

Department of Food Science and Technology
Ohio State University

Strategic Plan 2009 - 2013

August 17, 2009

Food is a basic necessity of human life, and yet the issues that surround its availability, affordability, nutritional value and safety are increasingly complex. Successfully addressing these complex issues requires well-resourced public/private partnerships integrating numerous disciplines and participants across academia, industry and government.

Food enhances – and because of the complexities and challenges that now surround it, can also threaten – human life. Food must be processed to allow for delivery in sufficient quantities to feed a growing global population, while being kept safe and secure across a global supply chain. Meeting these needs will require extraordinary innovation in the science and technology of food, effective education of its leaders, researchers, educators and practitioners, and effective and rapid dissemination of new developments and knowledge to all who need it.

What we know about food science and technology is advancing on every front. Issues surrounding food extend far beyond the farm and the kitchen table. The ***OSU Department of Food Science and Technology (FST)*** stands in the center of many of the defining global issues of our time. Climate change, environmental sustainability, energy independence, human health, domestic productivity, the elimination of poverty and hunger are but a few of the issues that concern leaders of communities near and far.

The food chain has become global in scope and reach, creating risks and opportunities that were unimaginable just decades ago. Consumers seek convenient, good tasting and nutritious foods and look to the food industry to provide them. The food industry seeks to add value to raw commodities while at the same time reducing the cost to produce and deliver it to the plate. Governments around the world seek solutions to food processing and delivery that will sustain rapidly-growing populations.

In the context of this unending demand for more and better food, important trends are emerging that will influence and shape the future and focus of food science and technology.

- Globalization of the food chain “from gate to plate”
- Rapidly emerging advancements in food science and technology, which must be diffused and adopted just as rapidly across increasingly complex and dispersed networks
- A spotlight on food safety by consumers, policy-makers and the media as a result of some highly publicized food-borne illness outbreaks in recent years

- Processors who are challenged by consumer demand for food that tastes good, is quick to prepare, minimally processed, safe, stable, affordable, nutritious *and* environmentally friendly, a complicated set of criteria to balance
- The emergence of health-promoting or “functional foods,” products that might enhance human health through innovation, which are being met with both excitement and skepticism by the public
- Increasing – and increasingly diverse - global populations leading to new concerns about food, increased need for public knowledge and new food products and technologies
- Increasingly complex problems requiring collaboration across disciplines both within and outside the boundaries of FST, CFAES and the University
- Demand for talent and leadership that outstrips the supply, and rising expectations for that talent in terms of scientific knowledge, problem-solving capacity and communication skills
- Rising impact of the food manufacturing industry on the Ohio economy in terms of both GDP and high-quality jobs, especially as the rest of the manufacturing sector continues to decline
- Funders’ expectations for research are increasingly outcome- and application-driven, even as the availability of financial resources continues to decrease in light of recessionary economic conditions

As these trends reflect, the range and importance of critical problems to solve place FST in a position to create real impact as it leads the discovery and dissemination of knowledge in food innovation for the students, industries, policy-makers and consumers that we serve. Opportunities for how we can best create and disseminate knowledge in the FST discipline include:

- Developing talent and leadership to fill the human capital gap in industry, academia and government
- Influencing public policy on food issues, both locally and globally
- Serving as a leading source of public education on food issues
- Concentrating resources on strategically focused areas of excellence to drive innovation and application of new knowledge
- Serving as a primary research and development resource for industry partners
- Reaching more students (both traditional and non-traditional) and clients through new teaching methods at a high level of quality using new technologies and collaboration among disciplines both within and outside of the department
- Aligning resources to address the CFAES signature issues (Food Security, Production and Human Health; Environmental Quality and Sustainability; Advanced Bioenergy and Biobased Products)
- Creating new opportunities for faculty to learn, contribute and grow

While the opportunities are limitless, significant challenges exist along the path to seizing them. Some of these challenges include:

- Increasing competition for resources (e.g., students, faculty, funding and partnerships,) both internally and externally
- Rising expectations of accountability and measurable impact by funders
- Rising expectations of graduate preparation by employers
- Intense focus at the University on performance, accountability and competitiveness
- Increasing size of student population which may require new approaches and practices
- Increasing need for external visibility at the same time budgets are threatened
- An academic tradition of individualism, silos and suboptimal resource-allocation models

This is the 21st century environment in which we will operate for the foreseeable future. Our success in seizing the opportunities it presents and overcoming its challenges requires a clear vision of FST's role in this new world, the impact we intend to make and a firm focus on the strategic priorities that will allow us to achieve our vision for ourselves and for all those that we serve.

A New Strategic Vision for Food Science and Technology

“A global leader in food science and technology education, research and outreach”

In response to the 21st century environment, *OSU's Department of Food Science and Technology* will lead collaborative innovation focused on *discovering and applying knowledge* in food safety and public health, value-added food processing, ingredient technology, and health-promoting foods; *developing professionals and leaders* who advance industry, academia, and government both locally and globally and continue to grow professionally over the course of their careers and *improving human health* via the effective dissemination of the collective knowledge of the department to our stakeholders across the university, Ohio and the national and international community. We will:

- Lead programs in basic and applied research and innovation that advance the field in food science in the core areas identified above
- Prepare students to become leaders and professionals who possess the balance of scientific, problem-solving and communication skills that enable them to add measurable and meaningful value to industry, government and academia
- Seek out and leverage the work of other disciplines to improve our teaching, research and outreach
- Partner with the food industry to support its success by anticipating and responding to its needs and delivering results in the timeframes it requires
- Be a leading source of science-based food information by disseminating knowledge in targeted and impactful ways that effectively meet the needs of our stakeholders
- Create an environment characterized by collaboration, effective communication and decision-making, collegiality, respect and diversity of thought where people are inspired to offer their best

Impact is central to our vision. Impact that can be measured on human health, industry competitiveness, and economic development. Impact that is achieved in industry, academia and governments through the research we perform and the leaders and professionals we prepare. Impact that is achieved by our students in the careers they pursue. Impact that is achieved by faculty in adding to the world's knowledge about food safety and public health, value-added food processing, ingredient technology, and health-promoting foods. Impact by disseminating that knowledge productively to an increasingly complex world. Impact that is well-known because we are connected with the stakeholders that we serve.

Innovation is central to our vision. Innovation in research. Innovation in rigorous teaching and learning. Innovation in how we develop students to meet the increasing demands of industry. Innovation in outreach as we convert knowledge to practice. Innovation in using technology to expand our impact. And innovation in ensuring sustainable funding to continue and expand our work.

Assessment is central to our vision. Assessment that ensures our graduates meet the needs of industry, government and academia. Assessment that ensures our curriculum is rigorous and relevant. Assessment that allows us to understand whether or not our research methods are achieving desired outcomes. Assessment that measures and demonstrates the impact of our outreach efforts. Assessment that ensures continual development of our faculty. Assessment that drives decision-making and accountability.

Collaboration is central to our vision. Collaboration among researchers, teachers, and students with a shared purpose of discovering, disseminating and applying knowledge in our core areas of focus. Collaboration among the academy, industry and government to organize shared responses to global challenges. Collaboration with industry partners to meet consumer demands. Collaboration across the university to maximize the value of limited resources. Collaboration that values diversity of interests, skills and perspectives. Collaboration that makes it exciting to work and learn here.

Balance is central to our vision. Balance across the often-competing demands of industry, consumers and governments. Balance, both as a department and as individuals, across research, teaching and outreach to ensure dissemination and application of new knowledge. Balance across classroom and out-of-classroom learning. Balance between growth and quality. Balance across the skills that our students and faculty develop. Balance between the demands of work and life.

Our vision is as much or more about **how** we apply our individual knowledge, skills and abilities in service to our mission as it is about **what** we do as individuals. It is about an engaging culture in which every member of the department is focused on our collective success. In pursuing and achieving our vision, we will:

- Attract, develop and retain faculty who are at the leading edge of their disciplines
- Attract, develop and mentor students who are well-prepared for success in their chosen professions and in their communities

- Attract, develop and sustain partnerships for support and funding across industry, government and NGOs
- Support the success of CFAES in achieving its strategic goals
- Be sought after and recognized as a national leader in food science and technology

Strategies, Actions and Metrics

RESEARCH: *Accelerate Discovery, Innovation, and Commercialization Through Targeted Research Investment in the CFAES Food Security, Production, and Human Health Signature Area.*

Although the department has interest and expertise in all three of the Signature Areas identified by CFAES, we will focus our efforts in the Food Security, Production, and Human Health Signature Area. In times of diminishing budgets, it is important to maintain a critical mass of faculty expertise that can address one area well. It is expected that faculty will collaborate with and support other CFAES researchers working in the Environmental Quality and Sustainability and Advanced BioEnergy and BioBased Products Signature Areas.

Strategy 1. Accelerate fundamental and applied research leading to advances in food safety and public health, value-added food processing, ingredient technology, and health-promoting foods that address relevant state, national and global research needs while promoting energy efficiency and sustainability of the food chain.

Action Steps

1. Establish critical mass and multi-disciplinary strength in the Department's core competency areas through strategic faculty and staff hires.
2. Encourage broader FST faculty participation to strengthen centers that can sustain and provide future growth opportunities for the Department.
 - Center for Food Safety and Agrosecurity
 - Center for Advanced Functional Food Research and Entrepreneurship (CAFFRE)
 - Center for Advanced Processing and Packaging Studies (CAPPS)
 - Food Industries Center (FIC)
 - Public Health Preparedness TIE Initiative
3. Strengthen partnerships with specific federal agencies (i.e., USDA, FDA, US Army, NIH) and the food industry by anticipating and responding to client needs and delivering solutions in a timely manner.
4. Promote collaborative partnerships with departments and schools within CFAES and across the university to expand department research capabilities
5. Identify and redirect resources to fill strategic staff positions that support and enhance research productivity of the faculty. This may include support for grant writing, post-award assistance, equipment maintenance, or other common support needs critical for long term growth and sustainability of the research program.

Metrics by 2013 unless noted

- Indirect cost returns increased by 25% as recommended by CFAES.
 - Current: \$19,000; Goal: \$25,000.
- Invention disclosures increased by 20% as recommended by CFAES.
 - Current: 3; Goal: 4
- Peer-reviewed scholarly publications co-authored with scientists at other universities, with collaborators outside the senior author's discipline and/or with industrial collaborators increase from 15% to 25% of publications.

Strategy 2. Enhance department endowments to support research in priority areas.

Action Step

1. Actively work with the Office of University Development to establish new endowments and expand existing endowments, including support for the purchase, upgrade or maintenance of laboratory equipment and instrumentation, pilot plant equipment, and information technologies.

Metric by 2013

- One new endowment established to support research infrastructure.

Strategy 3. Lead the initiation and establishment of a university-wide Center of Innovation (Food Institute) that will leverage current department efforts, and synergistically expand department signature research capabilities, and enhance multi-disciplinary collaborations.

Action Steps

1. Respond to the Provost's Centers for Innovation initiative by leading the visioning and development efforts necessary to form a university-wide food-focused Center of Innovation (Food Institute) in collaboration with interested faculty across the university.
2. Alternatively, work with CFAES to establish a vision for an interdisciplinary Food Institute.

Metric by 2013 unless noted

- Food Institute established with initial support from the university and/or CFAES.

ACADEMIC PROGRAMS: *Provide academic programs that are widely recognized for excellence in preparing capable students for the professional and/or academic challenges they will face.*

Strategy 1. Define undergraduates and graduates degree qualifications necessary to meet 21st century's needs and develop an effective program to assess student learning against measurable goals.

Action Steps

1. Define the most desirable qualifications our graduates need to be properly prepared for future careers by seeking advice from faculty of food science and technology and related disciplines, alumni, and stakeholders.
2. Based on information obtained in action step 1, establish learning outcomes for all degree programs (graduate and undergraduate) with a focus on experiential learning, international awareness, leadership skills, and professional success skills.
3. Based on information obtained in action steps 1 and 2, critically review existing curriculum and co-curricular activities.

Metrics by 2013 unless noted

- Learning outcomes and respective assessment methodologies are established.
 - Current: None; Goal: Completed by 2011.
- Initial curriculum review completed by 2011.

Strategy 2. Based on continuous assessment of student learning criteria, design undergraduate and graduate curricula and co-curricular programs to ensure relevance, rigor and effectiveness *during the semester conversion process*. Building blocks for the curricula may include core science (biology, chemistry, physics) and engineering courses, applied science course, applications/integration courses, experiential learning (including undergraduate research) and international experiences.

Action Steps

1. Using information gathered in Strategy 1, revise curricula for the BS Food Science and the BS Agriculture-Food Business Management majors, with consideration of specialized tracks within each major and constraints of the semester system.
2. Using information gathered in Strategy 1, revise curricula for the M.S. and Ph.D. degrees in Food Science and Technology.
3. Redirect resources to support faculty teaching efforts, including undergraduate research mentorships.

Metrics by 2013 unless noted

- Graduate and undergraduate curricula revised and implemented under semester format by 2012.

- Assessments developed in Strategy 1 are used as benchmarks to continuously improve program quality after 2012.
- Undergraduate food science curricula approved by the Institute of Food Technologists.

Strategy 3. Enhance the quality and diversity of our undergraduate majors by attracting capable and talented students.

Note: Action steps and metrics in italics are repeated in the Environment Section, strategy 2.

Action Steps

1. Develop an awareness of food science by assisting high school students and teachers as they prepare for state-wide science competitions, such as the Science Olympiad, FFA science competitions, or the Ohio Academy of Science sponsored science fair program.
2. *Increase the visibility of our undergraduate programs among students who have already met OSU's rigorous admission standards, including contacts with the Scholars Program and ethnic/cultural student organizations.*
3. Partner with ATI (Wooster) and Central Ohio Technical College (Newark) to attract bright and diverse undergraduate students.
4. *Collaborate more closely with college and university offices involved with recruiting and retention of a diverse student population.*
5. *Identify and partner with 1890, Hispanic serving or other universities serving underrepresented populations to recruit graduate students.*
6. Adjust recruiting and instructional efforts to grow undergraduate enrollment at a pace that maintains a high quality academic program.

Metrics by 2013 unless noted

- Each faculty member serves as an adviser/resource to one high school science competition, student project or teacher at least every other year by 2012.
- Maintain (GPA=3.4) or improve GPA of level 2 majors.
- Joint curriculum for the B.S. Agriculture-Culinary Science established.
- The 2+2 program between ATI and FST is implemented and supported by 2-3 scholarships by 2011.
- *Underrepresented groups within undergraduate and graduate major population approach that of OSU student demographics.*
 - *Current:10%; Goal: 16% (OSU 2007)*

Strategy 4. Build a reputation for excellence that will attract high quality graduate students

FST was rated in 2008 as having one of two strong graduate programs in CFAES (Ph.D. Quality Assessment Report). In response, the University and College will provide some

limited resources to help maintain and improve quality. It is our responsibility to continue improving this program.

Action Steps

1. Increase enrollment of highly qualified domestic students in our Ph.D. program as suggested by the OSU Review of Doctoral Programs by focusing our marketing efforts at universities with nationally recognized food science departments and by increasing graduate stipends to match or exceed those of comparable institutions.
2. Recruit graduate students from other science and engineering majors to emphasize the interdisciplinary nature of our graduate program and diversify graduate student experiences.
3. Prepare Ph.D. graduates with qualifications to be successful in seeking careers in academia by developing programs in grant writing, teaching and other areas important to faculty success.
4. Provide professional development opportunities for students and encourage attendance via partial funding support and other mechanisms.
5. Lead college efforts in developing the graduate minor in food safety.

Metrics by 2013 unless noted

- Improvement in measures of graduate program quality as defined by OSU.
- Applicants from top food science departments (as defined by the NAS NRC survey of food science doctoral programs) are increased.
 - Current and Goal: TBD when survey is published.
- Graduate student stipends match or exceed those of comparable institutions.
- Ratio of domestic to international students in the Ph.D. program shifted from 40:60 to 50:50.
- Graduate students attend professional development programs offered by department, college, university or professional societies.
 - Current: TBD by survey; Goal: 50% annually
- PhD graduates join domestic research and academic institutions.
 - Current: 30%; Goal: 40%
- Food safety graduate minor approved and implemented.

OUTREACH AND ENGAGEMENT: *Maintain relevant, targeted programming and services focused on disseminating knowledge and information to entrepreneurs, food and allied industries and relevant governmental organizations while transitioning to a sustainable, fee-based funding model.*

The Department of Food Science and Technology has a significant outreach program with only 2.2 faculty FTE in extension. No staff or operating funds are provided by the extension budget. Consequently, all outreach and extension activities must become self-supporting through user fees, contracts or grants. Most departments in CFAES operate using a county educator model, but there are no county educators with food science training in Ohio. Expected budget cuts will result in loss of faculty positions unless the

college intervene. Loss of faculty positions will decrease our ability to offer outreach programming over time, thus our goal is to maintain current programs and transition to a 100% fee-based system.

Programs in the department support Extension strategies to 1) enhance food security and production, 2) improve human health through nutrition and 3) prepare youth for success in careers based on science, technology, engineering and math. Please see the Academic Programs section for our youth based initiatives (Strategy 3, Action Step 1).

Strategy 1. Serve as a factual science-based food science and technology information resource utilizing department core expertise.

Action Steps

1. Improve dissemination of relevant technical information via departmental website, fact sheets, trade magazine articles and similar means.
2. Provide an annual information program for Food Safety Educators.
3. Respond in a timely and factual manner to media queries by enhancing faculty expertise in media communications.
4. Participate in the IFT Food Science Communicators program.

Metrics by 2013 unless noted

- Sufficient revenue is generated to support and build programming
- Users of web based technical information increased by 10%.
 - Goal: Establish mechanism to determine baseline and demonstrate improvement
- Food safety educators program in place by 2012.
- Department response to media queries and interviews (newspaper, radio, TV) maintained.
 - Current: 12; Goal: 12

Strategy 2. Become a leading source of life-long learning in food science and technology focused toward professionals in the food industry. This effort will be led by the Food Industries Center and the Meat Science Program, however other faculty will also develop and coordinate specific programs.

Action Steps

1. Encourage and reward faculty member participation in outreach programs.
2. Continue supporting the advancement of the food industry in food/meat safety and HACCP, food/meat processing, and process and product development by offering high quality professional education courses either at OSU, on-site or by distance.
4. Evaluate market, and if appropriate, offer short courses in Spanish for international audiences.
5. Transition to a 100% self-supporting fee-based system to support outreach efforts.

Metrics by 2013 unless noted

- Outreach education programs maintained (due to budget and personnel constraints).
 - Current: 8; Goal: 8

Strategy 3. Food Industries Center to become recognized in Ohio and the surrounding region for outstanding, cost-effective service to food companies, food entrepreneurs, and related state organizations.

Action Steps

1. Increase efforts to promote and market FIC activities, including participation in trade shows and mailing of informational newsletters.
2. Focus services toward small to mid-sized companies by providing consulting, hands-on training, R&D studies, pilot plant facilities, and sensory evaluation programs.
3. Establish partnerships with state agencies and other institutions/agencies that support the development and growth of small food businesses.
4. Provide services to enhance department teaching and research efforts, including experiential learning for majors.
5. Establish a funding mechanism for continued operation, maintenance and upgrade of FIC equipment and infrastructure.

Metrics by 2013 unless noted

- FIC newsletter sent to current and potential clientele twice each year.
- FIC markets programs at two trade shows each year.
- FIC has established a partnership with 1-2 state agencies promoting small business development.
- Training of entrepreneurs increased.
 - Current: 1 ; Goal: 6
- Pilot plant service contracts increased.
 - Current: 4; Goal: 10
- FIC operations and programs are self-supporting.

INTERNATIONAL: *Extend FST's reach and impact through international programs and collaborations that engage, solve problems, inform and educate.*

Strategy 1. Encourage global networking of faculty and students to facilitate exchange of scientific knowledge to enhance department research programs.

Action Steps

1. Support faculty participation in international special research assignments and faculty professional leaves.

2. Support faculty and student participation in study abroad programs.
3. Support graduate student participation in international research opportunities.
4. Attract international visiting scholars from a variety of countries to work in core departmental research areas.
5. Prepare grants to fund international collaborative efforts supportive of department programs, such as the USDA-Chinese Ministry of Agriculture Scholar Exchange Program.

Metrics by 2013 unless noted

- A short-term study abroad program is designed and implemented.
- Undergraduates participate in study abroad programs led by department, college or university (Current: 22.5% after 4 years; Goal: 35% after 4 years).
- Faculty complete two FPLs or SRAs at international locations.
- One international research experience available annually for graduate students (Current: none).
- Eight international visiting scholars work in department annually (Current: 6)
- Four international proposals are submitted.

ENVIRONMENT: *Create a welcoming and inclusive culture that attracts and retains an outstanding and diverse faculty, staff, and student population in the department.*

Strategy 1. Create a welcoming and inclusive department climate.

Action Steps

1. Form a department diversity and culture committee.
2. Develop a department definition of diversity.
3. Develop a set of core values addressing mutual respect, civility, collaboration and effective communication.
4. Establish a formalized program of diversity training using the wide-range of campus and external resources available.
5. Develop a process to identify climate issues and develop approaches to proactively address concerns.
5. Participate in the OSU Commitment to Success Program offered by the University Center for Advancement of Teaching and the Office of Minority Affairs to assess and improve department climate.
6. Participate in other campus climate initiatives offered by the University.

Metrics by 2013 unless noted

- Diversity and Culture Committee formed and active in 2010.
- Core values established by 2011.
- Faculty, staff and students participate in at least one annual diversity training event by 2013.

- Commitment to Success process in progress by 2012 (this is a multi-year program)

Strategy 2. Recruit and retain a diverse student body.

Note: Action steps and metrics in italics are repeated in Academic Programs Section, Strategy 3.

1. *Increase the visibility of our undergraduate programs among students who have already met OSU's rigorous admission standards, with emphasis toward ethnic/cultural student organizations.*
2. Partner with OSU regional campuses and other post-secondary institutions in Ohio with large underrepresented populations to attract bright and diverse undergraduate students under the slogan "Ohio deserves Ohioan talent."
3. *Collaborate more closely with college and university offices involved with recruiting and retention of a diverse student population.*
4. *Identify and partner with 1890, Hispanic serving or other universities serving underrepresented populations to recruit graduate students.*

Metrics by 2013 unless noted

- *Increase underrepresented groups within undergraduate and graduate major population to approach that of OSU student demographics.*
 - *Current:10%; Goal: 16% (OSU 2007)*
- Retention data monitored and improving (Data is not available from the college, so we will need to prepare our own database and begin tracking)

Strategy 3. Attract and retain an outstanding and diverse faculty and staff

Action Steps

1. Develop and formalize processes to obtain a more diverse pool of candidates for all positions.
2. Identify and provide incentives to recognize faculty and staff for outstanding and innovative contributions to research, teaching, academic and co-curricular advising, and outreach.
3. Promote the capabilities and accomplishments of the faculty and staff, including award nominations and appropriate publicity.
4. Establish a formal mentoring program for junior faculty and staff.
5. Encourage professional and leadership development of faculty and staff via on and off campus seminars and workshops. Provide funding as available and appropriate.

Metrics by 2013 unless noted

- Search process formalized and in place.
- Incentive program developed by Awards Committee and in place.

- Communications staff hired and program established.
- Mentoring program in place for all junior faculty (Current: 0%; Goal: 100%).
- Faculty and staff participating in professional development programs annually as appropriate for their responsibilities in teaching, advising, research, extension and/or administration.
 - Current:15%; Goal: 50%