



Department of
Food Science and Nutrition

UNIVERSITY OF MINNESOTA
Driven to DiscoverSM

Strategic Plan

Innovating together to improve health through food

Strategic Plan Adopted June 15, 2016

Appendix A Added March 2017

Appendix B Added July 2018

Strategic Plan

Department of Food Science and Nutrition

University of Minnesota

Introduction

In 2016, the University of Minnesota's Department of Food Science and Nutrition undertook a strategic planning process to set the stage and direction for the next ten years. Transitions in leadership and faculty composition, coupled with shifts in institutional resources and innovations in scientific and educational practice, made it an opportune time for departmental stakeholders to collaboratively chart a strategic, creative path forward. This strategic plan describes long-term goals, strategic priorities and roadmap for fulfilling these goals, a common vision for the future, and a clear path forward for hiring and collaborating as scholars and educators.

Strategic Planning Process

The Department of Food Science and Nutrition's planning process included:

- ✓ Support from a planning consultant
- ✓ Regular meetings of a departmental strategic planning committee who have designed, overseen, and guided the planning process
- ✓ Small group interviews with faculty, staff, and students
- ✓ Administration of several surveys to key departmental stakeholders (including alumni serving as faculty in peer departments, department heads from other institutions, etc.)
- ✓ Structured feedback from the Department's Advisory Committee
- ✓ Preparation and faculty review/discussion of a preliminary findings brief
- ✓ Three faculty strategic planning meetings; three staff/faculty strategic planning meetings
- ✓ Development and department-wide review and refinement of plan

The strategic planning process occurred in three phases:

1. *Taking Stock* – gathering information from departmental stakeholders to produce a 'taking stock' brief that identified opportunities, issues, challenges, and emerging priorities
2. *Planning and Draft Development* – Structured meetings of departmental stakeholders to develop and review strategic plan content
3. *Draft Review and Refinement* – Structured online and in person discussions to refine successive versions of the strategic plan draft

The resulting strategic plan will be used for ongoing planning and decision-making within the department. It will also serve as the basis for discussion and planning within the College of Food, Agricultural, and Natural Resource Sciences and other academic units within the University.

Mission Statement

The Department of Food Science and Nutrition creates and shares knowledge to ensure a safe, healthy, and appealing food supply that supports the well-being and prosperity of people and the environment.

Vision Statement

Innovating together to improve health through food.

Values Statement

1. Our discovery, outreach, and teaching are ethical, rigorous, and relevant.
2. We are collaborative and compassionate.
3. Integrity, innovation, and a commitment to diversity guide our work.
4. Excellence and service to society shape our approach and focus.

Diversity, Equity, and Inclusion Statement

The Department of Food Science and Nutrition affirms the pressing importance of fulfilling our collective responsibility to create an environment where everyone is respected and valued. We believe it is critical to actively transform our work and learning environments to better meet this responsibility. Furthermore, we recognize that many cultures, communities and individuals offer knowledge and experience that can advance the health, well-being, and prosperity of our society, and we are obligated to continue learning about the deep relationships between culture, knowledge, and health. Our geographic context offers a unique opportunity and responsibility to lead our disciplines in valuing human difference. The richness of the human experience across difference is an untapped resource that can make our organization richer and more robust, leading to greater impact and innovation. This work will help us to cultivate educated and fair-minded citizens of the world. We commit ourselves to creating an academic environment that reflects the twenty-first century land grant mission of serving our pluralistic society, and we acknowledge the historic resistance of institutions to facing and addressing these needs.

Dual Discipline Statement

The Department of Food Science and Nutrition demonstrates unique promise and assets, given the dual disciplines that address the many dimensions of human nutrition, health, food safety, and food quality. Intentional, increased integration of these two disciplines in research, outreach, and teaching will position it for cutting edge scholarship, increased revenue, and growing economic and social impact.

Design Principles

Faculty also identified a series of design principles that should inform departmental decision-making and

their individual and collective approach to their work. These design principles will help ensure that work they undertake is in keeping with the departmental mission, vision, and values.

Collaborative	Feasible	Innovative
Engaged	Flexible	Realistic
Entrepreneurial	Focused	Strategic

Department of Food Science and Nutrition Cross-Cutting Themes and Strategic Priorities

Cross-Cutting Themes - Three key themes emerged from the Taking Stock process that inform the strategic priorities and future directions of the Department described in this plan:

- ✓ **Create a Funding Model Responsive to New Realities** – Ensure quality facilities, reasonable workloads, and innovative educational, research, and outreach portfolios. The Department will develop strategic, long-term relationships with private industry and other funding partners to support its research, outreach, and education, through rigorous, creative, and sustained efforts to build a new revenue model for the department.
- ✓ **Build a Culture of Shared Leadership and Entrepreneurship** – Grow its capacity to demonstrate shared leadership and entrepreneurship for governance, revenue generation, strategic plan implementation, and organizational culture across all faculty. These efforts will inspire collaboration, innovation, and investment in teaching, research, and outreach.
- ✓ **Promote and Reward Collaboration** – Foster and incentivize cross-disciplinary collaboration and innovation among faculty (within and beyond the Department) in learning, discovery, and outreach.

Strategic Priorities - Through the planning process, faculty collectively identified four strategic priorities for the department that respond to these themes:

1. **Build focused, flexible signature areas of expertise and departmentally-led strategic initiatives** that that produce knowledge and benefit the social good
2. **Foster an organizational culture** of collaboration, innovation, entrepreneurship, and shared leadership
3. **Offer high quality undergraduate and graduate education** that meets the needs of 21st century employers and society
4. **Upgrade equipment, facilities, and technological infrastructure** to fulfill teaching, research, and outreach portfolio

These strategic priorities build on the historic strengths of the Department, capitalize on the opportunity of a diverse set of industry partners in the Twin Cities, and necessitate a shift in organizational culture toward greater collaboration and shared leadership from all faculty members to generate knowledge and revenue in new ways. Times have changed, so too must the *modus operandi* of food and nutrition sciences.

This plan outlines a series of goals, objectives, and related activities that advance these strategic priorities, positioning the Department to together undertake meaningful research, outreach, and education that advances the public good.

Strategic Priority #1 - Signature Areas of Expertise and Strategic Initiatives

Build focused, flexible signature areas of expertise and departmentally-led strategic initiatives

The revenue model of public research universities has changed substantially in the last two decades. Resources are far scarcer, costs of conducting research are far higher, and faculty are now expected to generate substantial funding to conduct their scholarship. Furthermore, scholarly inquiry has changed. Large-scale, complex issues demand integrated, multi-disciplinary expertise to effectively explore and address them.

These factors have led to increasingly challenging funding environments that demand innovative, proactive approaches to revenue generation and scholarship. Therefore, the Department has determined that the establishment of signature areas of expertise and associated interdisciplinary, entrepreneurial strategic initiatives designed for large public impact can foster collaboration, new revenue, and more shared leadership among members of the Department and their partners. The Department is particularly suited to this kind of work, given its dual-discipline emphasis. Much can be accomplished by aligning food and nutrition sciences to advance a common research agenda; even more can be accomplished by further integration of other disciplines beyond the Department.

Goal – *Support a food system that offers healthy, high quality, safe food, where learning, discovery, and outreach activities of the Department advance the well-being and prosperity of the public*

Objectives

- Identify specific, long-term health impacts on society that the Department’s signature areas of expertise and strategic initiatives could address
- Identify signature areas of expertise that guide research and faculty hiring priorities with potential for major, long-term support from funders that respond to identified health impacts
- Develop major, multi-partner strategic initiatives with a coherent, specific, integrated research agenda that advances identified health impacts

Related Activities

- Develop shared definitions and understandings of signature areas of expertise and strategic initiatives
- Conduct inventory of existing areas of collaboration and expertise to identify signature areas for the Department
- Dedicate a pool of funding for faculty groups to plan for and institute a strategic initiative; funds

would be used to support and execute a planning process

- Support and advocate for existing departmentally-based entities (e.g. Pilot Plant or HFHL Institute) to convene, plan, and develop strategic initiatives (including buyout of faculty time; succession planning; facilities upgrades, etc.)
- Build effective, lasting partnerships with key funders and stakeholder organizations, positioned to collaboratively establish an effective fundraising and policy body to advance strategic initiatives that integrates food, health, agriculture, and the environment
- Develop long-term fundraising strategy based on the above model, including a legislative strategy, private sector fundraising, public sector grants, and the development of an integrated funding partnership between environmental, agricultural, health, and food systems interests
- Ensure department head provides leadership and support for strategic initiatives within the department, institution and with existing and potential partners
- Ensure that new faculty hires resonate with and advance signature areas and related strategic initiatives

Strategic Priority #2 – Organizational Culture

Foster an organizational culture of collaboration, innovation, entrepreneurship, and shared leadership

New Hires

This strategic plan includes priorities, goals, and commitments that influence the approach to candidate recruitment, interviews, hiring, and retention associated with all hiring in the Department. There are four new positions open at the time of creating this strategic plan, including a Department Head and three faculty appointments. This bulge in hiring presents an important opportunity for the search and hiring process to ensure that the goals for shared leadership, collaboration, and new revenue models shape all facets of the hiring process for these positions.

Furthermore, the Department’s commitment to diversity, equity, and inclusion means that the processes and practices for departmental searches and hiring should reflect the most effective, evidence-based tools for increasing workforce diversity and comply with University and collegiate policies.

Goal - Hire faculty and departmental leadership who demonstrate a track record of entrepreneurial revenue generation; shared leadership; and strong collaboration in teaching, research, and outreach, who can contribute to innovative, diverse, and strategic department

Objectives

- Assess applicants for their strengths and demonstrated successes in fostering collaboration and innovation in research, teaching, and outreach; entrepreneurship in revenue generation; shared leadership in governance of departmental affairs

- Ensure candidates are able to support the implementation of strategic plan and are willing to provide leadership, engagement, and support to strategic plan execution
- Determine extent to which candidates demonstrate proficiency at promoting a culture of diversity, equity, and inclusion
- Create decision-making approach and determine new faculty positions in future years (resulting from faculty retirements) that advance the priorities and goals of the strategic plan, strategic initiatives, signature areas of expertise, and that build key areas of Food Science and Nutrition

Related Activities

- Members of the Department develop interview questions for search committees, related metrics, and requests for candidate presentations that facilitate assessment of candidate capacities and demonstrated experience in shared leadership, collaboration skills, diversity/equity/inclusion and new revenue models¹
- Develop interview questions to assess capacity, interest, and demonstrated experience with diversity, equity, and inclusion, in partnership with CFANS Office for Diversity and Equity
- Initiate planning process for future faculty hires in Nutrition and Food Science that explore emerging scientific, food systems, and consumer trends and meet instructional needs. Create hiring plan with positions prioritized by faculty, and position descriptions resulting from plan.
- Explore interest of candidates in developing new course offerings for Food Science graduate education

Diversity, Equity, and Inclusion

Goal - *The Department exemplifies a diverse workforce and student population, and an equitable, inclusive organizational culture*

Objectives

- Build a department that is representative of the diversity of society in staff, faculty, students and offerings
- Foster a departmental climate that consistently draws upon the resources of human diversity
- Ensure discovery, learning, and outreach respond to current and future realities

Related Activities

- Establish evidence-based, data-driven departmental baseline focused on diversity, equity, and inclusion in partnership with CFANS' Office of Diversity
- Using baseline data, set goals, metrics, and create a departmental plan for diversity and equity that advance relevant goals contained in the strategic plan
- Work with CFANS Office for Diversity and Equity to ensure interview questions, candidate recruitment and selection processes, search committee composition and preparation, interview processes, candidate evaluation, and hiring reflect evidence-based best practices in advancing diversity and equity

¹ CFANS Office of Diversity and Equity will provide University-mandated resources and policy regarding search, recruitment, interview, and hiring to ensure diverse candidate pool

- Identify and use effective channels for publicizing open positions that will draw a diverse candidate pool within a rapidly changing society
- Support faculty and staff with ongoing professional development opportunities to increase intercultural competency
- Assess annual progress toward goals outlined in departmental diversity and equity plan

Building a Collaborative Culture

As this strategic plan suggests, collaborative endeavors will be a key feature for future learning, discovery, and outreach activities – with partners inside and beyond the department and the university. The aim of collaboration is to generate impact-focused research, outreach, and education that leads to social, environmental, and economic benefits.

Goal – *Build a culture of collaboration that advances productive, meaningful research, teaching, and outreach, in partnership with a diversity of partners*

Objectives

- Build capacity of faculty to better understand and embody collaborative leadership
- Create criteria and metrics that encourage collaboration

Related Activities

- Convene regularly scheduled, in person social gatherings to foster collaboration
- Offer professional development activities for department focused on relevant collaboration competencies; develop ‘case study’ and relevant definitions to be used at this event
- Develop criteria for collaboration as joint exercise with all faculty
- Integrate these criteria into the Department’s 7.12 document and use it for annual reviews of faculty
- Integrate these criteria into Department’s annual review process for staff
- Mandate that departmental funding that supports signature areas of expertise and strategic initiatives meet criteria for collaboration established by the Department

These collaboration-focused activities support a broader effort to enhance a culture of scholarly collaboration within the Department. Establishing signature areas of expertise, related strategic initiatives, and shared leadership for these efforts and for departmental governance are also intended to advance a collaborative culture.

Strategic Priority #3 – Undergraduate and Graduate Education

<p>Offer high quality undergraduate and graduate education that meets the needs of 21st century employers and society</p>
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The Taking Stock phase revealed numerous assets and needs for the Department. Students universally

affirmed the impact and quality of the department's approach to advising. Moreover, the Department offers multiple undergraduate and graduate degree programs, where every faculty member has extensive teaching responsibility.

Changes are ahead for the Department, as national standards for dietetics education and professional certification have implications for undergraduate and graduate programming. New university-wide requirements for graduate education means the Department will have to evaluate and adjust its approach to graduate education to meet guidelines and metrics associated with recruitment, admissions, and retention, which offers unique opportunities to strengthen diversity and inclusion efforts.

This section of the strategic plan both offers specific goals, objectives, and related activities for each program of study and describes a more general goal and related objectives and activities for all the Department's educational programs.

Goal #1 - *Develop intercultural capacity as a means to join food science and nutrition disciplines with undergraduate and graduate education*

Objective

- Provide an array of activities that strengthen diversity and equity in the Department

Related Activities

- Support and encourage student involvement in diversity and equity initiatives
- Reduce departmental threshold score for admissions and consider designing and implementing a holistic admissions process
- Participate in CFANS "Working Across Difference Initiative"
- Provide scholarships of at least \$1,000 to any FScN student participating in approved study abroad programs
- Ensure full support for implementing all facets of graduate level diversity plan, as mandated by University, integrating it into departmental diversity plan efforts

Goal #2 – *Increase students' capacity to understand and work across both departmental disciplines*

Objective

- Provide coursework that integrates food science and nutrition disciplinary perspectives and knowledge

Related Activities

- Develop and teach core courses jointly taught by food science and nutrition faculty
- Explore teaching opportunities with the new 'sports village' for athletes and other students that include food science and nutrition content

Goal #3 – *Maintain high quality undergraduate advising, as the College shifts to a centralized advising model*

Objective

- Provide undergraduates in our majors with timely and accurate information regarding their academic careers and employment options

Related Activities

- Work with CFANS undergraduate advisors servicing our majors to ensure they are knowledgeable about our programs and related extracurricular opportunities
- Enlist and train faculty to provide effective career mentoring to our undergraduate students

Food Science Education

The Department's undergraduate and graduate programs in Food Science are nationally recognized for their excellence. The curriculum in Food Science is regularly updated, in part due to Institute of Food Technology's requirements for undergraduate education. Food Science faculty meet at least once per semester to update undergraduate curriculum and foster interaction among teaching faculty. This approach of continuous review and improvement of curriculum provides a means to ensure that students are receiving the most up to date learning objectives, course content, pedagogy, and curriculum. Goals for Food Science-related education include:

Goal #1 - Offer a curriculum that meets the needs of next generation students and their employers

Objective:

- Ensure high quality undergraduate and graduate education that anticipates future needs and trends in Food Science, including experiential learning, study abroad, and state-of-the-art curriculum and pedagogy

Related Activities:

- Undertake baseline planning to ensure high quality Food Science educational programs, including focus groups with students, alumni, and employers
- Review course offerings and requirements for undergraduates
- Integrate Institute of Food Technology requirements and recommendations on an ongoing basis
- Integrate desired 'soft' and 'professional' skills into new and existing graduate courses; provide relevant training to faculty who teach these courses.
- Explore potential of independent study credits as way to add graduate level content
- Execute an assessment of graduate curriculum and undertake improvements that align with findings (e.g. consider new course offerings; create 'dormant' status for Food Science courses not offered; have them suppressed in student handbook)
- Strengthen graduate program's emphasis on cutting edge science and technologies (such as metagenomics, genomics, instrumental methods, etc. impacting the discipline)
- Explore possibility of brewing science as a track for graduate education
- Explore feasibility and opportunities for Food Science faculty to offer study abroad options
- Provide opportunities for experiential learning such as field trips

Goal #2 - Provide relevant career and professional development opportunities for Food Science students

Objective

- Provide high quality, consistent professional and career development support to students in Food Science-related programs of study

Related Activities

- Conduct annual seminar (spring semester) for FSc students that includes a panel with alumni, industry representatives, Career Center staff, and faculty (to speak to graduate education)

Nutrition Education

The Department's programs of study in nutrition and dietetics – at the undergraduate and graduate levels – face upcoming shifts, due to changes in national certification and licensure requirements. Nutrition faculty see this impending effort as an opportunity to carefully and systematically review their undergraduate and graduate offerings – in content and approach. There is also enthusiasm for incorporating state-of-the-art teaching methods and tools to provide a high quality learning experience for students. Goals for Nutrition-related education include:

Goal #1 - Offer a curriculum that meets the needs of next generation students and their employers

Objective

- Ensure high quality undergraduate and graduate education that anticipates future needs and trends in Nutrition, including experiential learning, state-of-the-art curriculum and pedagogy, and new national standards

Related Activities

- Establish evidence-based quality standards for Nutrition course content (includes lecture and slidedeck content, as well as use of new technologies). Using these standards, Nutrition faculty will review each other's content to ensure there is appropriate repetition and up to date information.
- Convene annual fall half-day Nutrition undergraduate education planning session; convene annual spring half-day Nutrition graduate education planning session; incorporate diversity-related priorities and activities into fall and spring Nutrition curriculum planning half-day retreats.
- Submit collaborative grant proposal for pedagogical and curricular innovations in Nutrition-related courses, including active and flipped classrooms, experiential and collaborative learning, soft skills acquisition, and intercultural competency. Develop and institute pedagogical features into Nutrition-related coursework.
- Provide leadership for the development of a student-run café and student-run peer nutrition counseling program in the St. Paul Campus Student Center.
- Modify undergraduate curriculum and requirements to meet national ACEND standards; establish necessary graduate-level program of study in dietetics to fulfill new national standards.
- Review and update recruitment, admissions, retention, and related aspects of student success, in compliance with University-mandated graduate education requirements. Ensure full support

for implementing all facets of graduate level diversity plan, integrating it into departmental diversity plan efforts.

- Encourage nutrition student enrollment in 'soft skills/professional development' course offered in department.
- Explore development of a large enrollment course that attracts students from multiple departments.

Goal #2 - Provide relevant career and professional development opportunities for Nutrition students

Objective

- Provide high quality, consistent professional and career development support to students in Nutrition-related programs of study

Related Activities

- Conduct annual seminar (fall semester) for Nutrition students that includes a panel with alumni, industry representatives, Career Center staff, and faculty (to speak to graduate education)
- Provide professional experience through the establishment of a student run café, store, and related community nutrition counseling program onsite
- Establish additional internship and career development options for nutrition students that do not place in an accredited Dietetics Internship
- Create new position to provide professional mentoring to undergraduate nutrition students

Strategic Priority #4 – Equipment, Facilities, and Technology Infrastructure Improvements

Upgrade equipment, facilities, and technological infrastructure

The Taking Stock phase of the strategic planning process revealed both easily resolved, small infrastructure needs and major infrastructural challenges that directly and substantially impact the teaching and research capacity of the department. Inadequate facilities and physical infrastructure also take their toll on departmental cohesion, due to a lack of common space and related amenities for meetings, events, and gatherings. Social capital matters to organizational culture, particularly when the Department is committed to shared leadership and collaborative endeavors as core aims for their future.

Comparatively speaking, the Taking Stock process demonstrated that similar departments at competing universities have far greater resources and state-of-the-art infrastructure and equipment. By contrast, the Department of Food Science and Nutrition has out of date facilities, equipment, and technological infrastructure – in many cases by half a century or more. It is difficult to compete with other Level I nutrition and food science programs, given the current physical and technological infrastructure of the Department.

Goal #1 – Increase the well-being, cohesion, and social capital of the departmental community

Objectives

- Make minor, evidence-based infrastructure improvements that enhance comfort, interaction, and a sense of place requested by departmental stakeholders

Related Activities

- Install comfortable seating in the 2nd floor foyer near the stairwell in the Food Science and Nutrition building
- Add plasma TV screen near front entry of FScN Building
- Hang mission and vision statements in various places throughout FScN facilities
- Purchase small, lightweight tables with wheels in Room 23 to facilitate flexible room layouts for classes and faculty meetings
- Add images of natural settings to meeting rooms that lack windows; add windows to Room 15
- Create congenial gathering spaces to foster collaboration
- Create signage, install a plasma TV with relevant messaging, and hang images in pilot plant observation area to use as a recruiting and marketing tool

Goal #2 – *Develop state-of-the-art facilities and infrastructure to support excellence and relevance in teaching, research, extension and fulfillment of strategic plan goals*

Objectives

- Improve and replace existing inadequate laboratories and equipment, facilities such as pilot plants, teaching and training capital resources, and public spaces
- Implement effective strategy to position Department to secure state and industry support for building renovation

Related Activities

- Develop and execute a plan, related strategy, and revenue model to improve or replace existing, inadequate laboratories and equipment (i.e. facilities such as pilot plants, teaching and training capital resources, and public spaces in FScN buildings)
- Conduct coordinated needs assessment of all teaching- and research-related equipment and supplies, executing an inventory that documents age, prevalence, quality, and estimated value. Prepare equipment purchasing and sharing plans and related budget and revenue model.
- Incorporate equipment purchasing and sharing plans into master plan for new FScN facilities.
- Gain administrative approval and University, public, and private sector resources to rebuild a state-of-the-art building that supports learning and discovery functions of the department
- Overhaul or replace the Food Science Nutrition building, ensuring that there is a new, state-of-the-art pilot plant (in keeping with similar institutions), up to date equipment (including lab benches, adequate internet connections, common office spaces for students, etc.)
- Gain administrative support and acquire resources for a new student run café, store that sells campus-based products (e.g. flowers, produce, honey, cheese, meat, and ice cream), and related community nutrition/clinical study space in the St. Paul Student Center
- Obtain administrative and private sector support to improve the common space on the first

floor of ABLMS to use for departmental functions

Appendices

A - Extension (added to document 3/27/17)

B - Strategic Key Area Descriptions (added to document 7/6/18)

APPENDIX A

FScN Strategic Plan - Extension

Goal: Interfacing science and society to ensure safe, healthful, affordable and appealing foods.

Strategy 1: Extension outreach and community engagement expertise works to inform and transform the FScN departmental culture of collaboration, innovation, entrepreneurship and shared leadership.

Tasks:

1. Assess FScN faculty/staff for community engagement and intercultural capacity needs [Intercultural Development Inventory (IDI) Assessment].
2. Serve as resource to assist FScN to fulfill its responsibilities in valuing human difference, equity and inclusion.
3. Serve as resources for FScN classes (community nutrition, socio-cultural nutrition, food product design/development).
4. Provide staff/professional development opportunities relevant to our unique land-grant context.

Strategy 2: Synergize outreach/community engagement between Extension and Healthy Foods Healthy Lives Institute (HFHL) and Food Entrepreneur Institute

Tasks:

1. Meet to identify current/future areas of work alignment.
2. Based upon 1, develop plans for funding/implementation.

Strategy 3: Serve as resource to FScN signature areas of expertise and strategic initiatives.

Tasks:

1. Assist in development/emergence of CFANS food entrepreneur program.
2. Assist in food systems education as it relates to outreach and/or community engagement.

APPENDIX B

Strategic Key Areas

Five strategic key areas, as part of Strategic Priority #1 of the department's strategic plan, were defined by faculty in 2017-18. Below is a brief description of each area.

Food, Health, Fitness, and Society 2050

FScN at the University of Minnesota is uniquely situated amidst and a highly diverse and vibrant metropolitan area with a history of a milling and food system hub, with many lakes, parks, biking trails and sport enthusiasts. With our experience in food charter, community/cultural engagement and food system work, FScN can take leadership in systems and cultural framing of our ongoing work in these areas. Producing knowledge of food, health and physical activity in the environment has always been central to the human experience, and every human culture has created its own understandings of how to create health. Many resources exist that remain untapped. Food, Health Fitness & Society 2050 leads the way.

Preventing Disease by Diet

Diets can make you sick. Diets can make you well. Preventing disease by diet discovers the links between diets and illness and between diets and wellness. Being well is better than being sick. Being sick costs more than being well. Most people want to prevent disease and improve their health. Our discoveries in this area contribute to individuals' ability to do so. Preventing disease and improving health are also public goods. Our discoveries in this area inform public policies that lead to better health.

Non-Thermal Processing to Improve Food Safety and Quality

New non-thermal processing methods are of interest to make foods safer and improve properties of food ingredients. Recent outbreaks of foodborne pathogenic bacteria in dry powdered foods has illustrated the need for new control strategies for food processing that reduces levels of foodborne pathogens and spoilage organisms, yet does not affect the nutritional or consumer acceptance of the foods or ingredients. In addition, there is also interest to utilize non-thermal processing technologies to improve the properties of foods, seeds, and ingredients for the food industry.

Microbial Genomics, Microbiomes, and Microbial Factories

With the advent of next-next generation genome sequencing, research utilizing these technologies has led to new discovery in our understanding of the link between diet and intestinal microbiomes, new approaches of using metagenomic data for food safety, and also for the microbial engineering of cells as microbial factories to produce valuable end products. Our department is uniquely poised with combined interdisciplinary strengths in Nutritional and Food Science expertise making us a hub for research projects utilizing whole-genome and

metagenomic sequencing, and genetic engineering of microorganisms to face future challenges in food safety, food production, and nutritional science and human health.

Center for Encapsulation Innovation

The Center for Encapsulation Innovation is being developed to expand the body of encapsulation work on food flavors and colors that has occurred for decades in our department. The trends of clean food labels and use of natural and bioactive ingredients, which generally are labile components, can benefit from encapsulation. Our expertise and facilities have broad application by others at the University of Minnesota in protecting enzymes, nutrients and microorganisms for human and animal nutrition, and biologics for agriculture use. The controlled release associated with encapsulation can also be used to most efficiently release nutrients to the soil or various pest control agents to plants. This work would also have implications in minimizing environmental issues regarding the use of such materials in the fields. The broad applicability of this center will lead to enhanced cross-disciplinary research and funding opportunities.