

# FOOD SAFETY CAREERS in FRESNO, MADERA, KINGS & TULARE COUNTIES

A labor market profile of Food Safety in Animal Science for  
community colleges



## **What is Food Safety in Animal Science?**

The Centers for Disease Control and Prevention estimate that each year 48 million people get sick from food-borne pathogens.<sup>1</sup> Given that California's 76,400 farms and ranches earn \$54 billion annually and lead the nation in generating agricultural revenue, food safety is an important issue for the state and in particular, the Central Valley, California's agricultural hub.<sup>2</sup>

Food safety encompasses the prevention of food-borne illness through the safe handling, preparation and storage of food. Food safety applies to a broad range of activities aimed at preventing and avoiding potentially severe health hazards. These activities include the safe growing, storing, transporting, processing and preparation all types of fruits, vegetables, dairy and meat.<sup>3</sup>

Government agencies play an important role in food safety and are tasked with the following responsibilities: setting food safety standards, conducting inspections, ensuring standards are met and maintaining enforcement programs.<sup>4</sup>

The following report provides food safety labor market analysis for the purpose of supporting program conversations at Reedley College. It is recommended that Reedley College work with its advisory boards and local industry partners on future decisions.

## **Occupational Overview**

Food safety in animal science programs prepare students for a variety of occupations. However, when the Animal Science TOP code was researched, only one occupation related to food safety was found, that of animal breeders.

Additional review indicated this single occupation was not a good fit for the study. As a result, alternative TOP codes for California community college programs and associated target occupations were identified and analyzed for this report.

A total of eight relevant community college programs were identified and matched with nine occupations. The relationship between the programs and occupations is shown in Exhibit 1.

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<sup>1</sup> "Estimates of food-borne illness in the United States." Centers for Disease Control and Prevention. Accessed August 12, 2016. <https://www.cdc.gov/foodborneburden/>

<sup>2</sup> "California agricultural production statistics." California Department of Food and Agriculture. Accessed August 12, 2016. <https://www.cdffa.ca.gov/statistics/>

<sup>3</sup> "About IAFP." International Association for Food Protection. Accessed August 12, 2016. <https://www.foodprotection.org/about/>

<sup>4</sup> "What government does." FoodSafety.gov. Accessed August 12, 2016. <https://www.foodsafety.gov/keep/government/>

**Exhibit 1 – Food safety community college programs and occupations**

TOP Code	Program	SOC Code	Occupation
010100	Agriculture Technology and Sciences, General	19-4011	Agricultural and Food Science Technicians*
		19-1012	Food Scientists and Technologists*
010400	Viticulture, Enology and Wine Business	19-4011	Agricultural and Food Science Technicians*
		19-1012	Food Scientists and Technologists*
011200	Agriculture Business, Sales and Service	13-1021	Buyers and Purchasing Agents, Farm Products*
011300	Food Processing and Related Technologies	19-4011	Agricultural and Food Science Technicians*
		19-1012	Food Scientists and Technologists*
043000	Biotechnology and Biomedical Technology	19-4021	Biological Technicians*
050920	Purchasing	13-1021	Buyers and Purchasing Agents, Farm Products*
095400	Chemical Technology	19-4031	Chemical Technicians*
095500	Laboratory Science Technology	19-4021	Biological Technicians*
		19-4031	Chemical Technicians*
No Code		45-2093	Graders and Sorters, Agricultural Products*
		51-3023	Slaughterers and Meat Packers*
		29-2056	Compliance Officers*

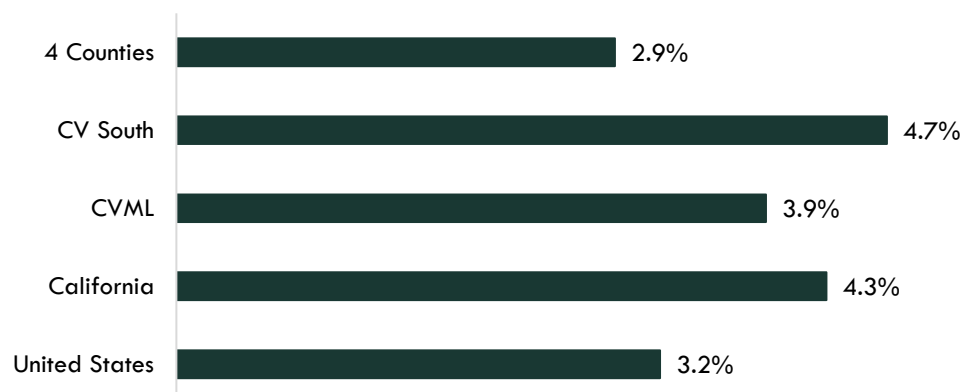
\*Asterisk denotes occupations included for this report based on input from Reedley College.

**Projected Growth in Occupational Employment**

The food safety occupations identified for this study shown positive growth (Exhibit 2). The four-county area, South Central Valley region and Central Valley-Mother Lode region all show projected growth greater than that for the nation.

The South Central Valley region has the highest projected growth of 4.7%, which exceeds the state rate of 4.3%.

The four-county area, however, is expected to experience the least amount of growth (only 2.9%), compared to the overall Central Valley-Mother Lode region and the state.

**Exhibit 2 – Projected Growth Rates  
2016-2021**

An analysis of current and projected jobs was conducted for each of the nine occupations identified for the study.

In the four-county area, the occupation of graders and sorters, agricultural products comprises more than half of the jobs for all the occupations combined. Graders and sorters total more than 4,000 workers in the region, but this occupation is only expected to grow by 1% over the next five years (Exhibit 3).

There are approximately 1,500 workers in the region who are slaughterers or meatpackers, the second largest occupation within the food science grouping. This occupation is expected to increase by 6% over the next five years, with 56 annual openings.

The two occupations with the fewest annual openings are food scientists and technologists and buyers and purchasing agents, farm products. These occupations are expected to undergo very slight growth by 2021.

The occupation with the greatest projected growth is chemical technicians. Expanding by 17% in the next five-year period, this occupation will increase from 166 jobs to 195 jobs. Also of note are agricultural inspectors, whose occupation is expected to shrink from 489 positions to 486 positions.

**Exhibit 3 – Food safety community college programs and occupations**

Occupation	2016 Jobs	2021 Jobs	% Growth*	Annual Openings**
Graders and Sorters, Agricultural Products	4,220	4,275	1%	94
Slaughterers and Meat Packers	1,503	1,589	6%	56
Compliance Officers	763	794	4%	21
Agricultural Inspectors	489	486	-1%	15
Agricultural and Food Science Technicians	449	461	3%	20
Biological Technicians	284	302	6%	12
Buyers and Purchasing Agents, Farm Products	184	190	3%	5
Food Scientists and Technologists	170	177	4%	7
Chemical Technicians	166	195	17%	10

\*Growth refers to net change over the period, i.e. new job creation or job decline, and does not factor in replacement jobs.

\*\*Annual Openings represents the annual average number of new jobs plus replacement jobs projected for the five-year period.

### Hourly Wages

The living wage for one adult in Fresno, Kings, Madera and Tulare counties ranges from \$9.89/hour in Kings County to \$10.84/hour in Fresno County. The average entry-level wage in the four-county area for all nine food safety occupations is \$11.12/hour, which is higher than the \$10.48/hour average living wage for a single adult in the four-county region.

Within the food safety occupational group, entry-level wages range from \$9.01/hour (graders and sorters, agricultural products) to \$20.71/hour (compliance officers). Five of the occupations fall below and four are above the four-county area's average living wage for a single adult (\$10.48/hour).

The occupation of compliance officers has the highest entry-level followed by buyers and purchasing agents, and agricultural inspectors. The order changes at experienced worker wage levels with buyers and purchasing agents, farm products earning the highest wage followed by compliance officers, and food scientists and technologists.

**Exhibit 4 – Entry-level and median hourly wages**

Occupation	Entry-level Hourly Wage*	Median Hourly Wage
Graders and Sorters, Agricultural Products	\$9.01	\$9.68
Slaughterers and Meat Packers	\$9.62	\$11.98
Compliance Officers	\$20.71	\$31.38
Agricultural Inspectors	\$15.53	\$21.08
Agricultural and Food Science Technicians	\$11.59	\$17.50
Biological Technicians	\$10.73	\$16.51
Buyers and Purchasing Agents, Farm Products	\$17.58	\$31.81
Food Scientists and Technologists	\$14.69	\$24.98
Chemical Technicians	\$10.04	\$15.00

\*Entry-level hourly wage is represented by the 10<sup>th</sup> percentile wage – 10% of workers in the occupation make less, while 90% of the workers in the job make more than this amount.

**Typical Education Level**

Education and training requirements for entry-level work varies by occupation and employer preference. Exhibit 5 shows the typical education required for each occupation as identified by the Bureau of Labor Statistics. Employer educational preferences collected by O\*NET for each occupation also are included.

The educational preferences listed by O\*Net and the Bureau of Labor Statistics do not complement one another for several animal science occupations. For example, the Bureau of Labor Statistics lists a bachelor's degree for agricultural inspectors, but O\*Net specifies a high school diploma or equivalent. Similarly, a high school diploma/equivalent is listed for buyers and purchasing agents, but O\*Net notes that this occupation requires a bachelor's or associate degree.

The occupations of graders/sorters and slaughterers/meat packers typically require short-term, on-the-job training, but formal education is not required beyond a high school diploma.

**Exhibit 5 – Educational requirements by occupation**

Occupation	Typical entry-level education	O*Net Job Zone: Education
Buyers and Purchasing Agents, Farm Products	High school diploma/equivalent	Most require a bachelor's or associate degree, but some do not.
Compliance Officers	Bachelor's degree	Most require a bachelor's or associate degree, but some do not. *
Food Scientists and Technologists	Bachelor's degree	Most require a bachelor's or associate degree, but some do not.
Agricultural and Food Science Technicians	Associate degree	Most require vocational training or an associate degree.
Biological Technicians	Bachelor's degree	Most require a bachelor's or associate degree, but some do not.
Chemical Technicians	Associate degree	Most require vocational training or an associate degree.
Agricultural Inspectors	Bachelor's degree	Some may require a high school diploma or equivalent.
Graders and Sorters, Agricultural Products	Less than high school	Some may require a high school diploma or equivalent.
Slaughterers and Meat Packers	Less than high school	Some may require a high school diploma or equivalent.

\* Due to lack of specification regarding compliance officers, Job Zone data had to be obtained from a specified occupation closely related to animal science within the general category.

## Occupational Trends

According to the report “Occupational Analysis of the Present and Future Food Safety Workforce,” there is a general shortage of qualified food safety professionals across all food sectors in the United States and attention must be given toward recruiting and training qualified food safety workers.<sup>5</sup>

Key findings from the report include:

- Food safety employment is expected to increase through 2020.
- The occupations of agricultural and food science technicians are projected to increase by 7%; animal scientists by 13%; and food scientists and technologists by 8%.
- “College students are generally ignorant about food safety careers and curricular offerings at their institutions; thus, there is an opportunity to better inform and attract young people to consider food safety careers,” the report states.
- The report also states, “workforce capacity building efforts may benefit from increased understanding of the variety of occupations in food safety.”<sup>6</sup>

According to the American Society of Animal Sciences, there are a number of challenges facing the industry. One leading challenge identified by the organization and related to food safety has to do with “developing and maintaining safe, effective and responsible animal health-management systems, including preventative vaccines, antimicrobial treatments, and production-technologies that promote efficient growth and ensure a healthy, safe and sustainable relationship between humans and farm animals.”<sup>7</sup>

Another critical goal identified by the American Society of Animal Sciences is the development of “intervention and control strategies for foodborne contaminants along the entire animal production chain” and enhancing “detection of pathogens to ensure a safe food supply and decrease foodborne illnesses.”

## Regional Programs

Community college data were reviewed for the four-county area. During the 2013-2014 academic year, animal science programs conferred a total of 15 awards, and 14 awards were conferred in 2014-2015 (Exhibit 6). Awards consisted of either certificates or associate degrees.

**Exhibit 6 – Community college awards related to animal science**

College	Program Title	Awards 2013-2014	Awards 2014-2015
Reedley College	Animal Science	2	1
College of the Sequoias	Animal Science	13	13

In the larger Central Valley region, animal science programs at Bakersfield, Merced, Modesto Junior, and San Joaquin Delta colleges conferred awards in 2014-2015. On average, each of the seven Central Valley community colleges conferred 92 awards annually in animal science.

A review of nearby universities determined that only California State University – Fresno offers an animal science program. In 2014-2015, this institution conferred five awards or degrees.

<sup>5</sup> Stevenson, Clinton D. “Occupational Analysis of the Present and Future Food Safety Workforce.” March-April 2015. Food Protection Trends, Vol 35, No. 2. <http://www.foodprotection.org/files/food-protection-trends/Mar-Apr-15-Stevenson.pdf>

<sup>6</sup> Ibid.

<sup>7</sup> “American Society of Animal Sciences: Grand challenges.” American Society of Animal Sciences. Accessed August 12, 2016. [https://www.asas.org/docs/default-source/public-policy/qc\\_pages\\_web2015.pdf?sfvrsn=2](https://www.asas.org/docs/default-source/public-policy/qc_pages_web2015.pdf?sfvrsn=2)

Those food safety occupations that reflect related community college programs and provide the bulk of projected sustainable employment over the next five years were identified and then crosschecked with their representative TOP codes. Those TOP codes and their titles are as follows:

- 010100 – Agriculture Technology and Sciences, General
- 011300 – Food Processing and Related Technologies
- 095400 – Chemical Technology
- 095500 – Laboratory Science Technology

## Conclusion and Recommendations

Based on the occupational and program findings, it is suggested that colleges in the four-county area consider taking the following next steps:

- Review the course offerings against the TOP codes and occupational titles included in this assessment to ensure that only those occupations with the most direct employment relevance to the curricula have been included.
  - The college might consider using the TOP code 019900 – Other Agriculture and Natural Resources as it provides a level of flexibility in occupational assignment and leaves it open for the California Community Colleges Chancellor’s Office to develop a specific code assignment within the agriculture sector.
- Consider focusing on training students to enter the occupation of chemical technicians, which typically requires an associate degree and is projected to grow by 17% over the next five years. Community colleges could also encourage students to pursue transfer to four-year colleges or universities in pursuit of degrees related to the occupations of biological technicians and food scientists and technologists, which will undergo 6% and 4% growth respectively in the region. Meanwhile, the region’s two largest occupations—graders/sorters and slaughterers/meat packers—only require high school education and are not suited for community college programs.
- To better understand what happens to students who earn similar credentials and move into employment, conduct secondary research of employment outcomes from programs at other institutions of higher education in the region or throughout the state. The CTE Launchboard is a good resource for this information.

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Information and data for this report are the following public and proprietary sources: Economic Modeling Specialists (EMSI), Bureau of Labor Statistics and O\*NET online. More information about the Centers of Excellence is available at [www.coecc.net](http://www.coecc.net).

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