

**Report on Areas of
Research, Scholarly and Creative Activities, and Discovery (RSCAD) Strength**

Date Spring 2014

A. Area of Strength:	Beef Cattle
B. Scope and Context:	Includes beef cattle health, nutrition and management; growth, muscle biology and beef products; beef safety (primarily microbiology); beef production economics and marketing.
C. Current or Emerging Strength:	<input checked="" type="checkbox"/> Current <input type="checkbox"/> Emerging <input type="checkbox"/> Both
D. Criteria of Strength (1, 3, 5, etc.):	1, 2, 3, 4, 5, 6, 7, 8, 11, 16, 17, 19, 20 (other)-- Largest single SUBJECT OF INVESTIGATION classification in our FY13 report of research expenditures to USDA. Accounted for \$10.9 million in expenditures (13.3% of KAES total).
E. Narrative:	Cattle account for almost half (\$7.9 billion of the \$16.2 billion total) of the value agricultural commodities sold in Kansas. Kansas routinely ranks third among all states in cattle inventory, outnumbering residents in the state nearly 3:1. Kansas also ranks third among all states in the value of beef exports totaling \$639 million. The Kansas Agricultural Experiment Station (KAES) supports a large core of scientists, students and staff supporting beef cattle research. KAES-supported faculty lead the USDA STEC CAP grant focused on beef safety and the Beef Cattle Institute. Interaction with the Kansas beef industry is strong.
F. Keywords/Tag words:	
A. Area of Strength:	Wheat
B. Scope and Context:	Includes wheat genetics, genomics, variety development, insect pests and diseases of wheat; crop management; various aspects of post-harvest grain chemistry, storage, handling, milling and baking; value-added processing; wheat production economics and marketing.
C. Current or Emerging Strength:	<input checked="" type="checkbox"/> Current <input type="checkbox"/> Emerging <input type="checkbox"/> Both
D. Criteria of Strength (1, 3, 5, etc.):	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 16, 17, 19, 20 (other)-- Second largest single SUBJECT OF INVESTIGATION classification in our FY13 report of research expenditures to USDA. Accounted for \$7.7 million in expenditures (9.4% of KAES total)
E. Narrative:	Kansas routinely ranks first among all states in wheat production and in the value of wheat exports. In general, wheat ranks first in value among all grains produced in Kansas and second (to beef cattle) in importance to the Kansas agricultural economy. Research strength led to first ever NSF I/UCRC center focused on wheat genetics and first plant disease research within BRI. Strengths in wheat research led to recent award of two major USAID Feed the Future awards focused on applied wheat genomics and minimizing post-harvest losses in stored grains. Strong collaborations exist with USDA/ARS scientists. K-State supports wheat breeding with programs in Manhattan and Hays and has an exceptional core of scientists spanning multiple departments focused on all aspects of the wheat value chain. Collaboration with the Kansas Wheat Commission and the Kansas Association of Wheat Growers is very

	strong. K-Stat researchers enjoy strong collaborations with Heartland Plant Innovations, a for-profit company housed within the Kansas Wheat Innovation Center located on K-State's north campus. The NSF I/UCRC brings wheat research scientists in close collaboration with important private companies affiliated with wheat, as well as the Kansas Department of Agriculture.
F. Keywords/Tag words:	
A. Area of Strength:	Sorghum
B. Scope and Context:	Includes sorghum genetics, genomics, hybrid development, insect pests and diseases of sorghum, crop management, various aspects of post-harvest grain chemistry, storage, handling, and milling
C. Current or Emerging Strength:	<input type="checkbox"/> Current <input type="checkbox"/> Emerging <input checked="" type="checkbox"/> Both
D. Criteria of Strength (1, 3, 5, etc.):	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 16, 17, 19, 20 (other)-- Accounted for \$3.7 million in expenditures (4.5% of KAES total) in FY13.
E. Narrative:	Kansas routinely ranks first among all states in grain sorghum production. Research strengths led to award of the USAID Feed the Future Innovation Lab for Collaborative Research on Sorghum and Millet. K-State houses a strong critical mass of scientists contributing to the Center for Sorghum Improvement. K-State supports sorghum breeding with programs in Manhattan and Hays and has a strong core of scientists working on grain sorghum. Strong collaborations exist with USDA/ARS scientists and with the Kansas Grain Sorghum Commission.
F. Keywords/Tag words:	
A. Area of Strength:	Swine
B. Scope and Context:	Includes swine health, nutrition and management; growth, muscle biology and pork products; pork quality
C. Current or Emerging Strength:	<input checked="" type="checkbox"/> Current <input type="checkbox"/> Emerging <input type="checkbox"/> Both
D. Criteria of Strength (1, 3, 5, etc.):	1, 2, 3, 4, 5, 6, 7, 8, 11, 16, 17, 19, 20 (other)-- Accounted for \$6.4 million in expenditures (7.8 % of KAES total) in FY13.
E. Narrative:	Kansas ranks 10 among all states for swine inventory. However, K-State hosts an impactful collection of swine scientists in the Department of Animal Sciences and Industry and the College of Veterinary Medicine. This group is recognized as expert in applied swine nutrition and management and is in close contact with the swine industry nationally and internationally. In addition, AES-supported scientists in the College of Veterinary Medicine are routinely on the forefront of solutions to emerging swine diseases (pathogenesis/diagnosis, vaccine development).
F. Keywords/Tag words:	
A. Area of Strength:	Insects/other pests
B. Scope and Context:	Includes: 1) Fundamental Insect Science - biological processes, systematics and taxonomy, chemical ecology, insect behavior and toxicology. 2) Safe & Sustainable Food production - alternative management strategies in field crops, including IPM, transgenic and biorational pest management options, GMOs and host-arthropod interactions. 3) Food Safety, Public and Animal Health - management of arthropods affecting animal and human health, post-harvest pest control and biology of insect vectored plant, animal and human diseases. 4) Environmental Stewardship - the

	impact of agricultural practices on insect biodiversity including non-target effects, ecological factors on invasive species, animal and plant waste management and toxicogenomics.
C. Current or Emerging Strength:	<input type="checkbox"/> Current <input type="checkbox"/> Emerging B Both
D. Criteria of Strength (1, 3, 5, etc.):	1, 2, 5, 6, 11, 15, 16, 17, 18, 19, 20 (other)— Accounted for \$5.4 million in expenditures (6.5% of KAES total) in FY13.
E. Narrative:	Few comprehensive, stand-alone departments of entomology remain among land grant universities. Unique opportunities exist for interaction with USDA/ARS including the recently re-located arthropod unit to Manhattan from Laramie, WY. Scientists in the Department of Entomology contribute to K-State’s Arthropod and Ecological Genomics Centers.
F. Keywords/Tag words:	
A. Area of Strength:	Water Resources
B. Scope and Context:	Includes water resources (including irrigation technologies), watersheds, wetlands and river basins
C. Current or Emerging Strength:	<input type="checkbox"/> Current <input type="checkbox"/> Emerging B Both
D. Criteria of Strength (1, 3, 5, etc.):	1, 2, 3, 4, 8, 15, 16, 18, 19, 20 (other)— Accounted for \$2.1 million in expenditures (2.7% of KAES total) in FY13. It should be noted that significant expenditures related to irrigated grain production are accounted for in specific commodity categories not counted in this total (e.g. corn, sorghum, and wheat).
E. Narrative:	At least one-third of the value of Kansas’ agricultural production can be associated with access to irrigation water from the Ogallala Aquifer in western Kansas. Water is used for irrigated corn production and corn, in turn, is the grain of choice for diets of feedlot cattle. Kansas Center for Agricultural Resources and the Environment (KCARE) and the Kansas Water Resources Institute are multidisciplinary, but are housed in the College of Agriculture. KCARE administers the Ogallala Aquifer Project, a cooperative project between Kansas State University, Texas A&M University, West Texas A&M University, Texas Tech University and USDA-ARS focused on supporting irrigated agriculture while extending the usable lifespan of the Ogallala. Through KCARE, strong ties exist with the Kansas Water Office and the Kansas Department of Agriculture.
F. Keywords/Tag words:	
A. Area of Strength:	Food and Feed Safety
B. Scope and Context:	Includes pre and post-harvest safety of fresh and processed meat, milk, eggs, fruit and vegetable products. Also includes safety of feed for livestock and poultry, as well as the nexus between feed safety and food safety.
C. Current or Emerging Strength:	<input type="checkbox"/> Current <input type="checkbox"/> Emerging B Both
D. Criteria of Strength (1, 3, 5, etc.):	1, 2, 3, 4, 5, 7, 8, 9, 11, 12, 15, 16, 17, 18, 19, 20 (other)— Obvious links to the Global Food Systems Initiative
E. Narrative:	Excellence in food science and safety was partially used as justification for planning and ultimately funding for Pat Roberts Hall (Biosecurity Research Institute--BRI) at Kansas State University. In 2001, the Food Science Institute was established at K-State to integrate expertise in food science across the campus. The Food Science Institute

	<p>was a Targeted Excellence initiative funded when Dr. Duane Nellis was K-State Provost. The BRI, the Food Science Institute and the newly formed food safety group at K-State Olathe (and proximity K-State Olathe to the Olathe Horticulture Research and Extension Center) are key, unique, core assets to support food safety research and training of graduate students.</p> <p>The recently completed O.H. Kruse Feed Technology Innovation Center contains the Cargill Feed Safety Research Center. The Feed Safety Research Center contains one of a kind BSL-2 capabilities including a pilot feed mill that has been designed and built to BSL-2 specifications. To our knowledge, this facility is unique globally.</p>
F. Keywords/Tag words:	