



2023 - 2024 HIGHLIGHTS



2023 - 2024 USDA SCIENCE HIGHLIGHTS

The REE mission area is comprised of more than 8,500 employees across five component organizations including the Agricultural Research Service (ARS), Economic Research Service (ERS), National Agricultural Statistics Service (NASS), National Institute of Food and Agriculture (NIFA), and the Office of the Chief Scientist (OCS). Together, they work to achieve USDA's science mission. This past year, REE employees made great strides in advancing USDA's priorities to better integrate equity in our research programs, tackle food and nutrition security, develop climate-smart solutions, and build more and better markets.

Key REE accomplishments during 2023 - 2024 include: *(click to navigate)*

REE EMPLOYEE SPOTLIGHTS

REE ACCOMPLISHMENTS

EQUITY

FOOD AND NUTRITION SECURITY

CLIMATE SMART AGRICULTURE

MORE AND BETTER MARKETS

REE EMPLOYEE SPOTLIGHTS

REE is home to the world's best and brightest minds in agriculture - from scientists, to statisticians, researchers, economists, administrative professionals, and many others - all working to transform agriculture through science and innovation.

This is evident by the continuous recognition REE employees receive from external organizations, including the three ARS **Meritorious Presidential Rank Award Winners** - Dr. Laurence Chandler, Dr. Jeffrey Silverstein, and Dr. Pamela Starke-Reed - and one **ARS Meritorious Senior Professional (SP) Recipient**, Dr. William P. Kustas.

On May 6, 2024, the Partnership for Public Service announced ARS' Dr. Tara McHugh, Dr. Yan Ping Chen, and Dr. Jay Evans as finalists for the **2024 Samuel J. Heyman Service to America Medals**. The honorees for this prestigious award are selected for their outstanding contributions to the health, safety, and prosperity of the Nation. **Be sure to vote for these three in the "Sammies" finals!** Additionally, check out the two ARS researchers that were 2023 Sammies finalists - **Dr. Vincent Edwards** and **Dr. Rebecca Schmidt-Jeffris**.

REE ACCOMPLISHMENTS

Released the **USDA Science & Research Strategy**, USDA's bold vision for transforming food and agriculture through research, science, data, and partnerships.

Published the **2022 Census of Agriculture**, a complete count of U.S. farms and ranches, and the people that operate them. Every five years, the Ag Census provides us with a clear picture of what agriculture in America looks like, and helps USDA and our stakeholders make critical, informed decisions.

Hosted the historic **AIM for Climate Summit**, which brought together more than 1,150 attendees and more than 43 foreign government delegations from around the world to increase investment and support for climate-smart agriculture and food systems innovation.

Established the **ASCEND for Better Health Nutrition Hub** in partnership with Southern University to improve food and nutrition security and reduce the burden of diet-related chronic diseases, especially in underserved communities.

Protected agricultural animal health and the American food supply by releasing the **USDA Antimicrobial Resistance Strategy** to prioritize USDA research in this area.

Strengthened America's bioeconomy efforts, including publishing the **biomass supply chain report** to enhance domestic biobased product manufacturing and releasing the **Hemp Research Needs Roadmap** to advance the nation's hemp industry.

Released the **2023 Plant Hardiness Zone Map** to provide access to new and relevant data needed for planting. Jointly developed by ARS and Oregon State University's PRISM Climate Group, the new map is more accurate and contains greater detail than prior versions. The new website includes "Tips for Growers" that provides gardeners, growers, and plant breeders information about ARS research programs. (**Press Release**)

Published "**Rural America at a Glance, 2023 Edition**," an annual report of economic and social trends. This year's edition highlighted the role of clean energy jobs in nonmetropolitan counties. In 2021, nonmetro counties had a comparable number of clean energy jobs to those in fossil fuel industries. Rural clean energy industries provided more than 243,000 jobs.

Produced over **400 NASS reports** covering virtually every aspect of U.S. agriculture. These reports provide objective and unbiased statistics that make our markets stronger by sharing information that is fair and impartial to all market participants.

This is a snapshot of the REE mission area's impact. For more stories about USDA's groundbreaking science, please visit the **USDA blog** and follow **@USDAScience X**. Find more REE milestones and achievements below.

EQUITY

Published the **REE Equity Action Plan**, that highlights opportunities for the mission area to reduce barriers of entry to programs and services of those who have been historically underserved.

Launched USDA-NIFA's "***From Learning to Leading: Cultivating the Next Generation of Diverse Food and Agriculture Professionals***" (NextGen) program, an \$262.5 million historic investment in Minority-serving colleges and universities to foster internship, fellowship, job matching, and learning opportunities for the next generation of diverse agricultural professionals.

Released **NIFA's Grant Funding Dashboard**, allow users the unprecedented ability to access high-level agricultural research funding data, such as awards funded by search of state or congressional district; and **NIFA's Application Status Dashboard** which allows tracking status of grant applications.

Established six new tribal research partnerships that focus on developing seed propagation techniques for culturally relevant crops which promote an authentic Indigenous diet.

Published "**America's Farms and Ranches at a Glance, 2023 Edition**" that includes the first-ever analysis of farm performance and household well-being from historically underserved ethnic and racial groups.

Released the **NASS Crop Sequence Boundaries** tool, which offers equitable public access to national-scale visual crop rotation data for the first time.

FOOD AND NUTRITION SECURITY

Continued to improve **NIFA's Gus Schumacher Nutrition Incentive Program (GusNIP)**, which aims to increase food and nutrition security while contributing to local economies and improving food systems in the United States. This past year alone, \$41.6 million in incentives had been redeemed, generating an \$85.6 million economic impact. Participants reported higher fruit and vegetable intake than the average U.S. adult after participating in the GusNIP program.

Continued to improve **NIFA's Expanded Food and Nutrition Education Program (EFNEP)**, that serves as the nation's first federal nutrition education program for low-income populations. In 2023, EFNEP educators reached more than 45,000 adults and 187,000 young people with education on diet, nutrition, physical activity and food budgeting. In one example, graduates of Lincoln University's EFNEP program in Pemiscot County, Missouri, reported increased consumption of fruits, vegetables and whole grains and an average savings of \$52 per month on food costs.

Expanded efforts to prevent food loss and waste by investing \$25 million from the American Rescue Plan Act to support multiple NIFA outreach, research and education efforts. For example, Aloha Harvest in Honolulu, Hawaii, is addressing Hawaii's critical need to reduce food insecurity and food waste by rapidly scaling and diversifying food rescue. These efforts expand collection capacity and help local food systems to better recover from crises. (**More info**)

Released **new pea cultivars**, named USDA "Dint," "MiCa," and "Klondike," that help offer more options for fall planting, retain nitrogen for subsequent crops, and use less soil moisture than wheat, rice, or corn. Incorporating these cultivars will also give farmers an opportunity to break weed, disease, and pest cycles.

Collaborated with the Robert Wood Johnson Foundation (RWJF) to **announce** \$1.4 million in research that focuses on equitable access to healthy food. Collectively, this funding gives 14 research institutions the opportunity to leverage restricted data to expand knowledge of food policy, food retail markets, consumer behaviors related to food purchases and diet, and USDA's nutrition assistance programs. The research will be completed and presented at a conference in Washington, D.C. in February 2025.

Released the ERS **International Food Security Assessment (IFSA)**, that indicates food security improved in 2023 in 83 low- and middle-income countries due to growth in per capita incomes and the easing of international and domestic food commodity prices. ERS projects that by 2033, 66.1% fewer people in the 83 IFSA countries will be considered food insecure. Information from the IFSA is used by USDA and USAID to target countries for program funding and food aid.

Released the ERS **Household Food Security in the United States in 2022** report. The report found most U.S. households, 87.2%, were food secure in 2022. However, the remaining 12.8% (17.0 million households) were food insecure. Food-insecure households had difficulty at some time during the year providing enough food for all their members because of a lack of resources. This report helps inform USDA's critical food assistance and nutrition programs.

Modernized NASS monitoring of agricultural disasters in near real-time and provided quantitative assessments by using remotely sensed data and geospatial techniques. This information helps educate the public about the impacts natural disasters have on agriculture in the United States. In 2023, NASS completed a disaster analysis for the **Midwest Derecho** in June, the **Hawaii wildfires** in August, **Hurricane Idalia's** impact to the southeast in September, and a **series of tornadoes** that moved through Kentucky and Tennessee in December.

Supported 1890 Land-grant universities (LGUs) to participate in a new integrated multistate project—the Climate Resiliency Initiative—addressing a broad range of climate change and mitigation issues in food and agriculture. Supported by Evans-Allen capacity funding, the project is the first multistate effort by 1890 LGUs in almost two decades.

Launched the Groundwater Transfer and Injection Pilot project, that uses injection wells to move filtered water into depleted underground aquifers which allow land managers to maintain critical agroecosystems. The project is the first to combine the extraction and injection processes and will help determine greater applicability, improve the sustainability of groundwater resources, and protect large swaths of agricultural land.

Worked with the Quapaw Tribe to create the first-ever high-resolution digital maps of soil properties and land-use interpretations for Tribal lands in northeastern Oklahoma that assist Tribal leaders and farmers when making sustainable soil-water-nutrient management land-use decisions. Access to this more detailed soil information will help provide greater food security for those residing on Tribal lands by providing a tool that helps increase sustainable production of culturally-important foods.

Established a national research and monitoring network to collect and synthesize multi-scale data on methane and nitrous oxide emissions to quantify greenhouse gas mitigation potential. The data will be used to update and improve models, reducing model uncertainty and improving greenhouse gas estimates for conservation programs and the National Inventory of U.S. Greenhouse Gas Emissions and Sinks.

Published "**Scenarios of Global Food Consumption: Implications for Agriculture**," which describes how increasing population, income, and agricultural productivity affect global production and consumption of crops and food products by 2050. Results show that in an income-driven food demand scenario, production of world crop calories increases by 47% from 2011 to 2050.

MORE AND BETTER MARKETS

Invested \$13.9 million in **NIFA's Small Business Innovation Research program** that support technologies benefitting small- and mid-sized meat and poultry processing facilities. These grants, made to small businesses from California to Iowa to North Carolina, funded research in the areas of monitoring and improving complex processes, worker safety and food safety.

Invested in a NIFA-funded program at Iowa State University which will assist swine producers with early identification of porcine reproductive and respiratory syndrome virus (PRRSV) outbreaks. The project will develop a surveillance system to assist swine producers in real-time monitoring of key production indicators to decrease the time to identify disease outbreaks. Access to this information will aid decision-making and decrease the time to identify disease outbreaks to prevent major economic losses to the U.S. swine industry.

Developed a new technology that freshens frozen fruit and vegetables. The new freezing method works by storing foods in a sealed, rigid container - typically made of hard plastic or metal - completely filled with a liquid such as water. Unlike conventional freezing, where the food is exposed to air and freezes solid at temperatures below 32 degrees F, isochoric freezing preserves food without turning it to solid ice. As long as the food stays immersed in the liquid, it is protected from ice crystallization, which is the main threat to food quality. As an added benefit, the method kills microbial contaminants during processing.

Bred four cotton lines that make **self-extinguishing textiles** when exposed to fire and reduce need for flame-retardant chemicals to be embedded in consumer products. When exposed to an open flame, the fabric from the new cotton lines self-extinguished whereas regular cotton fabric burned entirely in seconds. These lines will significantly benefit growers, producers and consumers.

Released "**USDA Lumina**," an early-season, winter-hardy strawberry with high yields, improved disease resistance, and appealing consumer traits. ARS and Cornell University's collaborative Breeding Insight (BI) support ARS breeding efforts in 25 species. BI scientists are collecting genetic and genomic data faster and fewer errors for the first time ever, leveraging all aggregated historical datasets to improve precision in selection and improve and accelerate the delivery of more nutritious, climate-resilient crops and livestock. These tools will enable researchers to release new and improved varieties of specialty crops, like strawberries, much faster.

Published "**Concentration and Competition in U.S. Agribusiness**," which identifies the drivers of increasing market concentration in three agribusiness sectors (seeds, meat processing, and food retail) and examines concentration's relationship to sectoral prices and competition. The report also examines public policy aimed at encouraging competition, focusing on the implementation of merger policy.