

FOOD SCIENCE... NOW WHAT?

Quick Facts: Agricultural and Food Scientists	
2020 Median Pay	\$68,830 per year
Entry-Level Education	Bachelor's degree
Work Experience in a Related Occupation	None
On-the-job Training	None
Number of Jobs, 2019	34,800
Job Outlook, 2019-29	6% (Faster than average)
Employment Change, 2019-29	2,000

[Found on the Occupational Outlook Handbook, <https://www.bls.gov/ooh/life-physical-and-social-science/agricultural-and-food-scientists.htm>]

What is Food Science?

Food science is the real-life application of chemistry, chemical engineering, microbiology, nutrition, physics, statistics, and law to the production, processing, preservation, evaluation, and distribution of food. Food scientists want to understand food processes to ultimately improve food products and processes for the general public along with the assurance of food safety and quality. They do this by developing high standards of quality and safety, new methods of manufacture, preservation, and storage of foods, new products, and new packaging materials/methods.

The basis of the discipline lies in an understanding of the chemistry of food components, such as proteins, carbohydrates, fats and water and the reactions they undergo during processing and storage. A complete understanding of processing and preservation methods is required including drying, freezing, pasteurization, canning, irradiation, extrusion, to name just a few. The ability to carry out analysis of food constituents is developed along with statistical quality control methods. The microbiology and the safety aspects of food must also be understood. Other topics covered include food additives, the physico-chemical properties of food, flavor chemistry, product development, food engineering and packaging.

What do food scientists do?

Applying additional concepts from animal science, nutrition, physics, statistics, and law, food scientists study the physical, microbiological, and chemical makeup of food, and are responsible for developing safe, nutritious, and abundant foods using cost effective methods. Agricultural and food scientists research ways to improve the efficiency and safety of agricultural establishments and products. They improve the quality, safety, storage and taste of our food. They may work for private industry to develop new products or improve processing. They may also work for government agencies such as the Food and Drug Administration to inspect food products and handlers to protect us from contamination or harmful practices. Food scientists test products to supply information used for the nutrition labels or to determine how packaging and storage affects the safety and quality of the food. Flavorists work with chemicals to change the taste of food, improve sensory appeal, by enhancing color, odor or texture. Graduates in Food Science may work in the industry, or may seek additional graduate or professional training in medicine, dentistry, business and law.

Work Environment

Agricultural and food scientists work in laboratories, in offices, and in the field. Most agricultural and food scientists work full time.

How to Become an Agricultural or Food Scientist

Agricultural and food scientists need at least a bachelor's degree from an accredited postsecondary institution, although many get advanced degrees.

Sample of Companies that have hired UMass Amherst Food Science graduates in recent years:

- Diluigi Foods
- Markforged
- Boston Beer Company
- Valley Shepherd Creamery
- Anheuser-Busch
- US Army
- The Kraft Heinz Company
- Crossfit One Nation
- Summit Nutritional Lab
- Lindt Chocolate (USA), Inc.
- Dunkin' Brands
- Natural Alternatives International
- Damascus Bakery
- Worldcare Clinical
- ripe.io
- Tribe Hummus, Nestlé
- Laird Superfood
- Harvard Bioscience
- Allen Flavors Inc.
- Taza Chocolate
- SharkNinja
- BeVrada
- Vermont Creamery
- Harbar LLC
- Ocean Spray Cranberries

Where Might I Do an Internship?

UMass Amherst Food Science students have held internships at the following sites:

- Cedar's Mediterranean Food
- SharkNinja
- IBM (China)
- FoodState Inc.
- Pepperidge Farms
- Roar Wines
- Agrimark
- Friendly's Ice Cream
- Nestle Purina
- HP Hood
- Bill State Milling
- Kraft Heinz
- Lightlife Foods
- MassPIRG
- Nestle
- Nu Products Seasoning
- Bigelow Tea
- August West Wines
- Campbell's
- ConAgra Foods
- Dunkin' Brands
- Israel Way Oranim Project
- US Food and Drug Administration (FDA)
- Analytical Testing Laboratory

What are some of the job titles in food science?

Food Research and Development Scientist

- Develops new and improved food products and processes to meet consumer wants and needs
- Develops laboratory prototypes and participates in factory scale-up to produce products found on grocery store shelves

Quality Assurance Director

- Monitors food processing and assures final product quality
- Generates specifications and supervises analyses of raw materials and ingredients

Food Plant Production Manager

- Manages and supervises food processing plant employees; solves production problems
- Monitors supplies and equipment to assure economical production

Food Ingredient Technical Salesman

- Contacts industrial users of food ingredients
- Provides technical insight and help
- Often requires travel

Food Molecular Biologist

- Manipulates cells to produce useful food ingredients, flavors, and other components
- Transforms genetic characteristics of food commodities to enhance production, processing, and final product attributes

College Teacher, Professor

- Instructs students
- Conducts basic and applied food research

More Job Titles in Food Science:

- Food Scientist
- Biochemist
- Cereal Scientist
- Dairy Products Scientist
- Director of Quality Assurance
- FDA/USDA Research Scientist
- Flavor Chemist
- Food Biochemist
- Food Biotechnologist
- Food Chemist
- Food Engineer
- Food Industry R&D
- Food Ingredient Sales
- Food Inspector
- Food Microbiologist
- Food Product Consultant
- Food Product Developer
- Food Safety Inspector
- Food Technologist
- Food Toxicologist
- General Manager, Research
- Laboratory Director
- Manager, Analytical Lab
- Manager, Meat Applications
- Market Researcher
- Meat Scientist
- Natural Products Researcher
- New Technologies
- Packaging Specialist
- Plant Manager
- Plant Supervisor
- Product Development
- Project Leader, Technology
- Project/Product Manager
- Public Health Official
- Quality Assurance Director
- Quality Assurance Manager
- Quality Assurance Supervisor
- Research and Development
- Research Scientist
- Quality Assurance Officer
- Sales Manager
- Scientific and Regulatory Affairs
- Scientific Research
- Senior Food Scientist
- Sensory Evaluation Expert
- Sensory Scientist
- Technology Development Manager
- Technical Sales Representative

Who Could I Work For?

Some of the Largest Food Companies:

- Alaska General Seafoods
- Anheuser-Busch Co.
- Archer Daniels Midland
- Campbell Soup Co.
- Cargill Inc.
- Con Agra
- Dannon
- Dole Foods Co.
- General Mills Inc.
- Gorton's
- Hershey Foods
- H.J. Heinz
- Hormel Foods Corp.
- Kellogg Co.
- Kraft Foods Group
- Mars Inc.
- Nabisco, Inc.
- Nestle
- Ocean Spray
- PepsiCo, Inc.
- Proctor & Gamble
- Quaker Oats Co.
- Sara Lee Corp.
- Taco Bell
- Tyson Foods Inc.
- Unilever
- Welch's

Additional Employers in the Food Sciences:

- Odwalla
- FDA
- General Mills
- Idahoan Foods
- Mio Liquid Flavors
- LDS Welfare Services
- Leprino Foods
- Lofthouse Cookies
- McCain Foods
- McCormick Spices
- Meadow Gold Dairy
- Morinda
- Mrs. Fields Original Cookies
- National Food Processors Association
- Nature's Sunshine
- Nuskin
- Nutraceutical Corporation
- Otis Spunkmeyer
- Otto & Sons
- Rich's Corporation
- Shasta
- Stouffer's Frozen Foods
- Sunkist
- Sweet's Candy
- Twin Lab
- USDA
- Weider Nutrition International

Career Planning Resources & Websites

UMass Amherst CNS Career Center	cns.umass.edu/careers
UMass Amherst Career Services Events Calendar	www.umass.edu/careers
UMass Food Science Club	https://www.foodsci.umass.edu/about/
FOCUS2 Career and Education Planning	www.umass.edu/careers/planning for sign-in button
What Can I Do With This Major?	https://www.umass.edu/careers/planning

(Click on "What Can I do with this Major" icon on the right-hand column.)

Bureau of Labor Statistics Occupational Outlook Handbook	www.bls.gov/ooh/agricult-and-food-scientists
Bureau of Labor Statistics Occupational Outlook Handbook	www.bls.gov/ooh/food-science-technicians
O-Net: "Food Science"	www.onetonline.org
Massachusetts Career Information System	http://masscis.intocareers.org
	<i>(Click Mass Resident to login with "Amherst/01003" Then click "Occupations" or "Assessments")</i>
Getting Started with Research at UMass	https://www.umass.edu/studentsuccess/career/research
Potential Career Paths and Salaries in Food Sci	http://foodscience.psu.edu/majors/careers
* Institute for Food Technologists Career Learning Ctr	http://careers.ift.org/jobseekers/resources
Guide for Nutrition and Food Science Majors	www.worldwidelearn.com
Top 10 Careers in Agriculture	http://sfs.wsu.edu/prospective-students/faq
Food Sci Undergrad and Grad Programs	http://www.ift.org/community/students.aspx

Food Science Job Search Resources (* = of particular note)

* UMass Handshake Database of Internships & Jobs	https://umass.joinhandshake.com/
Cereals & Grains Association	https://www.cerealsgrains.org/
American Chemical Society	www.acs.org/content/acs/en/careers.html
American Society for Microbiology: Career Connections	www.asmcareerconnections.org
AOAC International (agricultural chemistry)	https://www.aoac.org/
* Careers In Food	www.careersinfood.com
Careers in Food Science (UC Davis List)	https://foodscience.ucdavis.edu
Food Force	https://forcebrands.com/foodforce
Food Service / Food System Jobs	https://www.goodfoodjobs.com/search
Local Food Lab Blog	https://localfoodlab.com/
* Local Food Science Jobs on LinkedIn	www.linkedin.com/vsearch/j?type=jobs
* Institute of Food Technologists (IFT)	http://careers.ift.org/jobseekers/index.cfm
Society for Industrial Microbiology and Biotech	http://careers.simbhq.org

General Science Jobs

* Life Sciences Recruiters for multiple companies	www.propelcareers.com
* More sites for Life Science Jobs	www.masslifesciences.com/resources
General Science Jobs (widely defined)	http://jobs.sciencecareers.org

General Science Jobs (widely defined) <http://jobs.newscientist.com>
NatureJobs (widely defined) www.nature.com/naturejobs/science/
Science Journal www.sciencemag.org/careers
List of Science Job Sites <http://botw.org/top/Science/Employment>

Government Agencies

Food and Drug Administration (FDA) jobs <https://www.fda.gov/>
US Dept of Agriculture (USDA) jobs <https://www.usajobs.gov/Search/Results?d=AG>

Internships and Research Opportunities

* Finding Independent Lab Research On Campus www.umass.edu/biochem/undergraduate/lab
* Office of Undergraduate Research and Studies (OURS) www.umass.edu/ours
* Mass Life Sciences Internship Program www.masslifesciences.com/programs
* STEM Internships in Federal Government <https://www.science.gov>
* Summer STEM Research Opportunities www.pathwaystoscience.org/Undergrads

Food Science Professional Organizations

Cereals & Grains Association <https://www.cerealsgrains.org/>
American Chemical Society (ACS) www.acs.org
American Dairy Science Association (ADSA) www.adsa.org
American Meat Science Association (AMSA) www.meatscience.org
American Oil Chemists' Society (AOCS) www.aocs.org
American Society of Microbiology (ASM) www.asm.org
AOAC International (agricultural chemists) www.aoac.org
Food Marketing Institute (FMI) www.fmi.org
Institute for Food Safety and Health (IFSH) www.iit.edu/ifsh
Institute of Food Safety and Technology (IFST) www.ifst.org
* Institute of Food Technologists (IFT) www.ift.org
* IFT Student Association (IFTSA) <https://www.ift.org/community/students>
Intl Union of Food Science and Technology (IUFoST) www.iufost.org
Society for Industrial Microbiology (SIM) www.simbhq.org
IFT List of International Organizations www.ift.org/about-us/allied-organizations.aspx
* USDA list of additional professional organizations <http://fnic.nal.usda.gov/professional>

Important Transferable Skills to Include On Your Resume

Communication skills. Communication skills are critical for agricultural and food scientists. They must explain their studies: what they were trying to learn, the methods they used, what they found, and what they think the implications of their findings are. They must also communicate well when working with others, including technicians and student assistants.

Critical-thinking skills. Agricultural and food scientists must use their expertise to determine the best way to answer a specific research question.

Data-analysis skills. Agricultural and food scientists, like other researchers, collect data using a variety of methods, including quantitative surveys. They must then apply standard data analysis techniques to understand the data and get the answers to the questions they are studying.

Math skills. Agricultural and food scientists, like many other scientists, must have a sound grasp of mathematical concepts.

Observation skills. Agricultural and food scientists conduct experiments that require precise observation of samples and other data. Any mistake could lead to inconclusive or inaccurate results.

Analytical skills. Must be able to conduct scientific experiments and analyses with accuracy and precision.

Interpersonal skills. Typically work on research teams and need to be able to work well with others toward a common goal. Many also serve as team leaders and must be able to motivate and direct other team members.

Math skills. Regularly use complex equations and formulas in their work, and they need a broad understanding of mathematics, including calculus and statistics.

Perseverance. Scientific research involves substantial trial and error, and one must not become discouraged.

Problem-solving skills. Use scientific experiments and analysis to find solutions to complex scientific problems.

Speaking skills. Frequently give presentations and must be able to explain their research to others.

Writing skills. Write memos, reports, and research papers that explain their findings.

What Do Employers Look For? (NACE 2020 Job Outlook for Students)

