Relevance:</b> 4-H retention studies showed that youths are more likely to stay in 4-H if club programs and activities match their interests. A study conducted with Camden County, Georgia, 4-H members found 4-H'ers are most satisfied with 4-H clubs when they experience high quality 4-H club meetings, feel a sense of belonging, and learn new things (Defore, 2011). WVU Extension 4-H team recognized the need to diversify programming efforts to accommodate different areas of interest to meet youths' needs. As planning continues, social distancing requirements due to the pandemic caused a change from the traditional location-based delivery model to a virtual format. The change in program delivery method and the importance of offering youths' programs of interest led to the development of six virtual Special Interest (SPIN) clubs.</p> <p><b>Response:</b> To increase program efficiency in the virtual format, 4-H Agents from nine counties coordinated program efforts and taught six different SPIN club topics. These included agriculture, CSFirst scratch coding, global foods, healthy snacks, photography, and "This is 4-H." The <i>This is 4-H</i> SPIN club topic introduces youth to a project book that is to be completed. 89 youths from 26 counties throughout West Virginia participated for 4-6 weeks of programming. To enhance virtual interaction and to practice skill building, youths experienced hands-on activities within the topics offered. For example, participants wrote a computer program in scratch, learned how to sauté food, or learned to take a landscape photo. The virtual SPIN clubs allowed youth to stay connected to 4-H program and Extension professionals during COVID.</p> <p><b>Results:</b> Post retrospective data available for 42 respondents showed knowledge gains across topic areas. Furthermore, respondents reported learning a variety of skills in cooking, photography, and coding. One participant reported to have improved photography skills by learning</p>	<p>Strengthening Youth and Families</p>

		<p>how to “do every type of photography besides landscape and portrait.” Another youth reported to have learned how “to make the apple and peanut butter wrap” as a healthy snack. Most importantly, participants indicated a positive youth development experience by reporting that they felt safe, felt that there was an adult that cared about them and their success, enjoyed working with others, and felt motivated about being involved with the community. This was especially important for them during COVID-19 pandemic as most schools were remote or only meeting part-time. As one participant explained, “it was fun, and I liked having something to look forward to since so many of my extracurricular activities have been canceled.”</p>	
<p>42.</p>	<p><b>WVU Extension Service Nutrition Program Increases Access to Healthy food in Rural Communities.</b></p>	<p><b>Relevance:</b> According to Feeding America, food insecurity rate in West Virginia (WV) is 14.8% (20.8% among youth), increasing dramatically to 19.9% in more rural counties. This is in comparison to the national rate of 12.5%. For these rural counties, grocery shopping entails visiting convenience and "dollar" stores offering minimal fresh produce. Combined with the rugged terrain and limited access, WV adults have one of the lowest rates of fruit &amp; vegetable consumption in the nation &amp; a 90% risk for poor health outcomes. This has led to WV's high chronic disease rates in diabetes (16.2%), obesity (39.5%), and cardiovascular disease (12.9%), which are consistently above national levels.</p> <p><b>Response:</b> To address this issue, West Virginia University Extension Service (WVUES) developed a compound program to overcome barriers to healthy food that limited income individuals face such as awareness, access, and cost. WVUES efforts focused on increasing access to healthier foods in 10 WV rural counties by simultaneously layering four sub-programs. The four sub-programs which include FARMacy, SNAP Stretch, Kids Market, and Farm-to-Food Pantry, target people living with chronic illness, families who are food insecure, and children in low-income households. To adhere to COVID-19 safety guidelines, nutrition education was offered remotely</p>	<p>Nutrition and Obesity Prevention</p>

2020 Annual Report of Accomplishments and Results (AREERA)

		<p>via web-based meetings or through telephone conversations. Participants were taught food preparation using healthy recipes.</p> <p><b>Result:</b> Approximately 38,482 lbs. of produce, worth about \$90,800, were distributed to 10 rural counties. About 1,968 students, 175 people with chronic illnesses, and 3,730 households had access to the food distributed. Preliminary evaluation data showed an average of 0.63-point decrease in A1C of participants in the FARMacy sub-program. The program will continue to serve WV rural counties through strategic collaborations with community food banks and pantries.</p>	
43.	<p><b>Using Behavioral and Environmental Tools to Identify Weight Related Factors Associated with Health in Communities of Young Adults. (WVAFES)</b></p>	<p>This project is a multi-state focused on tools directed towards policy, systems and environmental approaches that address socio-economic drivers. The project resulted in 33 peer reviewed publications this year and developed training materials for undergraduate and graduate students.</p>	<p>Nutrition and Obesity Prevention</p>