



USDA ↔ REE ↔ NIFA

CES Programs Addressing the Goals of REE and NIFA

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Global Food Security and Hunger

Production of plant and animal products forms the base of food security. The U.S.'s agricultural production system has repeatedly transformed itself over the past century, each time meeting the demand for increased output and increased efficiency.

Utilizing a network of Campus-Based Expertise and Community-Based Education

The CES network provides transformational education and outreach experiences to agricultural producers, and the businesses and consultants that serve them. CES is an educational network stretching from the nation's Land Grant University campuses through community-based educators that touch nearly all of the 3,100 counties in the US. The CES network is there to respond as new issues and challenges arise.

Fundamental to global food security is the transformative learning that must occur for people across the globe to know about and to use the emerging agricultural production technologies in sustainable ways. CES is engaged in this mission both nationally and internationally and committed to providing research-based information to the community-level that transforms people's lives.

CES Programs – Campus to Community

- Science-based research data and practical knowledge gained from years of CES experience helps developing countries address Global Food Security and Hunger needs. The basic knowledge and understanding of agricultural production systems can be used in many situations/contexts, to address food security and hunger in the US and throughout the World.
- The CES network brings together community-based educators/agents and campus-based research specialists to work on a variety of food security issues, such as: development of new food products; the introduction of new technologies and feedstocks that increase food availability; and, objective research methodologies that are necessary to understand food delivery systems and product marketing in the broadest-realm of the public interest.
- The CES network regularly extends its expertise on food production to many foreign countries. Both Community-based educators/agents and State Specialists travel to other countries to share their knowledge and experiences. They willingly lend their knowledge in areas of: food product development, processing and storage; product marketing; human health; agricultural production; and environmental protection. Specific examples range from *Farm-to-Farmer Programs*, to the establishment of specific institutes and international-issue focused *Centers of Excellence* within a number of Land Grant Universities.
- In the US, CES research provides a better understanding of the extent of food insecurity and hunger. Much work has already focused on understanding the characteristics of food insecurity, especially among limited resource households. That research guides community-based Extension programs and makes them more effective in reaching those who need help most.
- Across the US, Cooperative Extension programs provide hunger awareness education to help communities better understand the scope of hunger and food insecurity, its underlying causes, and potential solutions.
- CES helps communities conduct school-based surveys of the food security status of local families, their participation in federal (USDA) nutrition assistance programs, and school meals (breakfast and lunch).



Climate Change

The impacts of carbon-based energy systems on global climate change challenge everyone to evaluate their energy use and look for ways to reduce atmospheric carbon emissions.

Utilizing a network of Campus-Based Expertise and Community-Based Education

The CES network actively responds with transformational education that is critical to achieve sustainable management of our natural resources and the protection of our climate.

Demands for energy consumption go hand-in-hand with climate protection. The use and management of agricultural lands affect the natural environment's ability to capture carbon. Our agricultural practices and management of the landscape calls for new plant production systems and approaches to facilitate more carbon capturing. Land use, social acceptance and economic feasibility of emerging technologies are challenges that CES is especially qualified to facilitate in local communities and especially with agricultural producers.

CES Programs – Campus to Community

- The CES network has a long history of effectively introducing new technologies for energy production, usage and conservation. Example CES programs include: biomass production for fuel and electricity; the introduction of new biofuel technologies; methods for energy conservation; and the identification of opportunities for local biofuel markets and bio-based products.
- CES research provides an objective science-based portfolio of information that local educators use to engage agricultural communities, local governments and individuals in understanding the long-term implications of climate change on land and water management.
- CES community-based educators work directly with farmers to determine what crops capture carbon the most efficiently – local CES educators help producers with issues such as seeding rates, tillage, variety trials, crop rotations, pest and disease control, harvest timing and marketing their products.
- CES community-based educators help producers objectively adjust their management practices in ways that address climate changes and more volatile climatic conditions – while respecting their existing production practices, their risk management strategies, and their overall farming systems
- CES community-based educators directly engage local units of government, community based organizations, businesses and the local community in risk assessment and development of strategies that reduce risk associated with climate change through investments and changes in business practices.
- CES community-based educators work directly with local units of government plan for climate change. Local governments commonly look for objective neutral Extension educators to help strategize on public policy associated with transportation, housing, public land management and environmental protection. CES educators in many rural communities are uniquely positioned to assist in the community planning process, citizen engagement efforts and public education programs. Many rural communities have few options for outreach providers and objective community planning.
- CES uses its network across states to develop and share educational materials and outreach methods that address climate change and land use. For example, several North Central states are jointly conducting Extension programs for ag producers on carbon credits and best management practices to conserve water, fertilizers and pesticides – thereby reducing the degradation of air, soil and water quality. Furthermore, CES's 4-H/Youth Development Programming through the Science, Engineering and Technology (SET) Mission Mandate provides non-formal, experiential education to help youth understand energy and climate demands.



Sustainable Energy

America's agricultural system provides much of the natural resource base for the conversion of biomass into new products and fuels. It is important that ag landowners and managers understand their options for sustainable ways to grow biomass; and how they can reduce their own energy needs through more efficient technologies and conservation.

Utilizing a network of Campus-Based Expertise and Community-Based Education

The CES network offers basic and applied science that leads to the development and refinement of technologies that can increase US independence on foreign energy sources. Our campus-based experts and community-based educators directly reach-out to farmers who grow plants for conversion to fuels. In addition, they also work directly to speed the introduction of commercial and enterprise level technologies for capturing solar, wind and other energy sources.

Energy conservation and renewable energy use in agricultural production systems; and in homes, businesses, schools and other community buildings is a challenging opportunity for the US. The CES network is uniquely positioned to assist in the adoption of new technologies that will lead to improving the conservation and management of energy consumption on farms, businesses and homes.

CES Programs – Campus to Community

- CES faculty develop educational curriculum, and conduct educational programs and demonstrations with businesses, industry, and individual home and farm owners about energy conservation and alternative energy.
- In agriculture specifically, the CES network directly assists farmers in understanding their energy uses and opportunities for conservation through on farm evaluations, energy audits, farmstead design and the use of more efficient technologies. There are a variety of CES educational program initiatives across the US, and among those notable include: development of manure digesters, the conversion of woody biomass to energy, and energy conservation practices for grain drying and irrigation.
- CES community-based educators work with local units of government to think through "smart energy" systems. For example, many local governments are evaluating cost effective, small-scale energy generation like solar, wind, anaerobic digesters, etc. They are calling on CES research to better understand such opportunities. And, they often call on CES community-based educators to conduct outreach efforts around those opportunities.
- CES helps energy users (farms, businesses and homeowners) better understand the cost differences of energy usage – buying at peak rates vs. non-peak rates and installing alternative energy technologies. CES helps communities, farmers, businesses and individuals to assess energy usage as a component of sustainable energy systems and to incorporate conservation practices into a comprehensive plan for sustainable energy systems.
- The CES network extends to the community scale. Local government and their leaders commonly ask CES for assistance with public outreach and engagement strategies around public policy development. For example, a common request of CES at the local level is assistance in conducting local forums and outreach programs that address what individual can do about energy production, food security, water availability and conservation of natural resources. These efforts educate individuals about what they can do personally to conserve energy. CES programs commonly engage the public in positive ways with their local officials that improve the impact of public energy policy through more objective and informed dialog.
- Many CES 4-H Youth Development programs are focused on teaching young people experientially about the practical applications of wind energy, electricity, energy conservation and recycling to their everyday lives. The *Power of the Wind* is an example of curricula that is designed to involve young people in the engineering design process as they learn about the wind and its uses.



Food Safety

Consumer concerns about the safety and security of the American food supply have grown in recent years. Scares from contaminated food have become frequent topics of discourse. A coordinated response from regulators, researchers and educators is necessary to address these problems.

Utilizing a network of Campus-Based Expertise and Community-Based Education

The CES network works with food consumers to increase their knowledge of proper food selection, storage and preparation. Such work is particularly important to low income and migrant families. Additionally, CES campus-based research is relevant to food producers, small food businesses and food handlers.

Ever evolving scientific studies with applied application help improve the delivery of safer food to consumers. Food safety begins at the farm or ranch with sound production practices. CES also directly engages farmers and consumers through the network of community-based educators who provide local outreach education on topics such as organic and local foods. Those Extension agents often work closely with farmers in helping them understand how to get their product from the field to markets.

CES Programs – Campus to Community

- CES campus-based faculty, which include Food Science Specialists at many Land Grant Universities, provide training and support for many food processors – dairy, meat, vegetable processing, etc.
- The CES Network across the county works directly with producers to promote higher quality and safe milk production practices. Programs involve campus-based research on dairy herd production, milk processing technologies and quality assurance testing; while community-based educators work directly with producers to introduce new technologies and management practices that ensure safe milk and the products derived from it.
- Community-based educators provide training and support to youth and adults for farm production practices. One example includes training and continued education opportunities in the area of pork and meat quality assurance where CES commonly conduct training on technologies and practices the prevent contamination in the processing of animal products.
- Community-based educators help local food producers and networks (such as Farmer's Markets) understand food safety regulations, licensing, etc. Furthermore, many communities across the US actually credit their local county Extension Agent with helping to establish their local farmer's market.
- The CES network trains consumers and participants, representing restaurants and other food service establishments, on safe food handling principles and practices that lead to safe food being served. That benefits the broader community by reducing food borne illness and associated health care costs. Many of these programs such as Serv Safe® prepare participants to pass required food safety certification exams.
- Community-based educators provide consumer food safety education directly to youth and adult consumers with an emphasis on reaching limited income families in order that they will be better able to purchase, prepare, and serve food that is safe to eat. Through a variety of educational programs, such as the *Expanded Food and Nutrition Education Program (EFNEP)*, the *Supplemental Food Assistance Education Program*, and *4-H Youth Development*, participants in CES programs increase their knowledge of what they can do to insure safe food and/or improve their safe food handling, storage and preparation practices.



Childhood Obesity

America's obesity epidemic costs consumers and our government billions of dollars in healthcare and lost productivity. The threat to America's future is substantial as the proportion of obese children become adults and carry with them a variety of related negative health problems such as diabetes, heart disease and an unhealthy workforce.

Utilizing a network of Campus-Based Expertise and Community-Based Education

The CES network is assisting in the fight against this epidemic through transformational educational programs directed at parents and children.

Nutrition education aimed at behavioral change in specific populations is providing positive impacts. Nutritional research focuses on new insights into personal health and well-being.

The efforts of the CES network, especially those that occur at the local individual level, are critical to improving the lives of youth and adults. Many needing educational assistance are at-risk low-income families that are hard to reach. Educational assistance must be directly targeted within communities at a local level.

CES Programs – Campus to Community

- The CES network has identified childhood obesity as a priority for interdisciplinary research that is integrated with community-based educational programming. Our efforts are leading to broaden institutional commitments that address critical knowledge gaps for research. Such research also help local Extension educators better target outreach programs on obesity and healthy living.
- CES nutrition research and educational programs aim to improve the nutritional well-being of participants by providing information on diet and physical activity, resulting in the prevention of chronic diseases, such as obesity. For example, CES community-based educators focus on both the child and family, providing parents with knowledge that can promote success in feeding and healthy eating behaviors for children at early stages in their life.
- CES community-based educators facilitate local collaborations to enhance development of strong families through nutrition education, family financial management, parenting skills, and consumer education. These outreach programs improve the families' ability to identify and access healthier foods.
- CES community-based education supports network building of local agriculture programs (e.g., CSA's) as well as community and urban gardening programs that increase participation in growing and accessing healthy foods at a local level. CES is uniquely positioned to reach both adults and young people through hands on participation in community gardening.
- CES faculty and educators often work with other groups in collaborative efforts, thereby ensuring that high standards are maintained in addressing childhood obesity issues.
- CES's 4-H/Youth Development programs place special emphasis on providing opportunities for urban and low-income youth to engage in activities that promote physical fitness in afterschool programs. Through these programs, youth and adults learn to make healthful food choices.
- CES community-based educators engage a broad spectrum of community members and stakeholders in drafting public policies and strategies focused on environmental changes that support healthy lifestyles within their community.
- CES community-based educators reach across all cultures to serve many different demographics in promoting healthy lifestyle and consuming healthy foods. These programs provide assistance that target families with young children and low-income households to show how better nutrition and healthy activity improves their lives. As an example, a 2002 cost benefit analysis of EFNEP in a group of Midwestern states projected an anticipated savings of \$8.82 in health care costs for every dollar invested in EFNEP. If adjusted further for current health care costs, the savings would be even greater.