Strategic Plan: A Roadmap to Achieving a Shared Vision

College of Agriculture and Life Sciences

The Department of Food, Bioprocessing and Nutrition Sciences

2013-2018
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When I became the interim head in July 2010, the Department of Food, Bioprocessing and Nutrition Sciences (FBNS) was facing a significant budget reduction. Nearly a half-million dollars was to be cut from the FBNS budget, representing an overall 8.7 percent reduction across the academic, research, and extension missions. The cuts were managed through the sacrifice of the faculty and staff who supported an FBNS cost-share plan to protect technical staff positions.

That unpleasant experience entered the department into the modern day era of practicing the land grant mission in a college of agriculture and life sciences. No longer will programs and missions be supported independently through the public sector. Our department now, like many others across the country, depends on extramural funding from federal and private sponsors. The future of the department will be one committed to growing entrepreneurial activities of FBNS programs, thereby lessening dependence on state support and formula funding.

As a result of the difficult decisions forced upon us from past reductions, the department elected to cease being reactionary and to define its future by writing and committing to a strategic plan. This plan, serving as our roadmap to the future, identifies core strengths of FBNS. These foundational directives represent the key areas for which the department will be nationally and internationally recognized, and every faculty member has been identified to champion or support a segment of the plan.

A strategic plan is never really finished. If implemented properly, the document will be used, evaluated, and revised on a routine basis. It will serve as the cornerstone for future faculty meetings, retreats, important decisions, and faculty reviews.

When we launched our planning process in spring 2011, the facilitator talked with the department about choice vs. chance. We chose to define our path and minimize the likelihood that the next budget crisis will derail this department from achieving a shared vision, to be a preeminent department in the food, bioprocessing, and nutrition sciences.

I thank the department for its patience throughout the planning process. Many have devoted countless hours writing and preparing the plan. I especially thank Dr. E.A. Foegeding for his leadership and energy to get this living document established. I look forward to monitoring our progress and accomplishing goals of the plan, and I am confident we will continue our history of achievements and leadership among all our disciplines.

Christopher R. Daubert
Summer 2013
The N.C. State University Department of Food, Bioprocessing and Nutrition Sciences was created in July 1961 within the College of Agriculture and Life Sciences. With personnel from the USDA Food Fermentation Laboratory, faculty with food-processing interests were transferred from the departments of Animal Science (dairy and meats), Horticulture Science, and Poultry Science into this new department. Extension faculty with responsibilities in food processing also became part of the department. Thus, teaching, research, and extension functions were integrated within the department with faculty interacting on a daily basis. This foresight in interdisciplinary unit structure had, and continues to have, major impacts on the programs and strengths of the department. When formed in 1961, the department had 15 faculty. Today, the department has 32 faculty (23 tenure-track, 2 non-tenure track, and 7 USDA).

Schaub Hall was completed and occupied in 1968, and a $12 million renovation of the building was initiated in June 2004 and completed in August 2005. A majority of activities of the Department of Food Science are located within this facility, except for the NC State University Seafood Laboratory located in the University’s Center for Marine Sciences and Technology (CMAST) at Morehead City, the Plants for Human Health Institute at Kannapolis, and the Dairy Farm on Lake Wheeler Road, Raleigh. A portion of the lower floor of Schaub Hall houses the Feldmeier Dairy Applications and Processing Laboratory. This unit is operated as an independent, self-supporting auxiliary enterprise with a director who is responsible to food science administration. The past renovation included upgrades to all major infrastructure systems, the addition of life-safety systems, significant upgrades to the dairy and meat processing pilot operations, as well as creation of a new teaching laboratory and sensory laboratory.

The Department Head (Dr. Christopher R. Daubert) is responsible to the Dean of the College of Agriculture and Life Sciences (Dr. Richard H. Linton), and coordinates delegated responsibilities through the Directors of the North Carolina Agricultural Research Service (Dr. Steve Lommel), Academic Programs (Dr. Samuel L. Pardue), and North Carolina Cooperative Extension (Dr. Joe Zublena). Within the Department, seven individuals assist the Department Head with administrative responsibilities. The Research Leader and Associate Department Head, Dr. K.F. Sandeep, assists the Head in various administrative functions as well as advancing the research capabilities and programs of the Department. The Departmental Extension Leader (DEL), Dr. David Green, coordinates administrative functions and activities related to extension programs. The Undergraduate Teaching Coordinators (UTC) for the Food Science, Nutrition Science, and Bioprocessing Science degree programs are Dr. Keith Harris, Dr. Sarah Ash, and Dr. John Sheppard, respectively. Dr. Jonathan Allen serves as the Department’s Director of Graduate Programs (DGP), and is responsible for coordinating administrative matters associated with the Master of Science and Doctor of Philosophy degree programs. Dr. Clint Stevenson serves the Department as the inaugural coordinator of FBNS distance education programs. Many of the functions associated with Departmental administration are carried out in committees that rotate membership and chairs on an annual basis.

The Department organized its research programs around key discipline areas: food chemistry (biochemistry), food processing and engineering, food microbiology, nutrition, and sensory science. Within the discipline areas, the Department is committed to achieving an appropriate balance between basic, applied, and translational research.

Organized Research Units (ORUs) have a long-standing history within the research structure of the Department. The ORUs have separate organizational structures and accounting from the Department, with their primary focus being research and extension:

- The USDA Food Fermentation Laboratory became part of the overall departmental makeup in 1961. This lab has served the nation’s vegetable fermentation industry, has grown to include four faculty programs, and is now called the Food Science Research Unit.
- In 1987 the industry/university cooperative research center, the Center for Aseptic Processing and Packaging Studies (CAPPS), received an official university charter. CAPPS was the first National Science Foundation-sponsored university/industry center organized in a specific area of food processing. CAPPS has been renamed the Center for Advanced Processing and Packaging Studies, and CAPPS management has been transferred to Ohio State University. These changes notwithstanding, NC State remains an important component of CAPPS.
- The Southeast Dairy Foods Research Center (SDFRC), one of six dairy foods research centers in the United States, grew out of the sponsorship of the National Dairy Promotion and Research Board (NDPRB). It began in 1988 and was developed in cooperation with Mississippi State University. NC State is the lead institution, and the SDFRC is administered and operated from the Department of Food, Bioprocessing and Nutrition Sciences. Funding is now directed by the new Dairy Management, Inc. (DMI), and the SDFRC presently has 20 industrial sponsors.
- In 1991, the USDA established a second USDA ORU within the Department – the USDA Market Quality and Handling Research Unit. This laboratory, which focuses on peanuts, is administered through the USDA structure and includes faculty in both the FBNS Department of Food Science and the Department of Biological and Agricultural Engineering.
- In 2000, N.C. State University opened the Center for Marine Sciences and Technology (CMAST). The principal mission of the center is to discover innovative solutions to questions and problems in marine systems and provide effective communication of these discoveries. By promoting multidisciplinary studies among research scientists, educators, and extension specialists from the participating NC State University colleges, enhancing interaction with other educational institutions and agencies concerned with marine sciences and coastal natural resources, CMAST provides a focal point for citizen contact with N.C. State University’s marine science and extension faculty.
- N.C. State’s Plants for Human Health Institute (PHHI) consists of research and extension programs that create a dynamic presence at the N.C. Research Campus in Kannapolis, NC. Research on fruits and vegetables will enhance the health-protective value of food crops and has the potential to increase the economic impact of North Carolina agriculture. PHHI is unique in that it supports an in-house outreach component, a group of N.C. Cooperative Extension personnel that works with institute faculty and...
Cooperative Extension agents and specialists statewide to deliver educational resources to enrich the lives and economy of North Carolinians.

- In 2011, N.C. State University received a $25 million grant from the Department of Agriculture’s (USDA) National Institute of Food and Agriculture (NIFA) to strengthen food safety by studying human noroviruses across the food supply chain in an effort to design effective control measures and reduce the number of virus-caused food borne illnesses. The USDA-NIFA Food Virology Collaborative (NoroCORE), led by Dr. Lee-Ann Jaykus, William Neal Reynolds Professor of Food, Bioprocessing and Nutrition Sciences, consists of a team of more than 30 collaborators from academia, industry and government. The team will work to increase understanding of the viruses; educate producers, processors and food handlers on safe handling and preparation of food; and develop control and management strategies to reduce food contamination before and after harvesting.

Since the 1999 CSREES review, among the most dramatic changes within the Department have been in the undergraduate teaching program. Beginning in the 2006 fall semester, the Department added two new baccalaureate programs, Nutrition Science and Bioprocessing Science. The undergraduate teaching program is continuously reviewed by a faculty committee to ensure that it is accomplishing the desired goals.

The graduate program has considerable flexibility and is tailored to the research and academic needs of each student, while ensuring that they are adequately trained. Research programs feature basic and applied research, oriented to specific commodity or discipline areas. Both undergraduate and graduate teaching programs have a goal of providing students with the fundamental tools they will need to establish successful, challenging, rewarding careers in the food, bioprocessing or nutrition sciences.

The extension program is primarily organized around a commodity orientation, but contains some discipline emphasis. It seeks to provide leadership and technical services in food manufacturing to the food industries, related governmental agencies, and entrepreneurial enterprises. Extension specialists are responsible for transferring knowledge generated by research into the pragmatic world of the food processor. In recent years there has been increased emphasis on the significance of involvement in applied research by extension specialists.

**FACULTY AND PROFESSIONAL RESOURCES**

The current distribution of faculty effort is 13.50 FTE research, 7.75 FTE academic programs (resident instruction), 3.50 FTE extension, and 0.95 FTE other, excluding the 7 USDA faculty who are primarily research focused. Time allocations, academic rank or title, and specialization of faculty and professional staff are summarized in the appendix.

**INTRODUCTION**

The Department of Food, Bioprocessing and Nutrition Sciences (FBNS) has evolved over the years to address the constantly changing challenges of producing a food supply that is abundant, safe, affordable, healthy and enjoyable. The combining of Bioprocessing Science and Nutrition Science programs with the Food Science program reflects our vision of the need for an integrated and multidisciplinary approach to address the numerous challenges facing the world food and feed supplies. As we look forward, we see everything from the current obesity crisis to the challenge of how we will feed 9 billion people worldwide by 2050.

With the backdrop of challenges to the food supply, there are also many changes taking place in society that affect our basic missions of teaching, research, and outreach. First, classroom face-to-face teaching is just one of many formats available to deliver information in today’s technology-driven world. It is now possible to teach a class to students in Raleigh, while simultaneously transmitting it around the world to students in other countries. Teaching in the electronic age has many opportunities, and pitfalls, requiring a diligence and critical analysis of past, current, and future pedagogical approaches to assure our practices are effective. Research opportunities remain abundant but research funding continues to be squeezed with changes in government and other traditional funding sources. Outreach and extension activities also must adjust to a new breed of entrepreneur who now has the ability to reach billions of potential customers simply by putting up a website. All of these changes made it clear that our department needed a Strategic Plan that is designed to take advantage of rapidly developing opportunities and maintain our history of achievement in teaching, research, and outreach.

The Strategic Plan started with a group of engaged faculty, emeriti, staff and students surveying activities in similar departments from universities throughout the United States and the world. In addition, information from stakeholders – former students, current partners, and other collaborators with consumers of our activities – also was gathered to gain insight into what was required to fulfill their needs. This information was analyzed and used as the foundation for developing a Strategic Plan designed to capitalize on our unique strengths.

The basic results were presented at a retreat in 2012 that resulted in the following Strategic Directions:

**I. Food Safety & Foodborne Disease Prevention**

**Statement:** Become the preeminent integrated (research, education, extension) food safety program to provide students and stakeholders the capacity to analyze situations, address issues, and provide solutions for preventing contaminants in food and their impact on human health.

**II. Food Manufacturing & Entrepreneurship**

**Statement:** Be the recognized authority for providing food and beverage manufacturing and entrepreneurship expertise to state, national, and international students and stakeholders to meet the demand for an abundant, safe, nutritious, tasteful, and affordable food supply.
III. Instructional Innovation & Effectiveness

Statement: Be recognized for designing, developing, and delivering highest quality instruction to various stakeholders, including students, professionals in industry, government agencies, and consumers, both locally and internationally.

IV. Foods for Health & Well-being

Statement: Be the preeminent program in identifying bioactive, nutritional, microbial, sensorial, and structural elements of food related to health and well-being by establishing mechanisms of action and translating that knowledge into food products and ingredients, bioactive interventions, prevention programs, and educational platforms for promoting public health.

In 2013 we finished the process at a faculty retreat where specific goals, strategies, tactics, timelines, and metrics were developed for each Strategic Direction. More importantly, each tactic has a faculty champion who will be assuring successful completion of the task and reporting back to the Department.

Rather than a roadmap, perhaps this plan is better referenced as a GPS (Global Positioning System) to the future. When that new opportunity arises, our plan allows us to hear that voice saying "recalculating the route" and keep us on the path to achieve our Mission and Vision.

We have a bright future ahead.

CULTURE & VALUES

As an academic community, The Department of Food, Bioprocessing and Nutrition Sciences prides itself on a long-standing commitment to service for one another, the university at-large, and the state of North Carolina. Our core values are grounded in respect for scientific integrity and quality, timeliness, and professionalism. As a diverse group of faculty and professionals with many different skills and personalities, we use our strengths to foster a truly collaborative spirit. In the academic realm, we promote student accomplishment and achievements toward learning and scholarship to ultimately foster better world citizens. In our interactions with stakeholders, we seek to develop scientifically credible solutions to real-world problems. As researchers, we use our creativity to enhance basic scientific knowledge that improves the quality, nutritional value, safety, and sustainability of the world’s food supply. We strive for professionalism, competency and quality in all our actions. As we move into the 21st century, our faculty will continue the tradition of service as we seek to address issues in food, bioprocessing, and nutrition sciences in an increasingly globalized world through continued excellence in education, research, and outreach.

MISSION

To foster and provide premier research, education and outreach efforts in food, bioprocessing, and nutrition sciences to improve the quality of lives throughout North Carolina, the United States, and the world.

VISION

The scientists, engineers, and educators of The Department of Food, Bioprocessing and Nutrition Sciences embrace an integrated approach of the land-grant philosophy to address local and global challenges to providing a food supply that is secure in availability and abundance, safe, and affordable. In addition, foods must provide essential nutrients and bioactive compounds and be desirable to consumers. The Department of Food, Bioprocessing and Nutrition Sciences will address those challenges through innovative teaching, scientific discovery, and outreach. Our success will be measured by how we help provide an abundant food supply that is safe, affordable, healthy, and enjoyable for citizens of North Carolina, the United States, and the world.
STRATEGIC DIRECTION I:
FOOD SAFETY & FOODBORNE DISEASE PREVENTION

Statement: Become the preeminent integrated (research, education, extension) food safety program to provide students and stakeholders the capacity to analyze situations, address issues, and provide solutions for preventing contaminants in food and their impact on human health.

1.1 GOAL
Increase knowledge and skills of students and stakeholders through excellence and innovation in food safety education and training programs.

1.1.1 Strategy
Develop an undergraduate food safety minor available to students across departments and colleges at NC State.

TACTICS:
- Develop core competencies to support an undergraduate food safety minor.
- Identify and propose improvements to relevant courses.
- Develop and submit approval forms for new courses in support of the minor.
  Champion: Johnston
  Actions and Deliverables: Launch the undergraduate food safety minor in fall 2015.

1.1.2 Strategy
Strengthen existing graduate food safety minor.

TACTIC:
- Develop and implement a plan to address the teaching needs for the graduate food safety minor, especially coordination of the pre-harvest food safety course.
  Champion: Jaykus
  Actions and Deliverables: Implement a sustainable plan for the interdisciplinary graduate food safety minor by fall 2014.

1.1.3 Strategy
Collaborate with UNC-Chapel Hill School of Public Health, North Carolina A&T, and other partners to develop an integrated food safety-public health certificate program.

TACTICS:
- Evaluate current food safety-public health certificate programs from other institutions.
  Champion: Kowalcyk
  Actions and Deliverables: Share opportunities and benefits to FBNS for an integrated program during the 2014 faculty retreat, and propose next tactics towards achieving the strategy and goal.
- Build partnership with UNC-Chapel Hill School of Public Health and others.
  Champion: Kowalcyk
  Actions and Deliverables: Identify interested collaborators and partners to sponsor a joint food safety seminar series, and provide a plan for cultivating the partnership by June 2014.
  • Develop high-level strategic plan for developing an integrated food safety-public health certificate program, including target audience, key competencies to be developed, program requirements/delivery, division of administrative responsibilities, and funding/timeline needed for implementation.
  Champion: Kowalcyk
  Actions and Deliverables: Submit the strategic plan for an integrated food safety-public health certificate program by December 2014.
  • Identify potential funding sources and apply for planning grant.
  Champion: Kowalcyk
  Actions and Deliverables: Apply for a planning grant by December 2014.

1.1.4 Strategy
Enhance the student experience by challenging students with case studies, real world problems, and internship experiences.

TACTIC:
- Individual case studies are to be assigned as components of oral and/or written presentations in FS 350 (Introduction to HACCP), FSA 520 (Pre-Harvest Food Safety), FSA 530 (Post-Harvest Food Safety), FSA 540 (Food Safety & Public Health), and FSA 580 (Professional Development & Ethics in Food Safety).
1.2 GOAL
Increase food safety and prevention outreach and service programs to students and stakeholders.

1.2.1 Strategy
Strengthen the relationship between FBNS and Plants for Human Health Institute (PHHI) to establish FBNS and NC State as the regional resource for produce food safety.

TACTIC:
• Engage with the produce food safety task force.

Champion: Gutierrez
Actions and Deliverables:
By June 2014, establish and define an FBNS leadership role in advancing produce food safety in coordination with the task force.

1.2.2 Strategy
Create and apply distance education and other novel approaches for improved communications with all students and stakeholders.

TACTICS:
• Enhance capacity for distance education (DE) and other teaching technologies.

Champion: Stevenson
Actions and Deliverables:
Hire a staff member to assist in DE course development, including video modules, and purchase a mobile Mediasite unit by December 2013.

• Improve food safety communications to the public through the development and expansion of novel audience-specific communication strategies and deliverables, i.e. coordinate website development and enhance social media activities of food safety faculty.

1.3 GOAL
Position FBNS to have a greater role and influence in federal, state, and local food safety policy.

1.3.1 Strategy
Provide service and consultation to federal, state, and local food safety agencies.

TACTIC:
• Continue to expand collaborative research and development supporting the Food Safety Modernization Act (FSMA) and other regulatory initiatives, including federal inspector training, web-based outreach to small business, and applied research aimed at helping industry meet regulatory requirements.

Champion: Green
Support: Breidt, Jaykus, Arritt, Hanson, Chapman
Actions and Deliverables:
Secure new collaborative agreements with federal and state partners, and establish FBNS as a key resource for FSMA implementation by fall 2014.

1.3.2 Strategy
Become a regional training center for federal, state, and local food investigators.

TACTICS:
• Continue to develop a relationship with FDA and NCDA by offering courses for inspectors in acidified foods and aseptic processing.

Champions: Arritt
Support: Green, Hanson
Actions and Deliverables:
Apply for a competitive grant to conduct food processing courses at NC State by December 2013.
STRATEGIC DIRECTION II: 
FOOD MANUFACTURING & ENTREPRENEURSHIP

Statement: Be the recognized authority for providing food and beverage manufacturing and entrepreneurship expertise to state, national, and international students and stakeholders to meet the demand for an abundant, safe, nutritious, tasteful, and affordable food supply.

2.1 GOAL
Establish a food and beverage manufacturing facility to support innovative and sustainable growth in the food and beverage industries with an entrepreneurial focus to train and educate students and stakeholders in current and emerging processing technologies.

2.1.1 Strategy
Create an action plan to establish a food and beverage manufacturing facility.

TACTICS:
• Assemble a planning committee that will advocate for and champion a new manufacturing facility.
  Champion: Daubert, Green
  Support: Hanson, Cartwright
  Actions and Deliverables:
  Form and charge a planning committee with representation from FBNS, CALS, NC State, industry and government by December 2013 to submit recommendations for location, features, and services by June 2014.
• Establish relationships with alumni, industry, and governmental agencies to procure funding for equipment and facilities.
  Champion: Sandeep
  Support: Simunovic, Drake, Hanson, Cartwright
  • Coordinate with CALS advancement to strategize and develop proposal packages that will be distributed to stakeholders and key interest groups by June 2014.

2.1.2 Strategy
Create a self-supporting brewing facility.

TACTICS:
• Partner with University Dining to sell product for distribution at university functions and outlets, including the golf course, university, and alumni clubs.
  Champion: Sheppard
  Support: Hollifield
  Actions and Deliverables:
  Complete a deal with University Dining by December 2013.
• Create a business model to grow FBNS brewing activities and create a financially independent and sustainable operation.
  Champion: Sheppard
  Support: Hollifield
  Actions and Deliverables:
  Submit a business plan to FBNS administration by June 2014.

2.2 GOAL
Be the primary resource to the food manufacturing sector in North Carolina and across the southeast.

2.2.1 Strategy
Expand educational and technical services offered for small business owners, entrepreneurs, and students to support economic growth.

TACTICS:
• Conduct an assessment of small business training and testing needs and create a plan for projected needs.
  Champion: Davis
  Support: Arritt, Hanson, Guttierez, Green
  Actions and Deliverables:
  Survey small business owners by December 2013; present results and propose recommendations for future steps to achieving the strategy and goal during the 2014 faculty retreat.
• Seek support from state and federal regulatory sources.
  Champion: Green
  Actions and Deliverables: Submit a grant by June 2014.

• In partnership with the Poole College of Management, offer a food manufacturing and entrepreneurship elective.
  Champion: Hanson
  Actions and Deliverables: Submit a grant by June 2014.

2.2.2 Strategy
Enhance FBNS capabilities for development and delivery of training and certification programs through partnerships with industry, regulatory, and education agencies.

TACTICS:
• Partner with Grocery Manufacturers Association (GMA) and the Preventive Control Alliance to broaden client base.
  Champion: Arritt
  Actions and Deliverables: Establish an agreement with GMA to provide training programs by June 2014.

• Seek support from state and federal regulatory sources.
  Champion: Green
  Actions and Deliverables: Submit a grant by June 2014.

• Develop curricula to meet needs in both traditional and distance education formats, and work with College of Textiles, McKimmon Center, and CALS to offer non-credit curricula on-line.
  Champion: Stevenson
  Support: Arritt, Hanson, Gutierrez
  Actions and Deliverables: Offer a non-credit, online course by June 2014.

2.3 GOAL
Establish funded research programs in new products and emerging process technologies that will spur innovation within the state and regional food and bioprocessing industries.

2.3.1 Strategy
Hire food and bioprocess engineering faculty and staff.

TACTICS:
• Prepare position descriptions and share with FBNS for pending submission to CALS.
  Champion: Lanier
  Support: Simunovic, Sandeep
  Actions and Deliverables: In coordination with the staffing plan adhoc committee, submit position descriptions to the FBNS department head by December 2013.
STRATEGIC DIRECTION III:
INSTRUCTIONAL INNOVATION & EFFECTIVENESS

Statement: Be recognized for designing, developing, and delivering highest quality instruction to various stakeholders, including students, professionals in industry, government agencies, and consumers, both locally and internationally.

3.1 GOAL
Maximize student learning and achievement.

UNDERGRADUATE/GRADUATE/NONDEGREE PROGRAMS:

3.1.1 Strategy
Identify areas of need for faculty positions to address curricular needs.

TACTIC:
- Coordinators for each program shall identify instructional needs for the future of all FBNS courses and programs.
  Champion: Ash
  Support: Sheppard, Harris, Allen
  Actions and Deliverables: In coordination with the staffing plan adhoc committee, submit position descriptions to the FBNS Department Head by December 2013.

3.1.2 Strategy
Assess use of instructional technology relative to its ability to maximize student learning.

TACTIC:
- Explore best practices associated with, and barriers to, implementing technology in the classroom and provide support as needed.
  Champion: Harris
  Actions and Deliverables: During the 2013-14 academic year, host a faculty forum for instructional faculty to highlight and recommend best practices and implementation strategies.

3.1.3 Strategy
Improve the undergraduate (UG) curricula and student performance, based on each degree's core competencies.

TACTICS:
- Review and revise core competencies for each UG program, defining levels of success through the development of rubrics.
- Use the capstone courses (NTR 490, FS 475) as summative assessments of student performance relative to the core competencies to determine need for changes in courses/curricula.
  Champion: Goodell
  Support: Lanier
  Actions and Deliverables: Revise the FBNS list of core competencies and rubrics and submit to the FBNS undergraduate committee by June 2014 for fall 2014 implementation.

GRADUATE PROGRAM

3.1.4 Strategy
Investigate the value and importance of core competencies and experiential learning for FBNS graduate students.

TACTIC:
- Explore which elements of the graduate student experience should be universal for all FBNS graduate students, or to all graduate students within a major (e.g., writing a grant proposal or a publishable literature review, teaching a lab or class session, managing the efforts of undergraduate students, meeting with all professors within their major at some point in their graduate experience, etc.).
  Champion: Barrangou
  Support: Foegeding
  Actions and Deliverables: Propose a plan that will address concerns of graduate student preparedness to the graduate committee by December 2013.
3.2 GOAL
Maintain relevancy of academic programs.

UNDERGRADUATE/GRADUATE/NONDEGREE PROGRAMS:

3.2.1 Strategy
Regularly survey current and former students relative to their needs and their skills/abilities and adjust course offerings, course content, and/or student learning outcomes as necessary.

TACTICS:
- Collect existing survey data from university planning & analysis (UPA) and FBNS exit interview summaries and establish a protocol whereby the FBNS curricula are evaluated and adjusted relative to student feedback.
  Champion: Fogleman
  Support: Morrison
  Actions and Deliverables: Review survey results annually, discuss strategies and recommendations for curricular improvements with the undergraduate committee, and implement necessary curricular change actions by June of the following year.

3.2.2 Strategy
Routinely survey employers relative to their needs and the skills/abilities of their employees/alumni and adjust course offerings, course content, and/or student learning outcomes as necessary.

TACTIC:
- Partner with UPA to develop a survey for employers of FBNS alumni.
  Champion: Morrison
  Support: Fogleman
  Actions and Deliverables: Launch the online survey by June 2014. Review survey results annually, discuss strategies and recommendations for curricular improvements with the undergraduate committee, and implement necessary curricular change actions by June of the following year.

3.3 GOAL
Recruit and retain highly qualified students to the Food, Bioprocessing and Nutrition undergraduate majors.

3.3.1 Strategy
Establish target enrollment numbers and minimum GPA intra-campus transfer requirements for each UG curriculum.

TACTICS
- Determine course capacity and student seating needs to establish target enrollment numbers.
- Request data from UPA that outlines time to graduation.
- Associate student goals after graduation with GPA to help determine minimum requirements.
- Use survey and focus group data to develop recruitment materials.
- Discuss recruitment strategies with peer faculty, on and off campus.
  Champion: Undergraduate Committee chair
  Support: Sheppard, Ash, Harris
  Actions and Deliverables: Present recommendations at a spring 2014 faculty meeting for student enrollment numbers across the FBNS curricula, and propose GPA requirements for intra-campus transfer students.

3.3.2 Strategy
Develop and conduct workshops for High School and Community College teachers and counselors.

TACTIC
- Work with the CALS Diversity Office to develop educational outreach programs to the High School and Community College teachers and counselors.
  Champion: Goodell
  Support: Harris
  Actions and Deliverables: Deliver a presentation at a North Carolina Teachers continuing education summer program and share an executive summary on establishing the partnerships to the FBNS Undergraduate Committee by December 2014.
STRATEGIC DIRECTION IV: FOODS FOR HEALTH & WELL-BEING

Statement: Be the preeminent program in identifying bioactive, nutritional, microbial, sensorial, and structural elements of food related to health and well-being by establishing mechanisms of action and translating that knowledge into food products and ingredients, bioactive interventions, prevention programs, and educational platforms for promoting public health.

4.1 GOAL
Develop innovative research programs to establish mechanisms of known and new bioactive compounds and microbes and elucidate how food structure contributes to bioactivity.

4.1.1 Strategy
Provide students with training in omic technologies (including genomics, transcriptomics, and metabolomics) and information that drive the identification, survival, and activities of microorganisms in food and bioprocessing environments.

TACTICS:
- Survey faculty that use omic technologies, and map competencies, resources, facilities, and pricing structures by complementing internal capabilities with relevant external (preferably locally in Raleigh and Kannapolis) organizations.
  Champion: Barrangou
  Support: Breidt
  Actions and Deliverables: Coordinate teams of FBNS faculty and work with an external organization to fund PhD research at one project per year starting fall 2014.

4.1.2 Strategy
Foster collaborations between the Plants for Human Health Institute (PHHI) and FBNS to strengthen shared research capabilities and programs.

TACTICS:
- Identify alternative approaches for strengthening communication and collaborations, and investigate relevant initiatives (NSF, NIH, akin to the existing Biotechnology and Genomics programs).
  Champions: Davis, Lila
  Support: Komarnytsky, Foegeding

4.2 GOAL
Develop science-based technologies for producing and distributing appealing, healthy foods and ingredients.

4.2.1 Strategy
Stimulate translational and applied research to develop new industrial applications.

TACTIC:
- Increase interaction with current industrial partners and identify opportunities with new industrial partners by promoting research strengths and capabilities.
  Champion: Johanningsmeier
  Support: Truong, Harris
  Actions and Deliverables: Prepare a professional communication highlighting research and service capabilities for distribution at the FBNS booth during the 2014 IFT Annual Meeting.

4.3 GOAL
Translate scientific discoveries to food, bioprocessing, nutrition and health professionals, stakeholders, policy makers, and the public.

4.3.1 Strategy
Seek funding from commodity groups, private industry, and foundations for student training, research, and communication.

TACTIC:
- Identify relevant organizations and establish protocol for creating new FBNS research partners.
  Champion: Drake
  Support: Dean, Sanders, Sandeep, Daubert
  Actions and Deliverables: Double the number of industrial members on CAPPS and SDFRC advisory boards by June 2015 and generate 5 new FBNS gold- or silver-level partners each year.

Actions and Deliverables:
Double graduate student numbers with committee membership representation from both PHHI and FBNS by June 2015.
4.3.2 Strategy
Develop programs that identify molecular mechanisms and connect them to food product functionality, nutrition, and health.

TACTICS:
- Identify interested faculty with relevant expertise in current core offerings within FBNS to assess this possibility and organize an initial meeting.
- Meet with faculty to discuss future offerings and design a program or track.

Champion: Foegeding
Actions and Deliverables:
Launch the program or track for the graduate program (and perhaps industry) in fall 2014.

4.3.3 Strategy
Develop educational programs that integrate the science of foods for healthy living with consumer education and behavior modification disciplines.

TACTIC:
- Identify interested faculty with relevant expertise within FBNS and outside departments and design a program.

Champion: Goodell
Actions and Deliverables:
Submit approval paperwork for the minor or certificate by fall 2014 and launch the program in fall 2015.

4.3.4 Strategy
Engage international partners to assist with teaching and student exchange.

TACTIC:
- Assess, catalog, and promote international partners and possible exchange opportunities while working with the CALS Office of International Programs and the NC State Office of International Affairs as appropriate.

Champion: Perez-Diaz
Support: Allen
Actions and Deliverables:
Report current status of international relationships and programs during the 2014 faculty retreat, and double the results of those efforts in the following year.

4.3.5 Strategy
Exploit opportunities in public and educational forums to communicate the positive impacts of FBNS programs on health and well-being.

TACTIC:
- Catalog those public forums with FBNS involvement and promote FBNS faculty participation in forums and communication opportunities.

Champions: Klaenhammer, Lila
Actions and Deliverables:
In alignment with the FBNS adhoc seminar committee, design a seminar series for a select number of speakers to systematically cover the multidisciplinary breadth of the department for a fall 2014 launch.

4.3.6 Strategy
Partner with government and non-profit organizations to establish public health policies based on research outcomes.

TACTIC:
- Assess, catalog and promote faculty activities that support public health policies.

Champion: Fogelman
Actions and Deliverables:
Identify and grow existing partnerships, and record scholarship on the activity by June 2014.

4.3.7 Strategy
Promote technology transfer and entrepreneurism.

TACTIC:
- Facilitate relationships between FBNS and the Office of Technology Transfer (OTT) to encourage disclosure submission.

Champion: Simunovic
Actions and Deliverables:
Host a technology transfer seminar and increase the number of disclosures submitted to OTT by 50% from calendar year 2013 to 2014.
4.4 GOAL
Create interdisciplinary approaches to investigate foods for healthy living.

4.4.1 Strategy
Expand interdisciplinary collaborations with veterinary and medical sciences to allow for food/nutrition intervention tests in animal and human subjects that better position us to receive funds from the National Institute of Health (NIH), the National Science Foundation (NSF), and other federal agencies.

TACTIC:
• Identify key collaborators and interdisciplinary partners.
  Champion: Komarnytsky

Actions and Deliverables:
Present the list of collaborators and partners, and propose next phase tactics to achieving the strategy at the 2014 faculty retreat.

4.4.2 Strategy
Develop non-traditional, interdisciplinary collaborations to investigate foods for healthy living, such as food product/structure and microbial/immunological interactions.

TACTIC:
• Map general scientific areas of interests, competencies and gaps, and gauge internal interest through a faculty survey.
  Champion: Foegeding

Actions and Deliverables:
Identify new, interdisciplinary collaborations that can address grand challenges and submit a grant by December 2014.

TO READ THE COLLEGE AND UNIVERSITY STRATEGIC PLANS, VISIT THESE LINKS:

COLLEGE OF AGRICULTURE AND LIFE SCIENCES:
http://go.ncsu.edu/cals-strategic-plan

NC STATE UNIVERSITY:
http://info.ncsu.edu/strategic-planning
# USDA-ARS FACULTY

<table>
<thead>
<tr>
<th>NAME</th>
<th>RANK</th>
<th>SPECIALIZATION</th>
<th>STRATEGIC PLAN CORE DIRECTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brent, F</td>
<td>Professor</td>
<td>Food Microbiology</td>
<td>I, IV</td>
</tr>
<tr>
<td>Davis, J.P</td>
<td>Associate Professor</td>
<td>Food Chemistry</td>
<td>II, IV</td>
</tr>
<tr>
<td>Dean, L.L</td>
<td>Associate Professor</td>
<td>Food Chemistry</td>
<td>IV</td>
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<tr>
<td>Johanningmeier, S.D</td>
<td>Assistant Professor</td>
<td>Chemistry</td>
<td>IV</td>
</tr>
<tr>
<td>Perez-Diaz, I.M</td>
<td>Associate Professor</td>
<td>Fermentation Microbiology</td>
<td>IV</td>
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<tr>
<td>Sanders, T.H</td>
<td>Professor</td>
<td>Peanut Flavor and Quality</td>
<td>IV</td>
</tr>
<tr>
<td>Truong, V.D</td>
<td>Professor</td>
<td>Sweetpotato Processing &amp; Chemistry</td>
<td>IV</td>
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# ASSOCIATE FACULTY

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<thead>
<tr>
<th>NAME</th>
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<tbody>
<tr>
<td>Anderson, K. E</td>
<td>Professor</td>
<td>Poultry Science</td>
</tr>
<tr>
<td>Chaplin, B.</td>
<td>Assistant Professor</td>
<td>4-H Youth Development and Family &amp; Consumer Science</td>
</tr>
<tr>
<td>Hale, S. A.</td>
<td>Professor</td>
<td>Biological &amp; Agricultural Engineering</td>
</tr>
<tr>
<td>Hassan, H. M</td>
<td>Professor</td>
<td>Microbiology</td>
</tr>
<tr>
<td>Khan, S. A.</td>
<td>Professor</td>
<td>Chemical Engineering</td>
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<tr>
<td>Sharma, R. R</td>
<td>Associate Professor</td>
<td>Biological &amp; Agricultural Engineering</td>
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<tr>
<td>Simmons, III, O.D</td>
<td>Research Assistant Professor</td>
<td>Biological &amp; Agricultural Engineering</td>
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<tr>
<td>Thakur, S.</td>
<td>Assistant Professor</td>
<td>Population Health and Pathobiology</td>
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# ADJUNCT FACULTY

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<thead>
<tr>
<th>NAME</th>
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<tbody>
<tr>
<td>Amezquita, A</td>
<td>Unilever, UK</td>
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<tr>
<td>Curtta, P.A.</td>
<td>Auburn University</td>
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<tr>
<td>Fairless, B.E</td>
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<tr>
<td>Keener, K.M.</td>
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<tr>
<td>Klara, A.</td>
<td>Arun Klara Worldwide</td>
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<tr>
<td>Sang S.</td>
<td>NC A&amp;T University</td>
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<tr>
<td>Theuer, R.</td>
<td>Theuer Research and Consulting</td>
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`30`
EMERITI FACULTY

<table>
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<th>NAME</th>
<th>LOCATION</th>
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<tbody>
<tr>
<td>Aurand, Dr. Leonard W.</td>
<td>Raleigh, NC</td>
</tr>
<tr>
<td>Ball, Dr. Hershel R.</td>
<td>Salisbury, NC</td>
</tr>
<tr>
<td>Boyd, Dr. Leon C.</td>
<td>Garner, NC</td>
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<tr>
<td>Carawan, Dr. Roy E.</td>
<td>Apex, NC</td>
</tr>
<tr>
<td>Carroll, Dr. Dan E.</td>
<td>Wilmington, NC</td>
</tr>
<tr>
<td>Catignani, Dr. George</td>
<td>Cary, NC</td>
</tr>
<tr>
<td>Christian, Dr. John A.</td>
<td>Raleigh, NC</td>
</tr>
<tr>
<td>Gregory, Dr. Max E.</td>
<td>Blowing Rock, NC</td>
</tr>
<tr>
<td>Hansen, Dr. Arthur F.</td>
<td>Garner, NC</td>
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<tr>
<td>Jones, Dr. Victor A.</td>
<td>Cary, NC</td>
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<tr>
<td>McFeeters, Dr. Roger F.</td>
<td>Raleigh, NC</td>
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<tr>
<td>Oblinger, Dr. James L.</td>
<td>Concord, NC</td>
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<tr>
<td>Piktinton, Dr. Dwain</td>
<td>Raleigh, NC</td>
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<tr>
<td>Rushing, Dr. John</td>
<td>Cary, NC</td>
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<td>Schwartz, Dr. Steven J.</td>
<td>Powell, OH</td>
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<td>Swaisgood, Dr. Harold E.</td>
<td>Raleigh, NC</td>
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<tr>
<td>Turner, Dr. Lynn</td>
<td>Cary, NC</td>
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<tr>
<td>Walter, Dr. William M.</td>
<td>Raleigh, NC</td>
</tr>
<tr>
<td>Ward, Dr. Donn R.</td>
<td>Holly Springs, NC</td>
</tr>
</tbody>
</table>

SPa STAFF
(STAFF CATEGORIES BY “STATE PERSONNEL ACT” (SPA) ARE BOTH TECHNICAL AND CLERICAL)

SPa TECHNICAL STAFF

<table>
<thead>
<tr>
<th>NAME</th>
<th>TITLE</th>
<th>GENERAL WORK AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolton, G.E.</td>
<td>Research Specialist</td>
<td>Seafood Chemistry (CMAST)</td>
</tr>
<tr>
<td>Bumgardner, M.W.</td>
<td>Research Specialist</td>
<td>Microwave Processing</td>
</tr>
<tr>
<td>Eckhardt, B.W.</td>
<td>Technical Support Analyst</td>
<td>Computer Network</td>
</tr>
<tr>
<td>Goulter, R. M.</td>
<td>Research Specialist</td>
<td>Food Microbiology</td>
</tr>
<tr>
<td>Hedrick, K.H.</td>
<td>Research Operations Manager</td>
<td>Departmental Building Liaison</td>
</tr>
<tr>
<td>Karan, A.M.</td>
<td>Research Technician</td>
<td>Food Microbiology</td>
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<tr>
<td>Luck, P.J.</td>
<td>Research Specialist</td>
<td>Functional Properties of Food Proteins</td>
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<tr>
<td>Massel, M.O.</td>
<td>Research Specialist</td>
<td>Food Safety, Bioprocessing</td>
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<tr>
<td>Miracle, R.E.</td>
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<td>Flavor Chemistry</td>
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<tr>
<td>Watkins, R.H.</td>
<td>Research Specialist</td>
<td>Nutrition Chemistry</td>
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<tr>
<td>Yates, M.D.</td>
<td>Social Research Associate</td>
<td>Sensory Analysis</td>
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SPa Clerical/Accounting Staff

<table>
<thead>
<tr>
<th>NAME</th>
<th>TITLE</th>
<th>GENERAL WORK AREA</th>
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<tbody>
<tr>
<td>Briseno, J.</td>
<td>Administrative Support Specialist</td>
<td>Administrative Academic/Research</td>
</tr>
<tr>
<td>Cole, J.M.</td>
<td>Administrative Support Specialist</td>
<td>Administrative Research</td>
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<tr>
<td>Cooper, J.D.</td>
<td>Administrative Support Specialist</td>
<td>Administrative Research</td>
</tr>
<tr>
<td>Gensel, C.L.</td>
<td>Public Communications Specialist</td>
<td>Administrative</td>
</tr>
<tr>
<td>Gordon, L.N.</td>
<td>Administrative Support Specialist</td>
<td>Administrative Departmental/Dairy</td>
</tr>
<tr>
<td>Jimenez, F.M.</td>
<td>Executive Assistant</td>
<td>Administrative Departmental</td>
</tr>
<tr>
<td>King, M.E.</td>
<td>Administrative Support Specialist</td>
<td>Administrative Departmental</td>
</tr>
<tr>
<td>Miller, J.S.</td>
<td>Public Communications Specialist</td>
<td>Administrative (CMAST)</td>
</tr>
<tr>
<td>Reilly, C.</td>
<td>University Program Specialist</td>
<td>Administrative (FSLI/SDFRC)</td>
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USDA STAFF

<table>
<thead>
<tr>
<th>NAME</th>
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<tbody>
<tr>
<td>Hayes, J.S.</td>
<td>Biological Sci. Lab Technician</td>
<td>Vegetable Fermentation Microbiology</td>
</tr>
<tr>
<td>Hendrix, K.W.</td>
<td>Biochemistry Laboratory Technician</td>
<td>Peanut Quality Evaluation</td>
</tr>
<tr>
<td>Medina Pradas, E.</td>
<td>Visiting Scientist (no-pay)</td>
<td>Fermentation Microbiology</td>
</tr>
<tr>
<td>Parker, S.</td>
<td>Program Support Assistant</td>
<td>Administrative Support</td>
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<tr>
<td>Priddy, V.E.</td>
<td>Biological Sci. Lab Technician</td>
<td>Food Safety &amp; Microbiology</td>
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<tr>
<td>Sanders, M.H.</td>
<td>Biological Sci. Technician</td>
<td>Peanut Quality Evaluation</td>
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<tr>
<td>Schaefer, J.A.</td>
<td>Biological Sci. Lab Technician</td>
<td>Food Chemistry</td>
</tr>
<tr>
<td>White, B.</td>
<td>Research Food Technician</td>
<td>Food Science</td>
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<tr>
<td>Whitley-Ferrell, S.</td>
<td>Program Support Assistant</td>
<td>Administrative Support</td>
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DAIRY PROCESSING AND APPLICATIONS LAB STAFF

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<thead>
<tr>
<th>NAME</th>
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<tbody>
<tr>
<td>Begley, J.R.</td>
<td>Vehicle/equipment Operator</td>
<td>Dairy and Process Applications</td>
</tr>
<tr>
<td>Canady, J.T.</td>
<td>Research Operations Manager</td>
<td>Dairy and Process Applications</td>
</tr>
<tr>
<td>Chesnutt, A.S.</td>
<td>Research Operations Manager</td>
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<tr>
<td>Davis, A.</td>
<td>Research Specialist</td>
<td>Dairy and Process Applications</td>
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<tr>
<td>Durham Jr., J.W.</td>
<td>Research Technician</td>
<td>Dairy and Process Applications</td>
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<tr>
<td>Hilliard, B.R.</td>
<td>Research Technician</td>
<td>Dairy and Process Applications</td>
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<tr>
<td>Hollifield, W.C.</td>
<td>Business Officer</td>
<td>Dairy and Process Applications</td>
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<tr>
<td>Johnson, H.L.</td>
<td>Research Technician</td>
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<tr>
<td>Jones, S.D.</td>
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<td>Kotzian, R.T.</td>
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<tr>
<td>Lindsey, S.F.</td>
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<tr>
<td>Stephens, C.V.</td>
<td>Vehicle/equipment Operator</td>
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<tr>
<td>Zerrer, J.T.</td>
<td>Research Technician</td>
<td>Dairy and Process Applications</td>
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Faculty Numbers

Research Expenditures ($M)

External Sources

State Appropriated
FBNS Student Numbers

Distance Education Growth

Projected growth of 5% from 2005 to 2013.

FBNS Undergraduate Statistics

<table>
<thead>
<tr>
<th>Major</th>
<th>Undergraduate Count as of September 2012</th>
<th>Average GPA/Average credit hours</th>
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<tbody>
<tr>
<td>Food Science</td>
<td>78</td>
<td>3.03/82.22</td>
</tr>
<tr>
<td>Bioprocessing Science</td>
<td>32</td>
<td>2.69/80.61</td>
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<tr>
<td>Nutrition Science</td>
<td>&gt;300</td>
<td>3.10/77.83</td>
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