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Labor Market Analysis

Food Science and Technology

Prepared by Central Valley/Mother Lode Center of Excellence

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Summary

The Central Valley/Mother Lode Center of Excellence developed this report for College of the Sequoias to determine whether there is demand in the local labor market that is not being met by the supply from postsecondary programs. This report summarizes labor market demand, wages, skills, and postsecondary supply for the following four *Food Science and Technology occupations*:

- Food Scientists and Technologists (19-1012)
- Agricultural Technicians (19-4012)
- Food Science Technicians (19-4013)
- Agricultural Inspectors (45-2011)

Key Findings

- **Occupational Demand —** Occupations related to *Food Science and Technology* have a labor market demand of 240 annual job openings in the South Central Valley/Southern Mother Lode (SCV/SML) subregion. Between 2022 and 2027, *food science technicians* are projected to have the most demand with 79 annual job openings.

- **Wages —** Average entry-level earnings of $20.32/hour for *Food Science and Technology occupations* are higher than the living wage in the SCV/SML subregion.[1] *Food scientists and technologists* earn the highest entry-level wage, $28.44/hour.

- **Employers and Job Titles —** Employers in the SCV/SML subregion include University of California, California Public Utilities Commission, and Foster Farms. The most common job titles in the subregion are Agricultural Technicians, Food Service Technicians, and Agricultural Specialists.

- **Skills —** The top baseline skill is operations; the top specialized skill is food science; and the top software skill is Microsoft Excel.

- **Education —** An associate degree is typically required for *agricultural technicians* and *food science technicians*. A bachelor's degree is typically required for *food scientists and technologists* and *agricultural inspectors*.

- **Supply and Demand Analysis —** Based on 240 annual openings (i.e., demand) and 42 postsecondary degrees awarded (i.e., supply), an analysis of supply and demand suggests there is an undersupply of 198 workers in the SCV/SML subregion. In the CVML region, 63 awards were conferred suggesting an undersupply of 316 workers (based on 379 annual openings in the CVML region).

Recommendation

Based on a comparison of demand and supply, there is an undersupply of trained workers in the SCV/SML subregion and the CVML region. The Center of Excellence recommends that College of the Sequoias work with the regional directors, the college's advisory board, and local industry in the expansion of programs to address the shortage of Food Science and Technology workers.

[1] The term "living wage" in Center of Excellence reports is calculated by averaging the self-sufficiency wages from the Insight Center's California Family Needs Calculator for each county in the subregion: https://insightcced.org/tools-metrics/self-sufficiency-standard-tool-for-california/.

Introduction

The Central Valley/Mother Lode Center of Excellence developed this report to provide College of the Sequoias with labor market information for *Food Science and Technology*. The geographical focus for this report is the South Central Valley/Southern Mother Lode (SCV/SML) subregion, but regional demand and supply data has been included for broader applicability and use. Analysis of the program and occupational data related to *Food Science and Technology* is included in the report. The Standard Occupational Classification (SOC) System codes and occupational titles used in this report are from the Bureau of Labor Statistics and O*NET OnLine.

Food Scientists and Technologists (SOC 19-1012)

- **Job Description:** Use chemistry, microbiology, engineering, and other sciences to study the principles underlying the processing and deterioration of foods; analyze food content to determine levels of vitamins, fat, sugar, and protein; discover new food sources; research ways to make processed foods safe, palatable, and healthful; and apply food science knowledge to determine best ways to process, package, preserve, store, and distribute food.
- **Knowledge:** Food Production, Biology, Chemistry, Production and Processing, English Language
- **Skills:** Active Listening, Reading Comprehension, Writing, Complex Problem Solving, Critical Thinking

Agricultural Technicians (SOC 19-4012)

- **Job Description:** Work with agricultural scientists in plant, fiber, and animal research, or assist with animal breeding and nutrition. Set up or maintain laboratory equipment and collect samples from crops or animals. Prepare specimens or record data to assist scientists in biology or related life science experiments. Conduct tests and experiments to improve yield and quality of crops or to increase the resistance of plants and animals to disease or insects.
- **Knowledge:** Mathematics, Biology, Chemistry, Administration and Management, English Language
- **Skills:** Active Listening, Reading Comprehension, Complex Problem Solving, Writing, Critical Thinking

Food Science Technicians (SOC 19-4013)

- **Job Description:** Work with food scientists or technologists to perform standardized qualitative and quantitative tests to determine physical or chemical properties of food or beverage products. Includes technicians who assist in research and development of production technology, quality control, packaging, processing, and use of foods.
- **Knowledge:** Production and Processing, Food Production, Chemistry, Biology, English Language
- **Skills:** Active Listening, Reading Comprehension, Speaking, Writing, Critical Thinking

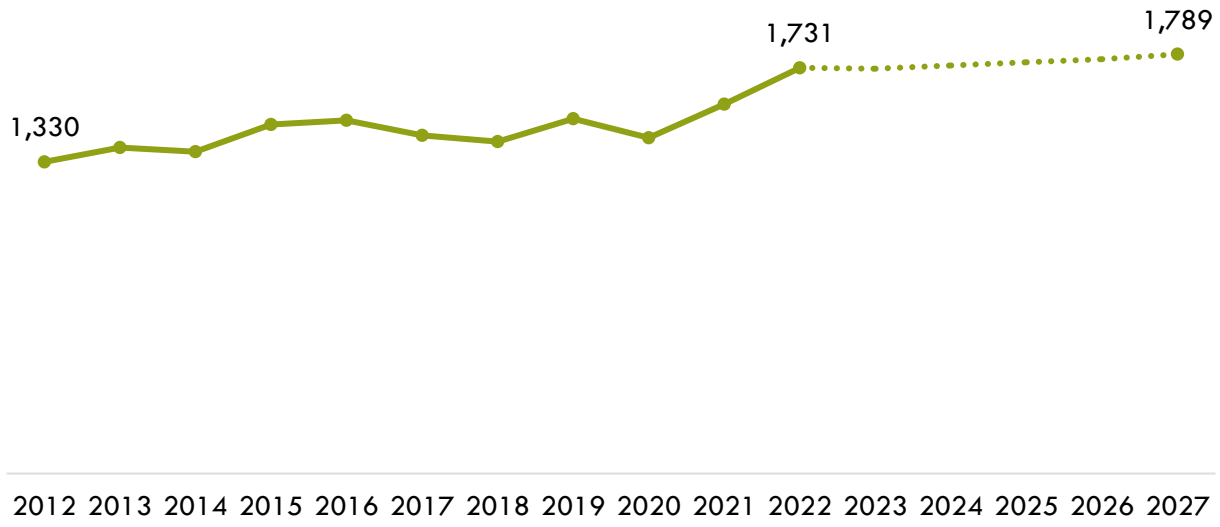
Agricultural Inspectors (SOC 45-2011)

- **Job Description:** Inspect agricultural commodities, processing equipment, and facilities, and fish and logging operations, to ensure compliance with regulations and laws governing health, quality, and safety.
- **Knowledge:** Customer and Personal Service, Administration and Management, Administrative, Law and Government, Mathematics
- **Skills:** Active Listening, Critical Thinking, Monitoring, Reading Comprehension, Quality Control Analysis

Employment

Exhibit 1a shows employment trends for the four *Food Science and Technology* occupations in the SCV/SML subregion. Between 2022 to 2027, the number of jobs for the four occupations of interest is projected to increase by 58, growing by 3%.

Exhibit 1a. Historical employment and projected occupational demand for occupations related to *Food Science and Technology* in the SCV/SML subregion, 2012-2027



Occupations related to *Food Science and Technology* in the SCV/SML subregion employed 1,731 workers in 2022 (Exhibit 1b). *Food Science Technicians* are projected to have the most demand with 79 annual job openings.

Exhibit 1b. Current employment and projected occupational demand for occupations related to *Food Science and Technology* in the SCV/SML subregion, 2022-2027

Occupation	2022 Jobs	2027 Jobs	5-Year Change	5-Year % Change	Annual Openings
Food Scientists and Technologists	304	312	8	3%	27
Agricultural Technicians	438	445	7	2%	59
Food Science Technicians	545	570	24	4%	79
Agricultural Inspectors	444	462	18	4%	75
TOTAL	**1,731**	**1,789**	**58**	**3%**	**240**

Wages

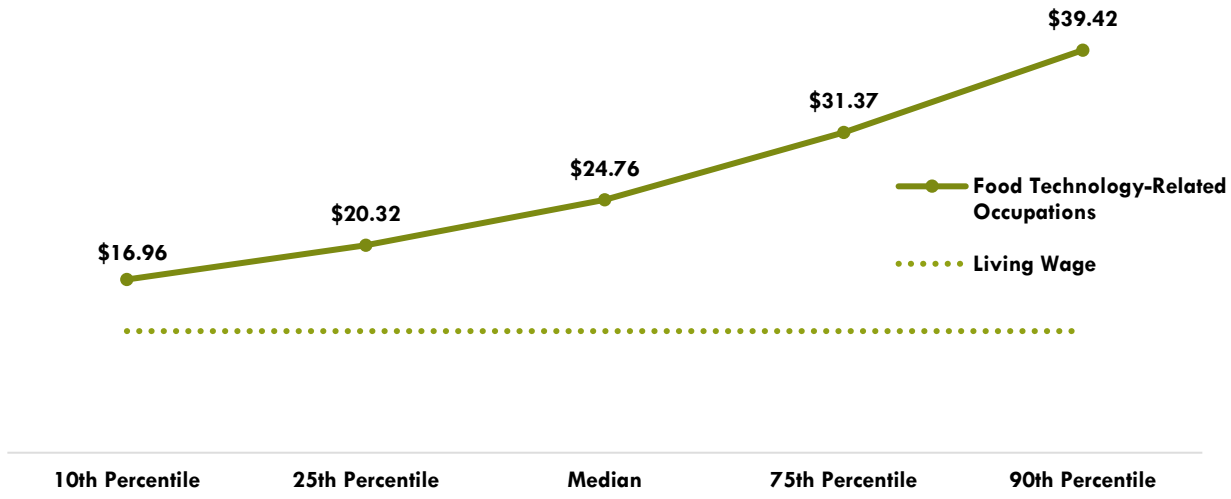
Exhibit 2a shows the hourly wages for each occupation studied in this report.[2]

Exhibit 2a. Hourly wages for occupations related to *Food Science and Technology* in the SCV/SML subregion

Occupation	25th Percentile Hourly Earnings	Median Hourly Earnings	75th Percentile Hourly Earnings
Food Scientists and Technologists	$28.44	$36.79	$46.75
Agricultural Technicians	$16.19	$18.03	$24.12
Food Science Technicians	$18.04	$21.57	$26.32
Agricultural Inspectors	$18.59	$22.65	$28.29

Exhibit 2b shows the average hourly wages for *Food Science and Technology* occupations; all five average wages shown below are higher than the living wage for the SCV/SML subregion.

Exhibit 2b. Average hourly wages for occupations related to *Food Science and Technology* in the SCV/SML subregion



[2] Note: 10th and 25th percentiles are considered entry-level wages while 75th and 90th are considered experienced wages, which may be obtained through long-term employment or extra training, etc.

Job Postings

There were 302 unique job postings for the four occupations related to *Food Science and Technology* in the SCV/SML subregion from May 2023 to April 2024.[3]

Top Employers

The employers with the most job postings are listed in Exhibit 3. The top employers in online job postings were University of California, California Public Utilities Commission, and Foster Farms.

Exhibit 3. Top employers of *Food Science and Technology* in job postings

Employer
University of California
California Public Utilities Commission
Foster Farms
JG Boswell Company
Grimmway Enterprises
Wilbur-Ellis
GPAC
State of California

Top Job Titles

Exhibit 4 shows the top job titles for *Food Science and Technology* in the SCV/SML subregion. Common job titles in postings include Agricultural Technicians, Food Service Technicians, and Agricultural Specialists.

Exhibit 4. Top job titles in job postings for *Food Science and Technology*

Job Title
Agricultural Technicians
Food Service Technicians
Agricultural Specialists
Agricultural Assistants
Food Safety Inspectors

[3] Other than occupational titles and job titles, the categories below can be counted one or multiple times per job posting, and across several areas in a single posting. For example, a skill can be counted in two different skill types, and an employer can indicate more than one education level.

Salaries

Exhibit 5 shows the "Market Salaries" for *Food Science and Technology*. These are calculated by Lightcast using a machine learning model built from millions of job postings every year. This accounts for adjustments based on location, industry, skills, experience, education, among other variables.

Exhibit 5. Market salaries for *Food Science and Technology*

Market Salary	Job Postings
$30,000-$34,999	13
$35,000-$39,999	38
$40,000-$44,999	46
$45,000-$49,999	20
$50,000-$54,999	17
$55,000-$59,999	13
$60,000-$64,999	6
$65,000-$69,999	6
$70,000-$74,999	16
$75,000+	56

Education

Of the 302 unique job postings, 214 listed a preferred or minimum educational requirement for the position being filled. Among those, 49% requested a bachelor's degree (Exhibit 6).

Exhibit 6. Education levels requested in job postings for *Food Science and Technology*

Education Level	Job Postings	% of Job Postings
High school or GED	62	29%
Associate degree	25	12%
Bachelor's degree	105	49%
Master's degree	22	10%

Baseline, Specialized, and Software Skills

Exhibit 7 depicts the top baseline, specialized, and software skills in job postings. The most common baseline skill is operations. The most common specialized skill is food science. The most common software skill is Microsoft Excel.

Exhibit 7. In-demand baseline, specialized, and software skills for *Food Science and Technology* in job postings

Baseline Skills	Specialized Skills	Software Skills
Operations	Food Science	Microsoft Excel
Communications	Food Safety and Sanitation	Microsoft PowerPoint
Detail Oriented	Agriculture	Microsoft Outlook
Quality Assurance	Fertilizers	Microsoft Office
Management	Soil Science	Microsoft Word

Education, Work Experience, & Training

An associate degree is typically required for *agricultural technicians* and *food science technicians*. A bachelor's degree is typically required for *food scientists and technologists* and *agricultural inspectors* (Exhibit 8).

Exhibit 8. Education, work experience, training, for occupations related to *Food Science and Technology*

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training
Food Scientists and Technologists	Bachelor's degree	None	None
Agricultural Technicians	Associate degree	None	Moderate-term on-the-job training
Food Science Technicians	Associate degree	None	Moderate-term on-the-job training
Agricultural Inspectors	Bachelor's degree	None	Moderate-term on-the-job training

Supply

An analysis of program data from the Integrated Postsecondary Education Data System (IPEDS) for the last three program years shows that, on average, 42 awards were conferred in the SCV/SML subregion (Exhibit 9 and 10).

Exhibit 9. TOP and CIP codes for *Food Science and Technology*

TOP Titles	CIP Titles
0101.00 - Agriculture Technology and Sciences, General	01.0102 - Agribusiness/Agricultural Business Operations
0113.00 - Food Processing and Related Technologies	01.0401 - Agricultural and Food Products Processing
	01.1002 - Food Technology and Processing

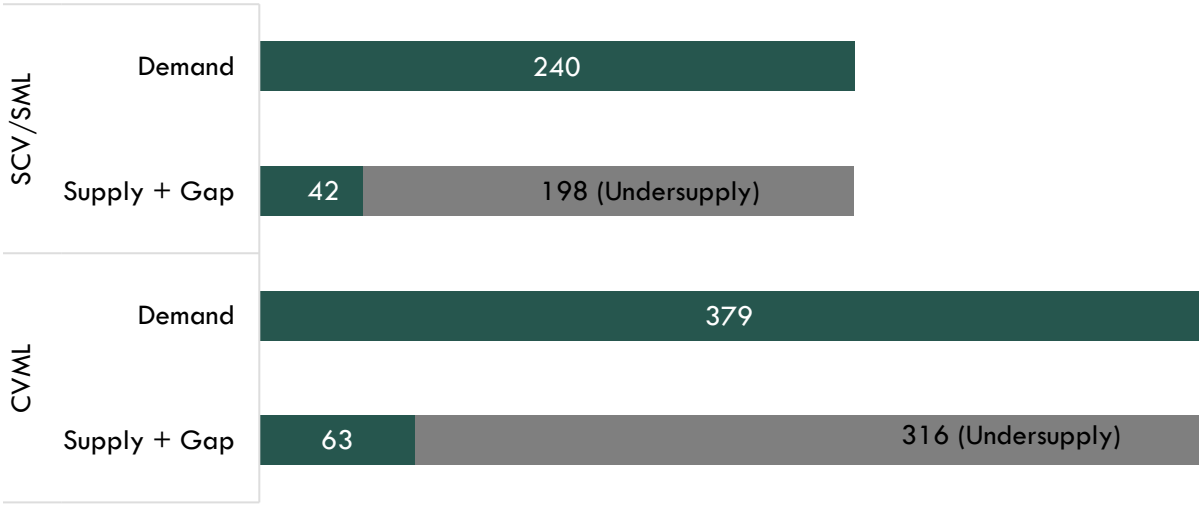
Exhibit 10. Postsecondary supply for *Food Science and Technology*

TOP/CIP Code- Title	College	Associate Degree	Certificate 18 < 30 Semester Units	Certificate 16 < 30 Semester Units	Certificate 8 < 16 Semester Units	Certificate 6 < 18 Semester Units	TOTAL
010100 - Agriculture Technology and Sciences, General	Merced	8					8
	Modesto	5			8		13
	Porterville	9					9*
	Reedley College	1					1*
	West Hills Coalinga	15	7			7	29*
010400 - Viticulture, Enology, and Wine Business	Reedley College			1			1*
011300 - Food Processing and Related Technologies	Bakersfield	1					1*
	Clovis						0*
	Sequoias					1	1*
SCV/SML TOTAL		**26**	**7**	**1**	**0**	**8**	**42**
CVML TOTAL		**39**	**7**	**1**	**8**	**8**	**63**

*SCV/SML awards

There is an undersupply of 198 *Food Science and Technology* workers in the SCV/SML subregion and an undersupply of 316 workers in the region (Exhibit 11).

Exhibit 11. *Food Science and Technology* workforce demand (annual job openings), postsecondary awards (supply), and additional students needed to fill gap in the SCV/SML subregion and region



Recommendation

This report suggests there is a shortage of 198 workers in the SCV/SML subregion and a shortage of 316 workers in the CVML region for *Food Science and Technology*. Based on these findings, it is recommended that College of the Sequoias work with the regional directors, the college's advisory board, and local industry in the expansion of programs to address the shortage of *Food Science and Technology* workers in the region.

Appendix: Methodology & Data Sources

Data Sources

Labor market and educational supply data compiled in this report derive from a variety of sources. Data were drawn from external sources, including the Economic Modeling Specialists, Inc., the California Community Colleges Chancellor's Office Management Information Systems Data Mart, and the National Center for Educational Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS). Below is the summary of the data sources found in this study.

Data Type	Source
Labor Market Information/Population Estimates and Projections/Educational Attainment	Economic Modeling Specialists, Intl. (LIGHTCAST). LIGHTCAST occupational employment data are based on final LIGHTCAST industry data and final LIGHTCAST staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors). Occupational wage estimates also affected by county-level LIGHTCAST earnings by industry: economicmodeling.com.
Typical Education Level and On-the-job Training	Bureau of Labor Statistics (BLS) uses a system to assign categories for entry-level education and typical on-the-job training to each occupation for which BLS publishes projections data: https://www.bls.gov/emp/tables/educational-attainment.htm.
LaunchBoard	Chancellor's LaunchBoard. https://www.calpassplus.org/LaunchBoard/SWP.aspx
Labor Force, Employment and Unemployment Estimates	California Employment Development Department, Labor Market Information Division: labormarketinfo.edd.ca.gov.
Job Posting and Skills Data	Lightcast. https://lightcast.io/.
Additional Education Requirements/ Employer Preferences	The O*NET Job Zone database includes over 900 as well as information on skills, abilities, knowledge, work activities and interests associated with specific occupations: onetonline.org.

Key Terms and Concepts

Annual Job Openings: Annual openings are calculated by dividing the number of years in the projection period by total job openings.

Education Attainment Level: The highest education attainment level of workers age 25 years or older.

Employment Estimate: The total number of workers currently employed.

Employment Projections: Projections of employment are calculated by a proprietary Economic Modeling Specialists, Intl. (LIGHTCAST) formula that includes historical employment and economic indicators along with national, state, and local trends.

LaunchBoard (Attained the Living Wage): Among SWP students who exited college and did not transfer to any postsecondary institution, the proportion who attained the district county living wage for a single adult measured immediately following academic year of exit.

LaunchBoard (Median Annual Earnings): Among SWP students who exited the community college system and who did not transfer to any postsecondary institution, median earnings following the academic year of exit.

LaunchBoard (Median Change in Earnings): Among SWP students who exited and who did not transfer to any postsecondary institution, median change in earnings between the second quarter prior to the beginning of the academic year of entry and the second quarter after the end of the academic year of exit from the last college attended.

LaunchBoard (Job Closely Related to Field of Study): Among SWP students who responded to the CTE Outcomes Survey and did not transfer to any postsecondary institution, the proportion who reported that they are working in a job very closely or closely related to their field of study.

Living Wage: The cost of living in a specific community or region for one adult and no children. The cost increases with the addition of children.

Occupation: An occupation is a grouping of job titles that have a similar set of activities or tasks that employees perform.

Percent Change: Rate of growth or decline in the occupation for the projected period; this does not factor in replacement openings.

Replacements: Estimate of job openings resulting from workers retiring or otherwise permanently leaving an occupation. Workers entering an occupation often need training. These replacement needs, added to job openings due to growth, may be used to assess the minimum number of workers who will need to be trained for an occupation.

Total Job Openings (New + Replacements): Sum of projected growth (new jobs) and replacement needs. When an occupation is expected to lose jobs, or retain the current employment level, number of openings will equal replacements.

Typical Education Requirement: represents the typical education level most workers need to enter an occupation.

Typical On-The-Job Training: indicates the typical on-the-job training needed to attain competency in the skills needed in the occupation.