

Department of Food Science and Technology
Ohio State University

Strategic Plan

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 and systems at a high level of quality using new technologies and collaboration among disciplines both within and outside of the department
- Aligning resources to address at least one of the three 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 prepare 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 Advanced Functional Food Research and Entrepreneurship (CAFFRE)
 - Center for Advanced Processing and Packaging Studies (CAPPS)
 - Food Industries Center (FIC)
 - Foods for Health: Discovery Theme Initiative
 - Food Innovation Center
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. Enhance and 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

- Increase indirect cost returns by 25%.
 - Current: 19,000; Goal: 25,000.
- Increase invention disclosures to 4 per year.
 - Current: 1;
- Increase peer-reviewed scholarly publications co-authored by scientists outside the senior author's discipline 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

- One new endowment established to support research infrastructure.

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. 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. Critically review existing curricula.

Metric

- Learning outcomes and respective assessment methodologies are established.

Strategy 2. Based on continuous assessment of student learning criteria, design undergraduate and graduate curricula to ensure relevance, rigor and effectiveness.

Building blocks for the curricula may include core science (biology, chemistry, physics) and engineering courses, applied science courses and applications/integration courses.

Action Steps

1. Revise curricula for the BS Food Science, the BS Agriculture-Food Business Management and the Culinary Science majors, with consideration of specialized tracks within each major.
2. Revise curricula for the M.S. and Ph.D. degrees in Food Science and Technology.
3. Redirect resources to support faculty teaching efforts.

Metrics

- Curricula (graduate and undergraduate) revised and implemented.
- Assessment outcomes are used to continuously improve program quality.
- 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.

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 OSU regional campuses, ATI, and other post-secondary institutions in Ohio to attract bright and diverse undergraduate students under the slogan "Ohio deserves Ohioan talent."
4. Adjust recruiting and instructional efforts to grow undergraduate enrollment at a pace that maintains a high quality academic program.

Metrics

- Every faculty member serves as an adviser/mentor to one high school science program, student or teacher each year.
- Partnership with Central Ohio Technical College will lead to a joint curriculum for the B.S. Agriculture-Culinary Science.
- The 2+2 program between ATI and FST is implemented and supported by 2-3 scholarships each year.

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. Lead college efforts in developing the graduate minor in food safety.

Metrics

- Show improvement in measures of graduate program quality as defined by OSU.
- Increase the number of applicants from top food science departments (as defined by the NAS NRC survey of food science doctoral programs)
 - Current: TBD; Goal: TBD when survey is published.
- Increase the number of applications by graduate students with one degree other than food science.
 - Current: TBD; Goal: TBD. Data is being compiled.
- Graduate student stipends match or exceed those of comparable institutions.
- Shift ratio of domestic to international students in the Ph.D. program from 40:60 to 50:50.
- Increase the number of PhD graduates joining domestic research and academic institutions.
 - Current: 30%; Goal: 45%
- 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 be 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 (when positions become vacant) unless the college intervenes. Loss of faculty positions will decrease our ability to offer outreach programming over time.

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 identifying and training three faculty members in media communications.
4. Participate in the IFT Food Science Communicators program.

Metrics

- Sufficient revenue is generated to support and build programming
- Increase number of users of web based technical information by 10%.
 - Current: Not known; Goal: Establish baseline and demonstrate improvement
- Food safety educators program in place.
- Increase faculty response to media queries (newspaper, radio, TV) by 50%.
 - Current: 10; Goal: 15

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 distance learning courses and on-site specialized corporate courses.
3. Expand non-degree professional education programs.

4. Offer short courses in Spanish for international audiences.
5. Transition to a self-supporting fee-based system to support outreach efforts.

Metrics

- Increase the number of outreach education programs to 8/year.
 - Current: 4

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

- FIC is sending newsletters to current and potential clientele twice each year.
- FIC is marketing programs at two trade shows each year.
- FIC has established a partnership with 1-2 state agencies promoting small business development.
- Increase training of entrepreneurs to 6/year.
 - Current:1
- Increase pilot plant service contracts to 10/year.
 - Current: 4
- 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.
3. Attract international visiting scholars from a variety of countries to work in core departmental research areas.
4. Prepare grants to fund international collaborative efforts supportive of department programs, such as the USDA-Chinese Ministry of Agriculture Scholar Exchange Program.

Metrics

- A short-term study abroad program is implemented.
- Thirty percent of undergraduates participate in study abroad programs led by department, college or university.
- Faculty complete three FPLs and SRAs at international locations.
- At least one international research experience available annually for graduate students.
- Attract ten international visiting scholars.
- Five international proposals are submitted.

ENVIRONMENT: *Create a culture that attracts and retains outstanding faculty, staff, students and external partners and engages them in effective and productive collaborations.*

Strategy 1. Attract and retain an outstanding and diverse faculty and staff by creating a collegial environment characterized by collaboration across different disciplines within the department, effective communication, shared decision making, mutual respect and diversity of thought where people are inspired and motivated to offer their best.

Action Steps

1. Develop a set of core values
2. Identify and provide incentives to recognize outstanding and innovative contributions to research, academic programs and outreach.
3. Promote the capabilities and accomplishments of the faculty, staff and students, including award nominations and appropriate publicity.
4. Establish a formal mentoring program for junior and mid-career faculty.

Metrics

- Core values established
- Incentive program in place
- Communications program established
- Mentoring program in place