During fiscal year 2015, the Department of Food Science and Human Nutrition (FSHN) added two new tenure system faculty members to our ranks to bolster our research cores in 'Integrated Food, Nutrition and Health' and 'Food Safety and Security'. Complementing existing strengths in ‘Food Material Science and Engineering’ and ‘Biochemical and Molecular Nutrition,’ the FSHN Department is dedicated to implementing education, research, and outreach programs designed to provide a safe, nutritious, and affordable food supply that enhances human health. We achieve this mission by taking a systems approach to scholarly efforts aimed at solving grand challenges in the agricultural, behavioral, biological, consumer, engineering, life, and social sciences.

Research in the FSHN Department is by nature inquiry driven, integrative and collaborative. Faculty experts across food and nutritional sciences, dietetics, and hospitality management are found working side-by-side with undergraduate and graduate students, national and international partners, and government, industry, and foundation associates to make important and impactful discoveries that contribute to a sustainable food supply that supports human nutrition and a healthy citizenry.

Research highlights from 2015 are included in this report. We look forward to future contributions in research innovations that accomplish our mission.

Sincerely,

Dr. Shelly Nickols-Richardson
Head, Department of Food Science and Human Nutrition
TOTAL RESEARCH AND DEVELOPMENT (R&D) EXPENDITURES* FY11 – FY15

FY11: $3.69M
FY12: $3.95M
FY13: $3.65M
FY14: $3.32M
FY15: $4.16M

TOTAL SPONSORED RESEARCH EXPENDITURES FY11 – FY15

FY11: $4.28M
FY12: $5.35M
FY13: $4.27M
FY14: $3.68M
FY15: $3.41M

EXPENDITURE DISTRIBUTION BY SOURCE TYPE FY15

- State Appropriations and Tuition: 48.4%
- Institutional: 15.6%
- Grants and Contracts: 21.9%
- Gifts and Endowments: 6.4%
- Self-supporting, FWS, Land-grant: 7.7%

*Sponsored project expenditures (grants and contracts) by the home department of the principal investigator instead of the unit receiving the grant. Expenditures from sponsored research project funds (grants and contracts) plus overheads deducted from these funds. Includes amounts awarded to subcontractors.
Various studies on the mechanisms of nutrient and bioactive food compounds on aging and cognition are supported by Abbott Nutrition at over $1 million.

$1.3 million from the National Institutes of Health to investigate botanical estrogens in cancer research.

Over $540,000 from Mead Johnson to study dietary interventions, brain development and cognitive function as mediated via the gut-brain-microbiome axis.

Research on improving gut health with broccoli is supported by the USDA - National Institute of Food and Agriculture with a grant of nearly $500,000.

A childhood obesity prevention program is supported by a 5-year integrated challenge grant at roughly $500,000 per year from the USDA - National Institute for Food and Agriculture.

Approximately $450,000 from the University of California at Berkeley - British Petroleum Consortium to explore use of microbes in food/energy bioprocessing.

Approximately $300,000 from the Gerber Foundation to study modulation of infant microbiome and metabolome by dietary oligosaccharides.

Pfizer Incorporated is providing nearly $140,000 for a study of conjugated estrogens and bazedoxifene in metabolic and reproductive health.

Research on corn zein solubility, solution stability, and gelation behavior is being supported by POET Nutrition in an amount approximating $83,400.

Enhancing perception of saltiness while reducing actual sodium intake is supported by the USDA - National Institute of Food and Agriculture with a $362,000 grant.
Pilot Plant: A 10,000 square-foot food pilot plant serving the needs of FSHN and others, with space for food production, teaching, and research activities.

Botanical Estrogens Research Center: The Center provides basic information on how botanical estrogens work and the activities that they exhibit.

Human Nutrition Assessment Laboratory: A shared resource for investigators needing anthropometric and body composition, dietary intake and vital signs data. The laboratory may also be used to collect biological samples with human participants. The lab supports clinical interventions and behavioral and community based research programs.

Bevier Café and Spice Box Restaurant: Staffed and managed by FSHN students, Bevier Café is also a real-life classroom laboratory, offering an opportunity to study and experience challenges related to managing quantity food service operations. The Spice Box is a student-run restaurant associated with FHSN’s Hospitality Management program. Senior students are responsible for planning, staffing, executing and evaluating a financially viable themed fine dining meal.

Illinois Transdisciplinary Obesity Prevention Program: An innovative research-based PhD/MPH degree program with a focus on obesity prevention and child health and wellbeing. Funded by the USDA, I-TOPP also provides opportunities for cross-disciplinary interactions between local faculty, scholars and international leaders.

Integrated Bioprocessing Research Laboratory: Advances research and education focused on renewable food, fuel and fiber-based processing platforms and aims to stimulate bio-economic development in the State of Illinois through translational scale-up of developed technologies leading to commercialization.

Metabolic Kitchen: Supports the design and distribution of foods and meals down to the micronutrient level as required by research protocols. Provides full kitchen facilities, analytical areas, and group and individual food intake spaces.
17TH FOOD INNOVATION ASIA CONFERENCE 2015
Keith Cadwallader for Keynote speech on “Quest for Stability of 2-acetyl-1-Pyrroline: The Key Odorant in Aromatic Rice and Pandan”.

EARLY INVESTIGATOR AWARD FROM ENDOCRINE SOCIETY
Zeynep Madak-Erdogan for research focused on the mechanisms of Estrogen Receptor action in breast cancer.

PEPSICO INC.
Graciela Padua to study design and fabrication of nanocomposite coatings for starch based granules.

NESTLÉ INC.
Pawan Takhar for measurement of transport microstructural and mechanical properties of foods.

BORLAUG FELLOW
USAID fellowship for student of Juan Andrade to study gender, nutrition, and agricultural linkages in Honduras.

FUNK RECOGNITION AWARD
Elvira de Mejia for outstanding achievement and major contributions to the betterment of agriculture, natural resources, and human systems.

USDA AGRICULTURAL RESEARCH SERVICE
Elizabeth Jeffery for determination of glucosinolates in brassica.

ACES FACULTY AWARD FOR GLOBAL IMPACT
Karen Chapman-Novakofski for international achievements and demonstrated excellence related to global engagement.

KOREA RESEARCH INSTITUTE OF BIOSCIENCE AND TECHNOLOGY
Yong-Su Jin to research construction of a xylulose-fermenting metabolic pathway in yeast.

NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY OF THE UNIV. OF QUERETARO
Elvira de Mejia recognized with Distinguished Professorship of Food Science for contributions to the university’s doctoral degree program in Food-Science Food-Technology.

95th Percentile
Faculty with an Award Academic Analytics, 2014

100th Percentile
Authors with a Citation Academic Analytics, 2014

90th Percentile
Faculty Articles per Author Academic Analytics, 2014
At many universities, the fields of food science and human nutrition are pursued separately, even housed within different campus departments.

The University of Illinois Department of Food Science and Human Nutrition combines both disciplines and hospitality management under one conceptual roof, allowing for synergistic combinations of expertise.

Nutritionists wanting to examine the health outcomes of a particular lipid, vitamin, or other compound can easily work with food scientists to develop foods that encapsulate a nutrient for greater bioavailability. A food scientist wanting to assess the health impact of a new food processing technique has multiple departmental colleagues with whom to consult and collaborate.

This interdisciplinary ethos extends to other campus departments, and to other universities and organizations as well. Following are a sampling of such interdisciplinary efforts.

**STRONG KIDS 1 AND 2**

The Synergistic Theory and Research on Obesity and Nutrition Group, or STRONG Kids Program, is a cross-disciplinary project examining how genetic, family, community, child care provider, cultural, and media factors contribute to the development of childhood weight imbalance, obesity, health behaviors and health beliefs.*

Like its namesake, STRONG Kids 2 is a cross-disciplinary program focused on children, but with an emphasis on how individual biology interacts with the family environment to promote healthy eating habits. A five-year, $1 million grant from the Dairy Research Institute funds the program.*

**ABRIENDO CAMINOS**

An approach to reducing Hispanic obesity rates through a community-based program targeted at whole families. Abriendo Caminos encourages healthy eating by incorporating elements of traditional Hispanic dietary patterns, collective family mealtimes, and culturally-tailored physical activity into a unified program.*

**KRAFT FOOD COLORS**

A three-year, $1.4 million research collaboration between Kraft Foods Group, Inc. and the University of Illinois focuses on the economic and technical feasibility of extracting food colors from corn for incorporation into food and beverages.**

**INSTITUTIONAL AFFILIATIONS**

Many faculty have positions with other campus research organizations, such as the Beckman Institute and the Institute for Genomic Biology.

*familyresiliency.illinois.edu/research

**go.illinois.edu/kraftfoodcolors
Faculty research spans from crop to clinic

international food science and nutrition • dietary patterns and energy balance influence on cancer • food and biomass microbiology • flavor chemistry • community nutrition • nutrigenomics and epigenetics • bioactive peptides and proteins in foods with health benefits • pediatric nutrition • food chemistry • bioactive food components and carotenoids • food engineering and processing • nutrition, biochemistry and genetics of folate, vitamin B-12 and sulfur amino acid and one carbon metabolism • nutritional toxicology • nutrition and the microbiome • functional foods including anticarcinogenic and anti-inflammatory effects of non-nutritive dietary components • microbial genomics • food chemistry and sensory evaluation • food processing, rheology, and microencapsulation • nutrition, genomics, transcriptomics, cistromics, epigenetics, metabolomics, biomarker discovery, biosensors, molecular and physiological effects of phytochemicals • food microbiology • food engineering • biochemical and molecular nutrition • determinants of obesity prevention and body weight regulation • nanostructured foods and biomaterials • nutrient-gene interaction and chronic diseases • food chemistry characterization of water and solids mobility • nutrition in the functional development of the gastrointestinal tract, immune response and establishment of the neonatal microbiota • food safety microbiology • porous media modeling of fluid and species transport in biomaterials • nutrition and intestinal function • obesity prevention in children and young adults

www.fshn.illinois.edu/directory/research www.aces.illinois.edu
FSHN FACULTY RESEARCH AREAS COLLEGE OF AGRICULTURAL, CONSUMER AND ENVIRONMENTAL SCIENCES