# Labor Market Analysis for Program Recommendation: 0113.00/Food Processing and Related Technologies (*Fermentation*)

Orange County Center of Excellence, July 2024

## Summary

| Program LMI Endorsement | Endorsed: All LMI Criteria Met ☐ | Endorsed: Some LMI Criteria Met ☒ | Not LMI Endorsed ☐ |
|---|---|---|---|
| Program LMI Endorsement Criteria | | | |

| | Yes ☑ | No ☐ |
|---|---|---|
| **Supply Gap:** | Co*mments:* There is projected to be **154 annual job openings** throughout Los Angeles and Orange counties for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders*, which **is more than the awards conferred by educational institutions. Over the past three years, there were no awards related to this occupation.** | |

| | Yes ☐ | No ☑ |
|---|---|---|
| **CA Insight Living Wage: (Entry-Level, 25th)[1]** | Co*mments:* **Entry-level hourly wages for s*eparating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* are $18.41, which is below the OC living wage of $20.63.** | |

| | Yes ☑ | No ☐ |
|---|---|---|
| **Education:** | Co*mments:* The typical entry-level education for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* is a high school diploma or equivalent. However, **more than one-third of workers in the field have completed some college or an associate degree as their highest level of education.** | |

| Emerging Occupation(s) | |
|---|---|
| *Yes* ☐ | *No* ☑ |
| *Comments:* N/A | |

The Orange County Center of Excellence for Labor Market Research (OC COE) prepared this report to determine whether there is a supply gap in the Los Angeles/Orange County regional labor market related to one middle-skill occupation:

- Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders (51-9012)

This occupation is most closely related to fermentation and food processing technology. A sample of job titles that fall under this occupation are beer maker, brewer, cellar worker, fermenter, liquor maker, winemaker, and yeast fermentation attendant. This report analyzes traditional labor market information for this occupation. To identify other jobs that require fermentation skills, this report also includes an analysis of all online job postings that requested "fermentation" as a skill over the past 12 months in Los Angeles and Orange counties.

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[1] The living wage endorsement criteria in this report uses the California Insight Center's living wage of $20.63 for Orange County, last updated in September 2021, as currently employed by the Chancellor's Office for the *Students Who Attained the Living Wage Strong Workforce Program* metric. However, this figure is outdated and does not reflect recent increases in the cost of living. The MIT Living Wage, updated on February 14, 2024, better accounts for existing economic conditions, with the current MIT Living Wage in Orange County being $30.48, which is mentioned as a reference only throughout this labor market analysis brief.

Based on the available data, there appears to be a supply gap for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* and typical education requirements for this occupation aligns with a community college education. However, entry-level wages are below the California Insight living wage. **Therefore, due to some of the regional labor market criteria being met, the COE endorses this proposed program.**

Exhibit 1 lists the occupational demand, supply, typical entry-level education, and educational attainment for the occupations included in this report.

## Exhibit 1: Labor Market Endorsement Summary

| Occupation (SOC) | Demand (Annual Openings) | Supply (CC and Non-CC) | Entry-Level Hourly Earnings (25th Percentile) | Typical Entry-Level Education | Community College Educational Attainment |
|---|---|---|---|---|---|
| Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders (51-9012) | LA: 110<br><br>OC: 44 | LA: 0<br><br>OC: 0 | OC: $18.41 | High School Diploma or Equivalent | 35% |
| **Total** | **154** | **0** | **N/A** | **N/A** | **N/A** |

## Demand:

- The number of jobs related to *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* is projected to increase 2% through 2027, equating to 154 annual job openings.
- The hourly entry-level wage for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* is $18.41 in Orange County, which is below the living wage of $20.63.
- There were 126 online job postings for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* over the past 12 months. The highest number of postings were for brewers, brewery representatives, and head brewers.
    - There were 112 online job postings that specifically requested fermentation skills over the past 12 months. The highest number of postings were for bread bakers, brewers, and bakers.
- The typical entry-level education for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* is a high school diploma or equivalent.
- Approximately 35% of workers in the field have completed some college or an associate degree as their highest level of educational attainment.

## Supply:

- There were no awards conferred by community colleges in Los Angeles and Orange Counties from 2019 to 2022.
- There were no awards conferred by non-community college institutions from 2019 to 2021.
- There are no community colleges in Orange County that offer food processing and related technologies programs or courses. Therefore, student outcomes data is unavailable.

# Demand

## Occupational Projections:

Exhibit 2 shows the annual percent change in jobs for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* from 2017 through 2027. Employment for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* declined 7% from 2019 to 2020 due to the COVID-19 pandemic, the exact same percentage decline across all occupations during the same period. Employment for this occupation sharply increased by 28% from 2020 to 2021 in Orange County and is projected to grow at a similar rate to all occupations through 2027.

In the years preceding the pandemic, employment for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* slowly grew in Orange County each year from 2017 to 2019, but declined during the same period in Los Angeles County.

### Exhibit 2: Annual Percent Change in Jobs for Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders, 2017-2027
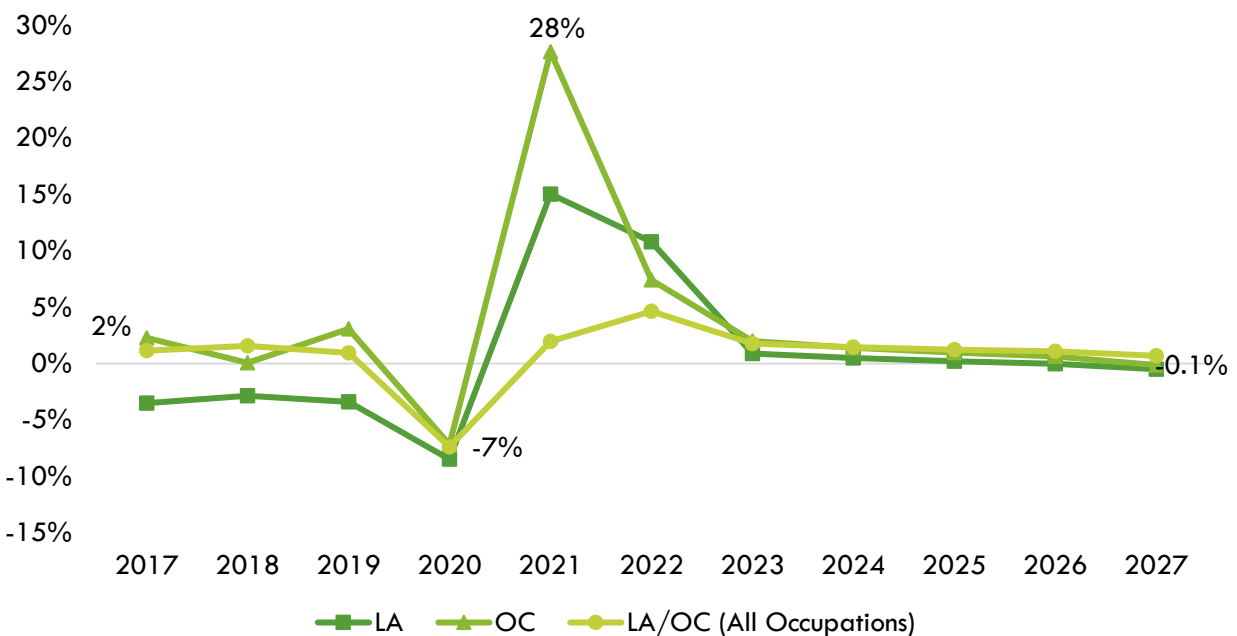


Exhibit 3 shows the five-year occupational demand projections for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders*. In Los Angeles/Orange County, the number of jobs related to this occupation is projected to increase by 2% through 2027. There is projected to be 154 jobs available annually.

### Exhibit 3: Occupational Demand in Los Angeles and Orange Counties[2]

| Geography | 2022 Jobs | 2027 Jobs | 2022-2027 Change | 2022-2027 % Change | Annual Openings |
|---|---|---|---|---|---|
| Los Angeles | 1,014 | 1,025 | 11 | 1% | 110 |
| Orange | 373 | 391 | 18 | 5% | 44 |
| **Total** | **1,387** | **1,416** | **29** | **2%** | **154** |

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[2] Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

Exhibit 4 shows the top industries of employment for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* in Los Angeles/Orange County as of 2022. Notably, 13% of *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* are employed in the Soft Drink Manufacturing industry, followed by 12% in Breweries. Full-Service Restaurants account for 7% of employment for this occupation. These restaurants may also have breweries but primarily service as a restaurant rather than a brewing facility.

### Exhibit 4: Top Industries of Employment for Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders in Los Angeles Orange Counties, 2022

| NAICS | Industry | 2022 Jobs | % of Occupation in Industry |
|---|---|---|---|
| 312111 | Soft Drink Manufacturing | 185 | 13% |
| 312120 | Breweries | 163 | 12% |
| 325412 | Pharmaceutical Preparation Manufacturing | 117 | 8% |
| 722511 | Full-Service Restaurants | 100 | 7% |
| 312130 | Wineries | 66 | 5% |
| 561320 | Temporary Help Services | 56 | 4% |
| 325620 | Toilet Preparation Manufacturing | 52 | 4% |
| 311511 | Fluid Milk Manufacturing | 42 | 3% |
| 722410 | Drinking Places (Alcoholic Beverages) | 34 | 2% |
| 312112 | Bottled Water Manufacturing | 24 | 2% |

## Wages:

The labor market endorsement in this report considers the entry-level hourly wages for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* in Orange County as they relate to the county's living wage. Los Angeles County wages are included below in order to provide a complete analysis of the LA/OC region.

It is important to note that the living wage endorsement criteria in this report uses the California Insight Center's living wage of $20.63 for Orange County, last updated in September 2021, as currently employed by the Chancellor's Office for the *Students Who Attained the Living Wage Strong Workforce Program* metric. However, this figure is outdated and does not reflect recent increases in the cost of living. The MIT Living Wage, updated on February 14, 2024, better accounts for existing economic conditions, with the current MIT Living Wage in Orange County being $30.48. Both figures are notated in the exhibits below.
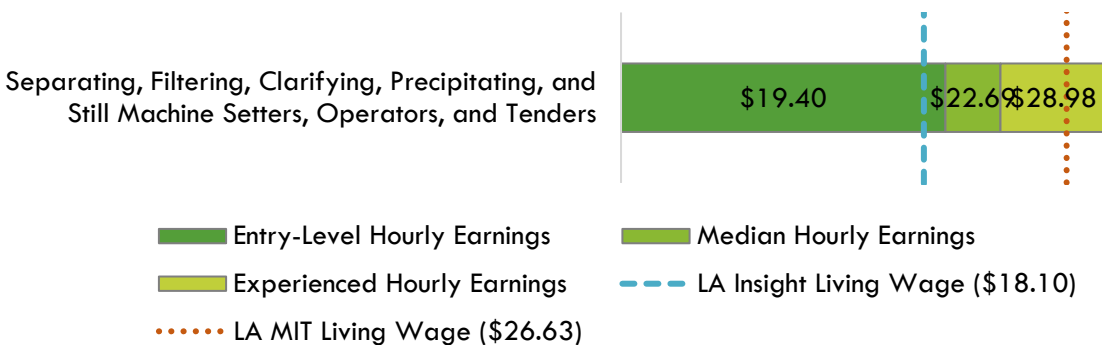
The typical entry-level hourly earnings for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* are $18.41, which is below the California Insight living wage for one adult in Orange County ($20.63). Median wages are $21.52, which is above the California Insight living wage. Orange County's average wage ($23.57) is below the average statewide wage of $27.49 for this occupation. Exhibit 5 shows the wage range for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* in Orange County and how it compares to the regional living wage.

## Exhibit 5: Wages by Occupation in Orange County
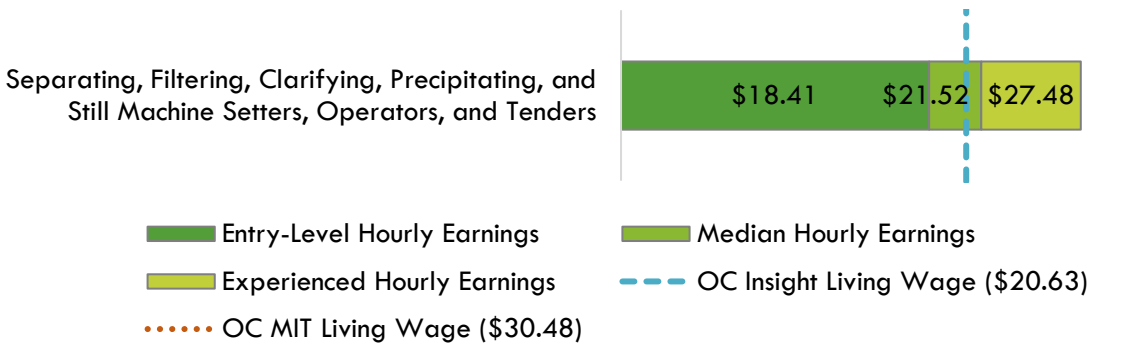
Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders

$18.41    $21.52   $27.48

- Entry-Level Hourly Earnings
- Median Hourly Earnings
- Experienced Hourly Earnings
- OC Insight Living Wage ($20.63)
- OC MIT Living Wage ($30.48)

The typical entry-level hourly earnings for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* are $19.40, which is above the California Insight living wage for one adult in Los Angeles County ($18.10). Los Angeles County's average wage ($24.90) is below the average statewide wage of $27.49 for this occupation. Exhibit 6 shows the wage range for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* in Los Angeles County and how it compares to the regional living wage.

## Exhibit 6: Wages by Occupation in Los Angeles County

Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders

$19.40    $22.69 $28.98

- Entry-Level Hourly Earnings
- Median Hourly Earnings
- Experienced Hourly Earnings
- LA Insight Living Wage ($18.10)
- LA MIT Living Wage ($26.63)

## Job Postings:

***Important Online Job Postings Data Note:*** *Online job postings data is sourced from Lightcast, a labor market analytics firm that scrapes, collects, and organizes data from online job boards such as LinkedIn, Indeed, Glassdoor, Monster, GovernmentJobs.com, and thousands more. Lightcast uses natural language processing (NLP) to determine the related company, industry, occupation, and other information for each job posting. However, NLP has limitations that include understanding contextual words of phrases; determining differences in words that can be used as nouns, verbs, and/or adjectives; and misspellings or grammatical errors.[3] For these reasons, job postings could be assigned to the wrong employer, industry, or occupation within Lightcast's database.*

*Additionally, there are several limitations when analyzing job postings. A single job posting may not represent a single job opening, as employers may be creating a pool of candidates for future openings or hiring for multiple positions with a single posting. Additionally, not all jobs are posted online, and jobs may be filled through other methods such as internal promotion, word-of-mouth advertising, physical job boards, or a variety of other channels.*

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[3] K. R. Chowdhary, Fundamentals of Artificial Intelligence (Basingstoke: Springer Nature, 2020), https://link.springer.com/book/10.1007/978-81-322-3972-7.

This section includes two analyses of online job postings in Los Angeles and Orange counties over the past 12 months. The first analysis examines online job postings for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders*. To identify other jobs that require fermentation skills, this section also includes an analysis of all online job postings that requested "fermentation" as a skill.

## Occupation Job Postings

There were 126 online job postings related to *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* listed in the past 12 months in Los Angeles and Orange counties, as shown in Exhibit 7.

### Exhibit 7: Number of Job Postings by Occupation (n=126)

| Occupation | Job Postings | Percentage of Job Postings |
|---|---|---|
| Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders | 126 | 100% |

The top employers in the region for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders*, by number of job postings, are shown in Exhibit 8.

### Exhibit 8: Top Employers by Number of Job Postings (n=126)

| Employer | Job Postings | Percentage of Job Postings |
|---|---|---|
| Mission Yogurt | 24 | 19% |
| Boston Beer Company | 14 | 11% |
| Allied Universal | 7 | 6% |
| Anheuser-Busch | 7 | 6% |
| Brewery X | 4 | 3% |
| 1886 Brewing Company | 3 | 2% |
| Cal Poly Pomona Foundation | 3 | 2% |
| Caran Precision Eng & Mfg Corp | 3 | 2% |
| WEBB's GRAINWORKS | 3 | 2% |
| 8One8 Brewing | 2 | 2% |

The top specialized, soft, and computer skills for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* listed by those most frequently mentioned in job postings (denoted in parentheses) are shown in Exhibit 9.

### Exhibit 9: Top Skills by Number of Job Postings (n=126)

| Top Specialized Skills | Top Soft Skills | Top Computer Skills |
|---|---|---|
| Restaurant Operation (40) | Communication (46) | Microsoft Office (6) |
| Quality Management (24) | Sanitation (44) | Microsoft Excel (5) |
| Management Styles (21) | Customer Service (40) | Microsoft Outlook (5) |
| Fermentation (10) | Cleanliness (36) | Microsoft PowerPoint (3) |
| Food Preparation (10) | Management (29) | Accounting Software (2) |
| Food Safety And Sanitation (10) | Ethical Standards And Conduct (27) | Microsoft Access (2) |
| Forklift Truck (10) | Operations (27) | Spreadsheets (2) |
| Food Quality Assurance And Control (9) | Packaging And Labeling (27) | Wonderware (2) |
| General Mathematics (9) | Professionalism (27) | Adobe Illustrator (1) |
| Food Services (8) | Honesty (26) | Adobe Photoshop (1) |

## Fermentation Job Postings

There were 112 online job postings that specifically requested "fermentation" as a skill listed in the past 12 months in Los Angeles and Orange counties. Exhibit 10 shows the number of job postings by occupation.

### Exhibit 10: Number of Job Postings by Occupation (n=112)

| Occupation | Job Postings | Percentage of Job Postings |
|---|---|---|
| Bakers | 29 | 26% |
| Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders | 10 | 9% |
| Production Workers, All Other | 7 | 6% |
| Food Scientists and Technologists | 5 | 4% |
| Chemical Engineers | 3 | 3% |
| Industrial Engineering Technologists and Technicians | 3 | 3% |
| Cooks, Restaurant | 3 | 3% |
| Dining Room and Cafeteria Attendants and Bartender Helpers | 3 | 3% |
| Farmers, Ranchers, and Other Agricultural Managers | 2 | 2% |
| Architectural and Engineering Managers | 2 | 2% |

The top job titles, by number of job postings, are shown in Exhibit 11.

### Exhibit 11: Top Employers by Number of Job Postings (n=112)

| Employer | Job Postings | Percentage of Job Postings |
|---|---|---|
| AbbVie | 20 | 18% |
| Tartine Bakery | 10 | 9% |
| Aspire Bakeries | 3 | 3% |
| Mdrn Staffing | 3 | 3% |
| Tartine | 3 | 3% |
| 8One8 Brewing | 2 | 2% |
| Absolution Brewing Company | 2 | 2% |
| Bottega Louie Restaurant And Gourmet Market | 2 | 2% |
| Colossus Bread | 2 | 2% |
| Compu-Vision Consulting | 2 | 2% |

The top employers in the region for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders*, by number of job postings, are shown in Exhibit 12.

### Exhibit 12: Top Employers by Number of Job Postings (n=112)

| Employer | Job Postings | Percentage of Job Postings |
|---|---|---|
| AbbVie | 15 | 11% |
| Disability Solutions | 5 | 4% |
| Tartine Bakery | 4 | 3% |
| Black & Veatch | 3 | 2% |
| Bottega Louie Restaurant And Gourmet Market | 3 | 2% |
| Greenbar Distillery | 3 | 2% |
| Rangam Infotech | 3 | 2% |
| Sterling Engineering | 3 | 2% |
| Tartine | 3 | 2% |
| Tesse Restaurant | 3 | 2% |

The top specialized, soft, and computer skills for postings that requested fermentation skills, listed by those most frequently mentioned in job postings (denoted in parentheses), are shown in Exhibit 13.

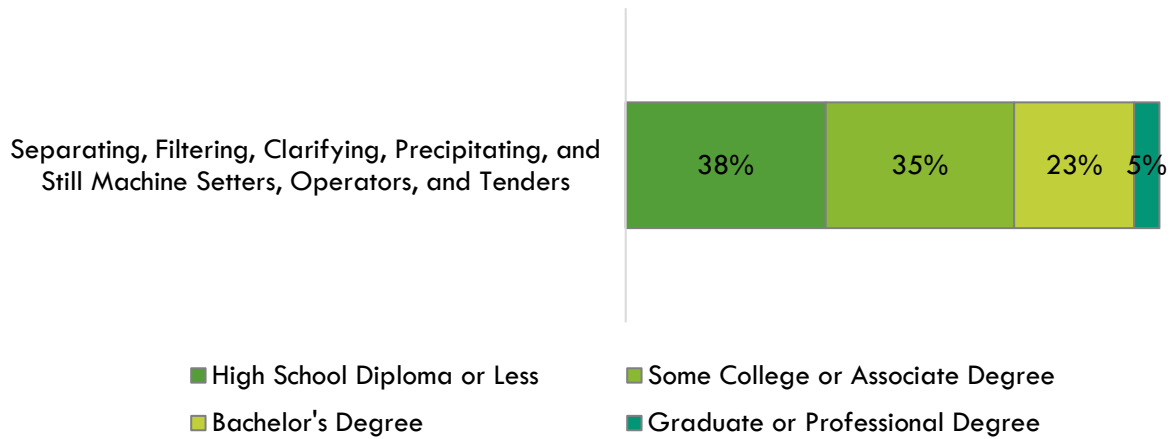### Exhibit 13: Top Skills by Number of Job Postings (n=112)

| Top Specialized Skills | Top Soft Skills | Top Computer Skills |
|---|---|---|
| Fermentation (111) | Communication (34) | Microsoft Excel (14) |
| Baking (33) | Detail Oriented (34) | SAP Applications (8) |
| Microbiology (23) | Operations (25) | Microsoft PowerPoint (7) |
| Restaurant Operation (21) | Packaging And Labeling (24) | Microsoft Word (5) |
| Biochemistry (19) | Lifting Ability (23) | Microsoft Office (4) |
| Chemical Engineering (17) | Sanitation (22) | Enterprise Application Software (3) |
| New Product Development (17) | Leadership (21) | Geneious (Bioinformatics Software) (3) |
| Biopharmaceuticals (14) | Cleanliness (19) | Microsoft Outlook (3) |
| Process Development (14) | Problem Solving (19) | Python (Programming Language) (3) |
| Biotechnology (13) | Management (18) | AutoCAD (2) |

## Educational Attainment:

The Bureau of Labor Statistics (BLS) lists a high school diploma or equivalent as the typical entry-level education for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders*. The national-level educational attainment data indicates 35% of workers in the field have completed some college or associate degree as their highest level of education. Exhibit 14 shows the educational attainment for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders*.

## Exhibit 14: National-level Educational Attainment for Occupations

Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders

| 38% | 35% | 23% | 5% |

■ High School Diploma or Less    ■ Some College or Associate Degree

■ Bachelor's Degree    ■ Graduate or Professional Degree

Of the 40% of cumulative job postings for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* that listed a minimum education requirement in Los Angeles/Orange County, 96% (40) requested a high school diploma or an associate degree and 4% (10) requested a bachelor's degree.

Conversely, of the 45% of cumulative job postings for jobs that requested fermentation skills and that listed a minimum education requirement in Los Angeles/Orange County, 76% (39) requested a bachelor's or master's degree and 24% (11) requested a high school diploma or an associate degree.

# Educational Supply

## Community College Supply:

Currently, no community colleges in Los Angeles and Orange counties offer food processing and related technologies programs or courses. Therefore, there is no community college supply for this occupation. Over the past 12 months, there were no other related program recommendation requests from regional community colleges.

## Community College Student Outcomes:

Exhibit 15 shows the Strong Workforce Program (SWP) metrics for food processing and related technologies programs in Rancho Santiago Community College District (RSCCD), the Orange County Region, and California. Currently, no community colleges in Los Angeles and Orange counties offer food processing and related technologies programs or courses. Therefore, there are no student outcomes for RSCCD or the Orange County Region

Throughout California, there were 243 students enrolled in food processing and related technologies courses in 2020-21. Students throughout the state students who exited food processing and related technologies programs in the 2020-21 academic year had median annual earnings of $40,836 and 57% attained the living wage. There was insufficient data to determine the percentage of students employed in their field of study.

### Exhibit 15: Food Processing and Related Technologies (0113.00) Strong Workforce Program Metrics, 2020-21[4]

| SWP Metric | RSCCD | OC Region | California |
|---|---|---|---|
| SWP Students | N/A | N/A | 243 |
| SWP Students Who Earned 9 or More Career Education Units in the District in a Single Year | N/A | N/A | 23% |
| SWP Students Who Completed a Noncredit CTE or Workforce Preparation Course | N/A | N/A | Insufficient Data |
| SWP Students Who Earned a Degree or Certificate or Attained Apprenticeship Journey Status | N/A | N/A | Insufficient Data |
| SWP Students Who Transferred to a Four-Year Postsecondary Institution (2019-20) | N/A | N/A | 10 |
| SWP Students with a Job Closely Related to Their Field of Study (2019-20) | N/A | N/A | Insufficient Data |
| Median Annual Earnings for SWP Exiting Students | N/A | N/A | $40,836 |
| Median Change in Earnings for SWP Exiting Students | N/A | N/A | 15% |
| SWP Exiting Students Who Attained the Living Wage | N/A | N/A | 57% |

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[4] All SWP metrics are for 2020-21 unless otherwise noted.

## Non-Community College Supply:

For a comprehensive regional supply analysis, it is also important to consider the supply from other institutions in the region that provide training programs for *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders*. However, there were no awards conferred by other institutions under the related Classification of Instructional Programs (CIP) Codes: Brewing Science (01.1003), Viticulture and Enology (01.1004), and Zymology/Fermentation Science (01.1005).

# Regional Demographics

This section analyzes demographic data for Orange County community college students enrolled in water and wastewater technology programs compared to the OC population, as well occupational data, for the purpose of identifying potential diversity and equity issues that can be addressed by community college programs.

As noted in the community college supply and student outcomes sections, no community colleges in Orange County offer food processing and related technologies programs or courses. Therefore, student demographic data is unavailable, and this section compares the Orange County population to *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders*.

## Ethnicity:

Exhibit 16 shows the ethnicity of the overall Orange County population, as well as for workers employed as *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders*. Hispanic or Latino workers comprise the largest group of *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* (63%), which is significantly higher than their representation among the population (34%). Conversely, 24% of *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* are white and 11% are Asian, both of which are lower than their representation among the population (40% and 21%, respectively).
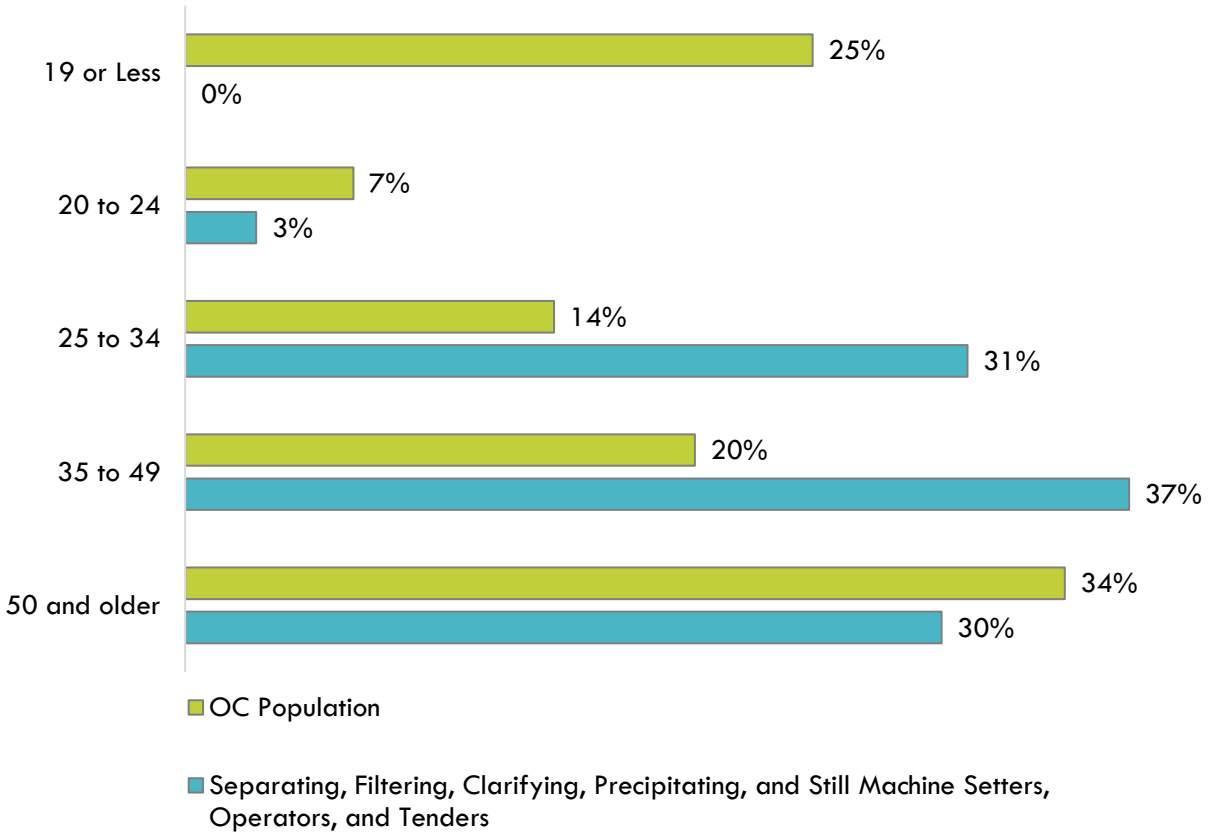
### Exhibit 16: Program and County Demographics by Ethnicity



| Ethnicity | OC Population | Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders |
|---|---|---|
| Asian | 21% | 11% |
| Black or African American | 2% | 0% |
| Hispanic or Latino | 34% | 63% |
| White | 40% | 24% |
| Other Race/Ethnicity | 4% | 3% |

■ OC Population

■ Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders
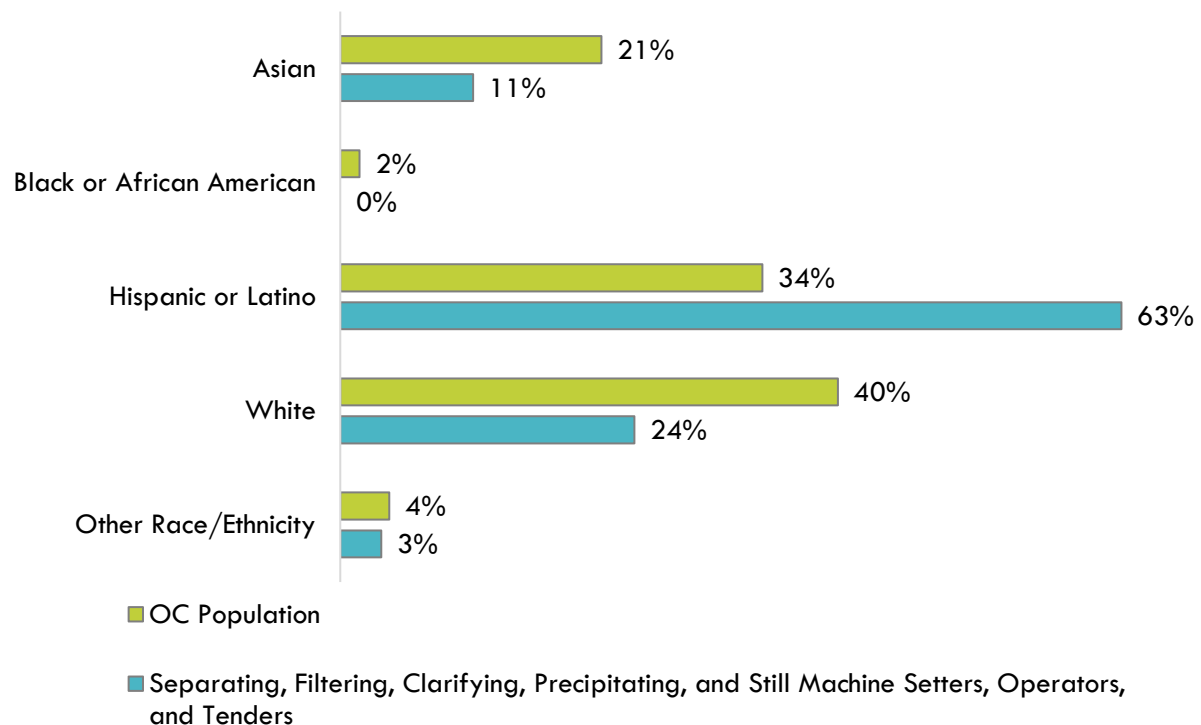
## Age:

Exhibit 17 shows the age of the overall Orange County population, as well as *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders*. Two-thirds (67%) of s*eparating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* are 35 and older, which is significantly higher than the population (54%).

### Exhibit 17: Program and County Demographics by Age

| Age | OC Population | Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders |
|-----|-----|-----|
| 19 or Less | 25% | 0% |
| 20 to 24 | 7% | 3% |
| 25 to 34 | 14% | 31% |
| 35 to 49 | 20% | 37% |
| 50 and older | 34% | 30% |

■ OC Population

■ Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders

## Sex:

Exhibit 18 shows the sex of the overall Orange County population as well as *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders*. While women and men are nearly evenly represented among the population, men comprise almost all *separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders* (97%).

### Exhibit 18: Program and County Demographics by Sex

| Category | Female | Male |
|---|---|---|
| OC Population | 51% | 49% |
| Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders | 3% | 97% |

□ Female  □ Male
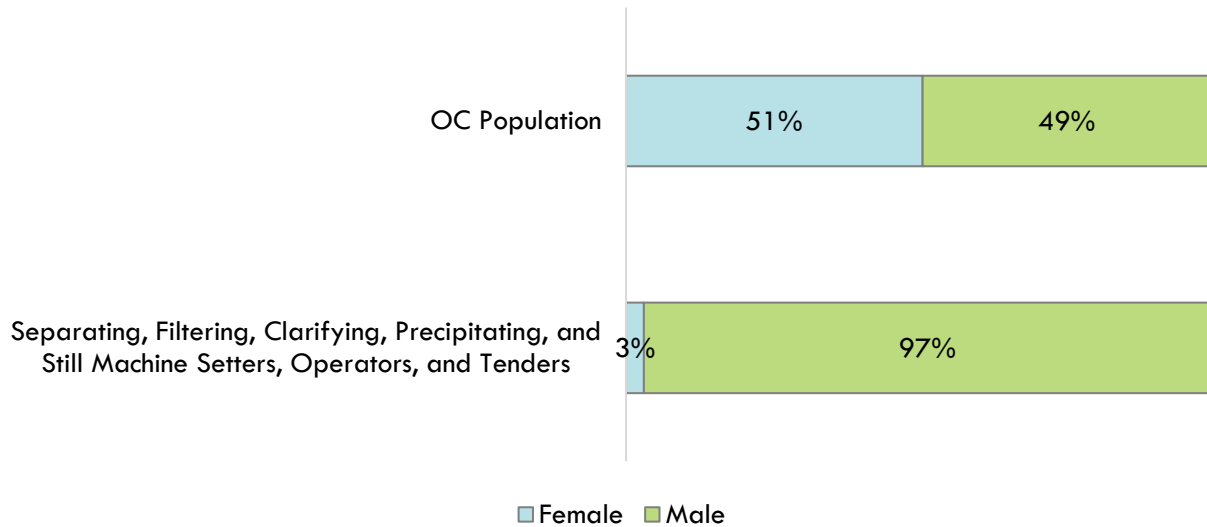
# Appendix A: Methodology

The OC COE prepared this report by analyzing data from occupations and education programs. Occupational data is derived from Lightcast, a labor market analytics firm that consolidates data from the California Employment Development Department (EDD), U.S. Bureau of Labor Statistics (BLS) and other government agencies. Program supply data is drawn from two systems: Taxonomy of Programs (TOP) and Classification of Instructional Programs (CIP).

Using a TOP-SOC crosswalk, the OC COE identified middle-skill jobs for which programs within these TOP codes train. Middle-skill jobs include:

- All occupations that require an educational requirement of some college, associate degree or apprenticeship;
- All occupations that require a bachelor's degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or
- All occupations that require a high school diploma or equivalent or no formal education, but also require short- to long-term on-the-job training where multiple community colleges have existing programs.

The OC COE determined labor market supply for an occupation or SOC code by analyzing the number of program completers or awards in a related TOP or CIP code. The COE developed a "supply table" with this information, which is the source of the program supply data for this report. TOP code data comes from the California Community Colleges Chancellor's Office MIS Data Mart (datamart.cccco.edu) and CIP code data comes from the Integrated Postsecondary Education Data System (nces.ed.gov/ipeds/use-the-data), also known as IPEDS. TOP is a system of numerical codes used at the state level to collect and report information on California community college programs and courses throughout the state that have similar outcomes. CIP codes are a taxonomy of academic disciplines at institutions of higher education in the United States and Canada. Institutions outside of the California Community College system do not use TOP codes in their reporting systems.

Data included in this analysis represent the labor market demand for relevant positions most closely related to the proposed program as expressed by the requesting college in consultation with the OC COE. Traditional labor market information was used to show current and projected employment based on data trends, as well as annual average awards granted by regional community colleges. Real-time labor market information captures job post advertisements for occupations relevant to the field of study which can signal demand and show what employers are looking for in potential employees, but is not a perfect measure of the quantity of open positions.

All representations have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. The most recent data available at the time of the analysis was examined; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and findings; however, neither the Centers of Excellence for Labor Market Research (COE), COE host district, nor California Community Colleges Chancellor's Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.

# Appendix B: Data Sources

| Data Type | Source |
|---|---|
| Occupational Projections, Wages, and Job Postings | Traditional labor market information data is sourced from Lightcast, a labor market analytics firm. Lightcast occupational employment data are based on final Lightcast industry data and final Lightcast staffing patterns. Wage estimates are based on Occupational Employment Statistics and the American Community Survey. For more information, see https://lightcast.io/ |
| Living Wage | The living wage is derived from the Insight Center's California Family Needs Calculator, which measures the income necessary for an individual of family to afford basic expenses. The data assesses the cost of housing, food, child care, health care, transportation, and taxes. For more information, see: https://insightcced.org/family-needs-calculator/<br><br>The living wage for one adult in Orange County is $20.63 per hour ($42,910.40 annually). This figure is used by the CCCCO to calculate the percentage of students that attained the regional living wage. |
| Typical Education and Training Requirements, and Educational Attainment | The Bureau of Labor Statistics (BLS) provides information about education and training requirements for hundreds of occupations. BLS uses a system to assign categories for entry-level education, work experience in a related occupation, and typical on-the-job training to each occupation for which BLS publishes projections data. For more information, see https://www.bls.gov/emp/documentation/education/tech.htm |
| Emerging Occupation Descriptions, Additional Education Requirements, and Employer Preferences | The O*NET database includes information on skills, abilities, knowledges, work activities, and interests associated with occupations. For more information, see https://www.onetonline.org/help/online/ |
| Educational Supply | The CCCCO Data Mart provides information about students, courses, student services, outcomes and faculty and staff. For more information, see: https://datamart.cccco.edu<br><br>The National Center for Education Statistics (NCES) Integrated Postsecondary Integrated Data System (IPEDS) collects data on the number of postsecondary awards earned (completions). For more information, see https://nces.ed.gov/ipeds/use-the-data/survey-components/7/completions |
| Student Metrics and Demographics | LaunchBoard, a statewide data system supported by the California Community Colleges Chancellor's Office and hosted by Cal-PASS Plus, provides data on progress, success, employment, and earnings outcomes for California community college students. For more information, see: https://www.calpassplus.org/LaunchBoard/Home.aspx |
| Population and Occupation Demographics | The Census Bureau's American Community Survey (ACS) is the premier source for detailed population and housing information. For more information, see: https://www.census.gov/programs-surveys/acs<br><br>Data is sourced from IPUMS USA, a database providing access to ACS and other Census Bureau data products. For more information, see: https://usa.ipums.org/usa/about.shtml |