

April 2021

Labor Market Analysis

Meat Science and Processing

POWERED BY



California
Community
Colleges



Prepared by the Central Valley/Mother Lode Center of Excellence

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COVID-19 Statement: This report includes employment projection data by Emsi. Emsi's projections are modeled on recorded (historical) employment figures and incorporate several underlying assumptions, including the assumption that the economy during the projection period will be at approximately full employment or potential output. To the extent that a recession or labor shock, such as the economic effects of COVID-19, can cause long-term structural change, they may impact the projections. At this time, it is not possible to quantify the impact of COVID-19 on projections of industry and occupational employment. Other measures such as unemployment rates and monthly industry employment estimates will reflect the most recent information on employment and jobs in the state and, in combination with input from local employers, may help validate current and future employment needs as depicted here.

If for any reason this document is not accessible or if you have specific needs for readability, please contact us and we will do our utmost to accommodate you with a modified version. To make a request, contact Nora Seronello by phone at (209) 575-6894 or by email seronellon@mjc.edu.

Summary

Please note the COVID-19 statement on page 2 when considering this report's findings.

This study conducted by the Central Valley/Mother Lode Center of Excellence examines labor market demand, wages, skills, and postsecondary supply for meat science and processing. Four occupations related to meat science and processing were identified for Merced College:

- 51-1011, First-Line Supervisors of Production and Operating Workers
- 19-4011, Agricultural and Food Science Technicians
- 51-9032, Cutting and Slicing Machine Setters, Operators, and Tenders
- 19-1012, Food Scientists and Technologists

Key findings:

- **Occupational demand** — Nearly 3,400 workers were employed in jobs related to meat science and processing in 2019 in the North Central Valley/Northern Mother Lode (NCV/NML) subregion. The largest occupation is first-line supervisors of production and operating workers with 2,188 workers in 2019, a projected growth rate of 1% over the next five years, and 212 annual openings.
- **Wages** — Food scientists and technologists earn the highest entry-level wage, \$28.79/hour in the subregion and \$28.71/hour in the region.
- **Employers** — Employers with the most job postings in the subregion are Foster Farms, Ryder System Incorporated, and Danaher Corporation.
- **Occupational titles** — The most common occupational title in job postings in the subregion is first-line supervisors of production and operating workers. The most common job title is production supervisor.
- **Skills and certifications** — The top baseline skill is communication, the top specialized skill is scheduling, and the top software skill is Microsoft Excel. The most in-demand certification is a driver's license.
- **Education** — An associate degree is typically required for agricultural and food science technicians, and a high school education is typically required for first-line supervisors of production and operating workers and cutting and slicing machine setters, operators, and tenders.
- **Supply** — Analysis of postsecondary completions in the region shows that on average 35 awards were conferred in the Central Valley/Mother Lode region each year.

Based on a comparison of occupational demand and supply, there is an undersupply of 352 trained workers in the subregion and 774 workers in the region. The Center of Excellence recommends that Merced College work with the Agriculture, Water and Environmental Technologies Regional Director, the college's advisory board, and local industry in the expansion of programs to address the shortage of meat science and processing workers in the region.

Introduction

The Central Valley/Mother Lode Center of Excellence was asked by Merced College to provide labor market information for meat science and processing. The geographical focus for this report is the North Central Valley/Northern Mother Lode (NCV/NML) subregion, but regional demand and supply data has been included for broader applicability and use. The average living wage for a single adult in the NCV/NML subregion is \$10.30/hour.¹ Analysis of the program and occupational data related to meat science and processing resulted in the identification of applicable occupations. The Standard Occupational Classification (SOC) System codes and titles used in this report are:

- 51-1011, First-Line Supervisors of Production and Operating Workers
- 19-4011, Agricultural and Food Science Technicians
- 51-9032, Cutting and Slicing Machine Setters, Operators, and Tenders
- 19-1012, Food Scientists and Technologists

The occupational titles, job descriptions, sample job titles, and knowledge and skills from the Bureau of Labor Statistics and O*NET OnLine are shown below.

First-Line Supervisors of Production and Operating Workers

Job Description: Directly supervise and coordinate the activities of production and operating workers, such as inspectors, precision workers, machine setters and operators, assemblers, fabricators, and plant and system operators. Excludes team or work leaders.

Knowledge: Production and Processing, Administration and Management, Personnel and Human Resources, English Language, Clerical

Skills: Active Listening, Management and Personnel Resources, Speaking, Time Management, Coordination

O*NET lists two separate entries for 19-4011, Agricultural and Food Science Technicians:

Agricultural Technicians

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: Reading Comprehension, Active Listening, Complex Problem Solving, Critical Thinking, Writing

Food Science Technicians

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, Customer and Personal Service, Chemistry, Clerical, English Language

Skills: Active Listening, Reading Comprehension, Speaking, Writing, Critical Thinking

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://insightccd.org/tools-metrics/self-sufficiency-standard-tool-for-california/>.

Cutting and Slicing Machine Setters, Operators, and Tenders

Job Description: Set up, operate, or tend machines that cut or slice materials, such as glass, stone, cork, rubber, tobacco, food, paper, or insulating material.

Knowledge: Production and Processing, Mathematics, Mechanical

Skills: Operation Monitoring, Operation and Control, Quality Control Analysis, Monitoring, Reading Comprehension

Food Scientists and Technologists

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

Occupational Demand

The North Central Valley/Northern Mother Lode subregion employed 3,398 workers in meat science and processing occupations in 2019 (Exhibit 1). The largest occupation is first-line supervisors of production and operating workers with 2,188 workers in 2019. This occupation is projected to grow by 1% over the next five years and has the greatest number of projected annual openings, 212.

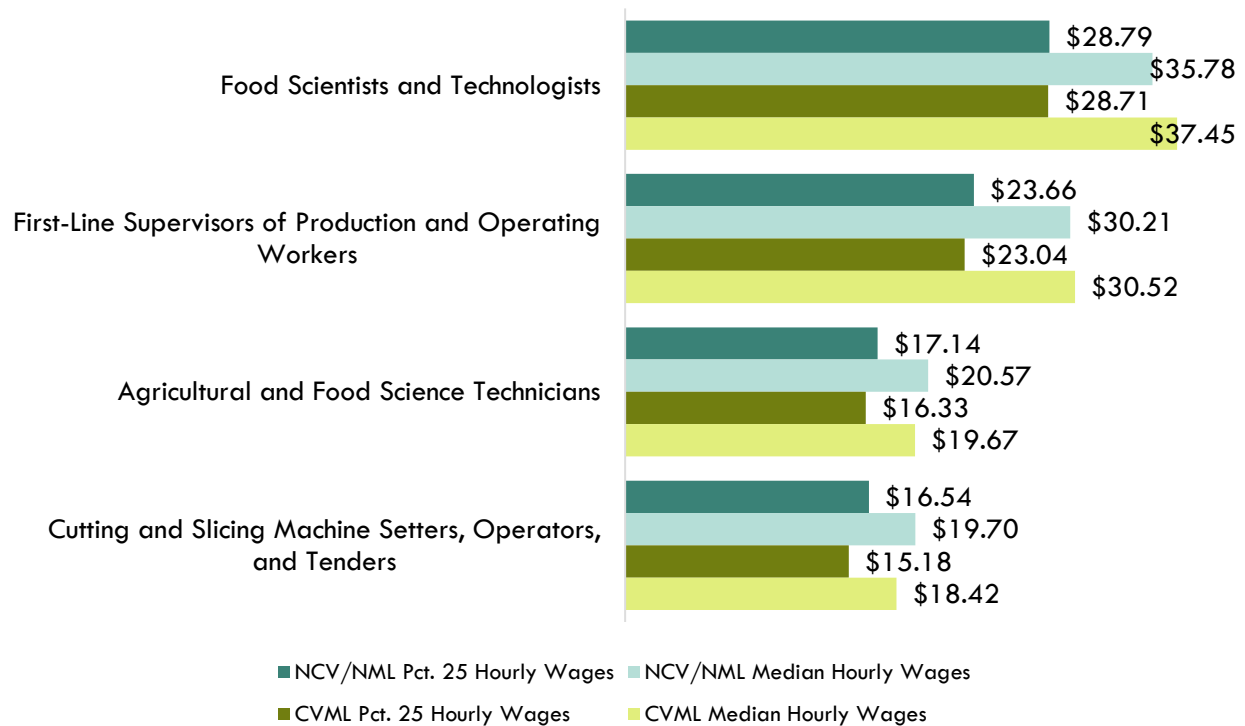
Exhibit 1. Meat science and processing employment and occupational projections in the NCV/NML subregion

Occupation	2019 Jobs	2024 Jobs	5-Year Change	5-Year % Change	Annual Openings
First-Line Supervisors of Production and Operating Workers	2,188	2,208	20	1%	212
Agricultural and Food Science Technicians	636	668	33	5%	80
Cutting and Slicing Machine Setters, Operators, and Tenders	372	416	44	12%	54
Food Scientists and Technologists	202	208	6	3%	23
TOTAL	3,398	3,500	102	3%	369

Wages

Exhibit 2 compares the entry-level and experienced wages of the meat science and processing occupations. Food scientists and technologists earn the highest entry-level wage, \$28.79/hour in the subregion and \$28.71/hour in the region.

Exhibit 2. Entry-level and experienced wage comparison in the NCV/NML subregion and region



Median salary data from Emsi shows that food scientists and technologists earn the highest median salary, more than \$74,430 annually, followed by first-line supervisors of production and operating workers, more than \$62,830 annually.

Exhibit 3. Median salaries for meat science and processing occupations

Occupation	Median Salary
Food Scientists and Technologists	\$74,430.10
First-Line Supervisors of Production and Operating Workers	\$62,830.04
Agricultural and Food Science Technicians	\$42,783.59
Cutting and Slicing Machine Setters, Operators, and Tenders	\$40,966.00

Job Postings

There were 345 job postings for the four occupations in the NCV/NML subregion from October 2020 to March 2021.² The employers with the most job postings are listed in Exhibit 4.

Exhibit 4. Top employers of meat science and processing by number of job postings

Employer	Job Postings	% Job Postings
Foster Farms	15	5%
Ryder System Incorporated	15	5%
Danaher Corporation	10	3%
Ej Gallo Winery	10	3%
Gallo Glass Company	8	3%
California Dairies Incorporated	6	2%
Cepheid	6	2%
Aramark	5	2%
Dole Packaged Foods	5	2%
Ej Gallo	5	2%

Exhibit 4 shows how job postings for the targeted occupations in the NCV/NML subregion are distributed across five O*NET OnLine occupations. The occupational title first-line supervisors of production and operating workers is listed in 309 job postings. Note how this occupational title dominates the job posting results. Common job titles in postings include production supervisor in 45 job postings, plant manager in 20 job postings, and production lead in 17 job postings.

Exhibit 5. Top occupational titles in job postings for meat science and processing

Occupational Title	Job Postings	% of Job Postings
First-Line Supervisors of Production and Operating Workers	309	90%
Cutting and Slicing Machine Setters, Operators, and Tenders	16	5%
Food Scientists and Technologists	11	3%
Agricultural Technicians	5	1%
Food Science Technicians	4	1%

Education

Of the 345 job postings, 243 listed an education level preferred for the positions being filled. Of those, 63% requested high school or vocational training, 60% requested a bachelor's degree, and 7% requested an associate degree (Exhibit 6). A job posting can indicate more than one education level. Hence, the percentages shown in the chart below may total more than 100%.

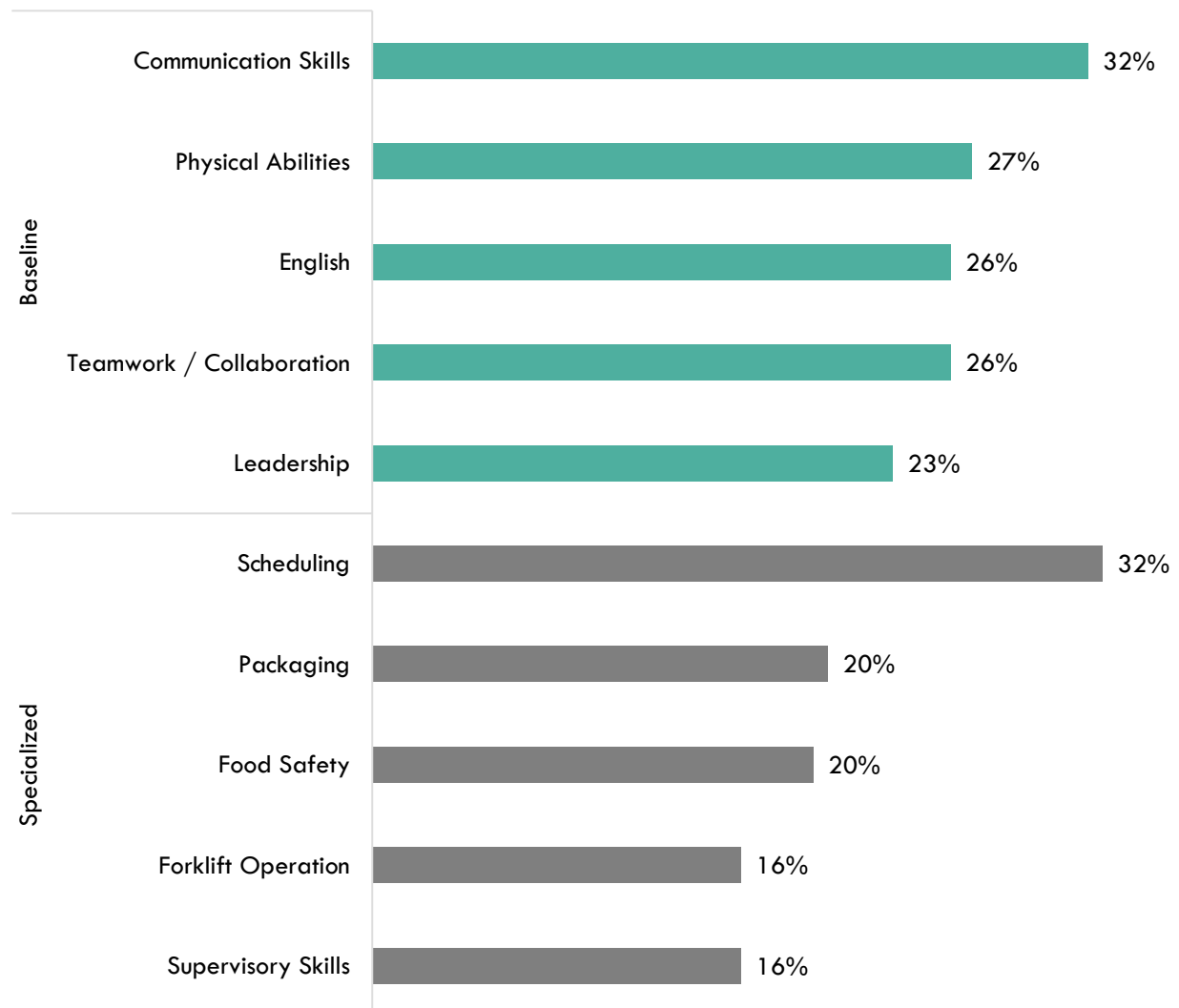
² Other than occupation titles and job titles, the categories below can be counted one or multiple times per job posting, and across several areas in a single posting. For example, a skill can be counted in two different skill types, and an employer can indicate more than one education level.

Exhibit 6. Education levels requested in job postings for meat science and processing

Education Level	Job Postings	% of Job Postings
High school or vocational training	153	63%
Bachelor's degree	147	60%
Associate degree	18	7%
Master's degree	9	4%

Baseline and Specialized Skills

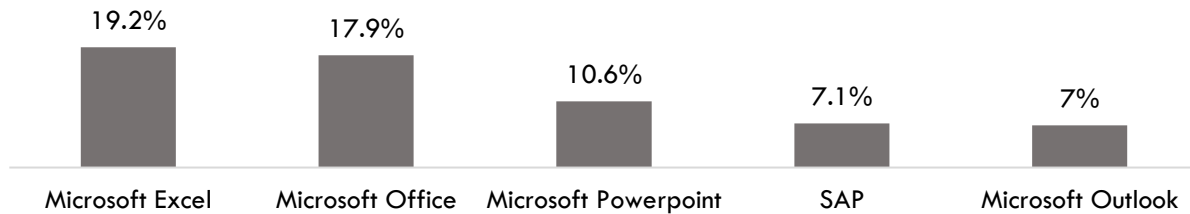
Exhibit 7 depicts the top baseline and specialized skills for the targeted occupations. The three most important baseline skills are communication, 32% of job postings, physical abilities, 27%, and English, 26%. The top three specialized skills are scheduling, 32% of job postings, packaging, 20%, and food safety, 20%.

Exhibit 7. In-demand meat science and processing baseline and specialized skills

Software Skills

Analysis also included the software skills most in demand by employers. Microsoft Excel and Office were the top two software skills identified in job postings (Exhibit 8).

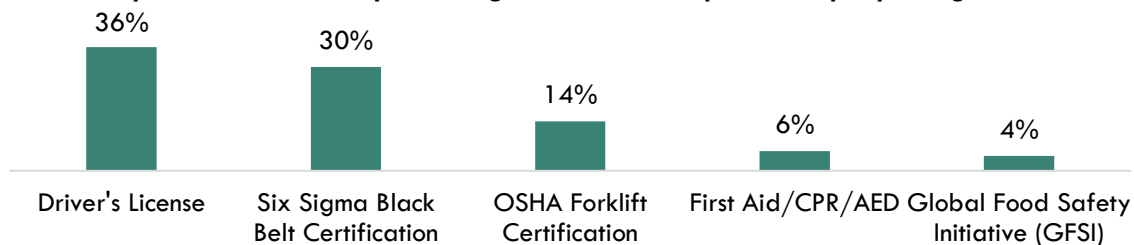
Exhibit 8. In-demand meat science and processing software skills



Certifications

Of the 345 job postings, 70 contained certification data. Among those, 36% indicated a need for a driver's license. The next top certifications are Six Sigma Black Belt Certification (pertaining only to first-line supervisors of production and operating workers) and OSHA Forklift Certification (Exhibit 9). (Due to the low number of job postings with certifications listed, the chart below may not be representative of the full sample.)

Exhibit 9. Top meat science and processing certifications requested in job postings



Education, Work Experience & Training

An associate degree is typically required for agricultural and food science technicians, and a high school education is typically required for first-line supervisors of production and operating workers and cutting and slicing machine setters, operators, and tenders (Exhibit 10). A bachelor's degree is typically required for food scientists and technologists.

Exhibit 10. Education, work experience, training, and Current Population Survey results for meat science and processing occupations³

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
First-Line Supervisors of Production and Operating Workers	High school diploma or equivalent	Less than 5 years	None	34.3%
Agricultural and Food Science Technicians	Associate degree	None	Moderate-term	37.3%
Cutting and Slicing Machine Setters, Operators, and Tenders	High school diploma or equivalent	None	Moderate-term	20.4%
Food Scientists and Technologists	Bachelor's degree	None	None	0.0%

³ "Labor Force Statistics from the Current Population Survey," Bureau of Labor Statistics, <https://www.bls.gov/cps/>.

Supply

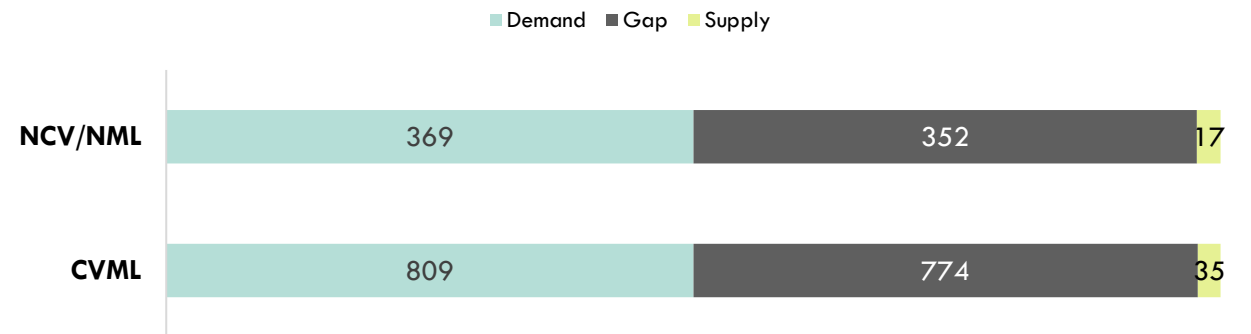
Analysis of program data from the California Community Colleges Chancellor's Office Data Mart included the TOP codes and titles: 010100 - Agriculture Technology and Sciences, General and 011300 - Food Processing and Related Technologies. Analysis of the last three years of data shows that, on average, 35 awards were conferred in the Central Valley/Mother Lode region each year (Exhibit 11).

Exhibit 11. Postsecondary supply for meat science and processing occupations in the region

TOP Code - Title	Colleges	Associate Degree	Certificate 18 < 30 Semester Units	Certificate 6 < 18 Semester Units	Subtotal
010100 - Agriculture Technology and Sciences, General	Merced	10			10
	Modesto	7			7
	Porterville	7			7
	Reedley College	1	1		2
	West Hills Coalinga	2	2	1	5
011300 - Food Processing and Related Technologies	Clovis		4		4
TOTAL		27	7	1	35

There is an undersupply of 352 meat science and processing workers in the NCV/NML subregion and 774 workers in the region (Exhibit 12).

Exhibit 12. Meat science and processing workforce annual demand and supply in the NCV/NML subregion and region



Student Outcomes

Exhibit 13 summarizes employment and wage outcomes from the California Community College Chancellor’s Cal-PASS Plus LaunchBoard for the TOP codes related to meat science and processing. Of note, there were 19 agriculture technology and sciences, general students who received a degree or certificate or attained apprenticeship journey status and 72 who transferred; 54% of students obtained a job closely related to their field of study; 66% reported a median change in earnings; and 64% attained a living wage.

Exhibit 13. Regional metrics for the TOP codes related to meat science and processing

Metric	Agriculture Technology and Sciences, General	Food Processing and Related Technologies
	010100	011300
Students Who Got a Degree or Certificate or Attained Apprenticeship Journey Status	19	13
Number of Students Who Transferred	72	*
Job Closely Related to Field of Study	54%	*
Median Change in Earnings	66%	41%
Attained a Living Wage	64%	100%
* denotes data not available.		

Conclusion

The entry-level wages of the four occupations exceed the NCV/NML subregion's average living wage. There were 345 job postings in the past six months for occupations related to meat science and processing in the subregion. Analysis of skills and certification requirements in job postings indicates:

- The top baseline skill is communication, and the top specialized skill is scheduling.
- The top software skill is Microsoft Excel.
- The top certification is a driver's license.

There is an undersupply of trained workers, a shortage of 352 in the NCV/NML subregion and 774 in the region.

Recommendation

Based on these findings, it is recommended that Merced College work with the Agriculture, Water and Environmental Technologies Regional Director, the college's advisory board, and local industry in the expansion of programs to address the shortage of meat science and processing in the region.

Appendix A: 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. (EMSI). EMSI occupational employment data are based on final EMSI industry data and final EMSI 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 EMSI 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 .
Labor Force, Employment and Unemployment Estimates	California Employment Development Department, Labor Market Information Division: labormarketinfo.edd.ca.gov .
Job Posting and Skills Data	Burning Glass: burning-glass.com/ .
Additional Education Requirements/Employer Preferences	The O*NET Job Zone database includes over 900 occupations 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 ages 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. (EMSI) formula that includes historical employment and economic indicators along with national, state and local trends.

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.