



IANR

**Institute of Agriculture and Natural Resources
University of Nebraska – Lincoln**

**Year in Review
2016**

Agricultural Research Division

Ongoing Investment in World-Class Faculty is Creating a Competitive Edge

ARD Faculty Teams continue to be successful in an extremely competitive external funding environment. Expenditures for externally-sponsored research increased for a fourth consecutive year, reaching a record high in FY2016 (\$56.3M).

Strategic Investments Spur Cutting-Edge Innovation in the Plant Sciences

ARD continues to invest in the newest technologies for high-throughput imaging of plant morphological and physiological characteristics (plant phenomics) under greenhouse and field conditions. As a next step from the LemnaTec phenotyping facility in the 45,000 ft² Greenhouse Innovation Center at NIC (a computerized 672-pot conveyer system through a series of imaging chambers; <http://innovate.unl.edu/greenhouse-innovation-center>), construction will be completed in March at the Agricultural Research & Development Center (ARDC) of a unique carrier system of multiple cameras (Spidercam®, Austria) suspended on cables from 85 ft corner-poles. This new field system provides automated plant imaging in small field plots up to a 1-acre scale. Through these investments, along with our existing unmanned and conventional aerial systems, IANR will have unmatched capacity to link genomics to important crop traits (e.g., drought/stress tolerance) from the lab and greenhouse, to fields and landscapes.



A 2016 example of large return on ARD investment in the plant sciences is establishment of The Center for Root and Rhizobiome Innovation (CRRRI) through a \$20M grant from the National Science Foundation. The Center is designed to improve soil and crops (corn, soybeans) in Nebraska, the region and globally through holistic studies including the plant/root/soil microbiome. This follows a \$13.5M grant from Department of Energy in 2015 for similarly holistic studies of energy-sorghum.

The Nebraska Food for Health Center

The Nebraska Food for Health Center (NFHC), located at the Food Innovation Center at NIC, will create and implement a high-throughput approach to identifying unique plant-based components that can be used to promote health through dietary modulation of the gut microbiome. Establishment of the NFHC is funded through a University of Nebraska Program of Excellence and support from the Raikes and Gates Foundations. High-value plant nutrients discovered through the Center can inform future breeding programs for Nebraska crops.

Next Steps in the Beef Systems Research Initiative

Momentum in IANR studies of Beef Systems will be further fueled by recently announced funding from a partnership of ARD, NE Extension and IANR Units of up to \$1.5M over the next 5 years. A multi-disciplinary faculty team is charged with completing a research plan by April that strategically integrates IANR state-wide facilities, and partnerships with USMARC, and leverages for additional external funds.

Nebraska Extension

Farm Financial Management

High input costs and declining commodity prices have driven farm incomes down in 2016, and they are expected to remain at low levels for the foreseeable future. Nebraska Extension has developed a number of resources to assist producers during this challenging economic time.

- Displays at Husker Harvest Days focused on research, recommendations and tools designed to help farmers and ranchers prepare for large variations in weather and economic conditions
- Over 220 people attended Ranching for Profitability meetings held at 10 sites across the state. The meeting series addressed current issues impacting ranchers profitability. Eight-two percent of participants were likely to make changes from knowledge gained.
- Twenty-three Extension educators from across Nebraska completed curriculum training of financial management for tools to help producers in the financial downturn.
- Weekly beef profit tips are shared through a 90 second radio spot on KRVN and on beef.unl.edu.

Support for Industry Growth

There is a growing interest in establishing new livestock and poultry facilities in Nebraska, many of which will involve contractual arrangement with supply chain partners. In anticipation of approximately 400 poultry barns in eastern Nebraska as a result of Costco developments, Nebraska Extension educators were trained on regulatory, environmental, nuisance and biosecurity considerations relative to the siting of a livestock/poultry operation to support farmers through the planning process for new facilities.

Healthy Living for Youth

Childhood obesity is a serious problem in the United States putting kids at risk for poor health. Programs developed in Nebraska Extension are addressing this issue in Nebraska.

- WeCook: Fun with Food and Fitness is a program targeting underserved fourth and fifth graders. The program is dedicated to teaching food preparation skills, the importance of proper nutrition and increasing physical activity.
- The 4-H Food Smart Families program equips youth and their families to make healthy living part of their everyday lives. 3,067 youth participated across the state. Since participation in the program, 86 percent of youth agree or strongly agree their family has prepared healthier meals.



College of Agricultural Sciences and Natural Resources (CASNR)

CASNR Graduates Impacting the Future

- Our graduating CASNR students are optimistic and self-confident with a strong sense of their role and responsibility as global citizens. They are servant leaders with a strong commitment to serving their community.
- We celebrated our 23,560th graduate in December 2016.



Continued Enrollment Growth Aligned with Career Opportunities

- Twelfth consecutive year with an increase in undergraduate enrollment, sixth consecutive all-time high CASNR undergraduate enrollment (2340);
- First-time student (new UNL/CASNR freshman) enrollment increased from 460 to 482 (+4.8%);
- Nebraska residents comprise 78.1% of our total student population (1828/2340);
- The top five degree programs based on CASNR enrollment are: Animal Science (338), Agribusiness (241), Agronomy (191), Fisheries and Wildlife (191) and Agricultural Economics (132); and
- Graduate student enrollment on the sixth-day census increased 4.7% from Fall 2015.

Impacting the Campus and Connecting with our Partners Statewide

- Curriculum Updates
 - Bachelor of Science in Integrated Science – emphasis on experiential learning and systems-thinking;
 - Food, Energy and Water in Society Minor open to all UNL students;
 - CASNR courses aligned with science requirements for pre-service teachers;
 - CASNR courses aligned with UNL's general education program; and
 - Partnering with the College of Arts and Sciences to provide a comprehensive, campus-wide life science curriculum
- In partnership with Nebraska Extension, the Agricultural Research Division, and the College of Education and Human Science, our reach extends statewide (e.g. IANR Science Literacy and K-12 STEM formal and non-formal programming for teachers and their students).

CASNR Impacting the World

- Internationalizing the curricula through innovation to position our graduates to provide global leadership in enhancing worldwide food security; and
- The College continues to build relationships with partners around the world to expand international programming on food, energy and water systems. Examples of new innovative educational programming focused on global food security include the new 3+1 degree completion program with Northwest Agricultural and Forestry University (NWAUFU). This program allows NWAUFU students to study in China for three years, before transferring to the UNL campus to complete their program of study. CASNR has also launched a new initiative focused on preparing the next generation of Rwandan agricultural leaders that will be the catalyst for transforming the agricultural industry, accelerating agricultural production through sustainable resource and environment management, and positioning Rwanda to emerge as the model for African agricultural development.

College of Education and Human Sciences (CEHS)

In 2016, CEHS completed one of its most strategic years in making faculty/staff hires. **Thirty-three new faculty members were brought on board** to help the college address the pressing challenges of Nebraska and the world. New hires were made to support teaching, research and extension in: early childhood; multicultural populations; bullying prevention; math and science education; rural education/rural communities; hospitality; and, merchandising and textiles. These highly talented newcomers hit the ground running in August.

Undergraduate enrollments remained stable across CEHS at just under 3,000 students. Graduate enrollments were up 5%. The 1,233 graduate students in CEHS programs represent approximately 1 in 4 of the university's graduate student population.

CEHS IANR-related units had a successful year earning national recognition and grant support for their work. A few examples include:

U.S. News Best Online Education Programs rankings. CEHS programs jumped to 4th place (up from #14 last year.) Programs that contributed to this ranking were:

- MS Family and Consumer Science Education (CYAF)
- MED P-12 Educational Administration (EDAD)
- MA Special Education (SECD)
- MED Special Education (SECD)
- MA German Language Education (TLTE)

USDA awarded a **\$1.7 million grant to Nutrition & Health Sciences (NHS)** researcher Janos Zemleni and colleagues to chronicle the fantastic voyage that gene-regulating molecules make from cow's milk to the human body. Their efforts could improve the accuracy, lower the cost and speed the process of screening for cancers and other diseases.

CEHS's Scholarly Enhancement Program (SEP) supports new faculty to ensure their long-term professional success in research. Two participants in the SEP last year, Dipti Dev, Child, Youth and Family Studies (CYAF) and Soonkyu Chung from NHS, were successful in earning USDA grants during this year.

The Department of Textiles, Merchandising & Fashion Design (TMFD) sponsored the 4-H **"Celebration of Youth XXIII: A Harvest of Creatives"** at the Robert Hillestad Textiles Gallery in September/October. The event displays the work of 4-H youth from across Nebraska that were winners in the areas of clothing, home environment and Quilt Quest from the Nebraska State Fair. The Gallery also enjoyed a 'complete' make-over during the summer – we hope you will visit this new and inviting space.

The **Creative Excellence Award** was presented to the Food Team by the Joint Council of Extension Professionals and the National Extension Association of Family and Consumer Sciences. The team was recognized for its work in developing a statewide food website that reaches the general public as well as educators, health professionals, and media outlets. Food Team members (Left to Right): Cami Wells, Lisa Franzen-Castle, Kayla Colgrove, and Alice Henneman.



Nebraska College of Technical Agriculture (NCTA)

NCTA Academic Quality Receives National Recognition:

- NCTA was reaccredited with high marks from Higher Learning Commission
- Aspen Institute named NCTA among top 15% of U.S. two-year institutions
- WalletHub ranked NCTA in top 2% of U.S. two-year institutions (9th of 821), and #4 for “graduate career outcomes - return on educational investment”
- Named to Top 50 by *Community College Week* for number of graduates from two-year programs in Agriculture, Agricultural Operations and Related Sciences
- Higher Learning Commission authorized NCTA to offer first college program online
- NCTA received authorization to offer online courses to 43 states via SARA authorization

NCTA Enhances Academic Programming:

- NCTA signed an *A to B Transfer Agreement* with the UNL College of Agricultural Sciences and Natural Resources, facilitating seamless transfer from NCTA to CASNR
- Launched popular, new certificate programs in Agricultural Chemical Applications, Agricultural Welding and Laboratory Animal Care
- Heifer Link program for student cattle ownership transferred 4 donated heifers to graduates
- Renovated the college welding laboratory with a complete set of new multi-functional welders
- Implemented a collaborative Dairy Science Program with South Dakota State University
- Opened NCTA Center for Economic Education
- NCTA Crops Judging Team won the national championship contest at NACTA. NCTA also won many top awards in agricultural computing, livestock judging, livestock management, and horse and dairy judging



NCTA Enrollment, Equity and Quality:

- Fall 2016 full-time, on-campus enrollment showed 2.5 percent growth to 245 fulltime students
- Successfully implemented a faculty salary market equity initiative
- Achieved faculty salary gender equity
- Successfully implemented a comprehensive, transparent and inclusive college budgeting process
- Accomplished significant milestones on the 2014-2019 Strategic Plan, including goals for policy development, college assessment and accountability
- Launched comprehensive college marketing, brand identity and public relations campaign
- Six faculty saluted by UNL Parents Association for outstanding service: Teri Jo Bek, Tee Bush, Mary Rittenhouse, Judy Bowmaster Cole, Dr. Brad Ramsdale and Joanna Hergenreder
- Agronomy Professor Brad Ramsdale, PhD, selected for Holling Family Teaching Award
- The NCTA agricultural education program, led by Dr. Doug Smith, was identified as the *Outstanding Post-Secondary Education Program*