PROPOSAL TO OFFER A NEW DEGREE PROGRAM*

Proposals will only be accepted electronically as a Word document to the Office of the Provost when submitted to provost.deg.changes@wsu.edu

If a new unit will be created to offer the proposed degree, a notice of intent to establish the new unit (program, department, or school) will also be required.

This proposal will be circulated to other institutions in the state via the Interinstitutional Committee for Academic Program Planning (ICAPP). You may be asked to interact with other institutions if they have questions or concerns.

Degree Title:	Master of Science in Food Manufacturing Technologies
Academic Program:	Food Manufacturing Technologies
Academic Plan:	Food Manufacturing Technologies
Number of Credits:	30
Department(s) or Program(s):	Biological Systems Engineering
College(s):	CAHNRS
Campus(es):	Global
Method of Instructional Delivery:	Asynchronous Online Delivery

Contact Name:	Kelly Newell	Email Address:	knewell@wsu.edu
Contact Phone:	509-432-6991	*Proposed start date:	Fall 2026

Proposed Start Date: Approval must be received from the Northwest Commission on Colleges and Universities before the program may be advertised or recruited for. Financial aid may not be available until the program has been approved by the Department of Education subsequent to NWCCU approval. Approval notification will be sent by the Office of the Provost and Executive Vice President.

Proposal

Mission and Strategic Goals:

Provide a clear statement of the nature and purposes of the new degree in the context of WSU's mission and strategic plan.
The food manufacturing industry is an important component of US economy, providing jobs and needed food products to consumers. This sector is critical to ensuring food security and meeting the growing demand for diverse and high-quality nutritious food products. A significant number of employees in food industry are needed with training in sustainable food manufacturing technologies, ecofriendly packaging materials, food supply chain management, and big data analytics. The proposed online MS in Food Manufacturing Technologies will offer training to students in advanced technologies, packaging materials, novel digital tools, and management practices to build sustainable food system in the US and the globe. It advances the WSU mission as a land-grant university in service to society through advancing knowledge across academic disciplines and application of knowledge that enhances quality of life and the economy of the state, nation and world. Additionally, by offering this degree online through the Global Campus, this degree will address WSU system strategic goal of outreach, extension and engagement. Additionally, the department of Biological Systems Engineering is working closely with industry to ensure a robust, engaging student experience that will directly

prepare graduates for a career in academia, regulatory agencies, and industry which directly addresses WSU system goal #2 of Student Experience.

Educational Offerings*:

Describe the degree program, including the total number of credits required. Provide the four-year degree plan (undergraduate) or appropriate plan of study (graduate and professional).
Please note that all courses for the degree must be approved before the degree will be reviewed by the Catalog Subcommittee.

This professionally oriented master's degree will serve students across the state and the nation in learning the latest technologies and practices to be successful in the Food Manufacturing industry. Additionally, the program will offer two graduate certificates that will serve non-degree seeking students who are wishing to gain professional training in Food Technologies and Data Analytics or Food Technologies and Sustainability.

The FSM program focuses on the science of food management and science, including chemistry and microbiology. This program focuses on engineering technologies. So this program is a compliment to the FSM program, not a direct competitor. Many of these new courses will become electives for the FSM program. This should also improve enrollments and better serve students in the FSM program. Additionally, industry has been requesting this type of training and education.

There are no real prerequisite courses, and students may take the certificates and courses in any order. There is flexibility built into the design of the program. Undergraduate program will provide the foundation for successful completion of this Master's program.

See Exhibit A for the Plan of Study.
See Exhibit B for the Course Design and Delivery Schedule

The degree will require 30 Credits, total.

Provide descriptive information regarding the method(s) of instructional delivery (percent face-to-face, hybrid, distance, and/or competency-based).

This is a fully online professional master's degree offered asynchronously via the WSU Global Campus.

Assessment of Student Learning and Student Achievement*:
**For graduate programs, please contact the Graduate School before completing this section.*

Please provide a list and description of expected student learning outcomes.

Student learning: During their training in our online MS program, we expect students to grow professionally and acquire skills for successful careers. Our alumni may exhibit most these features:

1. Effectively manage engineering research and/or development research teams
2. Provide leadership in developing industry standards of sustainable practice
3. Stay creative and innovative
4. Develop sustainable and revenue saving products or manufacturing processes
5. Provide vision for future direction of their companies and for the industry

We will employ student feedback from course evaluation, student annual review, exit surveys to identify opportunities to improve graduate student learning outcomes at the program-level. We will also monitor the professional career of students graduated from our online MS degree and certificate programs.

The department faculty will work directly with the Global Campus Instructional Design professionals to create learning experiences that ensure the learning outcomes are met.

For undergraduate programs, provide the department's plan for assessing student learning outcomes. Describe briefly how information on student learning will be collected and incorporated into existing processes for evaluating student learning in the department. Please attach the plan and a curriculum matrix.

N/A

Please indicate as appropriate:

☐ Assessment of this program will be incorporated into the existing assessment plan for _____. Please attach a copy of the existing plan.

☒ The department is working with the office of assessment of teaching and learning to ensure a comprehensive assessment plan for this degree.

☐ A curriculum matrix is attached.

Planning:

Describe plans and include descriptions which provide evidence of:

1. The need for the new degree.

The proposed online master's degree in food manufacturing technologies (FMT) is specifically driven by the evolving requirements and opportunities within the food manufacturing industry. This is one of the largest sectors in the US economy, and there is a constant need for innovation and efficiency. Rapid technological advances such as automation, data analytics, and sustainable practices, require a workforce with advanced technological skills and knowledge. According to the Bureau of Labor Statistics (BLS), employment in food manufacturing is projected to grow steadily, and an online master's degree will address workforce shortages and provide career advancement opportunities.

Additionally, Washington State University is a leader in food manufacturing technology research and education, thanks to its strong industry collaborations, expert faculty, innovative curriculum, dedicated research centers, extension efforts, and national and international recognition, all of which position this degree to be highly desirable for students seeking a prestigious degree.

2. The student population to be served.

- Provide realistic justification for the projected FTE.
- How can transfer students articulate smoothly into the program and complete it with approximately the same number of total credits as students who enter WSU as freshmen?

- Please describe specific efforts planned to recruit and retain underrepresented students in this discipline.

The Global Campus primarily serves working professionals seeking additional skills and educational attainment. The Global Campus employs numerous recruiters and marketing professionals who seek appropriate students for all degree programs, though the College of Agriculture, Human, and Natural Resource Sciences (CAHNRS) and the Department of Biological Systems Engineering (BSysE) will be primarily responsible for marketing and recruiting directly related to this specific degree program.

Estimated FTE will serve as target goals for recruitment and are based on other master's programs launched via WSU Global Campus. CAHNRS, WSU Global and BSysE will ensure a targeted and focused marketing strategy to encourage enrollments. With the assistance Tri-cities campus, we will attempt to recruit underrepresented students from food companies in central and western Washington.

Although Master's enrollments have been lower in the past few years at WSU Pullman, the food manufacturing sector is expanding, driven by trends such as sustainable practices, health-conscious products, and innovative processing techniques. This degree aligns with these trends and should attract professionals looking to advance their careers. Additionally, these online programs appeal to working professionals who may not have time or resources to attend in-person classes, and therefore the scope is much greater. And finally, through thoughtful curriculum development that integrates practical skills, industry standards, and technological advancements coupled with collaboration with stakeholders in industry to recruit and support students, we believe this program will be able to attract students from across the country.

As with all online degree programs, enrollment will be closely monitored and should enrollment targets not be met, after every effort to recruit students has been exhausted, the program will be sunset and phased out slowly to ensure all students have the opportunity to complete their degree.

See Exhibit D for Lightcast Analysis and AI Executive Summary of demand.

3. Procedures used in arriving at the decision to offer the new degree (e.g., consultation with advisory boards, input from industry or employers, commissioned studies, faculty task force, etc.).

Over the last three decades, our food engineering program has graduated several students who are now working at reputable food companies across the nation. Our faculty maintain regular contact with food engineering alumni and often interact with them at professional meetings. During these meetings, as well as in exit interviews, our former graduates have mentioned the need for training company professionals in emerging and sustainable processing and packaging technologies, supply chain management, and the application of data analytics, sensors, and alternative plant proteins. We then conducted brief interviews with selected alumni to identify courses that could be offered in new degree and certificate programs.

4. Organizational arrangements required within the institution to accommodate the new degree.

Our existing faculty members have committed to developing new courses proposed for the online degree program and certificates. With the assistance of the Global Campus, the department plans to hire clinical faculty to manage and operate the online degree and certificate programs.

We have 4 faculty members in the department that are already working toward creating the courses for the program. This year, the development of the courses is part of their service efforts. Once the program is launched, and as it becomes necessary due to increased enrollments, we will add faculty as needed. Until we see the required enrollments, Shyam Sablani will manage the program. Dr. Ganjyal in Food Science will contribute to creation of one course. And we have two elective courses which are already being offered by the department of Math and Statistics and the Everett campus. Additionally, Dr. Munson from the College of Business will contribute to the creation of 50% of one course. See included list of faculty and courses.

5. Lay out a three-year timetable for implementation, including hiring plans, partnership contracts if needed, facilities modification, recruiting, and other elements of implementation. Provide dates for each step. **If faculty need to be hired, provide a written commitment from your funding authority of the necessary faculty lines.**

2024-2025	Course development (see course development schedule, Exhibit B)
2025-2026	Continue course development Continue marketing/recruitment for master's degree
2026-2027	Monitor enrollment in individual courses; revise frequency of offerings as indicated Continue marketing

Budget:

☒ Attach the Financial Worksheet with five-year FTE, revenue and expenditure projections. Fully account for costs such as staff support, training, library, facilities and so on.

Please describe the funding picture narratively, including funding sources, department, college and/or campus commitments, investments already made, one-time costs, facilities costs (labs, classrooms, offices, telecom etc.), and library costs.

The department is not planning to hire any new faculty to support the online degree. Instead, the courses will be taught by existing faculty in concert with their on-campus courses or necessary thought leaders (i.e., adjuncts) will receive stipends to teach specific content.

Additionally, the department is proposing $800 per credit to be in line with current online degree trends in professional master's degrees. This additional tuition revenue will incentivize the department and college and support the growth of the program through marketing and corporate relation activities and continuous program improvement.

We will conduct a survey to determine student interest in summer courses and then we will plan for offering selected courses during summer months.

Please see Exhibits C for the budget model details and enrollment goals and projections. Because the two budgets (Sustainable Fuels and FMP) reflect aspirational enrollment goals and nearly identical faculty and course roll-out plans, the two budgets are presented as the same. However, each program will be managed and evaluated separately by their respective faculty coordinators (Hanwu Lei for MS SF, and Shyam Sablani for FMT.)

Student Services:

Describe the capacity of student support services to accommodate the new degree. Include a description of admissions, financial aid, advising, library, tutoring, and other services specific to this request.

The Department of Biological Systems Engineering will provide direct student advising, admission decisions, mentoring, program coordination (Dr. Hanwu Lei), and assessment.

The Global Campus provides comprehensive student services, often in collaboration and cooperation with the centralized units, to ensure student success. Included are dedicated recruiters, transfer credit evaluation, career counseling, financial aid, e-tutoring, student involvement, and tech support for online students. The Global Campus is also skilled in working with students to match their goals with the programs and services offered by WSU.

Additionally, WSU Global Campus personnel are the experts on adult and contemporary distance learners and provide specialized services to meet the needs of these unique students.

WSU Global Campus creates opportunities for meaningful student engagement through unique student involvement activities offered virtually and face-to-face. The Global Campus provides a robust infrastructure of support programs to assist students enrolled at any degree level, CAHNRS will provide advising to the students enrolled and will handle all admissions decisions.

Describe the implications of the new degree for services to the rest of the student body.
Adding online courses and creating access to a new degree program adds opportunity and options for student success and flexibility that accommodates students' needs. Current students should not be negatively affected by the delivery of this new degree program and modality. Additionally, students and faculty from other WSU campuses will be able to participate in the courses (teaching and learning) when appropriate. The new online MS program may assist international students to complete selected courses while waiting for visas and complete other requirements before coming to Pullman Campus.

Physical Facilities and Equipment:

Outline the provision(s) made for physical facilities and equipment at the proposed location that will support the program and its projected growth. Include videoconferencing and other technologies that support course delivery, as well as classrooms, labs, and office space.
All online courses are fully supported by the Global Campus through the Learning Management System. In addition, we have built physical laboratory kits are housed in Food Engineering laboratories (FSN 348, and FSN 353) in the Food Science Building. These laboratory kits will be shipped to students registered in FMT 509.

Library and Information Resources:

Using the Library Analysis form, describe the availability and adequacy of library and information resources for this degree, degree level, and location. Note plans to address gaps.
This degree program will not require any new resources from the WSU Library to support students. The library currently offers access to numerous journals in the area of food manufacturing technologies and the online students will continue to have access to those. Additionally, the Global Campus is working in partnership with the Libraries to ensure resources are provided for all new programs.

Faculty:

- List the educational and professional qualifications of the faculty relative to their individual teaching assignments.
- List the anticipated sources or plans to secure qualified faculty and staff.

Existing and stipend/adjunct faculty will develop and teach the online courses. All faculty teaching online are held to the same qualifications as faculty on the physical campuses. Deans and Directors are directly responsible for the hiring of all teaching faculty and ensure credentials are appropriate for the program and will hire faculty using normal hiring processes. Content experts will be given a stipend and rank of adjunct faculty for delivery of the coursework that is beyond the capacity of the current faculty.

Food Manufacturing Technologies – Faculty List

Shyam Sablani, Professor (Tenured, Department of Biological Systems Engineering) - FMT 503 Food Packaging Technologies; FMT 506 Food Supply Chain Technologies and Management (50% share with Chuck Munson)); FMT 509 Remote and Virtual Laboratories; FMT 700 Master's Special Problems, Directed Study, and/or Examination

Gustavo Barbosa-Canovas, Professor (Tenured, Department of Biological Systems Engineering) - FMT 505 Advanced Food Preservation Technologies – Nonthermal; FMT 700 Master's Special Problems, Directed Study, and/or Examination

Youngsoo Lee, Associate Professor (Tenured, Department of Biological Systems Engineering) - FMT 501 Conventional Food Manufacturing Technologies; FMT 504 Advanced Food Preservation Technologies – Thermal; FMT 700 Master's Special Problems, Directed Study, and/or Examination

Kang Huang, Assistant professor (Tenure Track, Department of Biological Systems Engineering) - FMT 502 New Topics in Food Processing; FMT 507 Food Manufacturing Sustainability and Life Cycle Analyses; FMT 700 Master's Special Problems, Directed Study, and/or Examination

Girish Ganjyal, Professor (Tenured, School of Food Science) - FMT 508 Food Ingredients and Plant Protein Technologies

Gani Nurmukhametov, Teaching Assistant Professor (Career Track, WSU Everett Campus) - DATA 115 Introduction to Data Analytics

Nairanjana (Jan) Dasgupta, Professor (Tenure, Department of Mathematics and Statistics) - STAT 530 Predictive Models: Foundations in Data Science

Chuck Munson, Professor (Tenure, Department of Finance and Management Science) - FMT 506 Food Supply Chain Technologies and Management (50% share with Shyam Sablani)

Impact on Other Locations/Programs:

Briefly describe any impacts on other WSU programs and locations, and how you came to these conclusions (who was consulted?). If there are potential adverse impacts, describe how these will be addressed. Consider such things as: reallocation of faculty time, reallocation of AOI courses, impact of blended courses, internal competition, "cannibalization" of other programs, curricular effects for other degrees, effects on recruitment markets for other campuses. Indicate how such problems will be addressed for each campus or department affected.

We do not anticipate any "cannibalization" of other programs as this is a unique and targeted Master's program with the relevant faculty housed on the Pullman Campus, who will teach both the Pullman and Global courses. There is potential for courses to be taught in a blended modality to allow physical campus students to take online courses where needed and approved by the department.

All physical campus chancellors were consulted when submitting the Notice of Intent, and we anticipate having ongoing discussions and collaboration in particular with the WSU Tri Cities leadership to ensure successful partnerships in food manufacturing and student support in that area.

Sustainability:

What are the plans for continuing the program past 5 years if the goals for enrollment are not met, or other circumstances prevent the execution of the plan described here?
All new online degree programs will be evaluated continuously for enrollment and financial metrics. Under-performing degrees will be sunset once the college, department, and Global Campus have explored all reasonable efforts to increase enrollments and revenue through marketing, partnerships, and innovation. However, prior to sunsetting (phasing out a degree for non-enrollment performance) a degree, the need for the courses that are provided online will also be analyzed to ensure little to no impact on other departments and programs that rely on those courses. Any degree that is discontinued will include an appropriate teach-out plan and students will be supported to completion of the degree.

External Reviewer Contact Information:

If this program is new to the Washington State University system, please provide the names and contact information for 2-3 external experts from similar institutions *who could* be contacted to provide reviews of this program.

Name	Contact Information (email and phone)
Yonas Gezahegn, PhD	Nestle Purina Petcare, One Checkerboard Square – 3C, St. Louis, MO
H. Louis Cooperhouse	BlueNalu 6060 Nancy Ridge Dr, Ste 100, San Diego, CA
Wenjia Zhang	Coca-Cola Company, One Coca-Cola Plaza, Atlanta, GA

Attachments:

- ☒ Financial Worksheet
- ☒ Demand Analysis
- ☐ Library Analysis
- ☒ Four-Year Degree Plan (undergraduate); curriculum overview (graduate and professional)
- ☐ Curriculum Map (undergraduate)
- ☒ Assessment Plan
- ☐ Letters of financial commitment
- ☐ Contracts or MOUs if applicable

Submit completed form as a Word document to the Provost's Office at provost.deg.changes@wsu.edu

SIGNATURES: The names typed below certify that the relevant academic and campus officials have reviewed and approved this proposal:

Chair or Director Signature:	*Manuel Garcia-Perez*	Date:	9/26/24

Dean Signature:	Wendy Powers	Date:	9/27/2024

Signatures are required from all Chancellors (or delegates). A signature denotes endorsement if the degree will be offered and/or impact the respective campus. A signature will also denote receipt of notification if the degree is not being offered and/or will impact the respective campus. If needed, a signature abstention box is provided immediately below.

Everett Chancellor Signature:	Jacob Murray by email to K. Newell	Date:	10/14/24

Global Chancellor Signature:	Dave Cillay by email to K. Newell	Date:	9/27/24

Pullman Chancellor Signature:	Dave Cillay by email to K. Newell	Date:	9/27/24

Spokane Chancellor Signature:	Daryll DeWald by email to K. Newell	Date:	10/3/24

Tri-Cities Chancellor Signature:	Kate McAteer by email to K. Newell	Date:	10/5/24

Vancouver Chancellor Signature:	Renny Christopher by email to K. Newell	Date	10/2/24

Comments regarding abstention of signature(s)

Submit completed form as a Word document to the Provost's Office at
provost.deg.changes@wsu.edu

Provost's Office Signature:		Date:	

For Registrar's Office Use Only:					
Current CIP Code:		New CIP Code:		Date:	

Exhibit A

Course of study for Food Manufacturing Technologies Master's

MS in Food Manufacturing Technologies – Non-Thesis

Course Code	Course Name	Credit	Instructor	Semester
FMT Required courses (15 cr)				
FMT 501	Conventional Food Manufacturing Technologies	3	Youngsoo Lee	
FMT 502	New topics in Food Processing	3	Kang Huang	
FMT 503	Food Packaging Technologies	3	Shyam Sablani	
FMT 504	Advanced Food Preservation Technologies– Thermal	3	Juming Tang	
FMT 505	Advanced Food preservation Technologies – Nonthermal	3	Gustavo Barbosa-Canovas	
FMT Elective course (11 cr)				
DATA 115	Introduction to Data Analytics	3	Gani Nurmukhametov	
STAT 530	Predictive Models: Foundations in Data Science	3	Nairanjana (Jan) Dasgupta	
FMT 506	Food Supply Chain Technologies and Management	2	Shyam Sablani and Chuck Munson	
FMT 507	Food Manufacturing Sustainability and Life Cycle Analyses	3	Kang Huang and Ting Chi	
FMT 508	Food Ingredients and Plant Protein Technologies	2	Girish Ganjyal	
FMT 509	Remote and Virtual Laboratories	Variable (1 or 2)	Shyam Sablani	
Research credits (4 cr minimum)				
FMT 700 Master's Special Problems, Directed Study, and/or Examination: A minimum of four credits are required; must be enrolled in 2 credits of 700 in the term of your final exam. Project and examination requirements are explained here in detail: (Insert Weblink here)				
NON-THESIS OVERALL MINIMUM CREDIT REQUIREMENT: 30 (26 graded credits, and 4 research credits)				

Background: Students should have a background in a related area, or documented evidence of coursework or work experience in this area. Without this relevant background, students may need or be required to complete 6 to 9 semester credits of prerequisite courses at the beginning of their degree program, and these courses may or may not be counted toward the degree program requirements. Please review your preparedness or concerns regarding specific coursework in advance with your advisor and/or instructor.

Course Substitutions: Any substitutions to the course requirements must be approved by the MS FMT program director. Pullman students may have additional face to face course options.

Pre-Requisites: The registration system(s) does not recognize external transcripts in determining if prerequisites have been met. In these cases, students who meet the prerequisites may contact the instructor to request a prerequisite override exemption.

Program of Study (POS): The Program of Study document (confirming your committee and outlining your coursework) must be prepared by you and approved by your advisor and committee by the end of your first semester.

Enrollment and Continuous Enrollment: Degree-seeking students must maintain continuous enrollment in the Graduate School by enrolling for a minimum of 2 credits per semester (excluding summer sessions). A student who is not on approved graduate leave or internship leave status, and who is absent for one semester or two consecutive semesters (excluding the summer) must complete the reenrollment form ($25) before the student can register for classes. A student not enrolled for three consecutive semesters will be dropped from the Graduate School.

Unique features of the coursework: Coursework includes industrially relevant technologies, packaging materials, and sensors; discussions on case studies/real world problems, hands-on experience through take-home laboratory kits, food safety regulations in different countries, get

to know about suppliers of equipment, instruments, ingredients, and packaging materials; research activities at military and NASA food labs, webinars by industry leaders

Certificate in Food technologies and Data Analytics

Take any two courses from the list of FMT required courses: FMT 501, FMT 502, FMT 503, FMT 504, and FMT 505
Take two specialized courses: DATA 115 and STAT 530

Certificate in Food technologies and Sustainability

Take two courses from the list of FMT required courses: FMT 501, FMT 502, FMT 503, FMT 504, and FMT 505
Take two specialized: FMT 506 and FMT 507

Exhibit B

Course Design and Development Schedule

Course Development Plan

Course #	Course Title	Desired Development Term	Desired Delivery Term	Course Developer (faculty or Grad student)	Course Instructor
FMT 501	Conventional Food Manufacturing Technologies	Spring and Fall 2025	Spring 2026	Youngsoo Lee	Youngsoo Lee
FMT 502	Advanced Food Preservation Technologies– Thermal	Fall 2025 and Spring 2026	Fall 2026	Juming Tang	Juming Tang
FMT 503	Advanced Food preservation Technologies – Nonthermal	Fall 2025 and Spring 2026	Fall 2026	Gustavo Barbosa-Canovas	Gustavo Barbosa-Canovas
FMT 504	New topics in Food Processing	Spring and Fall 2025	Spring 2026	Kang Huang	Kang Huang
FMT 505	Food Packaging Technologies	Spring and Fall 2025	Spring 2026	Shyam Sablani	Shyam Sablani
FMT 506	Food Supply Chain Technologies and Management	Fall 2025 and Spring 2026	Fall 2026	Shyam Sablani and Chuck Munson	Shyam Sablani and Chuck Munson
FMT 507	Food Manufacturing Sustainability and Life Cycle Analyses	Spring and Fall 2026	Spring 2027	Kang Huang and Ting Chi	Kang Huang and Ting Chi
FMT 508	Food Ingredients and Plant Protein Technologies	Spring and Fall 2026	Spring 2027	Girish Ganjyal	Girish Ganjyal
FMT 509	Remote and Virtual Laboratories	Fall 2025 and Spring 2026	Fall 2026	Shyam Sablani	Shyam Sablani

Exhibit C

Budget

See attached electronic file for more legible version

Proposed Program	**Food Manufacturing Technology**					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	
Enter the fiscal year begin date of program (e.g. 2022 for Fall-21)	**2026**	**2027**	**2028**	**2029**	**2030**	
Enter total student headcount enrolled per year	**15**	**30**	**45**	**60**	**75**	
Enter student credit hours (estimated), per student, per year	**15**	**15**	**15**	**15**	**15**	
Enter anticipated tuition waivers or discounting granted (e.g. -10000)	$0.00	$0.00	$0.00	$0.00	$0.00	
Enter tuition rate per student credit hour to be charged in this program	$800.00	$800.00	$800.00	$800.00	$800.00	
Total student credit hours per student, per year, eligible for payout (State)	0	0	0	0	0	-
Total student credit hours per student, per year, eligible for payout (Self Sus)	0	0	0	0	0	-
Annual operating tuition, per full-time student	$12,000	$12,000	$12,000	$12,000	$12,000	
Total number of student credit hours delivered per year	225	450	675	900	1,125	**3,375**
Student credit hours available to be paid out through this program	225	450	675	900	1,125	
Total tuition earned through Masters' offerings, before waivers (State)	$140,051	$280,103	$420,154	$560,205	$700,256	
Total tuition earned through Masters' offerings, before waivers (Self Sust)	$180,000	$360,000	$540,000	$720,000	$900,000	**$ 2,700,000**
Academic Program Direct & Indirect Costs						
Faculty Instruction Costs						
Faculty 1 Name	Current Faculty	Current Faculty	Current Faculty	Current Faculty	Current Faculty	
Academic Year Salary	$ 130,000	$ 132,600	$ 135,252	$ 137,957	$ 140,716	
Percent of time dedicated to this program (e.g. 25)	25%	0%	0%	0%	0%	
Employee's benefit percentage (e.g. 28)	28%	0%	0%	0%	0%	
Salary & benefits dedicated to this program	**$ 41,600**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 41,600**
Faculty 2 Name	Current Faculty	Current Faculty	Current Faculty	Current Faculty	Current Faculty	
Academic Year Salary	$ 130,000	$ 132,600	$ 135,252	$ 137,957	$ 140,716	
Percent of time dedicated to this program (e.g. 25)	25%	0%	0%	0%	0%	
Employee's benefit percentage (e.g. 28)	28%	0%	0%	0%	0%	
Salary & benefits dedicated to this program	**$ 41,600**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 41,600**
Faculty 3 Name	Current Faculty	Current Faculty	Current Faculty	Current Faculty	Current Faculty	
Academic Year Salary	$ 130,000	$ -	$ -	$ -	$ -	
Percent of time dedicated to this program (e.g. 25)	25%	0%	0%	0%	0%	
Employee's benefit percentage (e.g. 28)	28%	0%	0%	0%	0%	
Salary & benefits dedicated to this program	**$ 41,600**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 41,600**
Faculty 4 Name	New Hire	New Hire	New Hire	New Hire	New Hire	
Academic Year Salary	$ 93,000	$ 94,860	$ 96,757	$ 98,692	$ 100,666	
Percent of time dedicated to this program (e.g. 25)	50%	200%	200%	200%	200%	
Employee's benefit percentage (e.g. 28)	28%	28%	28%	28%	28%	
Salary & benefits dedicated to this program	**$ 59,520**	**$ 242,842**	**$ 247,698**	**$ 252,652**	**$ 257,705**	**$ 1,060,418**
Direct Instructional Support Salaries & Benefits						
Employee 1 Name	Academic Coord	Academic Coord	Academic Coord	Academic Coord	Academic Coord	
Annual Salary	$ 80,000	$ 81,600	$ 83,232	$ 84,897	$ 86,595	
Percent of time dedicated to this program (e.g. 25)	20%	20%	30%	40%	50%	
Employee's benefit percentage (e.g. 28)	0%	0%	0%	0%	0%	
Salary & benefits dedicated to this program	**$ 16,000**	**$ 16,320**	**$ 24,970**	**$ 33,959**	**$ 43,297**	**$ 134,546**
Admistrative Leadership Support (Chair)	Chair	Chair	Chair	Chair	Chair	
Annual Salary	$ 200,000	$ 204,000	$ 208,080	$ 212,242	$ 216,486	
Percent of time dedicated to this program (e.g. 25)	5%	5%	5%	5%	5%	
Employee's benefit percentage (e.g. 28)	28%	28%	28%	28%	28%	
Salary & benefits dedicated to this program	**$ 12,800**	**$ 13,056**	**$ 13,317**	**$ 13,583**	**$ 13,855**	**$ 66,612**
Marketing Support						
Annual Salary	$ -	$ -	$ -	$ -	$ -	
Percent of time dedicated to this program (e.g. 25)	0%	0%	0%	0%	0%	
Employee's benefit percentage (e.g. 28)	0%	0%	0%	0%	0%	
Salary & benefits dedicated to this program	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Employee 4 Name						
Annual Salary						
Percent of time dedicated to this program (e.g. 25)						
Employee's benefit percentage (e.g. 28)						
Salary & benefits dedicated to this program	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Course Development Costs/Marketing Costs						**$ -**
Stipend for course updates			5,000	5,000	5,000	**$ 15,000**
Stipend for Development	15,000	7,000				**$ 22,000**
Marketing	5,000	3,000	1,000	1,000	1,000	**$ 11,000**
Direct Course Costs (Detail						
Goods and services - photocopies / supplies	-	-	-	-	-	**$ -**
						$ -
						$ -
						$ -
						$ -
Other (Detail						
Computers, Printers, Software	15,000	15,000	2,000	2,000	2,000	**$ 36,000**
						$ -
						$ -
						$ -
						$ -
Total Costs	**$ 248,120**	**$ 297,218**	**$ 293,985**	**$ 308,195**	**$ 322,858**	**$ 1,470,375**
				Check #	**$ 1,470,375**	

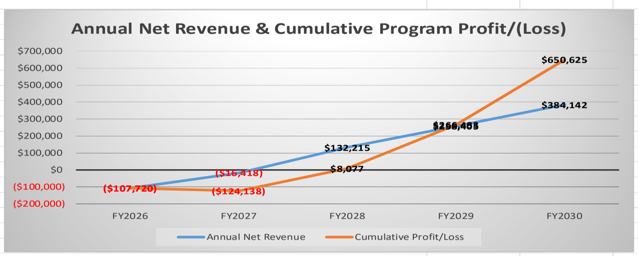
Program Name	Food Manufacturing Technology	Self-Sustaining Model

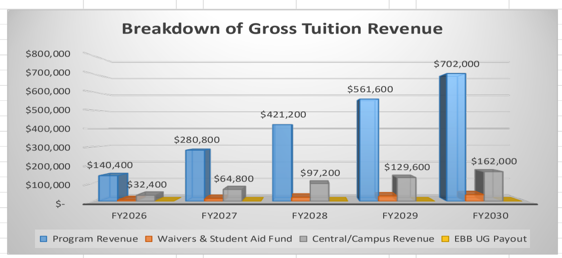
Tuition Earned	FY2026	% of Total Tuition	FY2027	% of Total Tuition	FY2028	% of Total Tuition	FY2029	% of Total Tuition	FY2030	% of Total Tuition	Cumulative	Cumulative %
Gross Operating Tuition - Masters Program (Excludes UG Tuition)	$ 180,000	100.00%	$ 360,000	100.00%	$ 540,000	100.00%	$ 720,000	100.00%	$ 900,000	100.00%	$ 2,700,000	100.00%
Less Waivers or Tuition Discounting - Masters	$ -	0.00%	$ -	0.00%	$ -	0.00%	$ -	0.00%	$ -	0.00%	$ -	0.00%
Net Tuition	**$ 180,000**	**100.00%**	**$ 360,000**	**100.00%**	**$ 540,000**	**100.00%**	**$ 720,000**	**100.00%**	**$ 900,000**	**100.00%**	**$ 2,700,000**	**100.00%**

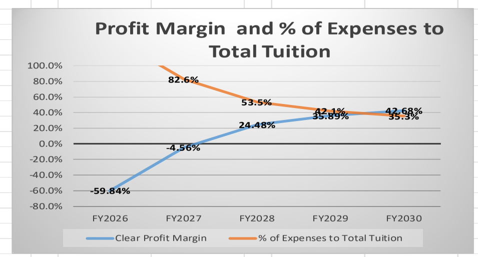
Split of Tuition by Area	FY2026	% of Total Tuition	FY2027	% of Total Tuition	FY2028	% of Total Tuition	FY2029	% of Total Tuition	FY2030	% of Total Tuition	Cumulative Total Tuition Split	Cumulative %
Food Manufacturing Technology	$ 140,400	78.0%	$ 280,800	78.0%	$ 421,200	78.0%	$ 561,600	78.0%	$ 702,000	78.0%	$ 2,106,000	78.0%
Tuition Waivers or Discounting	$ -	0.0%	$ -	0.0%	$ -	0.0%	$ -	0.0%	$ -	0.0%	$ -	0.0%
Campus Fee (5%)	$ 9,000	5.0%	$ 18,000	5.0%	$ 27,000	5.0%	$ 36,000	5.0%	$ 45,000	5.0%	$ 135,000	5.0%
Central (11% + 2% Strategic Reallocation)	$ 23,400	13.0%	$ 46,800	13.0%	$ 70,200	13.0%	$ 93,600	13.0%	$ 117,000	13.0%	$ 351,000	13.0%
Student Aid Fund (4%)	$ 7,200	4.0%	$ 14,400	4.0%	$ 21,600	4.0%	$ 28,800	4.0%	$ 36,000	4.0%	$ 108,000	4.0%
Total - Gross Tuition	**$ 180,000**	**100.0%**	**$ 360,000**	**100.0%**	**$ 540,000**	**100.0%**	**$ 720,000**	**100.0%**	**$ 900,000**	**100.0%**	**$ 2,700,000**	**100.0%**

	FY2026		FY2027		FY2028		FY2029		FY2030			
Direct & Indirect Costs for Academic Program	Program Costs	% of Program Revenue	Program Costs	% of Program Revenue	Program Costs	% of Program Revenue	Program Costs	% of Program Revenue	Program Costs	% of Program Revenue	Cumulative Program Costs	Cumulative %
Direct Instructional Salaries & Benefits	$ 184,320	131.3%	$ 242,842	86.5%	$ 247,698	58.8%	$ 252,652	45.0%	$ 257,705	36.7%	$ 1,185,218	81.4%
Direct Instructional Support Salaries & Benefits	$ 28,800	20.5%	$ 29,376	10.5%	$ 38,287	9.1%	$ 47,542	8.5%	$ 57,152	8.1%	$ 201,157	13.8%
Third Party Costs (Incl A.O.I. Level 2 / 3 Service)	$ 20,000	14.2%	$ 10,000	3.6%	$ 1,000	0.2%	$ 1,000	0.2%	$ 1,000	0.1%	$ 33,000	2.3%
Direct Course Costs	$ -	0.0%	$ -	0.0%	$ -	0.0%	$ -	0.0%	$ -	0.0%	$ -	0.0%
Other Costs	$ 15,000	10.7%	$ 15,000	5.3%	$ 2,000	0.5%	$ 2,000	0.4%	$ 2,000	0.3%	$ 36,000	2.5%
Total	**$ 248,120**	**176.7%**	**$ 297,218**	**105.8%**	**$ 288,985**	**68.6%**	**$ 303,195**	**54.0%**	**$ 317,858**	**45.3%**	**$ 1,455,375**	**100.0%**

	FY2026	%	FY2027	%	FY2028	%	FY2029	%	FY2030	%	Cumulative	Cumulative %
Profit or (Loss) & % of Profit to Program after all expenses are covered	**($107,720)**	**-59.8%**	**($16,418)**	**-4.6%**	**$132,215**	**24.5%**	**$258,405**	**35.9%**	**$384,142**	**42.7%**	**$650,625**	**24.1%**
Cumulative Profit/(Loss) to Date	**($107,720)**		**($124,138)**		**$8,077**		**$266,483**		**$650,625**			
Amount Paid to Program per SCH	**$ 624**		**$ 624**		**$ 624**		**$ 624**		**$ 624**			
Amount Paid to Program per AAFTE	**$ 18,720**		**$ 18,720**		**$ 18,720**		**$ 18,720**		**$ 18,720**			
Clear Profit/(Loss) to Program per SCH	**($478.76)**		**($36.48)**		**$195.87**		**$287.12**		**$341.46**			
Clear Profit/(Loss) to Program per AAFTE	**($7,181.33)**		**($547.25)**		**$2,938.11**		**$4,306.76**		**$5,121.90**			







Fiscal Year	FY2026	FY2027	FY2028	FY2029	FY2030
Annual Net Revenue	($107,720)	($16,418)	$132,215	$258,405	$384,142
Cumulative Profit/Loss	($107,720)	($124,138)	$8,077	$266,483	$650,625

	FY2026	FY2027	FY2028	FY2029	FY2030
Program Revenue	$ 140,400	$ 280,800	$ 421,200	$ 561,600	$ 702,000
Waivers & Student Aid Fund	$ 7,200	$ 14,400	$ 21,600	$ 28,800	$ 36,000
Central/Campus Revenue	$ 32,400	$ 64,800	$ 97,200	$ 129,600	$ 162,000
EBB UG Payout	$ -	$ -	$ -	$ -	$ -

	FY2026	FY2027	FY2028	FY2029	FY2030
Clear Profit Margin	-59.8%	-4.6%	24.5%	35.9%	42.7%
% of Expenses to Total Tuition	137.8%	82.6%	53.5%	42.1%	35.3%

Exhibit D
Demand Analysis and AI Executive Summary

Executive Summary: Labor Market Demand for a Master's in Food Manufacturing Technology

Program Context

Washington State University is evaluating the viability of a Master's program in Food Technology and Processing. The Lightcast report provides a comprehensive analysis of labor market demand, competitive landscape, and relevant skills to inform program development.

Key Findings

1. Competitive Landscape

- **Regional Institutions Offering Similar Programs**: Oregon State University, Brigham Young University, University of Idaho.
- **Program Format**: All completions in 2023 were from non-distance (in-person) programs.
- **Completions (2023)**: 20 total across 4 institutions.
  - WSU contributed 7 completions (35% market share), with a **40% year-over-year growth**.
  - Oregon State led with 8 completions but saw a **50% decline**.

2. Labor Market Demand

- **Target Occupations**:
  - *Food Scientists and Technologists*: 1,316 jobs in 2024, projected to grow **+9.73%** by 2029.
  - *Food Science Technicians*: 1,660 jobs in 2024, projected to grow **+6.20%**.
- **Regional Job Growth**: 7.8% (above national average of 7.5%).
- **Median Earnings**:
  - Technologists: **$40.18/hr**
  - Technicians: **$22.97/hr**

3. Job Postings Analysis

- **Total Postings (Oct 2024–Sep 2025)**: 1,026
- **Unique Postings**: 409
- **Posting Intensity**: 3:1 (average effort by employers)
- **Top Employers**:
  - Washington State University
  - Danone
  - Eurofins
  - Reser's Fine Foods
- **Top Cities**: Seattle, WA; Portland, OR; Denver, CO

4. Talent Pipeline

- WSU ranks **2nd** among regional talent providers with **52 alumni** working in target occupations (6.36% of regional profiles).
- Oregon State University ranks 1st with 65 alumni (7.95%).

5. Skills Demand

- **Top Specialized Skills**:
  - Food Science, HACCP, New Product Development, GMP, Data Analysis
  - Many are **rapidly growing**, especially HACCP (+27.2%) and Data Collection (+29.9%)
- **Top Common Skills**:
  - Communication, Research, Quality Assurance, Innovation
- **Top Software Skills**:
  - Microsoft Excel, Office, PowerPoint, R, SAP
- **Top Qualifications**:
  - HACCP Certification, SQF Practitioner, Valid Driver's License

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Conclusion

The data strongly supports the development of a Master's program in Food Manufacturing Technology at WSU. The region shows:

- **Robust job growth**
- **Strong employer demand**
- **A growing need for advanced skills**
- **WSU's strategic position as a top talent provider**

This program would align well with industry needs and enhance WSU's leadership in food science education.

Letters of support for degree from industry

Support letter.pdf

LetterofSupport-BlueNalu-WSU.pdf

Support Letter-Online MS Prc

PepsiCo Support Letter for WSU Onlin

Lightcast Demand Analysis Report

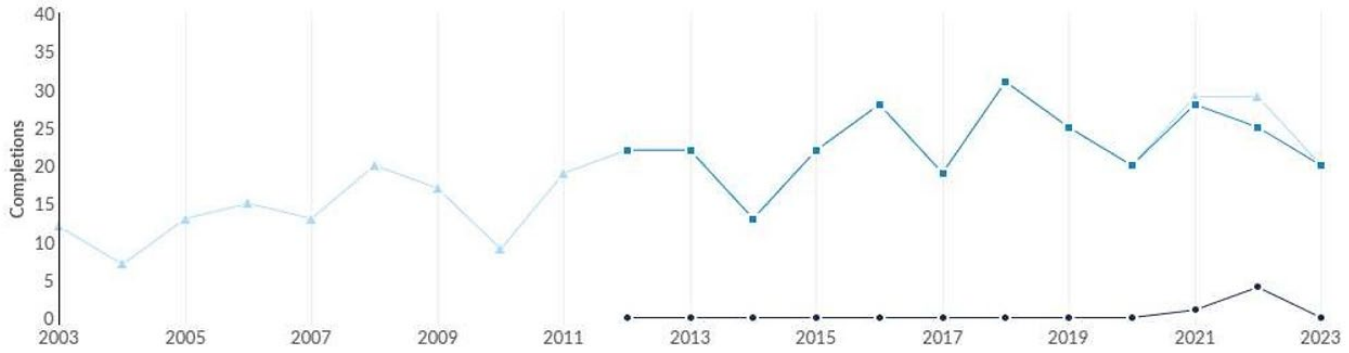
Program Overview

	Completions (2023)	% Completions	Institutions (2023)	% Institutions
All Programs	20	100 %	4	100 %
Distance Offered Programs	0	0%	0	0%
Non-Distance Offered Programs	20	100%	4	100%

Completions by Institution

Institution	Master's Degree Completions (2023)	Growth % YOY (2023)	Market Share (2023)	IPEDS Tuition & Fees (2023)	Completions Trend (2019-2023)
Oregon State University	8	-50.0%	40.0%	$13,494	
Washington State University	7	40.0%	35.0%	$12,997	
Brigham Young University	4	0.0%	20.0%	$6,496	
University of Idaho	1	Insf. Data	5.0%	$8,816	

Regional Trends



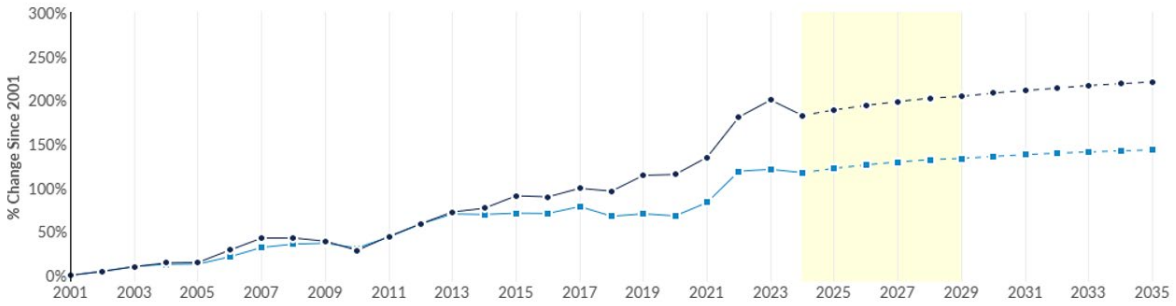
	2012 Completions	2023 Completions	% Change
Distance Offered Programs	0	0	0.0%
Non-Distance Offered Programs	22	20	-9.1%
All Programs	22	20	-9.1%

Target Occupations

2,976	+7.8%	$27.20/hr $56.6K/yr	401
Jobs (2024) 25% above National average	% Change (2024-2029) Nation: +7.5%	Median Earnings Nation: $30.07/hr; $62.6K/yr	Annual Openings

Occupation	2024 Jobs	Annual Openings	Median Earnings	Growth (2024 - 2029)
Food Science Technicians	1,660	271	$22.97/hr	+6.20%
Food Scientists and Technologists	1,316	129	$40.18/hr	+9.73%

Regional Trends



Region	2024 Jobs	2029 Jobs	Change	% Change
Region	2,976	3,207	231	7.8%
Nation	33,143	35,628	2,485	7.5%

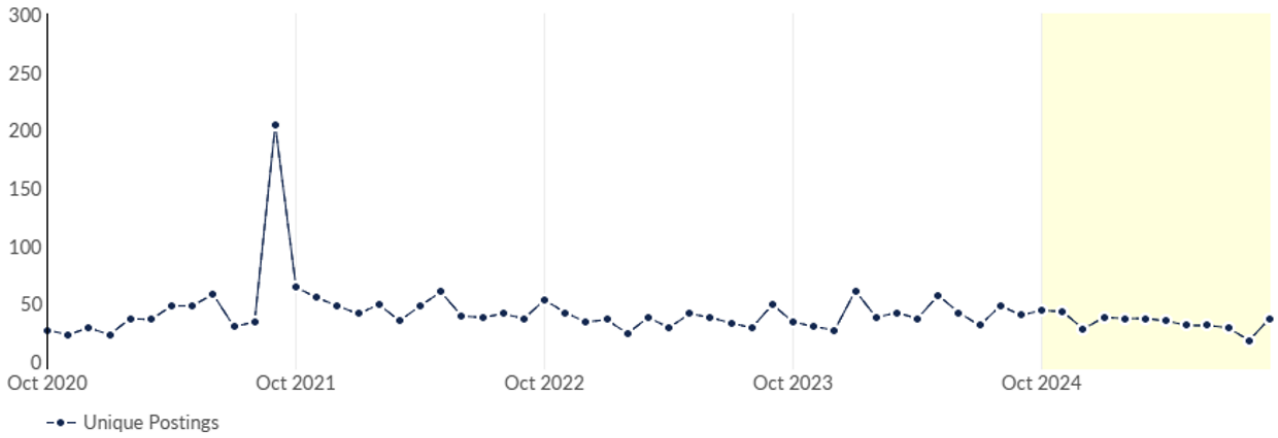
Job Postings Summary

408	3 : 1	159	29 days
Unique Postings 1,026 Total Postings	Posting Intensity Regional Average: 3 : 1	Employers Competing 127,956 Total Employers	Median Posting Duration Regional Average: 25 days

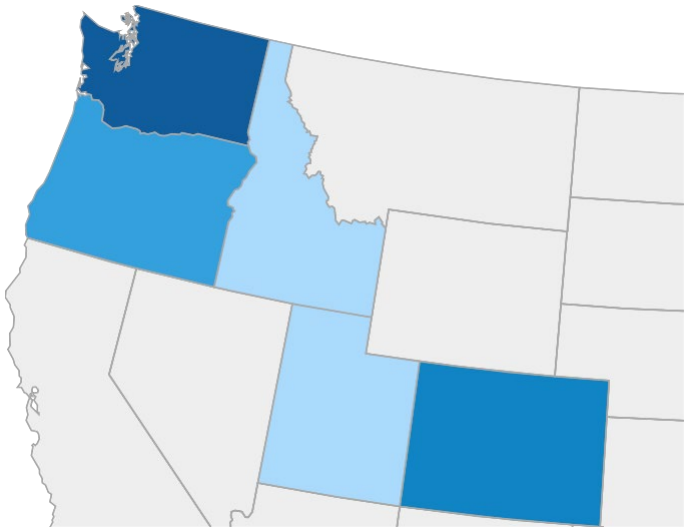
There were 1,026 total job postings for your selection from October 2024 to September 2025, of which 408 were unique. These numbers give us a Posting Intensity of 3-to-1, meaning that for every 3 postings there is 1 unique job posting.

This is close to the Posting Intensity for all other occupations and companies in the region (3-to-1), indicating that they are putting average effort toward hiring for this position.

Unique Postings Trend



Job Postings Regional Breakdown



State	Unique Postings (Oct 2024 - Sep 2025)
Washington	**117**
Colorado	**109**
Oregon	**76**
Utah	**54**
Idaho	**52**

Top Posted Occupations

Occupation (SOC)	Total/Unique (Oct 2024 - Sep 2025)	Posting Intensity	Median Posting Duration
Food Scientists and Technologists	738 / 313	2 : 1	29 days
Food Science Technicians	288 / 95	3 : 1	28 days

Top Posted Job Titles

Job Title	Total/Unique (Oct 2024 - Sep 2025)	Posting Intensity	Median Posting Duration
Food Scientists	121 / 46	3 : 1	29 days
Food Safety Quality Assurance Technicians	86 / 25	3 : 1	29 days
Food Equipment Service Technicians	59 / 15	4 : 1	40 days
Agricultural Technicians	50 / 14	4 : 1	26 days
Food Technologists	16 / 12	1 : 1	31 days
Product Development Scientists	26 / 12	2 : 1	25 days
Agriculture Interns	22 / 10	2 : 1	8 days
Food Safety Technicians	23 / 10	2 : 1	28 days
Research and Development Interns	30 / 9	3 : 1	22 days
Postdoctoral Research Associates	9 / 7	1 : 1	32 days

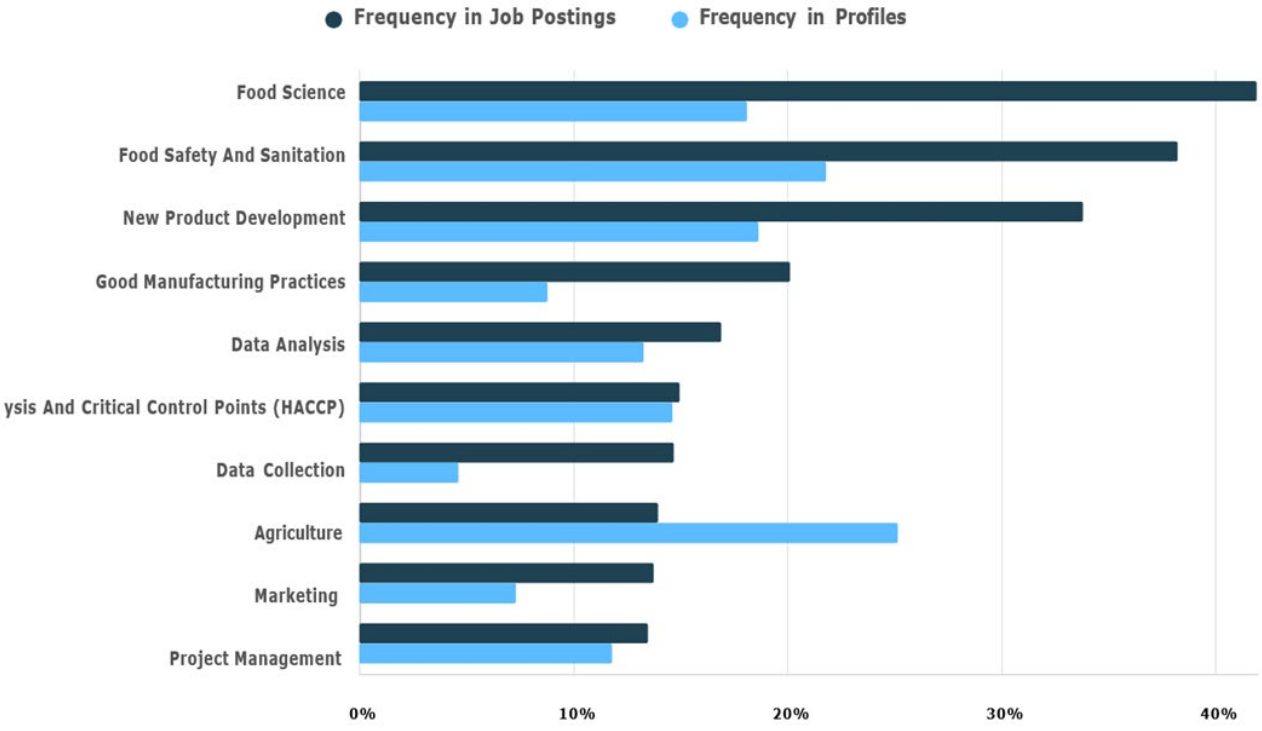
Rank as a Talent Provider

Lightcast's workforce profile data shows Washington State University has 52 alumni working regionally in the occupations *Food Scientists and Technologists* and *Food Science Technicians*. These 52 alumni represent 6.36% of regional profiles working in these occupations, which ranks your institution 2nd among regional talent providers.

52	6.36%	2
Your Alumni in Region Working in Target Occupations	Percent of Regional Profiles Working in Target Occupations	Your Rank as a Regional Talent Provider

Relevant Skills

Top Specialized Skills



Skills	Postings	% of Total Postings	Profiles	% of Total Profiles	Projected Skill Growth	Skill Growth Relative to Market
Food Science	171	42%	134	18%	+14.1%	Growing
Food Safety And Sanitation	156	38%	161	22%	+11.7%	Growing
New Product Development	138	34%	138	19%	+24.1%	Rapidly Growing
Good Manufacturing Practices	82	20%	65	9%	+13.1%	Growing

Top Talent Providers

The top regional institutions supplying the labor market with workers employed in the target occupations listed above, based on Lightcast's workforce profile data.

School	Profiles	Percent
Oregon State University	65	7.95%
Washington State University	52	6.36%
Colorado State University-Fort Collins	45	5.50%
Brigham Young University	28	3.42%
Kansas State University	21	2.57%
University of Idaho	19	2.32%
Utah State University	19	2.32%
University of Wisconsin-Madison	14	1.71%
University of California-Davis	13	1.59%
University of Washington-Seattle Campus	12	1.47%