



# **CGCC Food & Beverage Programming Feasibility Study**

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THOMAS P. MILLER & ASSOCIATES

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# EXECUTIVE SUMMARY & RECOMMENDATIONS

## Report Highlights

Columbia Gorge Community College (CGCC) is driven by the desire to provide relevant, in-demand training to the north central Oregon region and southcentral Washington, i.e.: Hood River, Wasco, Sherman, Gilliam, and Wheeler counties in Oregon; and Klickitat and Skamania counties in Washington. Thereby, CGCC contracted with Thomas P. Miller & Associates and Northwest Food Solutions to accomplish the following:

- Clarify the specific workforce needs of the food and beverage industry (including upstream and downstream industries);
- Diagnose how these needs are currently being fulfilled by companies;
- Reveal gaps in workforce training that are constraining companies' expansion and growth;
- Discover critical knowledge, skills, and certifications that employers need to keep fueling the growth of this industry;
- Elucidate value-added services that could be offered through the training center, such as commercial kitchen access, that would benefit the regional economy;
- Explore the interest and opportunities for partnership in forming sector partnerships and advisory committees from local industry partners, workforce partners, and other community organizations; and
- Determine if there is sufficient unmet demand to warrant the development of a food and beverage training facility at CGCC.

TPMA seeks to answer these questions in the course of the following seven-chapter analysis. The highlights of each chapter are summarized in the sections below.

## Comparison to Peer Regions

TPMA compares the Food & Beverage Manufacturing industries in the CGCC Region to ten other western areas of similar size and characteristics. The CGCC Region boasts of the second fastest growing food and beverage economy, **increasing by 185% since 2001**. In addition, despite being the fourth smallest region in the peer group population-wise, the CGCC Region outperformed numerous larger metro areas in terms of numeric job growth, including Chico (CA), Madera (CA), Wenatchee (WA), and Moses Lake (WA). One less positive highlight is that **average earnings for Food & Beverage workers are 12% lower** than the peer group average.

## Industry Analysis

In 2018 the Restaurant & Drinking Places industry group employed an annual average of 3,794 workers, and the Food & Beverage Production industry group employed 1,270 workers. In concert, the two industry groups are **32% more concentrated than the national average** for such industries. Both industry groups have expanded over the past five years, increasing by 318 and 75 workers, respectively. Industries with particularly strong regional competitiveness include **Dried & Dehydrated Food Manufacturing; Tortilla Manufacturing; Drinking Places (Alcoholic Beverages); and Breweries**. Individual industries with the strongest projected growth are demonstrated in Tables A1 and A2 below.

**Table A1: Highest Growth Industries within Food & Beverage Production**

Industry	Job Growth (2018-2023)
Dried & Dehydrated Food Manufacturing	+63 jobs
Farm Product Warehousing and Storage	+26 jobs
Animal (except Poultry) Slaughtering	+12 jobs
Coffee & Tea Manufacturing	+10 jobs
Food Service Contractors	+8 jobs

**Table A2: Highest Growth Industries within Restaurants & Drinking Places**

Industry	Job Growth (2018-2023)
Breweries	+79 jobs
Drinking Places	+64 jobs
Snack and Nonalcoholic Beverage Bars	+53 jobs
Wineries	+37 jobs
Limited-Service Restaurants	+37 jobs

Although the region has experienced employment growth in most industries, wage increases have been minor. Earnings in the Food & Beverage Production industry group rose at an average annual rate of 1.6% since 2001. Earnings in the Restaurants & Drinking Places industry group rose at an average annual rate of 0.6% over the same period of time. When compared with annual inflationary growth, the Food & Beverage Production industry group has roughly maintained the same spending power, whereas workers in the Restaurants & Drinking Places industry group have lost some spending power.

## Employer Demand

To complement the quantitative industry analysis, employers were provided an opportunity to detail their current workforce and recruitment challenges and hiring needs. Fifty-seven responses were collected from across the seven-county CGCC Region from a variety of industries. In addition, TPMA interviewed ten industry representatives from across the region.

The industry survey and interviews indicate that employers struggle to hire workers, believe strongly in the potential of the food and beverage industries in the CGCC Region, and are excited about the potential for CGCC to introduce programming to serve the industry. Of survey respondents, **74% believe that the regional economy is directly tied to the success of the food and beverage industries**. Additionally, **84% of respondents believe that the region needs dedicated higher education programming for food and beverage processing**. Currently, just 55% of respondents agreed that CGCC is “a valuable asset in educating/training the local workforce.”

Results indicate that most industries foresee more hiring over the next three years than over the past three years (55% of respondents), the majority of which will be driven by new job growth. Furthermore, most of the food and beverage producers in the region are either currently licensed or working toward licensing to export their products out of state, indicating a desire by businesses to expand business operations even further. One of the greatest challenges of employers in Food & Beverage Production and Restaurants & Drinking Places is a highly seasonal workforce. Remarkably, 43% of survey respondents indicate that 0 to 40% of their workforce is either seasonal, part-time, or both.

Questions about workforce challenges indicated across-the-board needs for more and better qualified talent. Ninety percent of respondents believe that there are not enough qualified workers in the regional labor pool. Based on specific workforce populations, the most difficult to hire include **skilled-trades workers (92% of respondents find hiring challenging); entry level/support workers (84%); and professional/technical workers (79%)**. Specific skills most commonly called for by employers include:

- Fermentation
- Food Prep & Culinary Arts
- Basic Computer Skills
- Food Safety & Sanitation
- Viticulture & Enology
- Maintenance
- Mechanical Skills

A further issue contributing to workforce shortages is the high cost of housing and transportation, issues that are particularly challenging for low-paid workers in the Food Service industry.

Lastly, business representatives interviewed by TPMA over the course of the study reveal that the Columbia Gorge is unique among regions in the western United States in the ability of producers to quickly and easily access fresh food and partner with other food and beverage professionals. Though small in numbers, the entrepreneurs in this industry are marked by high passion and willingness to partner with each other and CGCC.

## Benchmarking Analysis

TPMA identified twelve academic programs at the two-year and four-year levels across the country in the fields of culinary arts, food science, and fermented beverage manufacturing that can offer some practical guidance for CGCC. The following themes are most notable from this analysis:

- There are various training methods offered at these institutions that prepare students for a wide reach of occupations. This includes training via labs, clinicals, work-based learning, project-based learning, and lectures.
- Many programs require a work-based learning component as part of their curriculum including internships, co-op experiences, apprenticeships, job shadowing, and project-based learning.
- There are numerous variations of program completion levels including certifications, associate's degree, bachelor's degree, non-credit courses, diplomas, continuing education, and online courses. Additionally, many community college programs offer articulation to four-year programs at the completion of an associate's degree.
- Programs are regularly geared toward a variety of people including students, hobbyists, and industry professionals.
- Most programs engage with local industry. This includes partnerships with industry access pilot brewing facilities, visits to vineyards and hop fields, and industry representatives providing input into curriculum design.

## CGCC Facility Review

TPMA and Northwest Food Solutions conducted a comprehensive analysis of existing CGCC assets related to food and beverage production and education. Assets analyzed included a commercial and teaching kitchen and four science/technical labs. Conclusions from this analysis indicate that CGCC's facilities possess many of the assets required to serve this industry, but there are some opportunities for improvement.

CGCC's teaching labs are more than adequate to teach courses basic to fermentation and food science, including food chemistry and microbiology. There is capability within the labs to run tests that are common within the food industry. It is feasible to conduct the examination, identification, and propagation of yeast and bacteria cultures. Some equipment is recommended for purchase if CGCC were to offer courses specific to food and beverage production.

The 4,000 square foot commercial kitchen includes a teaching kitchen, a packaging room, a dishwashing room, a commercial kitchen, three storage rooms, and a walk-in cooler. The facility is well appointed but does require some basic maintenance to floors and various equipment. Through both the industry survey and interviews, it is clear that the region has strong demand for a functional commercial kitchen and the **CGCC facility is only used at 11% capacity** currently. In addition to serving industry partners, the facility could also be retrofitted to allow a pilot brewing facility and could be used to house a culinary arts program.

## Student Survey

To measure student demand TPMA reviewed both national trends in student demand and conducted a survey of CGCC students. In looking at four benchmark programs nationally, Culinary Arts & Related Services is by far the most popular but completions in these programs have tailed off considerably over the past five years. Conversely, Food Science & Technology and Viticulture and Enology programs, although much smaller in number, have exploded in recent years. Programs in Agriculture & Food Products Processing are fairly rare and are not growing at an outstanding rate.

Results of the student survey indicate that CGCC students are mildly interested in the food & beverage industry (32% are interested or highly interested). This low initial indication of interest may demonstrate many students perceive food and beverage jobs being primarily located at restaurants, a topic that many students are familiar with as they are employed in Food Services while attending college. However, more specific questions on types of food production indicate higher levels of interest; for example **68% of students indicate interest in courses in fermented food and beverages, as well as food production**. These results indicate the importance of crafting the right title and message for food and beverage processing programs, as to differentiate it from general cooking and food service courses.

## Recommendations

### Feasibility Scorecard for Degree Granting Programs to Serve Food & Beverage Industries

As is our custom with all feasibility studies, TPMA utilizes a feasibility scorecard methodology which allows the consulting team to weigh each driver of demand separately on a one to five scale, and then aggregate those results into a final one to five rating. The specific question being addressed with this Feasibility Scorecard is: ***Is it necessary and feasible to offer any degree-granting two-year programs to serve the food and beverage industries?***

Clearly, there are various other ways that CGCC could meet demand for the food and beverage industry other than such a program including workforce training, continuing education, and certificate programs, to name a few. The scorecard is not designed specifically to rate the feasibility of all of these alternatives. That said, the drivers of success are the same for each of these scenarios, so it should be considered input relative to any programming decisions in this realm.

With input from the CGCC steering committee, TPMA arrived at the following success criteria:

- **Employer Demand:** amount and intensity of demand from regional employers for programming;
- **Training Criticality:** essentialness for intervention to provide programming for these industries;
- **Community Support:** level of interest and enthusiasm among industry representatives;
- **Capital & Infrastructure:** adequacy of existing buildings and equipment to enable programming

Using this rating rubric, TPMA arrives at the following ratings. Table A3 also contains a short summary of the justification for each of these ratings.

**Table A3: Feasibility Scorecard Ratings**

Category	CGCC Rating	Justification
Employer Demand	2.5	Small but growing economy Ideal location for craft food and beverage production and food service Handful of businesses with expanding workforce needs Region is geographically large and highly rural Region perceived as very distant for Portland-area labor pool Potential geographic and infrastructure growth constraints
Training Criticality	3.0	Brewery industry has little challenge recruiting entry-level talent Most industries are using on-the-job training for upskilling but would prefer to hire more experienced workers Strong regional demand for general CTE programming (not food and beverage specific) Highly seasonal workforce
Community Support	5.0	Very high enthusiasm from industry representatives Willingness to provide input and partner with CGCC Strong calls for programming from industry representatives Strong network amongst existing businesses

Category	CGCC Rating	Justification
Capital & Infrastructure	4.3	Good existing facilities Some capital improvements required Potential to increase program demand with community and workforce education courses

Beyond just determining these ratings it is also necessary to weight the success criteria according to level of importance (shown in Table A4). By ensuring that the weights total to 100%, the final rating is maintained on a one to five scale. **The most important factor for the success of any higher education program is persistent and sufficient workforce demand;** hence the 40% rating for Employer Demand. Following this, the value of training through that program must be high enough that employers and students will prefer it to on-the-job training or other training options; hence the 30% rating for Training Criticality. Community Support is essential for program success but, in and of itself, not as important as basic demand. Lastly, Capital & Infrastructure are helpful but non-essential. In most cases, if all other factors line up funding and resources can be found to address a demand even in the absence of prior resources.

**Table A4: Feasibility Scorecard Ratings with Weighting**

Category	CGCC Rating	Weight	Index Score
Employer Demand	2.5	40%	1.00
Training Criticality	3.0	30%	0.90
Community Support	5.0	20%	1.00
Capital & Infrastructure	4.3	10%	0.43
Weighted Average Score (1 to 5 scale)			3.33

In summary, the region possesses ingredients that indicate strong need for specific programming for the Food & Beverage industries, most notably strong community support, strong recent growth, and a quantifiable shortage of highly-skilled workers. However, the region is also relatively low in population and, despite workforce challenges, industry continues to expand. The rating of 3.33 is above average but there are certain challenging factors that would need to be mitigated to ensure continuous demand for students.



## Recommended Program Matrix

As previously noted, there are numerous ways for CGCC to serve the Food & Beverage industries. Figure A1 demonstrates TPMA's recommendations for programming, ranked from left to right in level of certainty of success, with descriptions of the skills and courses that should be associated with each. Programs further to the right should not be considered infeasible, but they should be considered more of a risk. Certain strategies can be employed to mitigate those risks, some of which are outlined in the Keys to Success following Figure A1. Courses listed in Figure A1 are drawn both from Chapter 5: Benchmarking Analysis and observations from Chapter 3: Employer Demand.

**Workforce/Contract Training** includes a list of program needs that were mentioned repeatedly through TPMA's interactions with industry representatives.<sup>1</sup> Many of these courses could overlap with the certificate and degree programs but could also be offered to businesses looking to train-up their workforce, or to individual course auditors who are looking to build their skill set.

One of the unique benefits and the unique challenges of the CGCC region is that it possesses elements of all forms of food & beverage manufacturing; even within the subcategory of alcoholic beverage manufacturing nearly every variety is represented (e.g.: distilled spirits, wine, beer and cider). On its own, no one of these industries is large enough to warrant individual programming, but in combination the odds of success are much higher. The goal, therefore, of the **Associate's of Arts in Food Science & Fermentation** is to isolate skill sets that are common to all forms of Food & Beverage Production. Based on TPMA's research, there are several programs in the United States focused on Fermentation in general, but none that address both Food Production and Fermentation simultaneously. Lastly, it is greatly preferred if this program is an AA, rather than an AAS, as the ability to transfer credits to a four-year program could greatly increase the potential audience of students for CGCC.


The **Certificate in Culinary Arts** would address the need for chefs and cooks with a greater degree of kitchen skills. Industry demand for such workers is not as strong as it is for food and beverage production workers, which is why an associate's degree program is not recommended. Though recruitment is difficult in this industry, the wages are also low and, in many cases, workers can be brought up to speed in a few weeks of on-the-job training. However, numerous food service companies lament the degree of basic kitchen education that they invest in with entry-level workers. This program also serves to benefit Food and Beverage Production as well, as the growing sophistication of restaurants and breweries in their use of ingredients and pairing of food and beverages will only increase the baseline expectation of cooking staff.

Finally, **Community Education** classes would be a helpful addition to the regional population and economy. The listed courses are those that would likely draw the most interest from hobbyists and general community members. These programs may cover their costs but would be difficult to sustain in isolation of other programming further to the left on this chart. As an added benefit, these courses could provide valuable marketing and a source of additional students for the AA in Food Science and Fermentation and the Certificate in Culinary Arts programs.

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<sup>1</sup> Specific course material for Food & Beverage Workplace training should include the following: MS Excel and MS Word, basics of counting and inventory control, workplace safety, workplace organization, dependability, exposure to common industrial equipment, etc.

**Figure A1: Recommended Programs Matrix**

Level of Certainty 			
Workforce/Contract Training	AA in Food Science & Fermentation	Certificate in Culinary Arts	Community Education
<ul style="list-style-type: none"> <li>•Food Safety/Sanitation</li> <li>•Fermentation 101</li> <li>•Sensory Training</li> <li>•Food &amp; Beverage Workplace Training</li> <li>•Machinery Maintenance</li> <li>•Forklift Operation</li> <li>•PLC Training</li> </ul>	<ul style="list-style-type: none"> <li>•Algebra I &amp; II</li> <li>•Statistics</li> <li>•Basic MS Office Skills</li> <li>•Food Safety/Sanitation</li> <li>•Chemistry, Organic Chemistry</li> <li>•Biology</li> <li>•Microbiology</li> <li>•Raw Materials</li> <li>•Product Design/Flavoring</li> <li>•Sensory Training</li> <li>•Quality Assurance/Quality Control</li> <li>•Packaging</li> <li>•Business of Fermented Beverages</li> </ul>	<ul style="list-style-type: none"> <li>•Introduction to Hospitality</li> <li>•Food Safety/Sanitation</li> <li>•Culinary Basics</li> <li>•Meat, Poultry, Seafood</li> <li>•Nutrition</li> <li>•Pastries</li> </ul>	<ul style="list-style-type: none"> <li>•Food &amp; Beverage Pairing</li> <li>•Science of Homebrewing</li> <li>•Fermentation 101</li> <li>•Sensory Training</li> </ul>

## Keys to Success

A few additional points must be emphasized in relation to the recommended programs matrix. First, a few recommendations related to all programming opportunities. The Columbia Gorge area is rich in industry networking opportunities. CGCC should embrace these by becoming a member and regular participant in each of the following organizations:

- Breweries in the Gorge
- Columbia Gorge Winegrowers
- Cider Northwest Association
- Food Northwest

Engaging with such organizations will expand CGCC's network of employer partners and provide more opportunities to serve the industry. Furthermore, should CGCC develop dedicated programming, the college should explore the opportunity to host events and expos for such organizations.

With respect to Workforce/Contract Training, courses should be scheduled at times that are accommodating for working adults. No less than four business representatives interviewed indicated that they would regularly send employees through such programs if CGCC could work around employees' work schedules. For that same reason, CGCC should explore the possibility of developing mobile training modules for courses such as Fermentation 101 and Food Safety/Sanitation. The large geographic area included in the CGCC Region could make it difficult for some employers to send students to The Dalles for training.

In relation to the AA in Food Science & Fermentation, TPMA recommends that CGCC develop an Advisory Committee with members from the Food Production, Alcoholic and Non-Alcoholic Beverage Manufacturing, and Food Service industries to provide their input on program design. These employers can weigh in on many key decisions such as hiring decisions, curriculum choices, and defining industry recognized credentials.

TPMA further recommends that CGCC pursue formal partnership with each of the four-year institutions in the region that provide training for the Fermented Beverage industries, including:

- Portland State University: Business of Craft Brewing
- Oregon State University: Fermentation
- Washington State University: Enology & Viticulture

Though articulation agreements can be difficult, such agreements are worth the investment for what they could yield. In this case, partnering with any of these institutions could open up a market of potential students who are considering an advanced degree in fermentation but who wish to first acquire practical skills.

Lastly, as a word of caution in relation to Workforce/Contract Training, as well as Community Education, CGCC should be cautious to not design any of its degree programs to not cater to hobbyists and general residents. Doing so would set such programs up for inconsistent enrollment and unpredictable revenue.

## **Additional Opportunities**

There are opportunities for CGCC to utilize its existing resources to benefit local industry and stimulate further economic development. These activities could be pursued in concert with or independent of academic and workforce programming.

TPMA recommends that CGCC consider developing a pilot brewing facility. Such a facility would provide an essential service for test runs and small batches for mid- and large-sized brewers. In concert with the AA in Food Science & Fermentation, this facility could also provide students with valuable and necessary hands-on experience. Estimated costs for developing such a program are included in Table 54 of this report. It should be mentioned, as well, that such a facility would also require a manager/director who could maintain the equipment and teach students how to use it, which is an ongoing cost not estimated in this analysis.

TPMA recommends that CGCC consider investing in necessary equipment and maintenance of the commercial kitchen and marketing it for greater use within the CGCC area. Though the facility receives some use, it could be utilized to a much greater extent. Furthermore, it is clear from engagement with local businesses that such a facility is needed, and few are aware that CGCC already possesses this asset. Further investment in this facility could also complement the introduction of either the AA in Food Science and Fermentation or the Certification in Culinary Arts, both of which would require regular use of the kitchen.

# INTRODUCTION

This analysis focuses on north central Oregon and south-central Washington (the CGCC Region) which is made up of Gilliam, Hood River, Sherman, Wasco, and Wheeler counties in Oregon; and Klickitat and Skamania counties in Washington. The intention of this analysis is to provide statistics, information, employer and student insights, and recommendations regarding food and beverage-related academic programming within the CGCC Region.

The contents of this report are as follows:

- Chapter 1 is a comparison to ten peer regions in the western United States, to contextualize the size and growth of the Food and Beverage industries in the CGCC Region.
- Chapter 2 is a deep dive into the industries that compose the Food and Beverage clusters, with distinctive components on the Food & Beverage Production and Restaurants & Drinking Places groups.
- Chapter 3 focuses on measuring Employer Demand, both by analyzing the business survey which was fielded by TPMA in November 2018 and examining job postings sponsored by CGCC Region employers.
- Chapter 4 takes a close look at the workforce that supports the Food & Beverage cluster, focusing on employment, growth, earnings, and typical levels of education and training.
- Chapter 5 is a Benchmarking Analysis, which examines the characteristics of 12 academic programs across the United States at the 2-year and 4-year level that focus on food and beverage industry education.
- Chapter 6 contains a review of CGCC's existing facilities to determine their adequacy for meeting the needs of the expanding Food & Beverage cluster.
- Chapter 7 is a summary of student demand for Food & Beverage cluster programming, based on a survey of existing CGCC students, as well as tracking enrollment in such programs across the United States.
- The Appendices contain an assortment of detailed information that can be used as reference when reading the body of this report.

## Methodological Note

Prior to jumping into the research a few words should be said about the Food & Beverage industries and this report, in general. When looking at the Food and Beverage industries, there are several components that compose what regional scientists and economists call an industry cluster. Within the Food & Beverage cluster there are two groups, namely, Food & Beverage Production, and Restaurants & Drinking Places. Food & Beverage Production includes businesses that render raw food products into food and beverages that are sold via restaurants, e-commerce, wholesale, or retail. The Restaurants & Drinking Places group is comprised of businesses that provide food and beverage service but (generally speaking) do not produce their own food and beverage products.<sup>2</sup> Clearly, these industries are inter-related, as the Food & Beverage Production businesses often provide products that are sold directly to consumers at restaurants, tap-houses, wine bars, etc. In fact, the abundance of fresh produce and locally produced beverages is one of the primary tourist assets of the CGCC Region. However, it is important that the two groups are analyzed distinctly at certain points, as they possess unique business models, workforce needs, and skillset requirements.

The data referenced in this analysis comes from a variety of sources including Thomas P. Miller & Associates' (TPMA) survey and interviews conducted exclusively for this project, as well as our proprietary desktop research of other colleges' academic programs, the National Center for Educational Statistics, and Economic Modeling Specialists, Inc. (Emsi). In each case, the data source utilized is indicated beneath the tables and charts where it is referenced. In cases where the data are from a given source but were significantly enhanced by TPMA's analysis, the citation is provided as TPMA and the given source.

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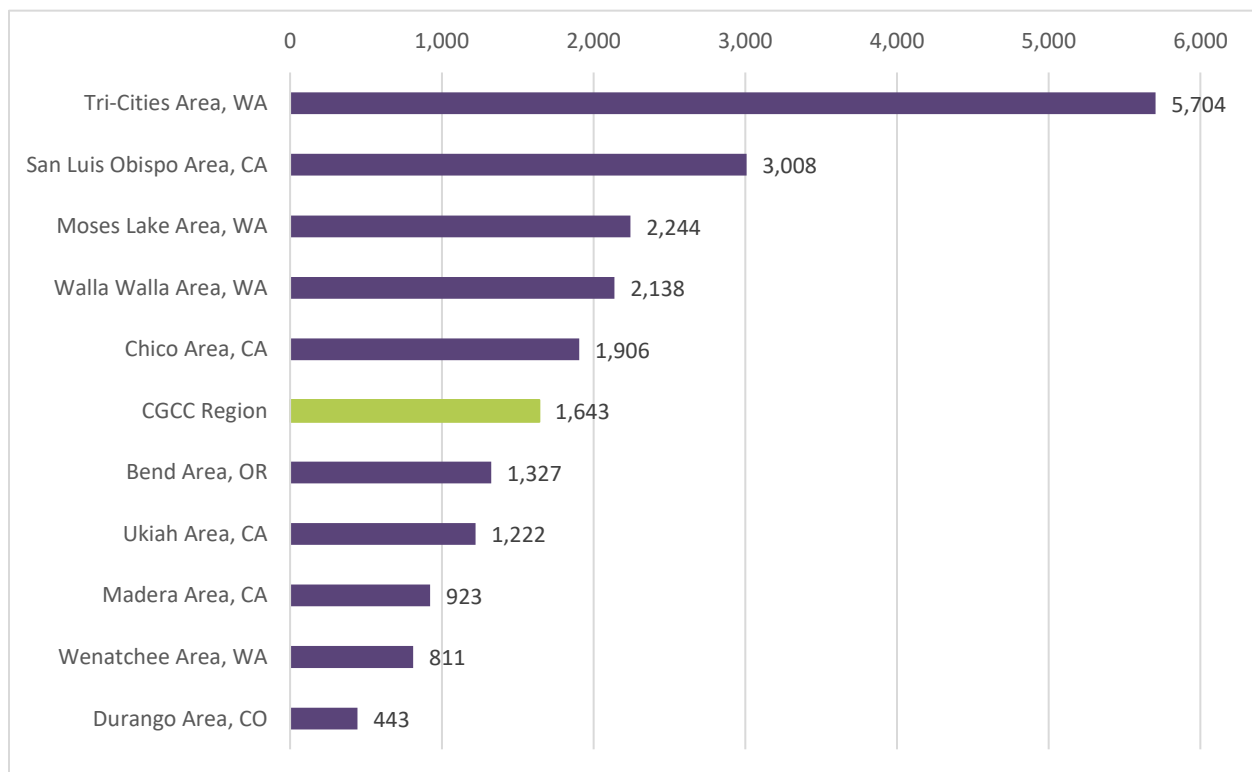
<sup>2</sup> Per standards of the Bureau of Labor Statistics, businesses that both produce a product and sell it directly to a customer, such as brew-pubs, wine tasting rooms, etc., are classified according to whichever component of their businesses generates the majority of that business's revenue.

# 1. COMPARISON TO PEER REGIONS

When determining the position of a given group of industries within a regional economy, it is often helpful to compare to other regions of the country that are also known for those same industries. In this case, TPMA selected ten comparison regions for the CGCC Region from within the western United States. Parameters for selection include population between 50,000 and 300,000, an above average presence of food and beverage production, and at least some degree of alcoholic beverage manufacturing. In addition, wherever possible TPMA looked to identify regions with some level of geographic growth constraints, similar to the CGCC Region.

For this comparison the Restaurant & Drinking Places group is excluded, as focusing on Food & Beverage Production provides a clearer comparison to areas where regional exports and tourism are driven by food and beverages, rather than other factors.<sup>3</sup> Lastly, it is important to note that unlike the ten peer regions, the CGCC Region is not an official Metropolitan or Micropolitan Statistical Area, according to the US Census Bureau, which means that it has a broader geographic area from which employment data are collected.

**Figure 1: 2018 Employment in Food & Beverage Production, CGCC Region Compared to Peer Group**



Source: Emsi, 2018 Q3

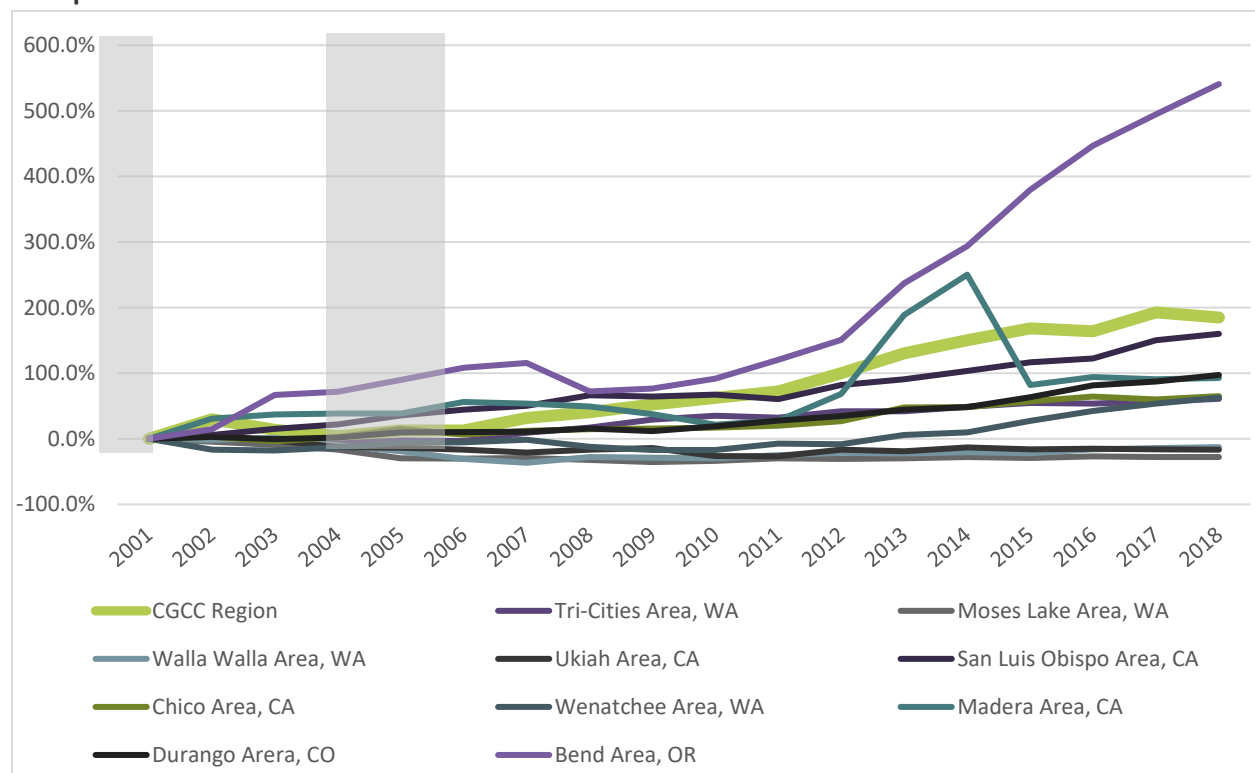
<sup>3</sup> Please note that total employment in Food & Beverage Manufacturing in this section differs from that listed in other chapters. In order to conduct an equal comparison to other regions, employment data for this section are based on the industry families 311: Food Manufacturing and 312: Beverage & Tobacco Product Manufacturing, rather than the customized industry groups described in Chapter 2.

Figure 1 demonstrates that in terms of total employment in 2018, the CGCC region ranks in the middle in total Food & Beverage Manufacturing employment when compared to other noteworthy western locations, ranking 6<sup>th</sup> of 11, just between the Chico (CA) Area and the Bend (OR) Area.

Figure 2 tells a more compelling story about the CGCC Region. This line chart demonstrates cumulative percentage change between 2001 and 2018 based on employment in the starting year (2001). The grey boxes in Figure 2 indicate periods during which the United States economy was in recession. Indexing employment to the start year brings into focus employment growth patterns, regardless of each region's actual employment size. The lime green bar representing the CGCC Region has been enhanced in size to make its position in the chart clearer.

These data indicate that Food & Beverage Manufacturing in the CGCC Region is among the fastest growing among peer regions in the United States. The Bend (OR) Area leads all peer regions with over 500% growth between 2001 and 2018. The CGCC Region ranks second within the peer group at 185% growth. Numerous regions with high visibility among wine and beer enthusiasts fall considerably behind the CGCC Region, including the Walla Walla (WA) Area, the San Luis Obispo (CA) Area.

**Figure 2: Food & Beverage Production Cumulative Growth (2001-2018), CGCC Region Compared to Peer Group**



Source: Emsi, 2018 Q3

In addition to looking at employment information, there are a few additional advanced metrics that indicate the level of specialization for a group of industries which will be used repeatedly throughout this report. *Location Quotient (LQ)* measures how concentrated or specialized an industry is in a particular county and helps to demonstrate what makes a particular county's economy unique. A number greater than 1.20 indicates that the particular sector is considerably more concentrated than the national average.

It also typically indicates that local demand for the products and/or services produced by that industry have been met and the industry is likely exporting products and/or services outside of the county. In other words, these may be industries that are bringing money into the county, rather than circulating money already present within the county. *Competitive Effect* indicates how much growth over a given period of time, has occurred due to reasons unique to the region, rather than industrial growth patterns. Any positive figures under competitive effect are a sign that the region is outperforming the national average over a given period.

Table 1 and Table 2 demonstrate some of the most significant statistics for comparing the CGCC Region to the peer group. Using both standard and advanced metrics, there are several other notable characteristics of the CGCC Region that have not already been highlighted. In terms of positive comparisons, despite being the fourth smallest region in the peer group population-wise, the CGCC Region outperformed numerous larger metro areas in terms of numeric job growth between 2001 and 2018, including Chico (CA), Madera (CA), Wenatchee (WA) and Moses Lake (WA). Additionally, based on competitive effect calculations, the CGCC Region significantly exceed expected levels of growth, falling short of just Bend (OR) and San Luis Obispo (CA), in this regard.

Furthermore, the CGCC Region's location quotient score of 3.23 indicates that the region is 223% more concentrated in the region than the national per-capita average, ranking fourth among the peer group just behind Moses Lake (WA) and the Tri-Cities (WA). Lastly, the CGCC Region has a relatively high average number of workers per establishment (23), which is unusual for a rural area. This indicates that there are a number of larger than average employers in the Food & Beverage Production industries in the area, which are likely reaching larger geographic markets and capable of making greater investments in workforce training and business growth.

**Table 1: Food & Beverage Manufacturing Industry Diagnostics, CGCC Compared to Peer Group**

Region Name	2018 Jobs	2001 - 2018 Change	2001 - 2018 % Change	Avg. Earnings Per Job	2018 Businesses	2018 Workers per Business
Tri-Cities Area, WA	5,704	2,159	60.9%	\$56,198	115	49.6
San Luis Obispo Area, CA	3,008	1,851	160.0%	\$54,469	178	16.9
Moses Lake Area, WA	2,244	(875)	(28.1%)	\$61,643	38	59.1
Walla Walla Area, WA	2,138	(306)	(12.5%)	\$47,585	94	22.7
Chico Area, CA	1,906	751	65.0%	\$59,223	32	59.6
<b>CGCC Region</b>	<b>1,643</b>	<b>988</b>	<b>184.7%</b>	<b>\$48,440</b>	<b>72</b>	<b>22.8</b>
Bend Area, OR	1,327	1,120	540.7%	\$52,625	65	20.4
Ukiah Area, CA	1,222	(240)	(16.4%)	\$60,819	64	19.1
Madera Area, CA	923	444	92.7%	\$53,625	31	29.8
Wenatchee Area, WA	811	312	62.7%	\$37,620	72	11.3
Durango Area, CO	443	219	97.3%	\$41,822	20	22.2

Source: TPMA & Emsi, 2018 Q3



**Table 2: Food & Beverage Manufacturing LQ and Competitive Effect, CGCC Compared to Peer Group**

Region Name	2018 Location Quotient	2001-2018 Competitive Effect
Tri-Cities Area, WA	3.56	13
San Luis Obispo Area, CA	1.84	514
Moses Lake Area, WA	4.36	(238)
Walla Walla Area, WA	5.35	(9)
Chico Area, CA	1.71	(24)
<b>CGCC Region</b>	<b>3.23</b>	<b>255</b>
Bend Area, OR	1.20	538
Ukiah Area, CA	2.73	(116)
Madera Area, CA	1.42	(639)
Wenatchee Area, WA	1.08	215
Durango Area, CO	1.24	77

Source: TPMA & Emsi, 2018 Q3

In terms of less positive comparisons, Food & Beverage Production earnings in the CGCC Region are 12% lower than the average of the peer group (average of \$54,751/year). Industry earnings are lower in the CGCC Region due to lower than national averages in multiple industries, most notably, Breweries and Fruit and Vegetable Canning.

## 2. INDUSTRY ANALYSIS

### Regional Growth Patterns

As mentioned in the introduction, this study is focused primarily on the Food & Beverage cluster, which is subdivided into the Restaurant & Drinking Places group and the Food & Beverage Production group. This chapter explains detailed industry employment, earnings, and growth statistics for the component industries that compose the cluster.

### Past and Projected Growth

Between the two subcomponents of the Food & Beverage Cluster, Restaurants & Drinking Places employs the lion's share with 3,788 workers, or 75% of the combined cluster.<sup>4</sup> The same case is true historically as in 2013 Restaurants & Drinking Places composed nearly 72% of employment in the Food and Beverage cluster.

**Table 3: Restaurants & Drinking Places and Food & Beverage Production Employment, 2013- 2018**

	2013 Jobs	2018 Jobs	2023 Jobs (Fore- casted)	Past 5 Year Change	Past 5 Year % Change	Next 5 Year Change	Next 5 Year % Change
Restaurants & Drinking Places	3,048	3,794	4,112	746	24.5%	318	8.4%
Food & Beverage Production	1,162	1,270	1,345	108	9.3%	75	5.9%
<b>Grand Total</b>	<b>4,210</b>	<b>5,064</b>	<b>5,458</b>	<b>854</b>	<b>20.3%</b>	<b>431</b>	<b>8.5%</b>

Source: Emsi, 2018 Q3

As shown in Table 3, the Food & Beverage Production group has seen a 9% increase in jobs since 2013, and Restaurants & Drinking Places has experienced a 24% growth in jobs. Looking at a five-year projection, the Restaurant & Drinking Place group is forecasted to expand an additional 8% (+318 jobs), and the Food & Beverage Production group is expected to grow 6% (+75 jobs).

**Table 4: Restaurants & Drinking Places and Food & Beverage Production LQ and Competitive Effect**

Description	2018 Jobs	2018 Location Quotient	('13 –'18) Competitive Effect
Restaurants & Drinking Places	3,794	1.19	(2)
Food & Beverage Production	1,270	1.98	24
<b>Grand Total</b>	<b>5,064</b>	<b>1.32</b>	<b>22</b>

Source: Emsi, 2018 Q3

Table 4 provides more detailed diagnostic data on the two groups, including location quotient (LQ) and competitive effect over the past five years. (For review, a description of LQ and competitive effect are contained in Chapter 1.) In combination, the Food & Beverage cluster is 32% more concentrated than the national average (LQ of 1.32). The Restaurant & Drinking Places group, though larger in numbers, is less specialized in the CGCC Region (LQ of 1.19), whereas the Food & Beverage Production group is nearly double the national per capita average for employment in such industries (LQ of 1.98). Likewise, growth

<sup>4</sup> Data from this section are from Economic Modeling Specialists International (Emsi), 2018.3 Class of Worker.

in Food & Beverage Production over the past five years, exceed national expected averages by 24 jobs, whereas for Restaurant & Drinking Places, past growth rates are as expected from national growth rates (Competitive effect of -2). Aggregated LQ and competitive effect can mask important details for individual industries; hence Tables 5 and 6 provided detailed statistics for each of the component industries for these groups. In these tables, to focus on only the most significant industries, all those with zero or less than ten employees in 2018 have been excluded.

**Table 5: Food & Beverage Production LQ and Competitive Effect**

Description	2018 Jobs	2018 Location Quotient	('13 –'18) Competitive Effect
Fruit and Vegetable Canning	372	23.42	(114)
Fresh Fruit and Vegetable Merchant Wholesalers	241	8.59	(68)
Dried and Dehydrated Food Manufacturing	183	57.00	146
Farm Product Warehousing and Storage	74	23.56	64
Coffee and Tea Manufacturing	64	10.22	18
Tortilla Manufacturing	52	9.92	34
All Other Miscellaneous Food Manufacturing	46	4.95	20
Food Service Contractors	44	0.30	7
Perishable Prepared Food Manufacturing	39	2.60	(117)
Other Grocery and Related Products Merchant Wholesalers	39	0.64	2
Animal (except Poultry) Slaughtering	35	0.93	25
Refrigerated Warehousing and Storage	22	1.32	21
Dairy Product (except Dried or Canned) Merchant Wholesalers	18	1.60	17
General Line Grocery Merchant Wholesalers	11	0.18	11

Source: Emsi, 2018 Q3

**Table 6: Restaurants & Drinking Places LQ and Competitive Effect**

Description	2018 Jobs	2018 Location Quotient	('13 –'18) Competitive Effect
Full-Service Restaurants	1,303	0.89	(107)
Limited-Service Restaurants	1,042	0.87	(106)
Breweries	406	20.74	49
Wineries	302	16.61	(2)
Drinking Places (Alcoholic Beverages)	262	2.48	139
Snack and Nonalcoholic Beverage Bars	258	1.34	44
Distilleries	89	22.69	(14)
Caterers	51	0.84	(2)
Mobile Food Services	35	2.60	18
Retail Bakeries	21	0.80	13
Commercial Bakeries	20	0.52	(1)

Source: Emsi, 2018 Q3

Within the CGCC Region, the industries with the most prominent concentration within the Food & Beverage Production group include: Dried & Dehydrated Food Manufacturing (57.00); Farm Product Warehousing & Storage (23.56); Fruit and Vegetable Canning (23.42); and Coffee & Tea Manufacturing (10.22). Of the industries in this group, all but two have increased in regional competitiveness in the past

five years, most notably Dried and Dehydrated Food Manufacturing, whereas Perishable Prepared Food Manufacturing and Fresh Fruit and Vegetable Merchant Wholesalers took notable steps back in regional competitiveness.

From within the Restaurants & Drinking Places group, Distilleries; Wineries; and Breweries are the most concentrated of the group, while Drinking Places (Alcoholic Beverages) and Mobile Food Services, also have noteworthy LQs. The restaurant industries (full-service and limited-service) did not keep up with national averages, demonstrating notable negative competitive effect between 2013 and 2018. Conversely, Drinking Places (Alcoholic Beverages); Breweries; and Snack and Nonalcoholic Beverage Bars, performed well by national standards.

## Detailed Industry Employment

Shown in the Food & Beverage Production individual industries chart, the industries that are expected to employ the most individuals by 2023 are Fruit & Vegetable Canning; Dried & Dehydrated Food Manufacturing; Fresh Fruit & Wholesalers; Farm Product Warehousing and Storage; and Coffee & Tea Manufacturing. The industries expected to see the largest job growth (2018-2023 Change) include Dried & Dehydrated Food Manufacturing (+63 jobs); Farm Product Warehousing and Storage (+26 jobs); Animal (except Poultry) Slaughtering (+12 jobs); Coffee & Tea Manufacturing (+10 jobs); and Food Service Contractors (+8 jobs).

**Table 7: Food & Beverage Production Detailed Employment, 2013- 2018**

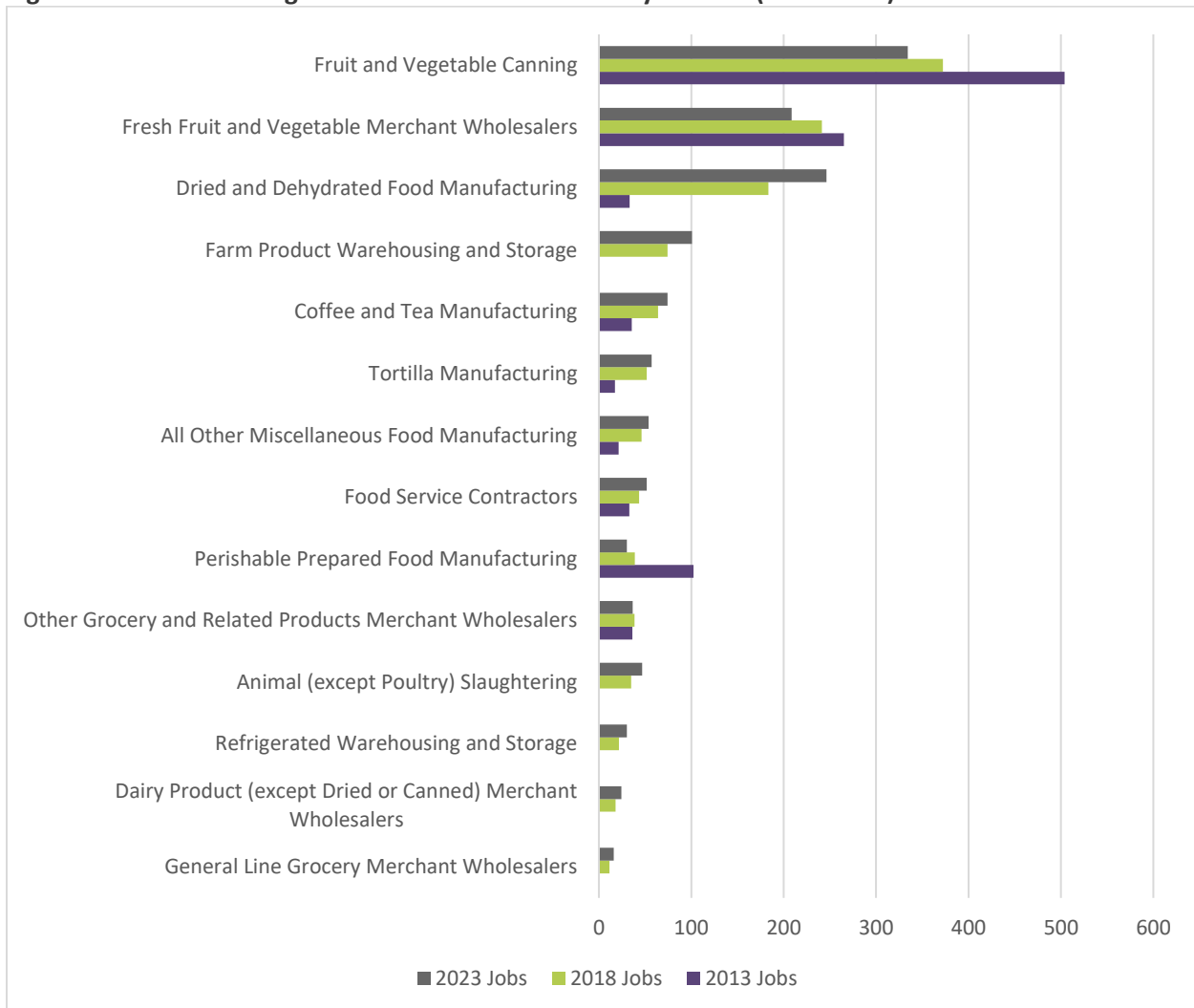
-----Food & Beverage Production-----							
	2013 Jobs	2018 Jobs	2023 Jobs	2013 - 2018 Change	2013 - 2018 % Change	2018- 2023 Change	2018- 2023 % Change
Fruit and Vegetable Canning	504	372	334	(132)	(26.2%)	(38)	(11.4%)
Fresh Fruit and Vegetable Merchant Wholesalers	265	241	209	(24)	(9.1%)	(33)	(15.8%)
Dried and Dehydrated Food Manufacturing	33	183	246	150	454.5%	63	25.6%
Farm Product Warehousing and Storage	0	74	101	74	N/A	26	25.7%
Coffee and Tea Manufacturing	36	64	74	28	77.8%	10	13.5%
Tortilla Manufacturing	18	52	57	34	188.9%	5	8.8%
All Other Miscellaneous Food Manufacturing	21	46	54	25	119.0%	8	14.8%
Food Service Contractors	33	44	52	11	33.3%	8	15.4%
Perishable Prepared Food Manufacturing	102	39	30	(64)	(62.7%)	(8)	(26.7%)
Other Grocery and Related Products Merchant Wholesalers	36	39	37	2	5.6%	(2)	(5.4%)
Animal (except Poultry) Slaughtering	0	35	47	35	N/A	12	25.5%
Refrigerated Warehousing and Storage	0	22	30	22	N/A	9	30.0%
Dairy Product (except Dried or Canned) Merchant Wholesalers	0	18	24	18	N/A	6	25.0%

	2013 Jobs	2018 Jobs	2023 Jobs	2013 - 2018 Change	2013 - 2018 % Change	2018- 2023 Change	2018- 2023 % Change
General Line Grocery Merchant Wholesalers	0	11	16	11	N/A	5	31.3%
Grain and Field Bean Merchant Wholesalers	54	0	0	(54)	(100.0%)	0	N/A
Fats and Oils Refining and Blending	11	0	0	(11)	(100.0%)	0	N/A

Source: Emsi, 2018 Q3

Looking at historical job growth for Food & Beverage Production, the following industries have declined in recent years and are projected to continue declining: Fruit and Vegetable Canning; Fresh Fruit & Vegetable Merchant Wholesalers; and Perishable Prepared Food Manufacturing. The following industries have decreased to zero employment in the seven-county region: Grain & Field Bean Merchant Wholesalers, and Fats & Oils Refining and Blending. Whereas General Line Grocery Merchant Wholesalers have increased from zero employment in 2013 and will continue to see growth over the next five years.

**Figure 3: Food & Beverage Production Detailed Industry Growth (2013-2023)**



Source: Emsi, 2018 Q3

Looking at detailed industry employment for the Restaurants & Drinking Places group provides a more in-depth look at overall job growth and decline. Shown below in the Restaurants & Drinking Places chart, the individual industries that are expected to staff the most individuals are Full-Service Restaurants, Limited-Service Restaurants, Breweries, Wineries, and Drinking Places. The industries that are expected to see the largest job growth (2018-2023 Change) are Breweries (+79 jobs), Drinking Places (+64 jobs), Snack and Nonalcoholic Beverage Bars (+53 jobs), Wineries (+37 jobs), and Limited-Service Restaurants (+37 jobs).

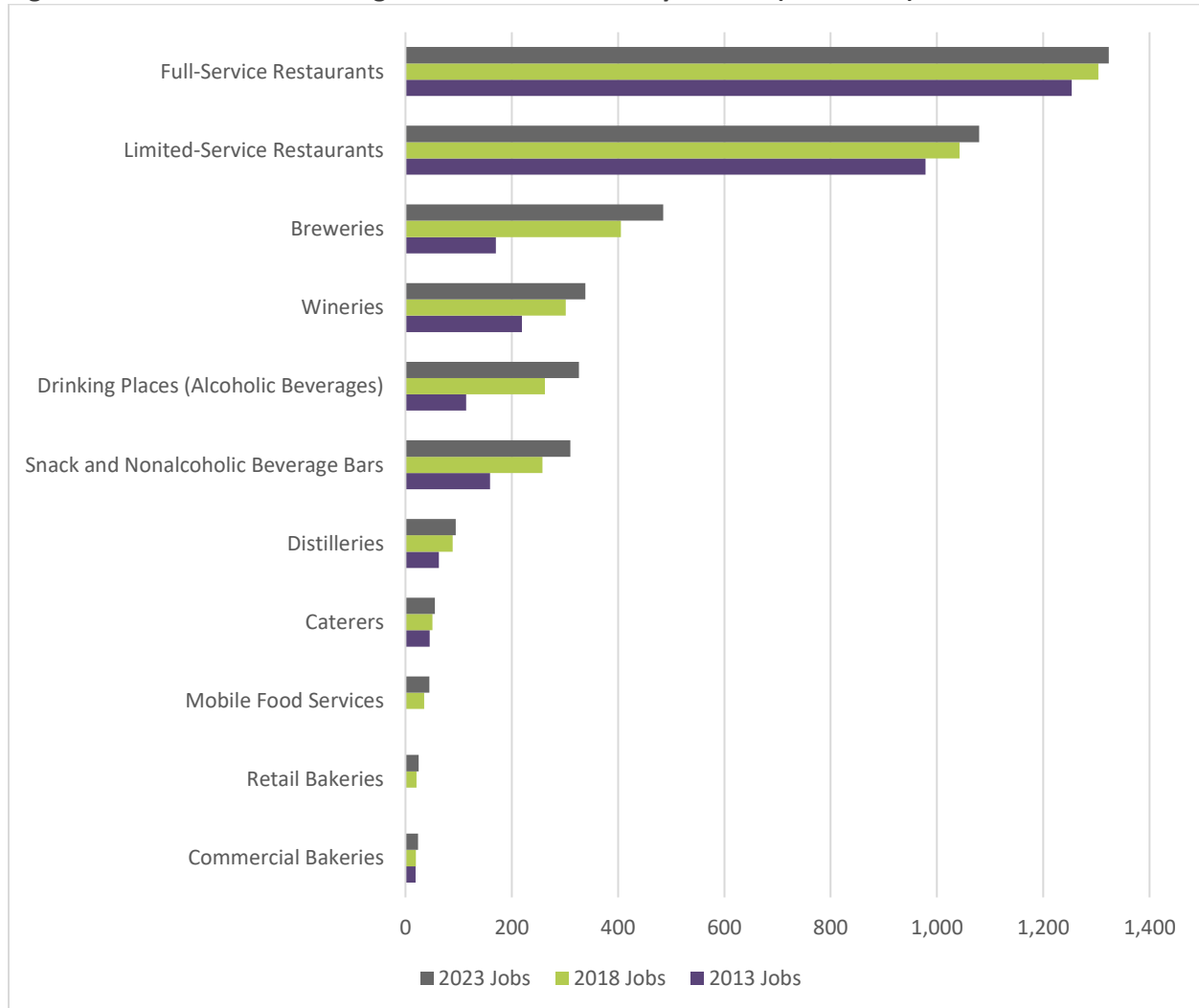
**Table 8: Restaurants & Drinking Places Detailed Employment, 2013- 2018**

-----Restaurants & Drinking Places-----							
	2013 Jobs	2018 Jobs	2023 Jobs	2013 - 2018 Change	2013 - 2018 % Change	2018- 2023 Change	2018-2023 % Change
Full-Service Restaurants	1,254	1,303	1,323	50	4.0%	20	1.5%
Limited-Service Restaurants	979	1,042	1,079	64	6.5%	37	3.4%
Breweries	170	406	485	236	138.8%	79	16.3%
Wineries	219	302	339	82	37.4%	37	10.9%
Drinking Places (Alcoholic Beverages)	114	262	327	148	129.8%	64	19.6%
Snack and Nonalcoholic Beverage Bars	159	258	310	99	62.3%	53	17.1%
Distilleries	63	89	95	26	41.3%	6	6.3%
Caterers	45	51	56	5	11.1%	5	8.9%
Mobile Food Services	0	35	45	35	N/A	9	20.0%
Retail Bakeries	0	21	25	21	N/A	4	16.0%
Commercial Bakeries	19	20	24	1	5.3%	4	16.7%
Cafeterias, Grill Buffets, and Buffets	0	0	0	0	N/A	0	N/A
Community Food Services	11	0	0	(11)	(100.0%)	0	N/A

Source: Emsi, 2018 Q3

Looking at historical growth for Restaurants & Drinking Places, most industries (with the exception of Cafeterias, Grill Buffets, and Buffets and Community Food Services) grew in the past five years and are projected to grow again in the next five. In terms of past growth, Breweries, Drinking Places, and Snack and Nonalcoholic Beverage Bars have outpaced other industries between 2013 and 2018 adding 483 new jobs.

**Figure 4: Restaurants & Drinking Places Detailed Industry Growth (2013-2023)**



Source: Emsi, 2018 Q3

## Earnings in the Food & Beverage Industry

The average earnings per job in the Food & Beverage Production industry group range from \$22,490 annually for Dairy Product (except Dried or Canned) Merchant Wholesalers at the low end to \$86,653 at the high end for All Other Miscellaneous Food Manufacturing. The Dried & Dehydrated Food Manufacturing industry has the most anticipated growth over the next five years with average earnings per job of \$64,850. The industry group as a whole has an average of \$49,333 in earnings.

**Table 9: Food & Beverage Production 2018 Detailed Industry Earnings**

-----Food & Beverage Production-----					
	2018 Jobs	2023 Jobs	2018- 2023 Change	2018- 2023 % Change	Avg. Earnings Per Job
All Other Miscellaneous Food Manufacturing	46	54	8	17.4%	\$86,653
Perishable Prepared Food Manufacturing	39	30	(9)	(23.1%)	\$68,573
Farm Product Warehousing and Storage	740	101	26	3.5%	\$68,112
Refrigerated Warehousing and Storage	22	30	9	40.9%	\$65,123
Dried & Dehydrated Food Manufacturing	183	246	63	34.4%	\$64,850
Tortilla Manufacturing	52	57	5	9.6%	\$56,112
Fruit & Vegetable Canning	372	334	(38)	(10.2%)	\$46,194
Fresh Fruit & Vegetable Merchant Wholesalers	241	209	(32)	(13.3%)	\$41,086
Other Grocery & Related Products Merchant Wholesalers	39	37	(2)	(5.1%)	\$35,689
Coffee & Tea Manufacturing	64	74	10	15.6%	\$31,062
Food Service Contractors	44	52	8	18.2%	\$30,536
Animal (except Poultry) Slaughtering	35	47	12	34.3%	\$24,850
Dairy Product (except Dried or Canned) Merchant Wholesalers	18	24	6	33.3%	\$22,490

Source: Emsi, 2018 Q3

The average earnings per job in Restaurants & Drinking Places industry group range from \$13,601 annually for Retail Bakeries at the low end to \$69,641 at the high end for Breweries. The Drinking Places (Alcoholic Beverages) industry has the most anticipated growth over the next five years with average earnings per job of \$26,510. The industry group as a whole has an average of \$29,503 in earnings.

**Table 10: Restaurants & Drinking Places 2018 Detailed Industry Earnings**

-----Restaurants & Drinking Places-----					
	2018 Jobs	2023 Jobs	2018-2023 Change	2018-2023 % Change	Avg. Earnings Per Job
Distilleries	89	95	6	6.7%	\$69,641
Breweries	406	485	79	19.5%	\$43,605
Wineries	302	339	37	12.3%	\$43,287
Drinking Places (Alcoholic Beverages)	262	327	64	24.4%	\$26,510
Caterers	51	56	5	9.8%	\$24,044
Mobile Food Services	35	45	9	25.7%	\$23,039
Full-Service Restaurants	1,303	1,323	20	1.5%	\$22,199
Commercial Bakeries	20	24	4	20.0%	\$21,731
Limited-Service Restaurants	1,042	1,079	37	3.6%	\$20,070



	2018 Jobs	2023 Jobs	2018-2023 Change	2018-2023 % Change	Avg. Earnings Per Job
Snack and Nonalcoholic Beverage Bars	258	310	53	20.5%	\$16,807
Retail Bakeries	21	25	4	19.0%	\$13,601

Source: Emsi, 2018 Q3

## Earnings Changes Over Time

When looking at historical earnings of the Food & Beverage Production industry since 2001, the average annual growth rate is 1.6%. This rate roughly holds with average annual inflation over the past several years, so on average, workers within the Food & Beverage Production group are maintaining their spending power.

**Table 11: Food & Beverage Production, 2001-2018 Average Annual Earnings Growth**

-----Food & Beverage Production-----	
Description	Average Annual Growth Rate Since 2001
Perishable Prepared Food Manufacturing	8.5%
Dried and Dehydrated Food Manufacturing	7.7%
All Other Miscellaneous Food Manufacturing	6.5%
Tortilla Manufacturing	5.9%
Fresh Fruit and Vegetable Merchant Wholesalers	2.1%
Food Service Contractors	1.6%
Fruit and Vegetable Canning	0.7%
Other Grocery and Related Products Merchant Wholesalers	(1.6%)
Refrigerated Warehousing and Storage	(1.6%)
Animal (except Poultry) Slaughtering	(2.3%)
Coffee and Tea Manufacturing	(3.5%)
Farm Product Warehousing and Storage	(4.9%)
Average	1.6%

Source: Emsi, 2018 Q3

It should be noted that certain industries within the group are excluded from this calculation because they do not have earnings data available back to 2001, namely, Breakfast Cereal Manufacturing; Nonchocolate Confectionery Manufacturing; Ice Cream and Frozen Dessert Manufacturing; Poultry Processing; Seafood Product Preparation and Packaging; Frozen Cakes, Pies, and Other Pastries Manufacturing; Roasted Nuts and Peanut Butter Manufacturing; Mayonnaise, Dressing, and Other Prepared Sauce Manufacturing; General Line Grocery Merchant Wholesalers; Packaged Frozen Food Merchant Wholesalers; Dairy Product (except Dried or Canned) Merchant Wholesalers; Confectionery Merchant Wholesalers; Fish and Seafood Merchant Wholesalers; and Meat and Meat Product Merchants.

When looking at historical earnings of the Restaurants & Drinking Places industry since 2001, the average annual growth rate is 0.6%. Like the Food & Beverage Production group, these wages are essentially keeping up with inflation.

**Table12: Restaurants & Drinking Places, 2001-2018 Average Annual Earnings Growth**

-----Restaurants & Drinking Places-----	
Description	Average Annual Growth Rate Since 2001
Snack and Nonalcoholic Beverage Bars	4.5%
Drinking Places (Alcoholic Beverages)	4.5%
Distilleries	3.8%
Full-Service Restaurants	3.1%
Limited-Service Restaurants	2.9%
Wineries	2.7%
Retail Bakeries	2.6%
Caterers	1.4%
Breweries	0.6%
Mobile Food Services	(1.1%)
Commercial Bakeries	(17.9%)
<b>Average</b>	<b>0.6%</b>

Source: Emsi, 2018 Q3

It should be noted that industries like Community Food Services and Cafeterias, Grill Buffets, and Buffets are not included in the compound annual growth rate since 2001 because they do not have earnings data available.

## Workforce Insights

Individuals' online resume and profile data can provide insight on location of workers in comparison to where they attended college. These data are a helpful indicator of how businesses are filling the need for skilled workers within a given industry group, particularly in this case as CGCC lacks any programming specifically designed for the Food & Beverage cluster. These data are not exhaustive of the entire labor force. However, in the case of Tables 13 and 14 below, sample sizes are adequate to draw inference related local recruitment and hiring practices.

## Food & Beverage Production Industry Group

The top three institutions that are training individuals with the skills needed to work within the Food & Beverage Production industry are Columbia Gorge Community College; Oregon State University; and Portland State University.

**Table 13: Top Colleges in the Region Graduating Students with Skills for Food & Beverage Production**

College	Profiles
Columbia Gorge Community College	35
Oregon State University	23
Portland State University	22
Mt Hood Community College	21
Portland Community College	18
University of Oregon	16
Washington State University	13
University of Phoenix	10
University of Washington	10
Central Washington University	8

Source: Emsi, 2018 Q3

## Restaurant & Drinking Places Industry Group

The top three institutions that are training individuals with the skills needed for the Restaurant & Drinking Places industry are Columbia Gorge Community College; Oregon State University; and Mt. Hood Community College.

**Table 14: Top Colleges in the Region Graduating Students with Skills for Restaurant & Drinking Places**

School	Profiles
Columbia Gorge Community College	63
Oregon State University	28
Mt Hood Community College	25
Portland State University	25
Portland Community College	24
University of Oregon	20
Clark College	13
Washington State University	13
University of Phoenix	11
University of Washington	11

Source: Emsi, 2018 Q3

### 3. EMPLOYER DEMAND

TPMA fielded a survey within the CGCC Region between October 30<sup>th</sup> and November 26<sup>th</sup> of 2018. TPMA designed a single survey instrument which applied to both Food & Beverage Production and Restaurant & Drinking Places industries, with an initial filtering question that directed respondents who indicated they did not operate within these industries out of the survey. Survey questions were designed by TPMA staff with input from the Columbia Gorge Community College. The survey garnered a gross total of 59 responses from six of the seven counties in the CGCC Region and across a broad array of industries

For each question of the survey a graphic is displayed that contains the percentage of responses along with an “N,” which represents the count of survey respondents who answered and did not skip the given question. In the body of this report, some of the questions have been truncated to make for a more readable narrative.

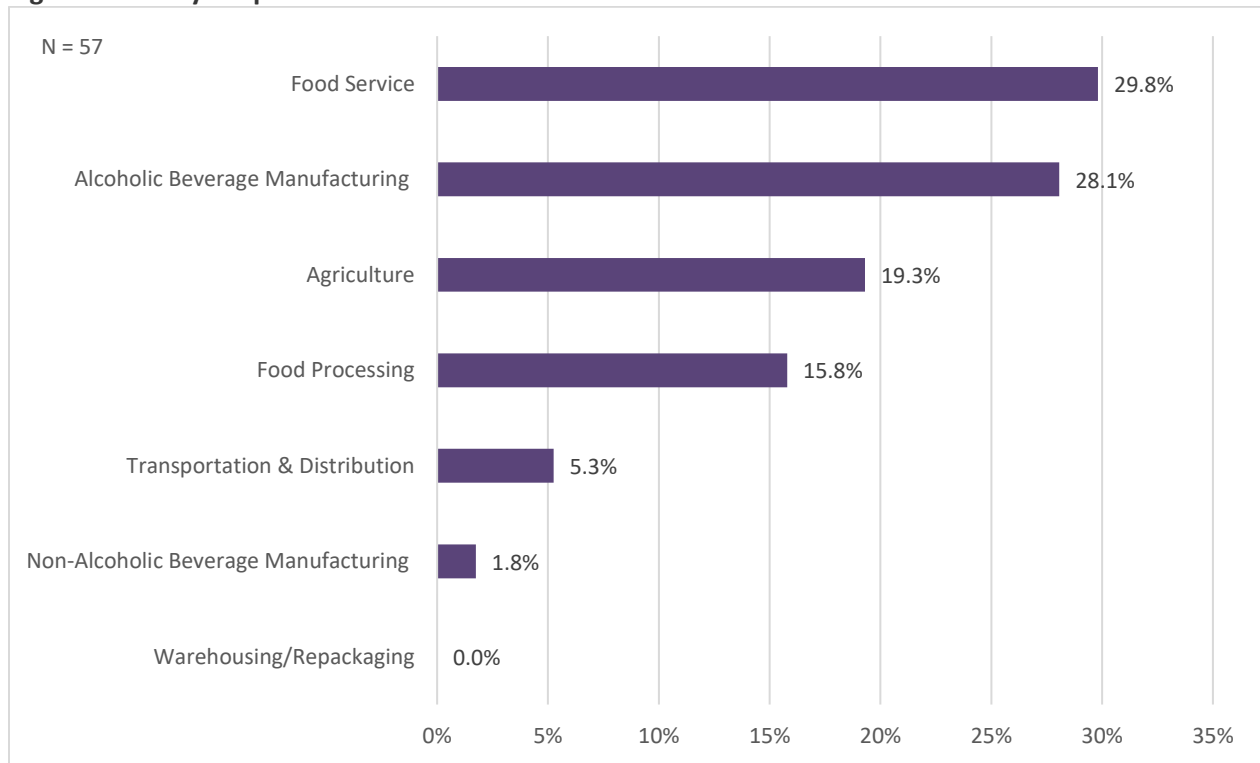
#### Business Survey Summary

TPMA’s survey for regional employers aims to provide insight on businesses’ workforce and training needs within the Food & Beverage cluster. More specifically, the survey focuses on recruitment and hiring practices; perceptions of higher education institutions; on-the-job training opportunities; and hiring projections, among other issues.

#### General Information about Businesses

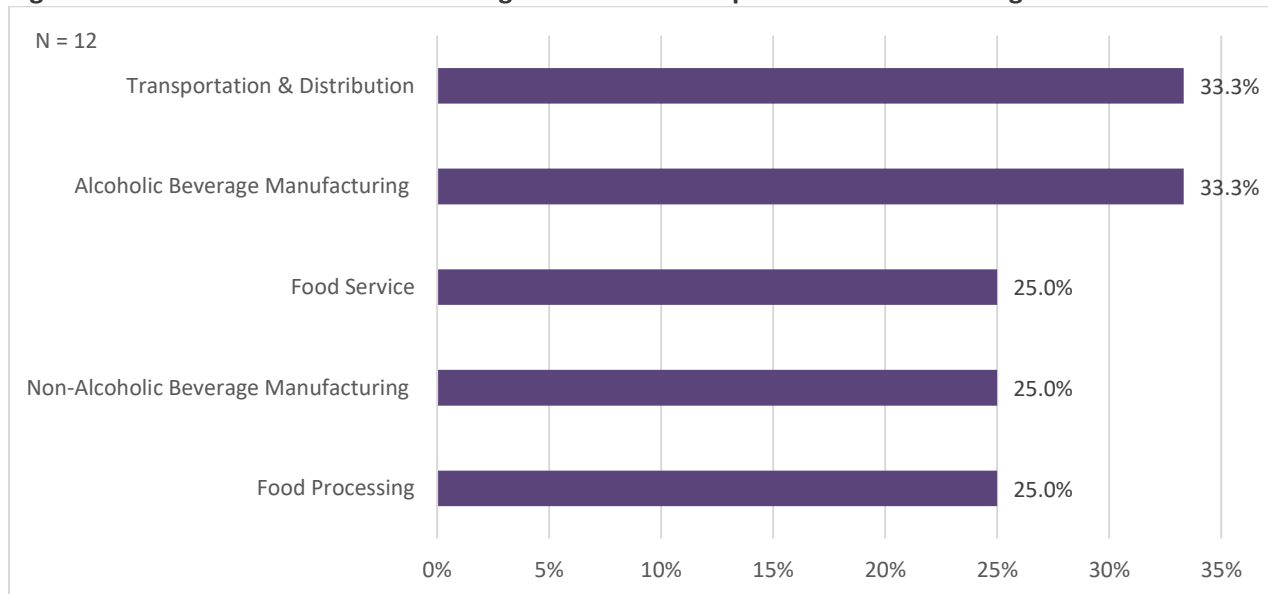
Survey respondents represent multiple industries within the Food & Beverage cluster (see Figure 5). Those that represent multiple industry options were asked to choose the option that generates the greatest amount of revenue. With the exception of the Warehousing/Repackaging industry, at least one response is provided from each of the industry sectors. The most common sectors include Food Service (30%), Alcoholic Beverage Manufacturing (28%), and Agriculture (19%).

**Figure 5: Survey Respondents' Industries<sup>5</sup>**



Source: TPMA 2018

**Figure 6: Alternative Revenue Generating Industries for Respondents that Chose Agriculture**



Source: TPMA 2018

<sup>5</sup> For example, Non-Alcoholic Beverage Manufacturing can include juice, cider, etc.; Agriculture can include farm, packing, orchard, or ranch; and Alcoholic Beverage Manufacturing can include wine, beer, hard alcohol, etc.

Respondents who selected Agriculture as their main revenue generating industry were asked to identify involvement in other industries, if applicable. This group of respondents indicate that they are also involved in other relevant industries, including Transportation & Distribution (33%) and Alcoholic Beverage Manufacturing (33%).

As indicated in Figure 7, business survey respondents are well distributed across the CGCC Region (with the exception of Wheeler County, which had no representatives). There are notable clusters of responses in the northwest area of the region (such as Hood River and Wasco Counties); Hood River County represents 42% of all responses.

**Table 15: Legal Licensing, Distributing Products Out of the State of Production**

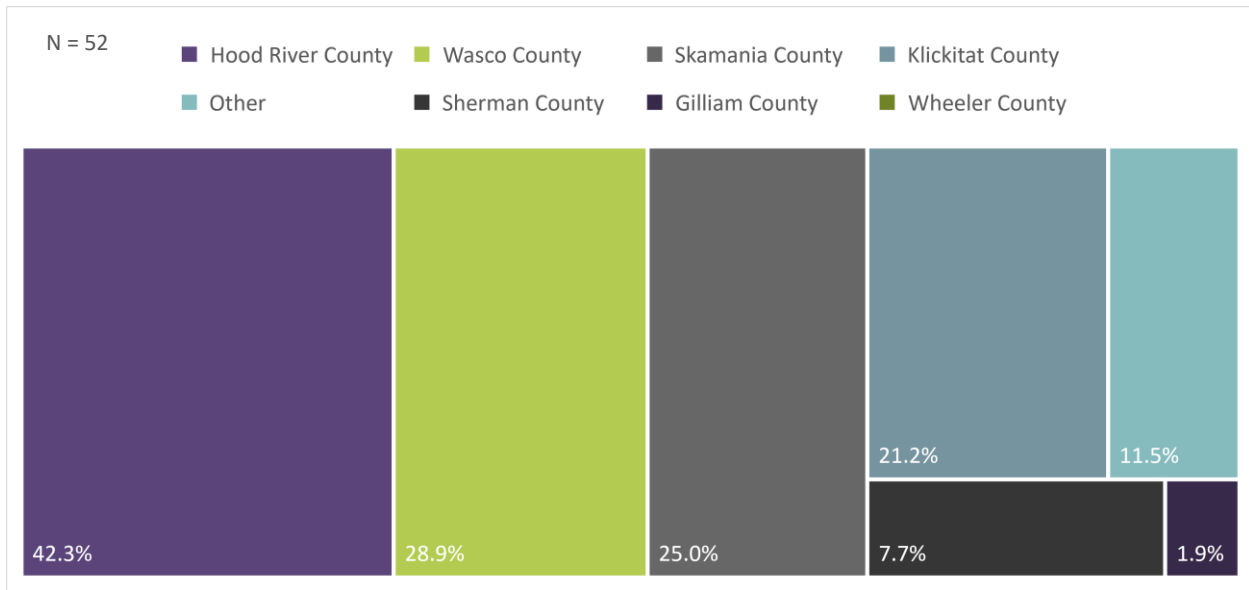
Answer Choices	Responses
Yes, licensed to distribute products out of the state	56.9%
No, and we do not intend to pursue such licensing	35.3%
No, and we intend to pursue such licensing	7.8%

Source: TPMA 2018

The majority of employers surveyed have obtained legal licensing that allows them to distribute their products out of the state of production (nearly 60% of companies). Nearly 69% of respondents that have obtained this legal licensing represent the Alcoholic Beverage Manufacturing (41%) and Food Processing (28%) industries, which aligns with the nature of these industries that support wider distribution outside of the state. This also emphasizes the point that, despite the challenges of receiving licensing and certification, many of the region’s Food and Beverage Production businesses intend to serve a much broader audience than local consumers, a point that was notable during industry interviews as well.

Of respondents who do not have legal licensing to distribute outside of the state, nearly 82% do not intend to pursue such designation. Most respondents who do not intend to pursue licensing are from the Food Service industry; whereas, most who do intend to pursue licensing are from the Agriculture industry.

**Figure 7: Primary Counties of Operation**



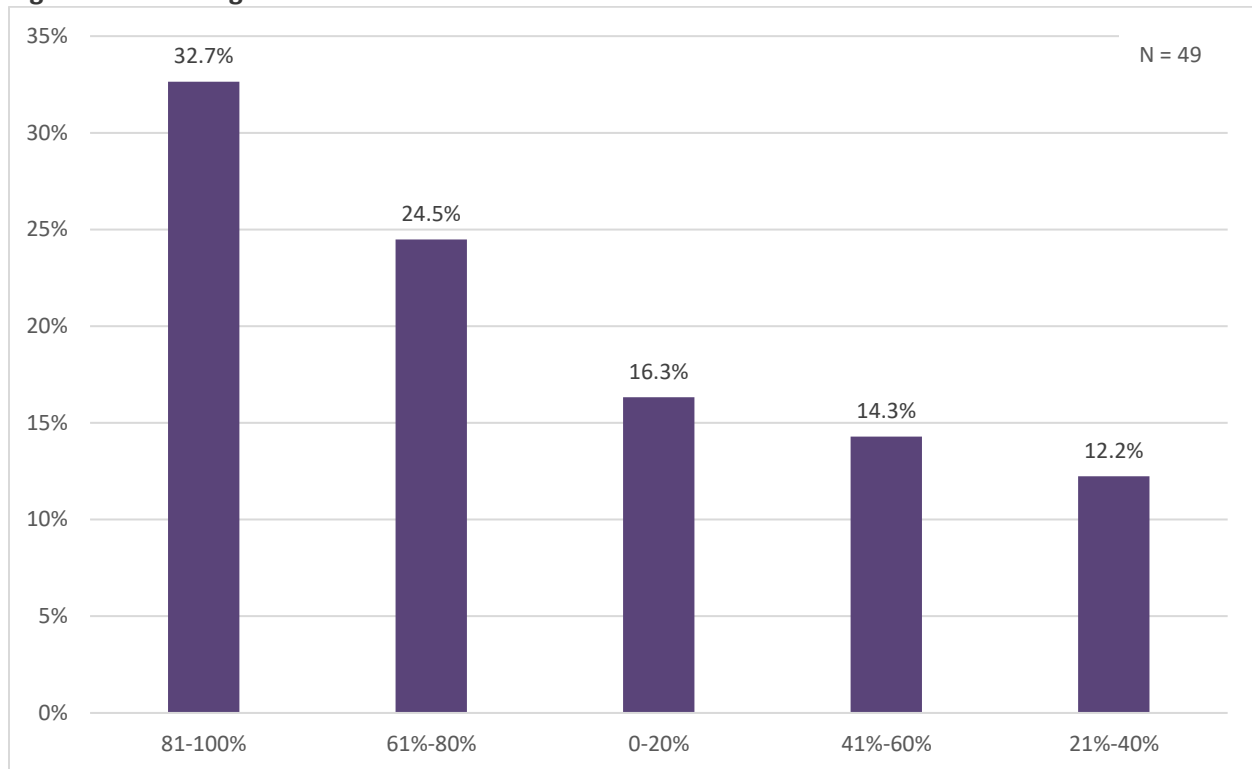
Source: TPMA 2018

The 12% of respondents who indicate their primary operations are outside of the seven-county region noted operations in both Washington and Oregon, including Adams, Franklin, Walla Walla, Prosser, and Benton Counties in Washington, and Multnomah County, Oregon.

On average, respondents employ 56 workers outside of Farming, Harvesting, and Ranching occupations, with individual responses ranging from zero to 400. Respondents were asked to further break down their workers by describing the percentage that are non-seasonal and full-time. Over 57% of respondents indicate that more than 60% of their employees are non-seasonal and full-time workers. Conversely, 28% of respondents employ a workforce that is less than 40% non-season and full-time. Whether the balance is in favor of full-or part-time labor, the fact that so many businesses employ part-time and seasonal staff is one of the unique challenges of running a business in the CGCC Region and in these industries. The influx of customers for Food Service and Alcoholic Beverage spikes during summer months and dips during the winter.

Respondents with the highest proportion of non-seasonal and full-time workers are from the Food Processing and Alcoholic Beverage Manufacturing industries. These businesses are also more likely to possess the legal licensing to distribute products outside of their current state.

**Figure 8: Percentage of Non-Seasonal and Full-Time Workers**



Source: TPMA 2018

## Hiring Practices

Respondents ranked their recruitment efforts on a scale of 1 (being the most used) to 9 (being the least used). Nearly 77% of respondents say online job boards are one of the top two recruitment tools. Local advertising (55% ranked as first or second) and employee referrals (56% ranked as first or second) are other top ways companies recruit employees. Using professional recruitment companies was the least common option with nearly 60% of respondents ranking it in eighth or ninth.

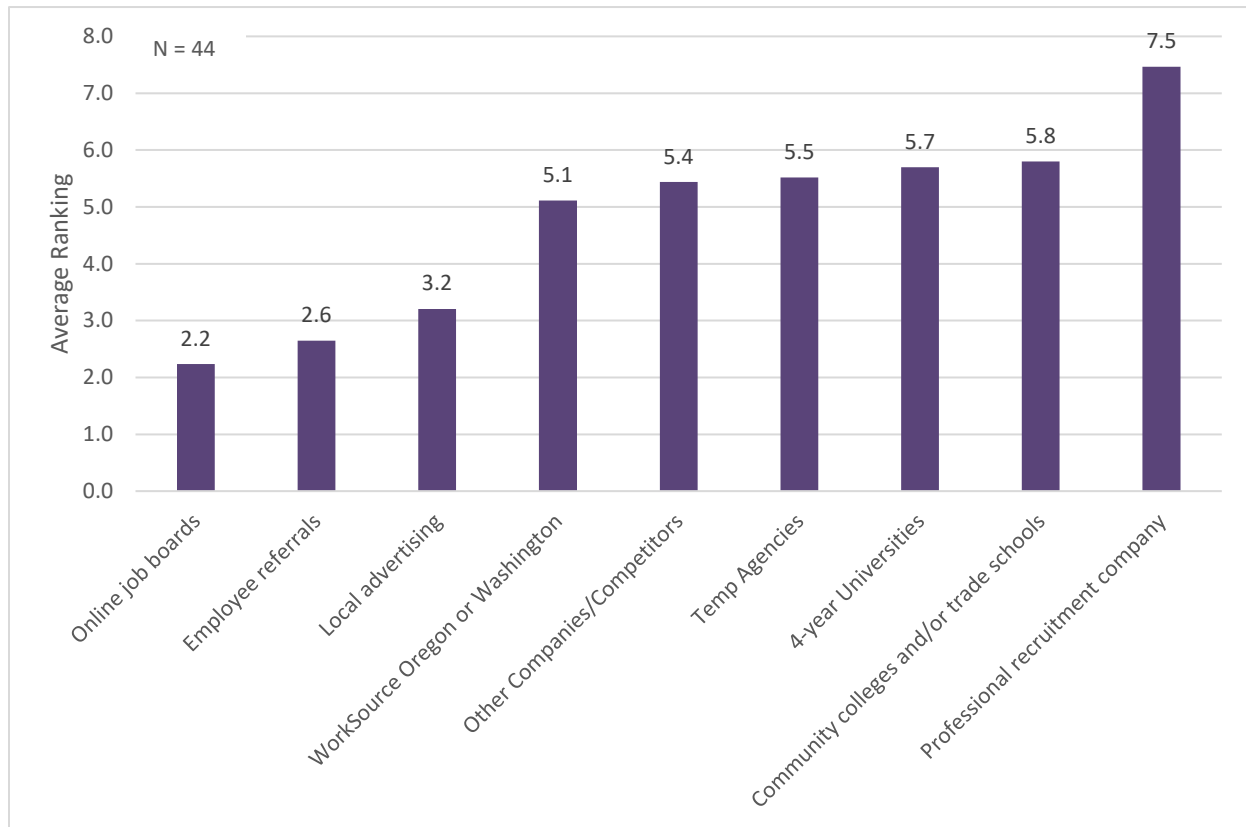
Employers from Wasco County say they most often hire from using an online job board, and do not recruit from the four-year universities or community colleges/trade schools. This recruitment trend is surprising given that CGCC is located in Wasco County. This could indicate that CGCC is an underutilized resource and/or that it does not currently offer programs that support employers in this industry. Another surprising trend is that respondents from Hood River County most often use online job boards, local advertising, and employee referrals, and few are using WorkSource Oregon though there are several centers located in the area. This recruitment trend shows another potentially underutilized resource and/or identifies a gap that other organizations in the region also do not have services dedicated to employers in this industry.

When looking at industry recruiting trends, respondents in the Alcoholic Beverage Manufacturing and Agriculture industries more often cite using employee referrals; whereas, the Food Service industry reports using employee referrals and online job banks most often. These comments are fitting with anecdotal information collected from interviews, which indicate that Breweries have less difficulty recruiting than many other industries and often rely upon walk-in applicants and word-of-mouth



advertising. Figure 9 shows recruitment practices by the average ranking received in survey responses, with 1 being the most utilized resource, and 9 being the least utilized.

**Figure 9: Recruitment Practices**



Source: TPMA 2018

Understanding which industries and counties engage in certain recruitment practices allows for a more thorough analysis of hiring trends. Respondents were asked to consider their 2017 hiring practices, in particular how many employees were hired, including replacements and new positions. Forty-four percent of respondents say they hired zero to five employees in 2017. Nearly half of these respondents who hired fewer than five employees in 2017 represented Alcoholic Beverage Manufacturing. Hiring numbers were highly correlated with the total number of workers that respondents employ. Of the respondents who hired zero to five, the average workforce is 13 employees. To recruit for these positions, the top-cited practices are employee referrals, online job boards, and local advertising. Following the same trends, of the 24% who responded they hired 26 or more employees, the average workforce is 176 employees. To recruit for these positions, the top-cited practice is using an online job board.

**Table 16: Number of Employees Hired, 2017**

Response Choices	Response Rates
0 to 5	44.4%
6 to 10	13.3%
11 to 25	17.8%
26 to 50	11.1%
51 or more	13.3%

Source: TPMA 2018

Respondents were asked to examine their 2017 hiring practices more in-depth, detailing specifically how many new positions were brought on, as opposed to replacement jobs. The majority of respondents (71%) indicated that hiring of new positions only accounted for zero to five hires. Of these respondents, over 70% represent the Food Service and the Alcoholic Beverage Manufacturing industries. Because the average number of employees represented by survey respondents was 35, zero to five new hires for new positions shows appropriate growth, while also showing that the Alcoholic Beverage Manufacturing and Food Service industries are adding new positions at higher rates than the other industries.

**Table 17: New Positions Hired, 2017**

Response Choices	Responses Rates
0 to 5	71.1%
6 to 10	11.1%
11 to 25	13.3%
26 to 50	2.2%
51 or more	2.2%

Source: TPMA 2018

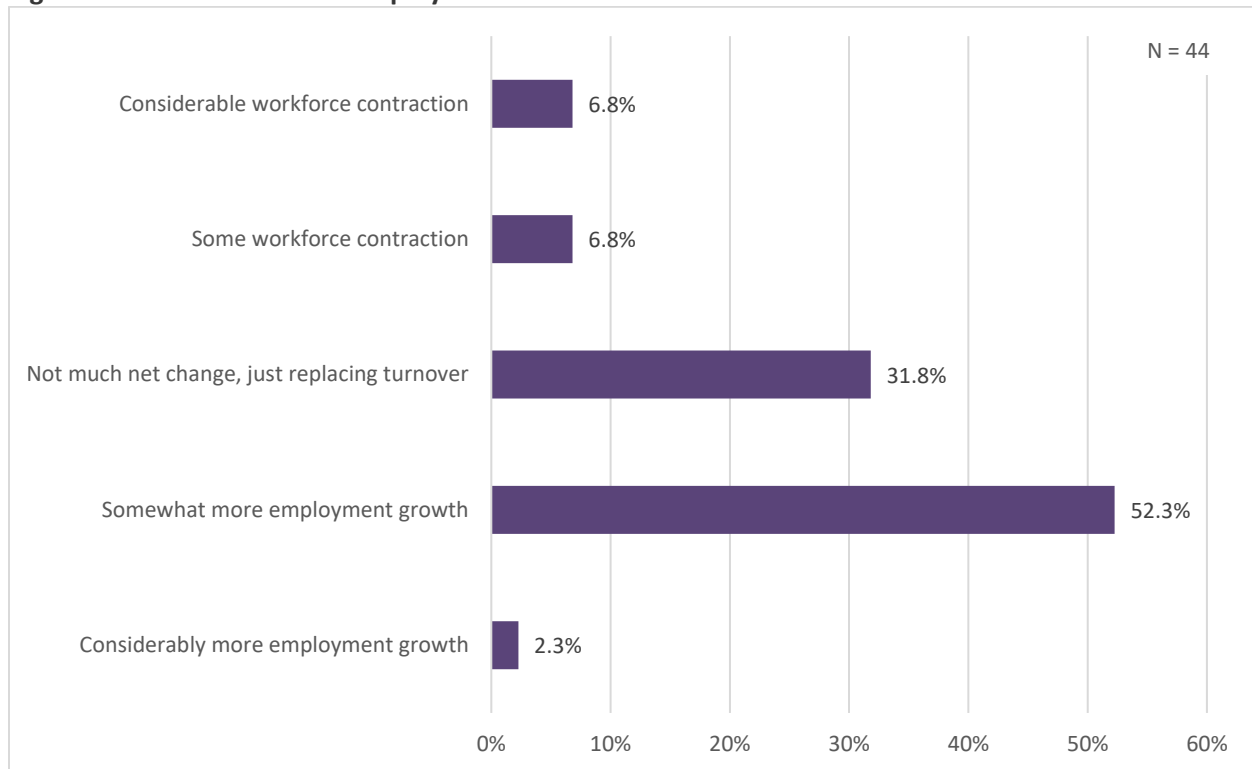
## Employment Outlook and Training

Compared with their hiring experiences over the last several years, survey participants were asked to project future trends of local employment. Over 52% of respondents indicated there will be somewhat more employment growth in the next three years and 32% indicated there will not be much net change (just replacing turnover).

Industries in which respondents anticipate considerable or somewhat more growth over the next three years compared to the last three years include Alcoholic Beverage Manufacturing (37.5%), Food Processing (25.0%) and Food Service (20.8%). Most of the respondents from the Food Service industry and over a third of those in Alcoholic Beverage Manufacturing anticipate little or no net change in employment.

Interestingly, two respondents from the Food Service industry indicate some workforce contraction over the next three years. These respondents represent workforces of 300+ employees; whereas the Food Service representatives who indicated some growth over the next three years represent companies with 120 or less employees. This many indicate that smaller Food Service companies are more likely to expand in the next few years.

**Figure 10: Estimated Future Employment Growth**



Source: TPMA 2018

Survey respondents were asked a series of Likert-scale questions where they indicated responses on a scale of “Strongly Agree” to “Strongly Disagree”. Figure 11 provides the top five statements that received the highest level of consent from respondents. Table 18 provides the full list of Likert-scale questions with the distribution of responses.

First, respondents were asked to indicate their level of difficulty in finding qualified workers. Nearly 80% of respondents “Strongly” or “Somewhat” agree that it is difficult to find qualified workers in Professional/Technical positions. Of these respondents, 67% represented the Food Service and Alcoholic Beverage Manufacturing industry. Over 92% of respondents “Strongly” or “Somewhat” agree it is difficult to find qualified workers for Skilled Trades, while 84% agreed to the same for Entry-Level positions. Of those respondents, the majority (62% for Skilled Trades, 65% for Entry-Level) represented either the Food Service or the Alcoholic Beverage Manufacturing industry.

As noted above, these industries rely on online job boards and local advertising to hire for positions. Surprisingly, the respondents who indicated they have trouble hiring for Professional/Technical positions also indicated they do not engage in recruiting from four-year universities, where professional and technical skill development is often offered. This may indicate there is an opportunity to expand recruitment efforts to the colleges and universities.

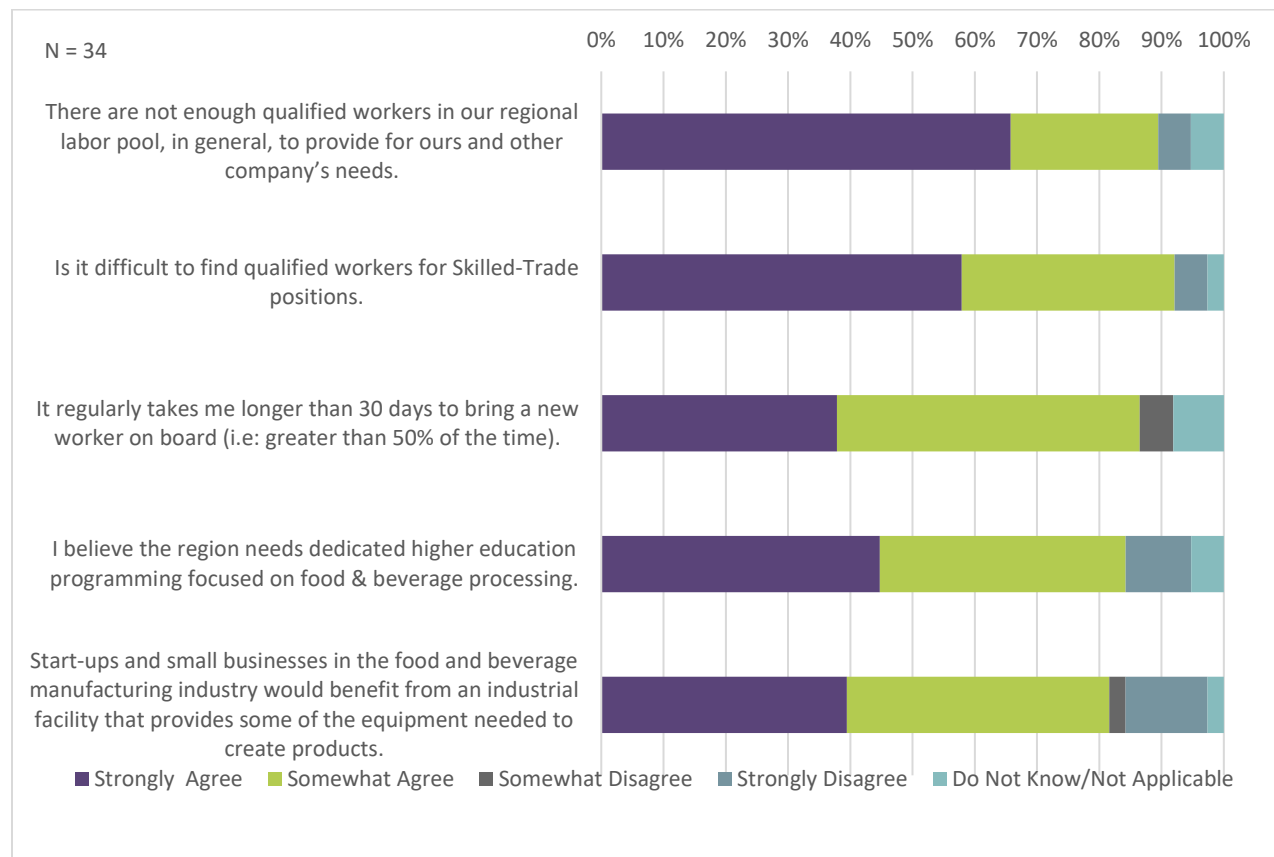
To expand further upon hiring difficulties, respondents were asked to assess if it took longer than 30 days to bring a new worker on board. As a general human resources industry benchmark, if it requires greater than 30 days to hire a worker, the business will suffer some productivity slow-downs. With this statement, 86% of respondents either “Strongly” or “Somewhat” agree. There is a wide variation of industry type and

business size among those representatives who indicated it took longer than 30 days to bring a new worker on board indicating potential wide-scale labor shortages in the region.

Respondents were then asked to expand upon their thoughts of the regional labor pool. Nearly 66% of respondents “Strongly agree” that are not enough qualified workers in the regional labor pool to provide for their and other companies’ needs. Interestingly, larger companies with 41-80% non-seasonal and full-time workers were more likely to “Strongly agree” with this statement. This could indicate that the labor pool is even more strained for seasonal and/or part-time workers.

Providing more insight, respondents expressed an inadequate available talent pool, as 58% of respondents “Strongly” or “Somewhat” disagree that individuals in the applicant pool in their area possess the skills needed for hire. Interestingly, those who responded that they “Somewhat agree” or that that the statement does not apply were mostly smaller companies (150 employees or less), and a handful are from the agriculture industry. An even larger portion of respondents indicated that they “Strongly” or “Somewhat” disagree that the individuals in the area who have the skills needed are available for hire, showing that they feel skilled workers in these industries are already employed and/or not looking for work. This lack of available talent led 78% of respondents to “Strongly” or “Somewhat” disagree that the labor pool in the region is large enough to fill the jobs that companies have available. To overcome the skills gaps, nearly 90% of respondents “Strongly” or “Somewhat” agree that their company provides an adequate level of on-the-job training to prepare workers for most positions.

**Figure 11: The Top Five Issues for Employers**



Source: TPMA 2018

One trend common throughout the responses is that the Food Service and Alcoholic Beverage Manufacturing industries more often indicate the workforce was meeting their hiring needs in both qualifications and size. This finding is consistent with comments from industry representatives who were interviewed, that there is so much excitement and passion in the alcoholic beverages industry, breweries especially, that finding workforce is less problematic than other industries.

Employers also indicate available housing to be a barrier among current and/or potential workers. Respondents were asked to respond to the statement, “Workers at our company need to commute from longer distances than they would like because of a shortage of affordable housing.” An overwhelming 79% either “Strongly” or “Somewhat” agree with this statement. All counties were represented in this response; however, Skamania, Gilliam, and Sherman Counties were the three counties that this statement most strongly applied to (over 75% of respondents from these counties indicated this was a concern).

**Table 18: Respondent’s Assessment of Recruiting Qualified Workers**

	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree	Do Not Know/Not Applicable
There are not enough qualified workers in our regional labor pool, in general, to provide for ours and other company’s needs.	65.8%	23.7%	0.0%	5.3%	5.3%
Is it difficult to find qualified workers for Skilled-Trade positions.	57.9%	34.2%	0.0%	5.3%	2.6%
Is it difficult to find qualified workers for Entry Level/Support positions.	40.5%	43.2%	2.7%	0.0%	13.5%
It regularly takes me longer than 30 days to bring a new worker on board (i.e: greater than 50% of the time).	37.8%	48.7%	5.4%	0.0%	8.1%
I believe the region needs dedicated higher education programming focused on food & beverage processing.	44.7%	39.5%	0.0%	10.5%	5.3%
My company provides an adequate level of on-the-job training to prepare workers for most positions.	26.3%	63.2%	0.0%	5.3%	5.3%
Workers at our company need to commute from longer distances than they would like because of a shortage of affordable housing.	50.0%	29.0%	0.0%	13.2%	7.9%
Is it difficult to find qualified workers for Professional/Technical positions.	47.4%	31.6%	0.0%	13.2%	7.9%
Start-ups and small businesses in the food and beverage manufacturing industry would benefit from an industrial facility that provides some of the equipment needed to create products.	39.5%	42.1%	2.6%	13.2%	2.6%
The economic future of the region is directly tied to the success of the food and beverage industries.	39.5%	34.2%	0.0%	26.3%	0.0%

	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree	Do Not Know/Not Applicable
Increased knowledge and awareness of food fermentation and processing would be helpful, even for the non-production workers that we employ.	35.1%	29.7%	2.7%	24.3%	8.1%
I consider Columbia Gorge Community College (CGCC) as a valuable asset in educating/training our local workforce.	26.3%	29.0%	2.6%	31.6%	10.5%
Individuals in the applicant pool in my area have the skills I need to hire.	0.0%	26.3%	15.8%	15.8%	42.1%
The individuals in the applicant pool in my area who have the skills I need are available for hire.	0.0%	13.2%	21.1%	15.8%	50.0%
The applicant pool in my area is large enough to fill the jobs companies have available.	2.7%	10.8%	51.4%	8.1%	27.0%

Source: TPMA 2018

A majority of respondents (55%) “Strongly” or “Somewhat” agree that CGCC is a valuable asset in educating/training the local workforce. The Food Processing industry respondents most commonly agreed with this statement; whereas those who indicated disagreement represented the Food Service and Alcoholic Beverage Manufacturing industries. More surprising is the fact that nearly one-third of respondents indicated they were unsure if the college is a valuable asset. This could present an opportunity for increasing awareness of the assets and resources available at CGCC within the industry. Regardless of the uncertainty of CGCC, over 84% of respondents, including representatives from all sectors, indicate that the region needs dedicated higher education programming focused on food & beverage processing.

Specific programming that the survey asked about included start-up resources and fermentation processes. Nearly 82% of respondents “Strongly” or “Somewhat” agree that start-ups and small businesses in the Food and Beverage Manufacturing industry would benefit from an industrial facility that provides some of the equipment needed to create products, while 64% of respondents indicated that increased knowledge and awareness of food fermentation and processing would be helpful, even among non-production workers.

A majority of survey respondents (74%) “Strongly” or “Somewhat” agree that the economic future of the region is directly tied to the success of the food and beverage industries, indicating that the region needs to continue to foster a strong pipeline of workers and ensure post-secondary curriculum is up-to-date to meet employers’ needs.

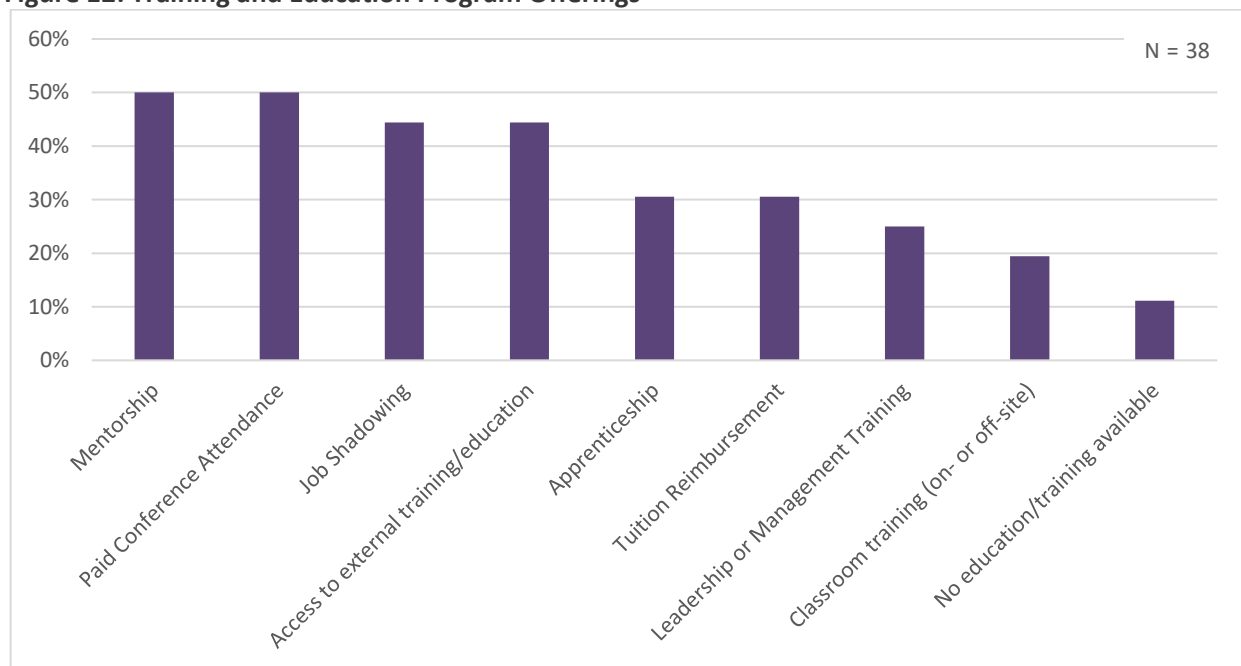
## Training Programs

When asked which of the following training and education programs do the respondents' companies offer for employee advancement, 50% indicated they offer mentorships, 50% offer paid conference attendance, 44% host job shadowing, and 44% offer access to training or education programs hosted by organizations. Only 11% indicated they do not provide education or training for employee advancement. Anecdotally, the 44% of respondents offering access to training or education programs is fairly low compared to other regions of the country which have more options for higher education. Furthermore, as indicated through conversations with industry representatives, many businesses would utilize workforce training programs if the appropriate programs were available.

Forty percent of the respondents who indicated they offer mentorships represent the Food Service industry. Other respondents who offer mentorships represent the Alcoholic Beverage Manufacturing (27%) and Agriculture (20%) industries. For paid conferences, 47% of respondents who offer this training/education program represent the Alcoholic Beverage Manufacturing industry. Other respondents who offer paid conferences represent Food Service (27%) and Food processing (20%).

The Alcoholic Beverage Manufacturing (40%) and Food Service (40%) industries reported they offered job shadowing. Alcoholic Beverage Manufacturing (40%) was the top industry that reported they offer access to training or education programs hosted by another organization or company.

**Figure 12: Training and Education Program Offerings**

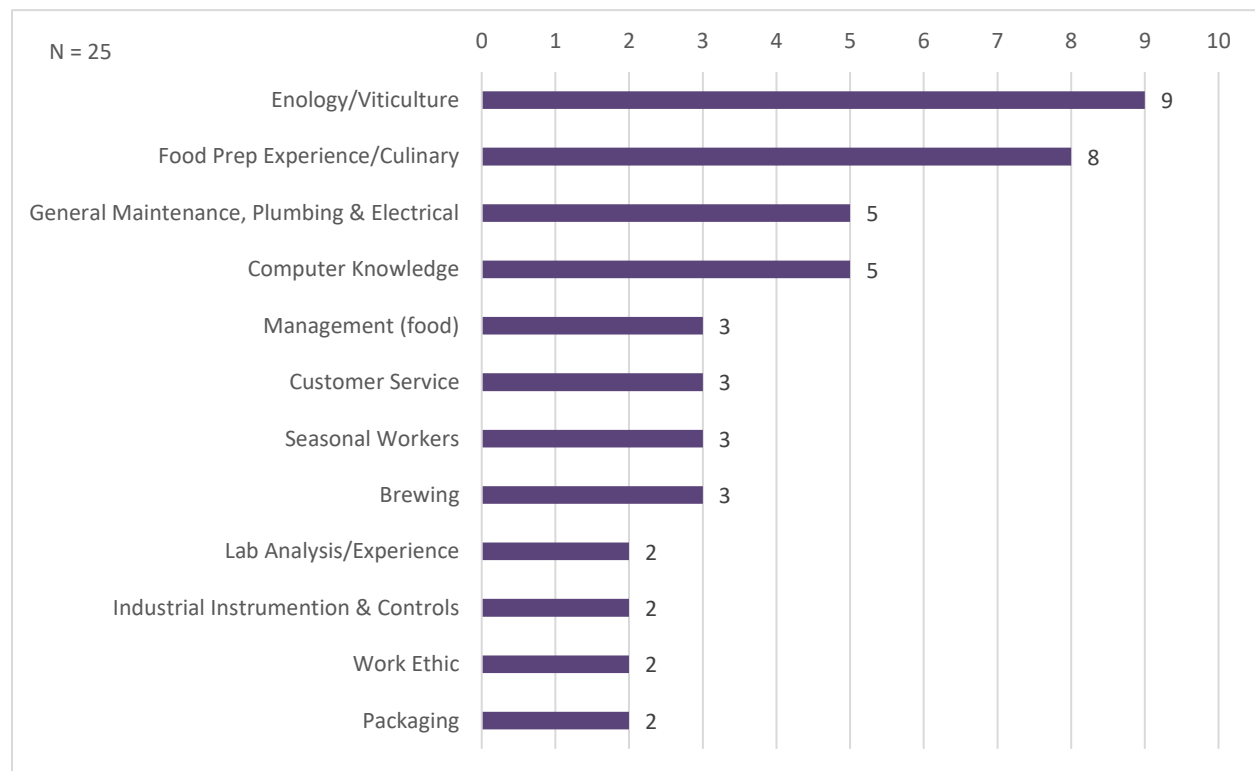


Source: TPMA 2018

Employers were also asked to identify their awareness of training programs, both inside and outside of the region, that prepare talent to meet the needs of the workforce. Sixty-two percent of respondents indicate they have awareness of training programs; whereas, 38% indicate they are unaware of programs. Surprisingly, many respondents who indicate they are unaware of training programs were located in Wasco, the same county where Columbia Gorge Community College is located. Other counties that indicate a lack of awareness are further removed from Wasco and located in Hood River and Skamania.

In addition to determining what academic programs will provide the greatest benefit, TPMA also sought to discover what skill sets are most in demand. In an open-ended question, respondents were asked to name up to three of the hardest-to-hire hard and technical skills. TPMA coded these responses into a short-list of themes. All responses that received more than one vote are listed in Figure 13. Respondents strongly emphasized the need for Enology/Viticulture skills, Food Prep Experience/Culinary skills; General Maintenance, including Plumbing & Electrical.

**Figure 13: Hardest to Find Hard/Technical Skills**



Source: TPMA 2018

Employers were asked to identify current training programs that meet their needs. The following answers were shared:

- Washington State University:
  - Enology and Viticulture (certificate)
  - Food Processing/Sanitization
- Columbia Gorge Community College:
  - Electro Mechanical Program
- Oregon State University:
  - Brewing degree
- Portland State University:
  - Brewery Management (certificate)
  - Culinary School
- Ellensburg Area:
  - Brewing/Winemaking (degree)



- The Small Business Development Center
- Oregon Liquor Control Commission Training
- UC Davis
- Siebel Institute
- American Brewers Guild
- Master Brewers Association of America
- VLB
- FFA, 4-H, Extension

Others indicated that none of the programs were adequately training employees. One response indicated that there are not enough candidates locally, and another shared that while the programs teach the knowledge, they are not teaching students how to work. Others noted that colleges outside the area offer programs for production staff and community colleges in Walla Walla, Washington and Salem, Oregon have strong training programs. However, these training programs are too far away for employees or potential employees to access.

Respondents were asked in an open-ended question to list the top education and training programs that are needed for the area. The results are displayed in the word cloud in Figure 14. Employers' top-rated needs are Enology & Viticulture; Culinary; programs that teach customer service; and Brewing & Fermentation. Other education and training programs that would benefit companies include integration of leadership and management skills, hospitality skills, computer skills, and Spanish-based courses. Other technical programs that respondents indicated were packing and processing, manufacturing processes, and wastewater certifications.

**Figure 14: Word Cloud of Education & Training Programs Needed**



Source: TPMA 2018

Finally, employers were asked in an open-ended question to provide further input that might be relevant to workforce training for the food and beverage industries. Moving forward, employers would like to see the following:

1. More Industry Collaboration: This includes outreach to rural areas, including business and industry in conversations, and strong partnerships with regional trade organizations (e.g. Food North West) to leverage resources
2. Soft Skills Training: This includes teaching youth work ethic and retaining non-seasonal workers
3. Technical Skills Training: Ensuring training and education is aligned with the demands of the area, including occupations in the culinary field; brewing; wastewater treatment; hospitality; customer service; and tourism. This also includes teaching students how occupations are interconnected (e.g. Brewing and wastewater treatment are similar as students of both disciplines may benefit from shared core curriculum before specializing)

## Industry Interviews Summary

In addition to the industry survey, TPMA also conducted in-depth interviews with ten business and industry representatives from the CGCC Region and surrounding area. Though a survey is an ideal vehicle for receiving input on broad topics, the lack of iterative interaction makes it difficult to dig deeper on significant regional issues. Hence, the in-depth interviews address many of the same topics, but provide better context and a level of feedback that is both deeper and more precise.

Between October and December of 2018, TPMA conducted ten interviews with representatives of Food and Beverage cluster industries. Most interviews were conducted on-site at the place of business for each of these representatives, and in some cases over the phone. TPMA received input from each of the following industries: breweries; cideries; distilleries; food manufacturing, packaging/bottling facilities; restaurants/pubs; and wineries. Interviewees were asked to speak freely in these conversations and told that their input would be aggregated within the final report but no individual comments would be traced back to them without their consent. Though there was broad diversity in industry input, the following themes were consistent across each of the ten interviews.

## Workforce Challenges

Every interviewee noted that finding and retaining talent is a challenge in the Gorge. The lack of workforce is felt at all skill levels from entry-level, to cooking staff, to professional/technical workers. In some cases, employers emphasized the need for people with basic skills and good workforce habits (work ethic, reliability, etc.). Yet, in more cases, employers emphasized that their bigger issue is finding staff with industry-relevant experience or educational credentials. Frequent pain-points for employers include a general lack of experience with the following skills: maintenance; mechanics; food safety and sanitation; basics of fermentation; culinary arts; and Microsoft Office skills. Lastly, a very common lament by interviewees is lack of management experience. One significantly sized employer even noted that lead and supervisory roles remain perpetually unfilled.

Numerous employers note that they employ staff from the Portland metro area for highly-skilled positions (e.g.: sales, accounting, engineering, etc.); however, the pool for such talent is limited due commuting distance. Though it would seem feasible for some employers to attract a workforce to move to the CGCC Region for highly-skilled positions, there is a reported perception that Portlanders view the region as too rural and too far from the city.

The pinch for experienced workers is so acute that numerous employers note making exceptional investments in training and continuous education, with the goal of moving entry-level workers into higher level roles. Furthermore, with the awareness that much of the workforce is interested in seasonal or summertime work, employers will offer bonuses and benefits for employees who are able to stay from Labor Day through Memorial Day.

Even within the CGCC Region there are unique sub-regional issues. For example, for cities on the Washington side of the border in western Skamania County or eastern Klickitat County, the sheer distance to the region's larger cities creates a recruitment challenge. For employers in Hood River, cost of housing and seasonality of the workforce are issues frequently raised by interviewees.

## Housing & Cost of Living

TPMA did not ask any questions directly about housing, but the issue was voluntarily raised by five of the ten interviewees. The ascension of Hood River and surrounding areas as a premier destination for tourism as well as second-home dwellers has driven up real estate values beyond rates attainable for working class and middle-class individuals. As noted in Chapter 2, earnings for those in the Food & Beverage cluster are low in the region, even compared to workers in those same industries in other parts of the United States. Many in the food and beverage manufacturing workforce typically rent rather than own homes. Those in the Restaurant & Drinking Places industry group often make exceptional sacrifices by cohabiting with a large number of roommates, commuting from long distances, or living in substandard affordable housing. One interviewee noted that one regional restaurant owner has invested in multi-family real estate just to provide affordable housing for their own workforce. Another interviewee noted that The Dalles is helpful source of housing for the region, as it has not been “discovered” to the same degree as Hood River. There were also rumors and excitement from numerous interviews about a potential affordable housing project under discussion in Hood River.

In addition to housing, some interviewees further noted that the CGCC Region has a high cost of living in other ways. Cost drivers noted were the cost of fuel for workers who need to drive greater than 30 minutes to and from The Dalles and Hood River, or from cities in Washington to Hood River and The Dalles. Those crossing the Columbia on a regular basis also face the added cost of toll bridges.

## Farm to Table Advantage

For numerous interviewees in the Food & Beverage cluster, the CGCC Region is the ideal location for growing, making, and serving foods and beverages. Many brewers, cider-makers, distillers, and food service companies heavily rely on locally grown products. With immediate access to regional orchards and vineyards, there are few places in the Pacific Northwest better suited for these companies. In addition to close proximity, the small population size allows those in Food and Beverage industries to easily work together. In TPMA’s interactions with businesses over the course of the project, this interconnectedness was clearly on display, with businesses buying and selling juice and produce and packaging and production services with great regularity.

In particular, one interviewee in the winery business migrated from California to Oregon. He faced the decision of what wine region to settle in and selected the CGCC Region because of its beauty and unique access to fresh produce. Another from the distilling industry noted that their company sources as many materials as possible from the Columbia Gorge or elsewhere in Washington, which is well over half of all their products and materials. As other entrepreneurs in the Food and Beverage industry are looking to expand and grow their businesses, the CGCC Region has a clear place on the radar amongst the craft food and beverage locations in the western United States.

## Industry Clustering Effects

Being a relatively sparsely populated area with a fairly large number of food and beverage businesses, many industry leaders are well acquainted. The strong network of businesses in the Food and Beverage industries includes both those in the Restaurants & Drinking Places and Food & Beverage Production industry groups. Some of these networks are formal, such as The Brewers in the Gorge and Columbia Gorge Winegrowers, and others are less formal, including dinner parties, backyard barbeques, etc. In

more populous areas businesses often work more autonomously or see each other as competitors, but there is a much more collegial feel within the CGCC Region.

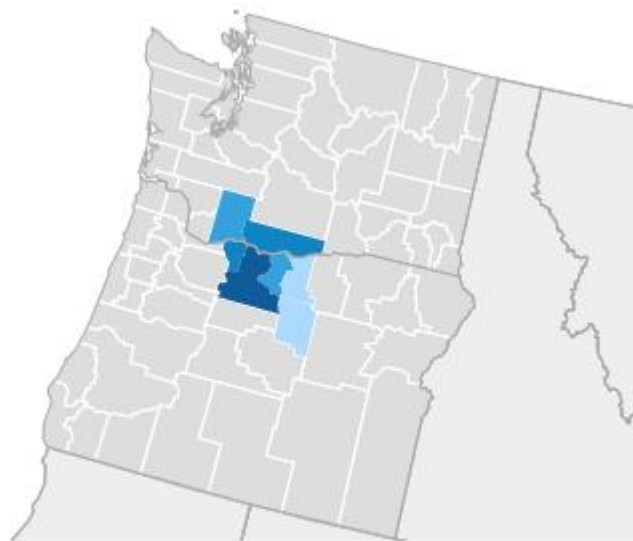
The value of such networks cannot be overestimated. In TPMA's discussions with industry leaders, there is a chain of connection that can frequently be drawn from one business to another. To provide a few examples, the owners of one new large-scale brewery used to work at two of the region's other breweries. One of the region's large-scale brewers has used the smaller batch equipment at another regional business for producing test batches. The human resources director at one company used to work in human resources for another local beverage producer. Oftentimes, when TPMA asked those in the alcoholic beverage producing industries where their top talent came from, they explained that they were trained under the wing of other renowned regional leaders in the industry.

Along with these connections is the presence of great passion and willingness to help others in the industry succeed. Interviewees during the course of this project expressed an interest in partnering with, volunteering for, or even teaching for CGCC should such a program launch. Such pledges of early commitment are rarely so strong at this stage of a feasibility study. It seems that in the absence of dedicated higher education programming, the industry has developed a pattern of training its own future leaders and supporting one another. In whatever way CGCC chooses to contribute to these industries, tapping into these existing bonds and partnerships will prove invaluable for the success of its Food and Beverage industry programming.

## Job Postings Summary

Job postings are another way to determine characteristics of employer demand, such as geographic areas of demand, in-demand job titles, skills, and companies looking to hire. These data are pulled from Emsi's Job Posting Analytics platform, which harvests over 110 million worker profiles and thousands of online job boards to report findings for more than 5,000 distinctive job titles and over 10,000 unique skill categories. As powerful as job postings data are, they are not a perfect representation of the local labor market as they are limited by the degree to which the CGCC Region's companies use online job boards to recruit and hire talent. However, given that over 56,000 job postings have been created for the CGCC Region by thousands of companies, the data offer strong statistical representation.

**Figure 15: Heat Map of Job Postings by County**



Source: Emsi JPA, November 2018

**Table 19: Job Postings by Location within the CGCC Region, 9/16- 10/18**

County	Unique Postings (Sep 2016 - Oct 2018)
Wasco County, OR	3,398
Klickitat County, WA	3,232
Hood River County, OR	2,672
Skamania County, WA	1,384
Sherman County, OR	859

Source: Emsi JPA, November 2018

Job postings data between September 2016 to October 2018 indicate that there were 20,439 total job postings for positions within the Food & Beverage cluster,<sup>6</sup> of which 7,327 were unique.<sup>7</sup> These numbers indicate a Posting Intensity of 3-to-1, meaning that for every 3 postings there is 1 unique job posting. This

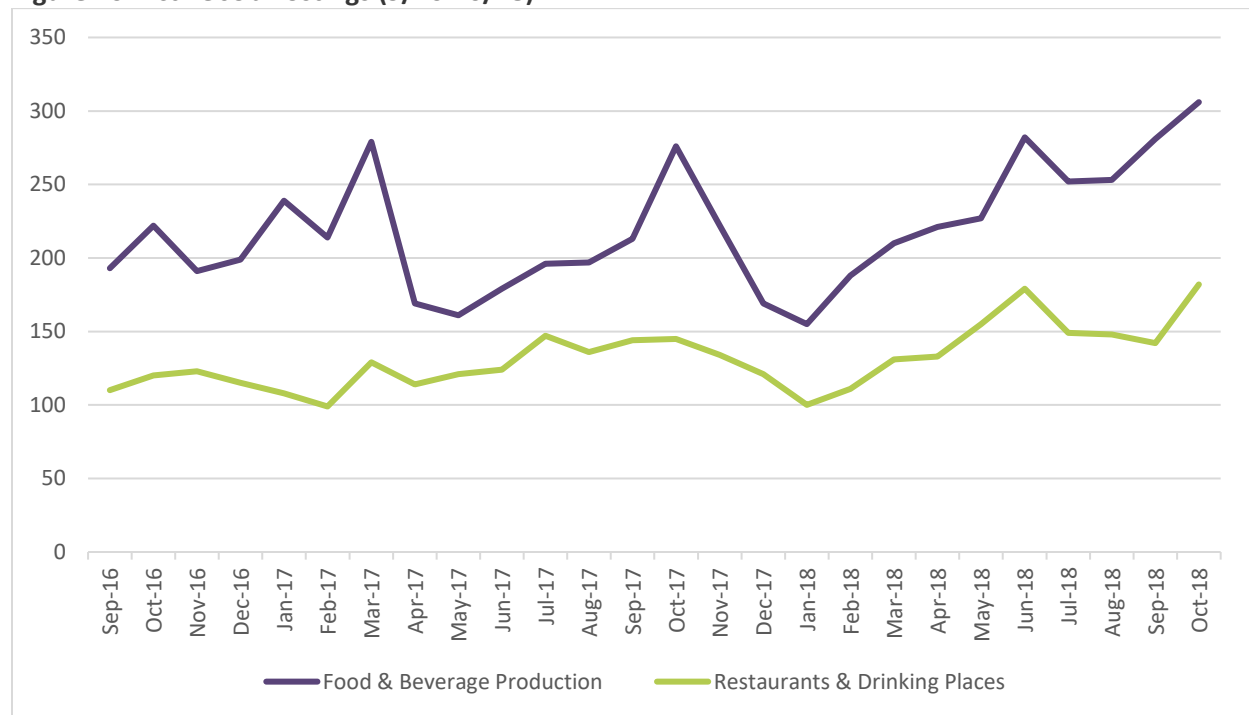
<sup>6</sup> These occupations were determined from a staffing pattern.

<sup>7</sup> Unique Job Postings are the number of de-duplicated job advertisements listed by companies on job boards and career sites. De-duplication is the process that job postings must undergo to provide the best approximate demand for jobs.

is close to the Posting Intensity for all other occupations and companies in the region (3-to-1), indicating that employers are putting average effort toward hiring for occupations in the Food & Beverage cluster. By county, the regional breakdown for job postings details Wasco, Klickitat, and Hood River as the top posting counties in the seven-county region.

Figure 16 indicates trends in active job postings between September 2016 and October 2018 for the Food & Beverage Production group and the Restaurant & Drinking Places group. The chart indicates some degree of similarity between the two groups with regard to an increase in job postings over time. This is due to the fact that each group shares certain occupational needs in common, and that they share similar seasonal hiring trends. In March of 2017, October of 2017, and June of 2018, the Food and Beverage Production group saw the greatest activity in job postings (279, 276, and 282 respectively); whereas, January of 2018 saw the least active job postings (155). Since that time, activity is trending slightly upward on a month-to-month basis. Interestingly, that trend has kept up into the Fall, as of October 2018 job postings for the two groups are up to 306 for the Food & Beverage Production cluster and 182 for the Restaurant & Drinking Place cluster.

**Figure 16: Active Job Postings (9/16-10/18)**



Source: Emsi JPA, November 2018

## Job Postings Activity: Food & Beverage Production

The top posted job titles in the CGCC Region over the past two years within the Food & Beverage Production group are displayed in Table 20.

**Table 20: Food & Beverage Production Common Job Titles Sought by Employers**

Job Title	Unique Postings (Sep 2016 - Sep 2018)
Delivery Drivers	165
Software Testers	114
Owner Operators	69
Product Analysts (Computer and Mathematical)	66
Maintenance Mechanics	60
Maintenance Workers	52
Material Handlers (Transportation and Material Moving)	45
Operations Supervisors (Production)	38
Package Handlers	36
Sales Representatives	27
Forklift Operators	27
Sales Managers (Management)	26
Commercial Driver's License (CDL) Drivers	26
General Managers (Management)	24
Assistant General Managers	24

Source: Emsi JPA, November 2018

As demonstrated in Table 21, some of the top organizations posting for talent similar to the Food & Beverage Production industry are C.R. England, Inc.; American Consumer Products Corporation; and the city of The Dalles.

**Table 21: Organizations Most Frequently Seeking Food & Beverage Production Related Talent**

Company	Unique Postings (Sep 2016 - Sep 2018)
C.R. England, Inc.	150
American Consumer Products Corporation	141
The Dalles	126
Landstar System, Inc.	61
Insitu, Inc.	54
United Parcel Service, Inc.	48
Xpo Logistics, Inc.	48
Waste Management, Inc.	44
Republic Services, Inc.	39
Pilot Flying J	37
U. S. Xpress, Inc.	35
United States Department of the Army	29
O'Reilly Automotive, Inc.	26
Weego	24
Avon Products, Inc.	24

Source: Emsi JPA, November 2018



## Job Posting Activity: Restaurants & Drinking Places

When isolating job posting analytics by industry, the top three job titles for Restaurant & Drinking Places are listed in Table 22.

**Table 22: Restaurants & Drinking Places Common Job Titles Sought by Employers**

Job Title	Unique Postings (Sep 2016 - Sep 2018)
Cashiers (Sales and Related)	74
Cooks	61
Restaurant Crew Team Members	58
Retail Merchandisers	55
General Managers (Management)	48
Restaurant Managers (Food Preparation and Serving Related)	45
Retail Sales Associates	45
Merchandisers	39
Line Cooks	31
Business Development Managers (Sales and Related)	31
Brand Ambassadors	31
Food Service Assistants	21
Bartenders	21
Material Handlers (Transportation and Material Moving)	20
Baristas	19

Source: Emsi JPA, November 2018

Some of the companies posting the most within the Restaurant & Beverage Places industry are: the City of The Dalles; Safeway Inc.; and Pilot Flying J, as listed in Table 23.

**Table 23: Restaurants & Drinking Places Most Active Job Postings by Employers**

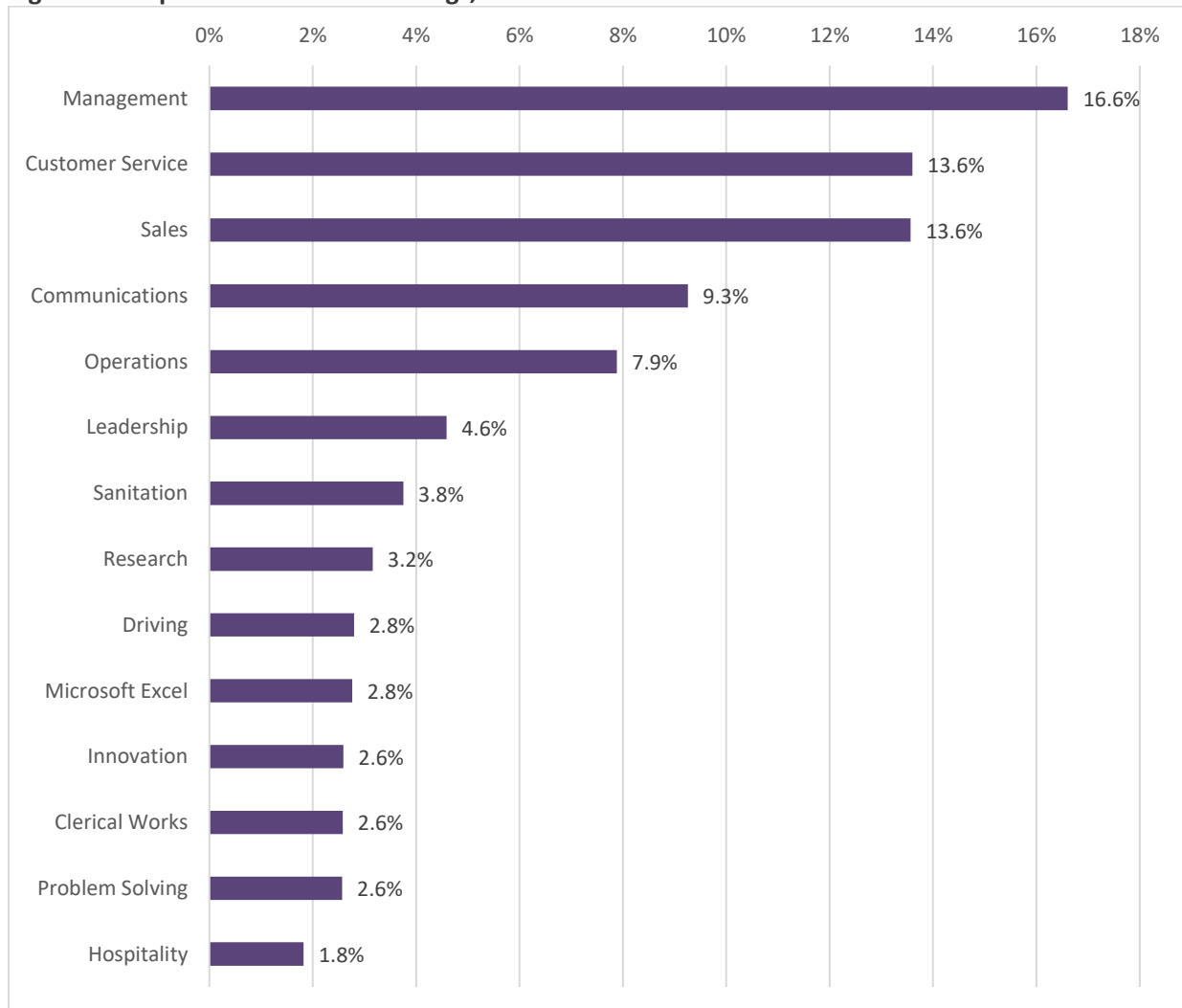
Company	Unique Postings (Sep 2016 - Sep 2018)
The Dalles	126
Safeway Inc.	123
Taco Bell Corp	67
Whole Foods Market, Inc.	51
Destination Hotels and Resorts, Inc	30
Starbucks Corporation	26
Kmart Corporation	20
The Springs Living LLC	18
Albertson's, LLC	17
Rite Aid Corporation	17
Q F C	16
The Kroger Co	15
Two Roads, LLC	15
Dollar Tree, Inc.	15
Sharis Restaurant & Pies	14

Source: Emsi JPA, November 2018

## Top Common & Hard Skills

The top common skills, or more commonly known as soft skills, that are requested via job postings are Management, Customer Service, Sales, Communications, and Leadership. Many of the top common skills require that applicants possess the ability to interact both externally (with customers) or internally (among co-workers). These skills require that applicants have the ability to build relationships, listen, and adapt their communication to a situation at hand.

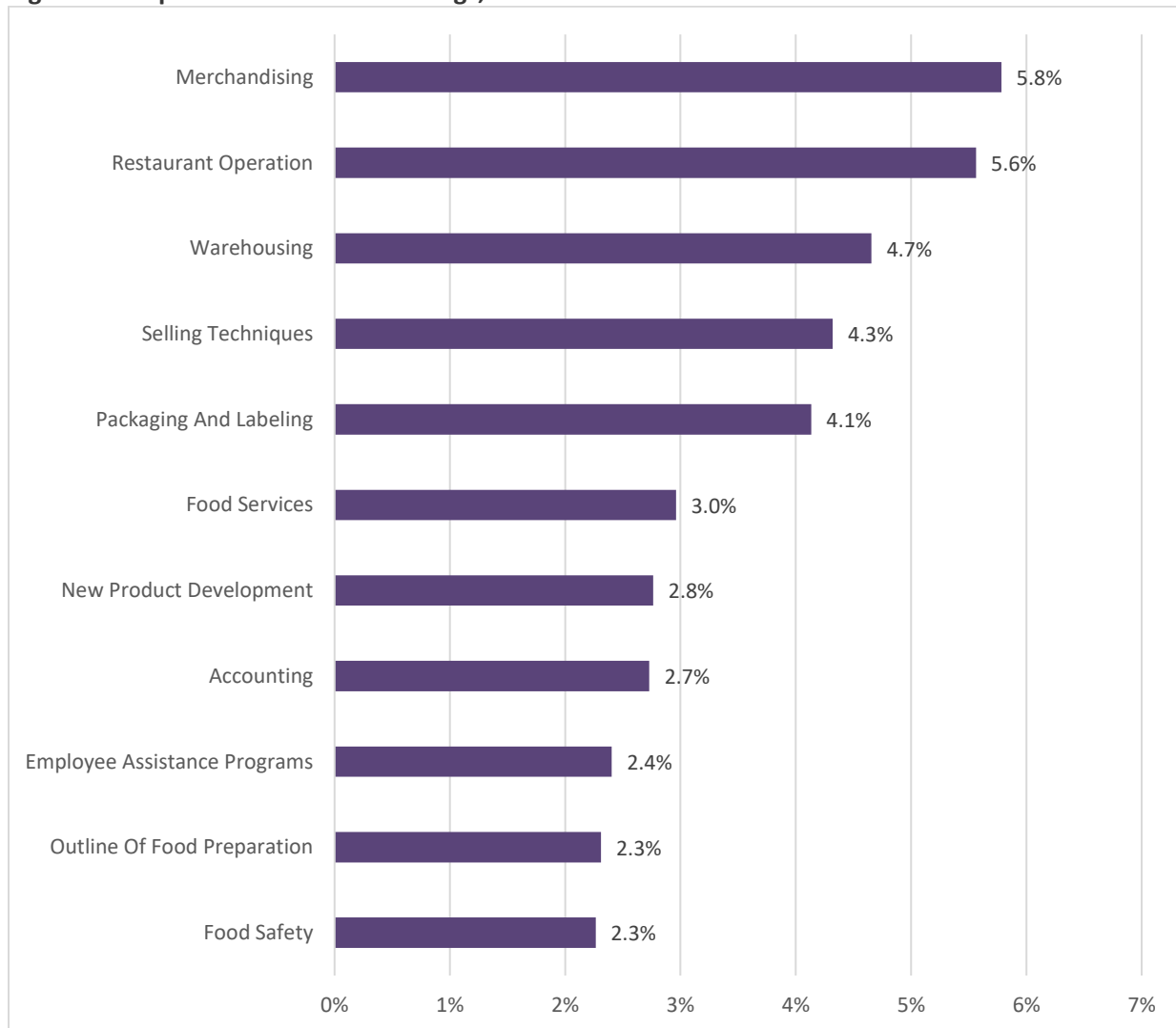
**Figure 17: Top Soft Skills in Job Postings, November 2018**



Source: Emsi JPA, November 2018

The top hard skills, or more commonly known as technical skills, that are requested within job postings are Merchandising, Restaurant Operation, Warehousing, Selling Techniques, and Packaging and Labeling. Many of the top hard skills require that applicants have an understanding of the daily operations that occur within the Food & Beverage Industry. The hard skills require that the applicant possess the common skills listed above; for example, Restaurant Operation, Selling Techniques, and Merchandising require effective communication skills.

**Figure 18: Top Hard Skills in Job Postings, November 2018**



Source: Emsi JPA, November 2018

## Restaurant & Drinking Places

The top common skills for Restaurant & Beverage Places are Customer Service; Sales; and Management. Many of the top common skills require that applicants possess the ability to interact both externally (with customers) or internally (among co-workers). These require that applicants have both sales-oriented and customer service-oriented skills. Understanding that many of the occupations in this industry require interaction with customers, having the ability to connect, communicate, and listen to the needs of customers is essential.

**Table 24: Top Soft Skills in Restaurant & Beverage Industry Job Postings, November 2018**

Skill
Customer Service
Sales
Management
Communications
Sanitation
Cleanliness
Hospitality
Leadership
Operations
Dishwashers
Computer Literacy
Time Management
Retail Sales
Trust
Presentations

Source: Emsi JPA, November 2018

The top hard skills for Restaurant & Beverage Places are Merchandising; Restaurant Operation; and Food Services. Many of the top hard skills require that the employee be understanding of internal operations and have the ability to handle day-to-day operations.

**Table 25: Top Hard Skills in Restaurant & Beverage Industry Job Postings, November 2018**

Skill
Merchandising
Restaurant Operation
Food Services
Outline Of Food Preparation
Selling Techniques
Food Safety
Franchising
Cooking
Warehousing
Recipes
Demonstration Skills
Fast Moving Consumer Goods
Bakeries
Point Of Sale
Packaging And Labeling

Source: Emsi JPA, November 2018

## Food & Beverage Production

The top common skills for Food & Beverage Production are similar to those for Restaurants & Drinking Places, including Management; Customer Service; and Sales. Many of the top common skills require that applicants possess the ability to interact both externally (with customers) or internally (among co-workers). These require that applicants have both sales-oriented and customer service-oriented skills.

Understanding that many of the occupations in this industry require interaction with customers, having the ability to connect, communicate, and listen to the needs of customers is essential.

**Table 26: Top Soft Skills in Food & Beverage Production Job Postings, November 2018**

Skill
Management
Customer Service
Sales
Operations
Communications
Clerical Works
Data Entry
Research
Leadership
Troubleshooting (Problem Solving)
Microsoft Excel
Computer Literacy
Problem Solving
Microsoft Office
Construction

Source: Emsi JPA, November 2018

The top hard skills for Restaurant & Beverage Places are Warehousing; Packaging and Labelling; and New Product Development. Many of the top hard skills require that the employee be understanding of internal operations and have the ability to handle day-to-day operations.

**Table 27: Top Hard Skills in Food & Beverage Production Job Postings, November 2018**

Skill
Warehousing
Packaging And Labeling
New Product Development
Marketing Management
Consumer Behavior
Market Research
Merchandising
Accounting
Selling Techniques
Microsoft Access
Restaurant Operation
Plumbing
Customer Satisfaction
Forklift Truck
Mechanics

Source: Emsi JPA, November 2018

## 4. WORKFORCE INFORMATION

### Detailed Occupational Data

The following charts provide detailed employment information for the types of workers employed in each of the industry groups. Included along with employment are median hourly earnings, typical entry level education, work experience required, and typical on-the-job training (OJT). To focus on the most significant workforce needs, occupations with fewer than 10 workers in 2018 have been excluded from these tables.

### Restaurants & Drinking Places

**Table 28: Restaurant and Drinking Places Group Detailed Occupational Data, 2018**

SOC	Description	Employed in Industry Group (2018)	Median Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
35-3031	Waiters and Waitresses	664	\$11.62	No formal educational credential	None	Short-term OJT
35-3021	Combined Food Preparation and Serving Workers, Including Fast Food	560	\$11.56	No formal educational credential	None	Short-term OJT
35-2014	Cooks, Restaurant	408	\$12.92	No formal educational credential	Less than 5 years	Moderate-term OJT
35-3011	Bartenders	218	\$12.23	No formal educational credential	None	Short-term OJT
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	211	\$13.58	High school diploma or equivalent	Less than 5 years	None
35-3022	Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	175	\$11.65	No formal educational credential	None	Short-term OJT
35-2021	Food Preparation Workers	116	\$12.30	No formal educational credential	None	Short-term OJT
51-9111	Packaging and Filling Machine Operators and Tenders	114	\$14.43	High school diploma or equivalent	None	Moderate-term OJT
35-9021	Dishwashers	99	\$11.67	No formal educational credential	None	Short-term OJT
41-2011	Cashiers	92	\$11.40	No formal educational credential	None	Short-term OJT

SOC	Description	Employed in Industry Group (2018)	Median Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
35-9031	Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop	86	\$11.49	No formal educational credential	None	Short-term OJT
11-9051	Food Service Managers	82	\$15.15	High school diploma or equivalent	Less than 5 years	None
35-9011	Dining Room and Cafeteria Attendants and Bartender Helpers	71	\$11.41	No formal educational credential	None	Short-term OJT
51-9012	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	65	\$18.32	High school diploma or equivalent	None	Moderate-term OJT
35-2011	Cooks, Fast Food	59	\$11.55	No formal educational credential	None	Short-term OJT
35-2015	Cooks, Short Order	51	\$11.92	No formal educational credential	None	Short-term OJT
53-3031	Driver/Sales Workers	49	\$13.65	High school diploma or equivalent	None	Short-term OJT
41-2031	Retail Salespersons	37	\$12.77	No formal educational credential	None	Short-term OJT
11-1021	General and Operations Managers	37	\$37.38	Bachelor's degree	5 years or more	None
49-9041	Industrial Machinery Mechanics	32	\$23.57	High school diploma or equivalent	None	Long-term OJT
41-9011	Demonstrators and Product Promoters	32	\$16.41	No formal educational credential	None	Short-term OJT
51-3011	Bakers	26	\$12.98	No formal educational credential	None	Long-term OJT
53-7051	Industrial Truck and Tractor Operators	25	\$16.50	No formal educational credential	None	Short-term OJT
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	25	\$23.53	High school diploma or equivalent	None	Moderate-term OJT
51-1011	First-Line Supervisors of Production and Operating Workers	22	\$30.44	High school diploma or equivalent	Less than 5 years	None

SOC	Description	Employed in Industry Group (2018)	Median Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	19	\$13.68	No formal educational credential	None	Short-term OJT
49-9071	Maintenance and Repair Workers, General	18	\$18.84	High school diploma or equivalent	None	Moderate-term OJT
53-3032	Heavy and Tractor-Trailer Truck Drivers	18	\$19.15	Postsecondary nondegree award	None	Short-term OJT
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	15	\$13.50	No formal educational credential	None	Short-term OJT
53-3033	Light Truck or Delivery Services Drivers	15	\$14.72	High school diploma or equivalent	None	Short-term OJT
43-3031	Bookkeeping, Accounting, and Auditing Clerks	15	\$18.80	Some college, no degree	None	Moderate-term OJT
43-9061	Office Clerks, General	14	\$16.25	High school diploma or equivalent	None	Short-term OJT
51-3092	Food Batchmakers	13	\$11.81	High school diploma or equivalent	None	Moderate-term OJT
35-1011	Chefs and Head Cooks	13	\$14.54	High school diploma or equivalent	5 years or more	None
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	13	\$15.74	High school diploma or equivalent	None	Moderate-term OJT
27-1026	Merchandise Displayers and Window Trimmers	12	\$11.33	High school diploma or equivalent	None	Short-term OJT
43-5081	Stock Clerks and Order Fillers	12	\$14.50	High school diploma or equivalent	None	Short-term OJT
45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	10	\$12.68	No formal educational credential	None	Short-term OJT
11-3051	Industrial Production Managers	10	\$32.69	Bachelor's degree	5 years or more	None

Source: Emsi, 2018 Q3



## Food & Beverage Production

**Table 29: Food & Beverage Production Group Detailed Occupational Data, 2018**

SOC	Description	Employed in Industry Group (2018)	Median Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
51-9111	Packaging and Filling Machine Operators and Tenders	122	\$14.43	High school diploma or equivalent	None	Moderate-term OJT
51-3092	Food Batchmakers	97	\$11.81	High school diploma or equivalent	None	Moderate-term OJT
53-7064	Packers and Packagers, Hand	78	\$12.95	No formal educational credential	None	Short-term OJT
49-9041	Industrial Machinery Mechanics	64	\$23.57	High school diploma or equivalent	None	Long-term OJT
53-7051	Industrial Truck and Tractor Operators	56	\$16.50	No formal educational credential	None	Short-term OJT
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	53	\$13.68	No formal educational credential	None	Short-term OJT
51-3093	Food Cooking Machine Operators and Tenders	50	\$12.81	High school diploma or equivalent	None	Moderate-term OJT
45-2041	Graders and Sorters, Agricultural Products	41	\$12.34	No formal educational credential	None	Short-term OJT
53-7063	Machine Feeders and Offbearers	35	\$12.63	No formal educational credential	None	Short-term OJT
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	34	\$23.53	High school diploma or equivalent	None	Moderate-term OJT
53-3032	Heavy and Tractor-Trailer Truck Drivers	31	\$19.15	Postsecondary nondegree award	None	Short-term OJT
51-3099	Food Processing Workers, All Other	28	\$10.65	No formal educational credential	None	Moderate-term OJT
53-3031	Driver/Sales Workers	26	\$13.65	High school diploma or equivalent	None	Short-term OJT
51-1011	First-Line Supervisors of Production and Operating Workers	24	\$30.44	High school diploma or equivalent	Less than 5 years	None

SOC	Description	Employed in Industry Group (2018)	Median Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
43-5081	Stock Clerks and Order Fillers	23	\$14.50	High school diploma or equivalent	None	Short-term OJT
49-9071	Maintenance and Repair Workers, General	22	\$18.84	High school diploma or equivalent	None	Moderate-term OJT
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	20	\$15.74	High school diploma or equivalent	None	Moderate-term OJT
11-1021	General and Operations Managers	18	\$37.38	Bachelor's degree	5 years or more	None
51-9198	Helpers--Production Workers	18	\$15.38	High school diploma or equivalent	None	Short-term OJT
43-5071	Shipping, Receiving, and Traffic Clerks	17	\$17.12	High school diploma or equivalent	None	Short-term OJT
43-9061	Office Clerks, General	15	\$16.25	High school diploma or equivalent	None	Short-term OJT
53-1048	First-line Supervisors of Transportation and Material Moving Workers Except Aircraft Cargo Handling Supervisors	15	\$22.88	High school diploma or equivalent	Less than 5 years	None
43-3031	Bookkeeping, Accounting, and Auditing Clerks	13	\$18.80	Some college, no degree	None	Moderate-term OJT
51-3011	Bakers	14	\$12.98	No formal educational credential	None	Long-term OJT
53-3033	Light Truck or Delivery Services Drivers	14	\$14.72	High school diploma or equivalent	None	Short-term OJT
51-9199	Production Workers, All Other	13	\$15.04	High school diploma or equivalent	None	Moderate-term OJT
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	13	\$13.50	No formal educational credential	None	Short-term OJT
11-3051	Industrial Production Managers	12	\$32.69	Bachelor's degree	5 years or more	None
53-7061	Cleaners of Vehicles and Equipment	11	\$12.47	No formal educational credential	None	Short-term OJT
11-9051	Food Service Managers	10	\$15.15	High school diploma or equivalent	Less than 5 years	None

Source: Emsi, 2018 Q3

## Occupational Profiles

The following occupational profiles provide a few high-level details on the characteristics of the top 10 occupations employed in each of the industry groups. These sketches also include the top four knowledge and skills for each occupation, according to O\*NET Online, a human resources database maintained by the Employment & Training Administration within the US Department of Labor.<sup>8</sup>

### Restaurants & Drinking Places

**Table 30: Combined Food Preparation and Serving Workers, Including Fast Food**

<b>Knowledge</b> <ul style="list-style-type: none"> <li>- Customer and Personal Service</li> <li>- Food Production</li> <li>- Public Safety and Security</li> <li>- Sales and Marketing</li> </ul>	<b>Skills</b> <ul style="list-style-type: none"> <li>- Restaurant Operation</li> <li>- Food Services</li> <li>- Franchising</li> <li>- Outline of Food Preparation</li> </ul>
Typical Entry level of Education: No formal education credential	
Median Hourly Earnings: \$11.56	
Employed in Industry Group (2018): 560	Employed in Industry Group (2023): 616

Source: Emsi, 2018 Q3 & O\*NET Online

**Table 31: Bartenders**

<b>Knowledge</b> <ul style="list-style-type: none"> <li>- Customer and Personal Service</li> <li>- Administration and Management</li> <li>- Education and Training</li> <li>- Sales and Marketing</li> </ul>	<b>Skills</b> <ul style="list-style-type: none"> <li>- Restaurant Operation</li> <li>- Food Services</li> <li>- Billing</li> <li>- Payment Processing</li> </ul>
Typical Entry level of Education: No formal education credential	
Median Hourly Earnings: \$12.23	
Employed in Industry Group (2018): 218	Employed in Industry Group (2023): 252

Source: Emsi, 2018 Q3 & O\*NET Online

**Table 32: Waiters and Waitresses**

<b>Knowledge</b> <ul style="list-style-type: none"> <li>- Customer and Personal Service</li> <li>- English Language</li> <li>- Food Production</li> <li>- Sales and Marketing</li> </ul>	<b>Skills</b> <ul style="list-style-type: none"> <li>- Restaurant Operation</li> <li>- Human Services</li> <li>- Food Services</li> <li>- Point of Sale</li> </ul>
Typical Entry level of Education: No formal education credential	
Median Hourly Earnings: \$11.62	
Employed in Industry Group (2018): 664	Employed in Industry Group (2023): 693

Source: Emsi, 2018 Q3 & O\*NET Online

<sup>8</sup> <https://www.onetonline.org/>

**Table 33: Cooks, Restaurant**

Knowledge	Skills
<ul style="list-style-type: none"> <li>- Food Production</li> <li>- Customer and Personal Service</li> <li>- English Language</li> <li>- Production and Processing</li> </ul>	<ul style="list-style-type: none"> <li>- Outline of Food Preparation</li> <li>- Restaurant Operation</li> <li>- Food Services</li> <li>- Cooking</li> </ul>
Typical Entry level of Education: No formal educational credential	
Median Hourly Earnings: \$12.92	
Employed in Industry Group (2018): 408	Employed in Industry Group (2023): 432

Source: Emsi, 2018 Q3 & O\*NET Online

**Table 34: Packaging and Filling Machine Operators and Tenders**

Knowledge	Skills
<ul style="list-style-type: none"> <li>- Production and Processing</li> <li>- Mechanical</li> <li>- Public Safety and Security</li> <li>- Education and Training</li> </ul>	<ul style="list-style-type: none"> <li>- Packaging and Labeling</li> <li>- Microsoft Access</li> <li>- Restaurant Operation</li> </ul>
Typical Entry level of Education: High school diploma or equivalent	
Median Hourly Earnings: \$14.43	
Employed in Industry Group (2018): 114	Employed in Industry Group (2023): 130

Source: Emsi, 2018 Q3 & O\*NET Online

**Table 35: First-Line Supervisors of Food Preparation and Serving Workers**

Knowledge	Skills
<ul style="list-style-type: none"> <li>- Production and Processing</li> <li>- Mechanical</li> <li>- Public Safety and Security</li> <li>- Education and Training</li> </ul>	<ul style="list-style-type: none"> <li>- Packaging and Labeling</li> <li>- Microsoft Access</li> <li>- Restaurant Operation</li> </ul>
Typical Entry level of Education: High school diploma or equivalent	
Median Hourly Earnings: \$13.58	
Employed in Industry Group (2018): 211	Employed in Industry Group (2023): 225

Source: Emsi, 2018 Q3 & O\*NET Online

**Table 36: Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders**

Knowledge	Skills
<ul style="list-style-type: none"> <li>- Production and Processing</li> <li>- Mechanical</li> <li>- English Language</li> </ul>	<ul style="list-style-type: none"> <li>- Food Safety</li> <li>- Packing and labeling</li> <li>- Inventory Management</li> <li>- Occupational Health</li> </ul>
Typical Entry level of Education: High school diploma or equivalent	
Median Hourly Earnings: \$18.32	
Employed in Industry Group (2018): 65	Employed in Industry Group (2023): 74

Source: Emsi, 2018 Q3 & O\*NET Online

**Table 37: Food Service Managers**

Knowledge	Skills
<ul style="list-style-type: none"> <li>- Administration and Management</li> <li>- Customer and Personal Service</li> <li>- Personnel and Human Resources</li> <li>- Mathematics</li> </ul>	<ul style="list-style-type: none"> <li>- Restaurant Operation</li> <li>- Operations Management</li> <li>- Franchising</li> <li>- Customer Satisfaction</li> </ul>
Typical Entry level of Education: High school diploma or equivalent	
Median Hourly Earnings: \$15.15	
Employed in Industry Group (2018): 82	Employed in Industry Group (2023): 89

Source: Emsi, 2018 Q3 & O\*NET Online

**Table 38: Retail Salespersons**

Knowledge	Skills
<ul style="list-style-type: none"> <li>- Sales and Marketing</li> <li>- Customer and Personal Service</li> <li>- Mathematics</li> <li>- Administration and Management</li> </ul>	<ul style="list-style-type: none"> <li>- Merchandising</li> <li>- Customer Experience</li> <li>- Selling Techniques</li> <li>- Loss Prevention</li> </ul>
Typical Entry level of Education: No formal educational credential	
Median Hourly Earnings: \$12.77	
Employed in Industry Group (2018): 37	Employed in Industry Group (2023): 44

Source: Emsi, 2018 Q3 & O\*NET Online

**Table 39: Industrial Machinery Mechanics**

Knowledge	Skills
<ul style="list-style-type: none"> <li>- Mechanical</li> <li>- Engineering and Technology</li> <li>- Production and Processing</li> <li>- Mathematics</li> </ul>	<ul style="list-style-type: none"> <li>- Disassembler</li> <li>- Calibration</li> <li>- Electronics</li> <li>- Test Equipment</li> </ul>
Typical Entry level of Education: High school diploma or equivalent	
Median Hourly Earnings: \$23.57	
Employed in Industry Group (2018): 32	Employed in Industry Group (2023): 38

Source: Emsi, 2018 Q3 & O\*NET Online

## Food & Beverage Production

**Table 40: Laborers and Freight, Stock, and Material Movers, Hand**

<b>Knowledge</b> <ul style="list-style-type: none"> <li>- Production and Processing</li> <li>- English Language</li> <li>- Mathematics</li> </ul>	<b>Skills</b> <ul style="list-style-type: none"> <li>- Operation Monitoring</li> <li>- Coordination</li> <li>- Equipment Maintenance</li> <li>- Monitoring</li> </ul>
Typical Entry level of Education: No formal educational credential	
Median Hourly Earnings: \$13.86	
Employed in Industry Group (2018): 53	Employed in Industry Group (2023): 63

Source: Emsi, 2018 Q3 & O\*NET Online

**Table 41: Packers and Packagers, Hand**

<b>Knowledge</b> <ul style="list-style-type: none"> <li>- Customer and Personal Service</li> <li>- English Language</li> <li>- Mathematics</li> </ul>	<b>Skills</b> <ul style="list-style-type: none"> <li>- Palletizing</li> <li>- Monitoring</li> </ul>
Typical Entry level of Education: No formal educational credential	
Median Hourly Earnings: \$12.95	
Employed in Industry Group (2018): 78	Employed in Industry Group (2023): 85

Source: Emsi, 2018 Q3 & O\*NET Online

**Table 42: Industrial Truck and Tractor Operators**

<b>Knowledge</b> <ul style="list-style-type: none"> <li>- Public Safety and Security</li> <li>- English Language</li> <li>- Customer and Personal Service</li> <li>- Production and Processing</li> </ul>	<b>Skills</b> <ul style="list-style-type: none"> <li>- Operation Monitoring</li> <li>- Coordination</li> <li>- Equipment Maintenance</li> <li>- Monitoring</li> </ul>
Typical Entry level of Education: No formal educational credential	
Median Hourly Earnings: \$16.50	
Employed in Industry Group (2018): 56	Employed in Industry Group (2023): 62

Source: Emsi, 2018 Q3 & O\*NET Online

**Table 43: Packaging and Filling Machine Operators and Tenders**

<b>Knowledge</b> <ul style="list-style-type: none"> <li>- Production and Processing</li> <li>- Mechanical</li> <li>- Public Safety and Security</li> <li>- Education and Training</li> </ul>	<b>Skills</b> <ul style="list-style-type: none"> <li>- Packaging and Labeling</li> <li>- Microsoft Access</li> <li>- Restaurant Operation</li> </ul>
Typical Entry level of Education: High school diploma or equivalent	
Median Hourly Earnings: \$14.43	
Employed in Industry Group (2018): 122	Employed in Industry Group (2023): 128

Source: Emsi, 2018 Q3 & O\*NET Online

**Table 44: Industrial Machinery Mechanics**

Knowledge	Skills
- Mechanical	- Disassembler
- Engineering and Technology	- Calibration
- Production and Processing	- Electronics
- Mathematics	- Test Equipment
Typical Entry level of Education: High school diploma or equivalent	
Median Hourly Earnings: \$23.57	
Employed in Industry Group (2018): 64	Employed in Industry Group (2023): 69

Source: Emsi, 2018 Q3 & O\*NET Online

**Table 45: Food Batchmakers**

Knowledge	Skills
- Production and Processing	- Monitoring
- Food Production	- Operation and Control
- Mechanical	- Critical Thinking
- Public Safety and Security	- Reading Comprehension
Typical Entry level of Education: High school diploma or equivalent	
Median Hourly Earnings: \$11.81	
Employed in Industry Group (2018): 97	Employed in Industry Group (2023): 101

Source: Emsi, 2018 Q3 & O\*NET Online

**Table 46: Machine Feeders and Offbearers**

Knowledge	Skills
- Production and Processing	- Operation Monitoring
- Mathematics	- Coordination
- Mechanical	- Reading Comprehension
Typical Entry level of Education: No formal educational credential	
Median Hourly Earnings: \$12.63	
Employed in Industry Group (2018): 35	Employed in Industry Group (2023): 37

Source: Emsi, 2018 Q3 & O\*NET Online

**Table 47: Heavy and Tractor-Trailer Truck Drivers**

Knowledge	Skills
- Transportation	- Operation and Control
- Public Safety and Security	- Operation Monitoring
- Customer and Personal Service	- Critical Thinking
- Mechanical	- Monitoring
Typical Entry level of Education: Postsecondary nondegree award	
Median Hourly Earnings: \$19.15	
Employed in Industry Group (2018): 31	Employed in Industry Group (2023): 33

Source: Emsi, 2018 Q3 & O\*NET Online

**Table 48: Food Cooking Machine Operators and Tenders**

Knowledge	Skills
- Food Production	- Operation Monitoring
- Customer and Personal Service	- Operation and Control
- Education and Training	- Reading Comprehension
- Production and Processing	- Monitoring
Typical Entry level of Education: High school diploma or equivalent	
Median Hourly Earnings: \$12.81	
Employed in Industry Group (2018): 50	Employed in Industry Group (2023): 52

Source: Emsi, 2018 Q3 & O\*NET Online

**Table 49: Maintenance and Repair Workers, General**

Knowledge	Skills
- Mechanical	- Equipment Maintenance
- Building and Construction	- Repairing
- Customer and Personal Service	- Troubleshooting
- Public Safety and Security	- Equipment Selection
Typical Entry level of Education: High school diploma or equivalent	
Median Hourly Earnings: \$18.84	
Employed in Industry Group (2018): 22	Employed in Industry Group (2023): 24

Source: Emsi, 2018 Q3 & O\*NET Online



## 5. BENCHMARKING ANALYSIS

### Basic Curriculum Suggestions

Master Brewer's Association of America

#### *Four-Year Degree<sup>9</sup>*

According to the Master Brewer's Association of America, a four-year brewing or fermentation degree should have foundational skills of science, with coursework specializing in food science, fermentation science, microbiology, biology, chemical engineering, or chemistry. A degree in brewing or fermentation science must provide students with knowledge, experience, and skill sets in the science of brewing/fermentation. It is important that the courses encompass a mix of lectures, practical classes, hands-on brewing experience, and analytical work in an operational small-scale brewing system.

Suggested Capstone Courses, according to MBAA, are Brewing Science; Brewing Analysis and Quality Assurance; and Practical Malting and Brewing. The learning outcomes required are brewing operations and science, sensory and product design, quality assurance and control, and industry best practices.

#### *Two-Year Degree<sup>10</sup>*

A two-year associate's in applied sciences (AAS) degree in brewing should have foundational skills of general science that are demonstrated by the completion of coursework (e.g., math, biology, chemistry, microbiology). An AAS-level degree in brewing must provide students with additional experience and skillsets through the completion of a minimum set of capstone courses targeting specified learning outcomes. It is also important that the courses encompass hands-on experience fulfilled through internships with nearby breweries if an onsite brewing system is not available.

Suggested Capstone Courses, according to MBAA, are Brewing Science; Brewing Analysis and Quality Assurance; and Practical Malting and Brewing. The learning outcomes required are brewing operations and science, sensory and product design, quality assurance and control, and industry best practices.

#### *Certificate<sup>11</sup>*

A certificate in brewing or fermentation science should have the foundational skills of science by the completion of coursework in one of the following areas: food science, fermentation science, microbiology, biology, chemical engineering, or biochemistry. A certificate in brewing or fermentation must provide students with knowledge, experience, and skillsets in the science of brewing/fermentation through completion of a minimum set of courses that target learning outcomes. It is important that the coursework encompass lectures, practical classes, hands-on brewing experience, and analytical work in an operational, small-scale set-up. Graduates of the certificate program should be able to pass a final exam equivalent to the Institute of Brewing and Distilling (IBD) General Certificate in Brewing Exam.

Suggested Capstone Courses, according to MBAA, are Brewing Science; Brewing History; Brewing Analysis and Quality Assurance; and Practical Malting and Brewing. The learning outcomes required are brewing

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<sup>9</sup> Retrieved from: [https://www.mbaa.com/education/Documents/4-year\\_BachelorDegree\\_LearningOutcomes.pdf](https://www.mbaa.com/education/Documents/4-year_BachelorDegree_LearningOutcomes.pdf)

<sup>10</sup> Retrieved from: [https://www.mbaa.com/education/Documents/2-year\\_AssocDegree\\_LearningOutcomes.pdf](https://www.mbaa.com/education/Documents/2-year_AssocDegree_LearningOutcomes.pdf)

<sup>11</sup> Retrieved from: [https://www.mbaa.com/education/Documents/Certificate\\_LearningOutcomes.pdf](https://www.mbaa.com/education/Documents/Certificate_LearningOutcomes.pdf)

operations and science, sensory and product design, quality assurance and control, and industry best practices.

The following programs in the benchmark have been recognized as meeting the approved guidelines and learning outcomes of MBAA:

- Appalachian State University: Fermentation Sciences program for the 4-year College or University Bachelor of Science Degree
- Oregon State University: Food Science and Technology, Fermentation Science program for the 4-year College or University Bachelor of Science Degree

## VESTA

### *Enology<sup>12</sup>*

The following courses are required under VESTA: Molecular Principles of Grape and Wine, Introduction to Wine Microorganisms, Introduction to Enology, Winery Sanitation, Winery Equipment Operation, Intermediate Enology (Harvest/Crush), Intermediate Enology (Post Harvest), Fall Wine Production Internships, Cellar Operations Technology, Sensory Evaluation, Wine and Must Analysis, Viticulture Elective.

The following programs in the benchmark have been recognized as meeting the approved guidelines and learning outcomes of VESTA for Enology:

- Napa Community College: Degree in Winemaking
- Chemeketa Community College: Winemaking Associate of Applied Science Degree

### *Viticulture<sup>13</sup>*

The following courses are required under VESTA: Molecular Principles of Grape and Wine, Introduction to Viticulture and Vineyard Establishment, Botanical Viticulture, Winter Viticulture Technology, Spring Viticulture Technology, Summer/Fall Viniculture Technology, Integrated Pest Management, Regional Management, Soil for Viticulture, and Computers for Learning.

The following programs in the benchmark have been recognized as meeting the approved guidelines and learning outcomes of VESTA for Viticulture:

- Napa Community College: Viticulture; Certificate of Achievement; Degree in Viticulture
- Chemeketa Community College: Vineyard Management Associate of Applied Science Degree; Vineyard Operations Certificate of Completion

### *Wine Business and Entrepreneurship<sup>14</sup>*

The following courses are required under VESTA: New Wine Business Feasibility, Entrepreneurial Finance for Vineyard and winery Business, Legal Aspects of Vineyard and Winery Operation, Equipment Technology for the Entrepreneur, Marketing for the Entrepreneur, Financial Management for the Entrepreneur, Addressing Human Resources in a Commercial Vineyard or Winery, Vineyard and Winery Safety, and Developing a Business Plan for Commercial Vineyard or Winery.

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<sup>12</sup> Retrieved from: <https://www.vesta-usa.org/Students/Programs-Offered/Enology>

<sup>13</sup> Retrieved from: <https://www.vesta-usa.org/Students/Programs-Offered/Viticulture>

<sup>14</sup> Retrieved from: <https://www.vesta-usa.org/Students/Programs-Offered/Wine-Business-and-Entrepreneurship>

The following programs in the benchmark study have been recognized as meeting the approved guidelines and learning outcomes of VESTA for Wine Business and Entrepreneurship:

- Washington State University: Wine Business Management
- Yakima Valley College: Winery Technology

### Institute of Food Technologies<sup>15</sup>

#### *Undergraduate Degree*

According to the Institute of Food Technologists (IFT), there are a series of courses that prepare undergraduate students for careers in food sciences and promote continued excellence in food science education. To be recognized by the IFT, programs must have the following courses: Chemistry, two courses in general chemistry followed by one course each in organic chemistry and biochemistry; Analytical chemistry and physical chemistry are recommended; Biological Sciences, one course in biology, and one course in general microbiology that has a laboratory; Nutrition, one course dealing with the basic concepts of human nutrition and the relationship of consumption of foods to health and well-being; Physics and Mathematics, one course in calculus and one in general physics; Statistics, one course; Communications, two courses, generally taught outside of the food science program, that provide the fundamentals of written and oral communication skills; Food Chemistry and Analysis; Food Safety and Microbiology; Food Processing and Engineering; and Applied Food Science.

The following programs in the benchmark study have been recognized as meeting the approved guidelines and learning outcomes of IFT:

- Oregon State University
- Washington State University

### American Culinary Federation Education Foundation<sup>16</sup>

The Postsecondary and Secondary Accreditation by American Culinary Federation Education Foundation Accrediting Commission (ACFEFAC) has colleges and universities detail their programs to ensure that they meet minimum standards and competencies set for faculty, curriculum, and student services. With regard to course description and units of instruction, ACFEF asks that schools applying for accreditation follow syllabi and lesson plans which clearly state measurable objectives, student activities, learning resources, time allotment, grading criteria, and student evaluation methods.

## Comparison to Peer Institutions

### Portland State University

- Certificate Program
- Targeted for Students and Professionals
- Twelve-week Student Internship
- Management and Consumerism Information

Portland State University offers an academic program that is a precursor to employment in the Food and Beverage industry. Students learn about the business practices of the industry, which includes topics such

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<sup>15</sup> Retrieved from: [www.ift.org/about-us.aspx](http://www.ift.org/about-us.aspx)

<sup>16</sup> Retrieved from: <https://www.acfchefs.org/ACF/Education/QualityPrograms/ACF/Education/Quality/>

as consumerism, trade of goods, and interactions among other industries. Students must be accepted into and thus are part of the School of Business at Portland State University. Students also choose a concentration like human resources or finance in order prepare them for food industry employment. In order to obtain a Food, Beverage, and Goods Leadership Certificate, the student must successfully complete 24 credits. Within the credits required to receive the Certificate, the student will partake in a practicum or internship to garner industry experience. Students and the employer for the internship agree on student expectations over the course of the twelve-week internship and the student must do a final paper upon completion. Additionally, students are allowed to take one elective course; most elective courses emphasize management insight, such as sales and merchandise management.

### Washington State University

- Certificate, Undergraduate, Graduate, and Doctorate Programs
- Access to Local Wineries
- Internships and Work-Based Learning
- Collaboration with University of Idaho

Washington State University's College of Agricultural, Human, and Natural Resource Sciences has a program for Viticulture and Enology in which a student can obtain a Bachelor of Science. It captures the science behind winemaking as well as tactics and practices of the winemaking industry. The Bachelor of Science degree requires 120 hours of study and takes four years to complete. Its course offerings involve farm-to-table processing, sensory evaluation of wine, and the fermentation process. There are also courses related to wine business management that students can pursue. During the student's third term, they have the option to do hands-on work experience, including internships at wineries. The college provides guidance in this process to help students find and obtain internships and work experiences. This work-based learning leads to professional rapport and engagement in the industry. Later in students' careers at Washington State University, they study at the Ste. Michelle Wine Estates WSU Wine Center and the Albert Ravenholt vineyard in Richland, Washington. Additionally, Washington State University has Master of Science in Food Science and Doctor of Philosophy in Food Science programs. These programs incorporate the Washington State University and University of Idaho. The graduate programs have invaluable information on food chemistry, microbiology, and processing in order to develop students who wish to become food scientists or work in food safety or development. Lastly, if students do not wish to commit to undergraduate and graduate study then they can obtain certificates in either Viticulture or Enology.

### Penn State Berks

- Accessible and Flexible Online Courses
- Targeted for Wine Hobbyists
- Craft Development
- Access to Local Wineries

The Penn State Berks campus offers a Winemaking certificate. It is an online program that engages the full scope of wine-making from growing grapes and the fermentation process to packaging the wine itself. This program is geared toward wine hobbyists and employees in the wine industry seeking more experience. Students can access course material at their leisure. The courses titled Sensory Evaluation, Wine Equipment, and Wine Chemistry take place in person at a winery for sufficient, live experience. The program is nine courses that are twenty-one hours each; the program can be completed within one year.

It allows for a well-rounded understanding of wine industry, supporting Pennsylvania's 250 wineries and counting. Accomplished students will be able to utilize their knowledge in the industry once they have received their certificate.

### Yakima Valley College

- Associate's Degree in Vineyard and Winery Technology
- Vineyard Technology Co-op Experience
- Internship Opportunities

Yakima Valley College offers two significant programs related to the wine industry: Vineyard Technology and Winery Technology. The successful result of each of these programs is an Associate degree of Applied Science. There is also a Vineyard Technology option for an Associate degree of Applied Science-Transfer, meaning that students can enter into the Bachelor of Science in Viticulture and Enology at Washington State University upon completion. Vineyard Technology focuses on the process of growing grapes. It provides pest and disease control approaches. It includes courses on farm management and sustainable agriculture. The Vineyard Technology program is composed of ninety-nine credits. Vineyard Technology students are able to complete a co-op vineyard experience during the second year of the program. Winery Technology is another avenue in order to obtain knowledge for the wine industry, dealing with wine-making procedures. Courses include winery management and operations needs and several courses on wine-making. The program is a total of 99 credits. It allows students to take on jobs such as quality control specialist and wine technician. Students or recent graduates can opt to find employment in internships in Washington listed on the Yakima Valley College website.

### SUNY Morrisville State University

- Bachelor's Degree Program in Brewing
- Industry Partnerships
- Apprenticeship and Internship Opportunities
- United States Open College Beer Championship 2018 Winner

The State University of New York, Morrisville—better known as Morrisville State College--has a four-year program dedicated to brewing. There are ten brewing classes incorporated into this program. It also includes an internship to take place at a nearby brewery. It includes the science of brewing beer and brew facility management. The program prides itself on showing students how to make premium beer. The SUNY Morrisville Brewing Institute is located at the Copper Turret restaurant and brewhouse. Several classes are completed at the Brewing Institute. Students can also do apprentice work at nearby breweries such as Good Nature Brewing. The total curriculum was designed with the voices of local brewers in New York State and will produce new, qualified workers in the brewing industry. SUNY Morrisville's program is highly regarded. It was crowned the Grand National Champion for the 2018 United States Open College Beer Championship. The United States Open College Beer Championship is open to colleges or universities with brewing classes.

### Walla Walla Community College

- Associate's Degree and Certificate Programs
- Curriculum Input from Wine Industry
- Teaching Vineyards

Walla Walla Community College offers many academic options for learning about Enology and Viticulture. The Associate degree programs include an Associate in Applied Sciences degree in Enology and Viticulture and an Associate of Arts and Science degree-Transfer in Enology and Viticulture, which is completed in conjunction with Washington State University. There is also an Associate in Applied Sciences Degree in Wine Business and an Associate in Applied Sciences Degree in Energy Systems and Technology with a focus on Cellar Maintenance. Students can receive a Viticulture Science Certificate or a Fermentation Science Certificate. The Institute for Enology and Viticulture is dedicated to these programs. The programs capture the entire scope of wine: growing vineyards, winemaking, marketing, and the business of wine. The curriculum is made with the input of area wine industry members. The Institute for Enology and Viticulture has some teaching vineyards for student work. Additionally, it has a facility called College Cellars where students can take classes and support the commercial winery. It is a teaching winery designed and helped run by students. All of the wines sold from College Cellars contribute to the Enology and Viticulture program. Students can also complete projects that expand outside of the enology and viticulture curriculum with the approval of faculty.

### Chemeketa Community College

- Associate's Degree and Certificate Programs
- Seasonal Vineyard Management Curriculum
- Cooperative Work Experience Component

Chemeketa Community College in Salem, Oregon has several programs to prepare students for the wine industry. There are Associate degrees of Applied Science in Winemaking and Vineyard Management. Chemeketa Community College also has two certificate programs in Vineyard Operations and Wine Hospitality and Operations. It has a variety of course offerings. It has courses regarding vineyard management during each season of the year. Courses discuss types of wine in different regions and the aging and bottling of wine. Students can complete a Cooperative Work Experience course in which they can physically operate in the wine industry. Those obtaining an Associate degree must complete a Wine Studies Capstone course at the end of their study. Students will be ready to take on employment in the wine industry after program completion.

### Napa Valley College

- Associate's Degree and Certificate Programs
- World Renown Program
- Student-run Vineyards

Napa Valley College is located in a prime wine-making region: Napa, California. Its location makes the community college an exceptional school to study winemaking. Students can obtain an Associate of Science degree in Viticulture, Winemaking, or Wine Marketing and Sales. There are also certificates in either Viticulture or Wine Marketing and Sales. The Associate Degree programs are sixty credits each while the certificate programs are thirty credits for Viticulture and twenty-one credits for Wine Marketing and Sales. The Associate Degree program takes two years while the certificate programs last one year each. Students operate vineyards at the Napa Valley College Estate with the oversight of their instructors. Napa Valley College has several program learning outcomes that students should satisfy by the end of their programs. Students should be able to know about grape production, wine styles, complete wine research, and exercise professional skills in the industry.



## Oregon State University

- Practical Workshops
- Multiple Disciplines and Specialties
- Hands-on Experience with Local Breweries
- Courses Open to Students and Hobbyists

Oregon State University has several programs to educate people about the beverage industry. The programs are open to people interested in gathering more experience from regional experts. It has a Beer Quality and Analysis Series. The Beer Quality and Analysis Series is geared toward people with some brewing experience. It combines online and in-person classes related particularly to the microbiology of beer. It includes classes in Corvallis, Oregon about fermentation science, as well as time spent at the Willamette Valley Pilot Brewery. Oregon State University also offers a program in Cider and Perry making. It has a program that is a significant precursor to opening a brewery called the Craft Brewery Startup Workshop. The Craft Brewery Startup Workshop discusses creating breweries, operations, branding beers, and much more. Similarly, Oregon State University has a Craft Cider Startup Workshop. People can learn at the Widmer Brothers Brewery in Portland, Oregon. People can obtain a Foundation Certificate in Cider and Perry Production. Lastly, there is a Distillery Startup Workshop, which discusses how to make spirits such as whiskey, vodka, and tequila, and distilling business operations. Oregon State University has a wider array of beverage industry offerings compared to other schools.

## South Puget Sound Community College

- Off-Site Experiences for Students
- Online Courses Offered
- Strong Industry Partners
- Innovative Programming to Include Hands-On Work Experience

The Craft Brewing and Distilling Associates degree program at South Puget Sound Community College has been sparking local conversation around the sustainability of careers in the craft beverage industry. It provides an integrated approach combining science, technology, and business to prepare students for the fast-paced and growing industry. To expand the program's reach, most courses are offered online where students from all over the country can partake in classes. While most of the courses are online, there are opportunities for off-site engagement events. These include trips to agricultural areas like Yakima's hop fields and equipment fabricators at JV Northwest. Each of these off-site engagements allow students to gain a hands-on and unique experience in craft brewing. In addition to the degree program, SPSCC offers non-credit classes that target local craft beverage makers and gauges community interest.

There is a new program in the works at SPSCC that combines beer, cider, and distilling. This program emerged from a greater need in the industry. SPSCC Dean of Social Science and Business, Valerie Sundby-Thorp shares, "What we've learned is there's just not a single program that does all three of these things (brewing, distilling and cider) anywhere in the country."<sup>17</sup> After discussions with brewers and distillers in the area, the two-year program emerged to help fill the need for more professionals in the industry. The 105-credit program leads to an Associate degree upon completion. SPSCC plans to partner with and lease

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<sup>17</sup> [www.thurstontalk.com/2017/05/22/south-puget-sound-community-college-brews-innovative-new-program/](http://www.thurstontalk.com/2017/05/22/south-puget-sound-community-college-brews-innovative-new-program/)

space from Craft District, LLC, as part of a new 10,000 square foot space in Tumwater, WA. The space will include classrooms, labs, small scale production space, offices, a conference room, and more.

Industry partners include: City of Tumwater, Thurston Economic Development Council, Thurston County Chamber, Port of Olympia, Port of Seattle, Cider Institute of North America, American Craft Spirits Association, Northwest Cider Association, Washington Distillers Guild, and the School of Food Science at Washington State University and University of Idaho.

### Nash Community College

- Collaboration with Rocky Mount Mills Brewery
- Certificate Programs
- Targeted for Entrepreneurs in the Field

The Nash Community College offers a Brewing, Distillation, and Fermentation degree program that prepares students for careers in the brewing, distillation, and fermentation industry. Students participating in the program are exposed to classroom instruction and practical laboratory applications of brewing, distillation, and fermentation principles and practices. NCC also offers a series of certifications: the Business of Brewing Certificate, Practical Brewer Certificate, Survey of Craft Beverages Certificate, and the Brewing, Distillation, and Fermentation Diploma.

One of the more innovative aspects of the Nash Community College experience is the relationship with Rocky Mount Mills Brewery. The Rocky Mount Mills Brewery has a three-year Incubator program that teaches entrepreneurs how to brew and prove their concepts. Extending beyond the brewing process, individuals also learn how to create a business plan, recruit investment, and move out of the incubator space. This innovative partnership with the Nash Community College allows incubator tenants to take courses on brewing as well as business development.<sup>18</sup>

### Siebel Institute of Technology

- Worldwide Alumni
- Certificate and Continuing Education Courses
- Hands-on Training Internationally

The Siebel Institute of Technology is one of the longest standing institutions, with alumni spanning over 60 countries around the world. One distinctive feature of Siebel is the emphasis on exposing students to differences in culture, equipment, methods, and beer styles. Through a series of campus and online courses, Siebel offers certificates and continuing education courses for a wide-reaching audience. Due to the international emphasis, individuals can participate in certificate and diploma options that include seven-week onsite modules at Siebel's campus and international travel to the Doemens Academy in Munich, Germany. This travel allows students to apply the skills and knowledge learned in the first seven-weeks within an international setting. Students also participate in advanced-level brewing theory training while at Doemens, including presentations regarding brewing techniques used in creating authentic German beer styles.

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<sup>18</sup> <https://www.craftbrewingbusiness.com/news/details-on-three-year-brewery-incubator-program-launching-in-north-carolina/>



The certificate studies courses are taught in a variety of levels: Entry Level or Preparation, Certificate Programs, or Individual Modules that individuals can elect to take as a separate unit. These courses are marketed for individuals who are interested in a career in brewing. The continuing education courses are taught in disciplines as Brewing Quality Control, Business and Management, Distilling, Draught (Draft), General Brewing Technology, and Sensory and Beer Styles. These courses are marketed for individuals with careers in the industry who wish to specialize their skillsets.

### Appalachian State University

- Bachelor's degree
- Workshop Series
- Curriculum Combination of Various Disciplines

Appalachian State University has a Bachelor of Science Degree in Fermentation Sciences. It combines chemistry, biology, and scientific information with business and entrepreneurial practices. The program is a total of 122 credits. Examples of courses are Wine and Production Analysis, Social Implications of Fermented Beverages, and Sensory Analysis of Wine and Beer. Students are required to complete a few standard business courses such as Marketing and Accounting as well. There are also five-day brewing courses, which take place every summer. The brewing program is acknowledged by the Master Brewers Association of America. Appalachian State University has an Enology Lab in which they assess wine, hops, beer, and other products. It was made in 2009 to provide feedback on wineries in North Carolina. It also has a Craft Beverage Workshop series. The workshop programming gives feedback on wineries and breweries and primarily focuses on fermentation. Students will be able to utilize their scientific knowledge in the beverage industry.

### Robert Morris University (Chicago)

- Associate's and Bachelor's Degrees
- Culinary Externship
- Hands-on Restaurant Training

Robert Morris University has a Culinary Arts Institute. It has two avenues for degrees: Associate in Applied Science Degree, Culinary Arts, and Bachelor of Professional Studies Degree, Advanced Culinary and Hospitality Management. The associate's degree takes two years and the bachelor's degree takes four years to finish. The Associate in Applied Science Degree has a particular culinary focus. The associate's degree recipient must do an internship in cooking or hospitality position. For example, one of the courses is called "Culinary Externship." The recipient will learn culinary techniques and restaurant necessities like menu and beverage design. The Bachelor of Professional Studies Degree's first twenty-four hours involve broad professional development such as financial planning. The latter courses involve restaurant management and hospitality. The bachelor's degree recipient should have a comprehensive understanding of how a restaurant functions. Culinary arts students will be able to collaborate with chefs and alumni. They will also work in Chicago restaurants and have the option to get pastry school training.

### San Diego Culinary Institute

- Cooking and Pastry Programs
- Externship in Professional Kitchen

The San Diego Culinary Institute has two programs available for cooking and baking expertise. The Cuisine Commis Culinary program specializes in cooking. It encompasses basic information on kitchen knowledge, simple and more complex cooking that takes place right in the kitchen, and an advised externship where students work in a professional kitchen. The Pastry Program operates similarly. Pastry students will understand the proper and detailed measurements of pastry recipes, decoration, and presentation of their craft. As in the culinary program, students will work primarily in a bake shop setting. The programs typically take eight to eleven months to finish. Successful students will receive an Advanced Professional Diploma at the end of their program. The San Diego Culinary Institute prepares apt culinary and pastry students for professional careers.

### The Restaurant School at Walnut Hill College

- Associate's and Bachelor's Degrees
- Pastry and Culinary Arts Programs
- Internship Opportunities

The Restaurant School at Walnut Hill College in Philadelphia, PA has a large array of culinary programs. There are Associate of Science degree in Culinary Arts and Bachelor of Science degree in Culinary Arts options. The associate's degree includes travel to taste French cuisine and the bachelor's degree includes travel to taste English cuisine. The Restaurant School offers associate's and bachelor's degrees in Pastry Arts as well. The Pastry programs involve learning how to make a variety of desserts and confections. It readies students for careers at bakeries and other roles in the food industry. Lastly, The Restaurant School has an associate's degree and bachelor's degree in Restaurant Management. Students learn about hospitality, professional food service, and dining operations. Associate's degree students in Restaurant Management can also tour Walt Disney World or Florida and Bahama locations. The bachelor's degree involves travel to England. All of these degree specialties include internship opportunities. The Restaurant School at Walnut Hill College prepares students for a plethora of food industry careers.

## 6. CGCC FACILITY REVIEW

During an on-site visit by the consulting team in November 2018, Northwest Food Solutions conducted a comprehensive analysis of existing CGCC assets related to food and beverage production and education. Assets analyzed included a commercial and teaching kitchen and four science/technical labs. Though these labs are currently used for a variety of science classes, they possess some capacity and equipment that could be used for food and beverage workforce instruction.

### Teaching Laboratory Review

Four teaching labs were observed during the Facility Review. Each lab is equipped with lab benches (including water, air, vacuum and gas at each bench), a fume hood, and chemical storage facilities (including facilities for flammable and corrosive chemicals). A detailed outline of the laboratory equipment and specifications are included in Table 50.

**Table 50: Existing Teaching Laboratory Equipment and Facilities**

Equipment	Additional Specifications
Fume Hoods	One in each classroom
Microscopes	
Dissolved O <sub>2</sub> Meters	Vernier (range not known)
Spectrophotometer	Vernier
pH meters	
Pressure cooker	
Balances	Low weight
Refrigerator/freezer	Stand alone
Chemical Storage Area	
Flammable Chemical Storage Room	
Incubators	
Hot plate/stirrers	

Source: NW Food Solutions, October 2018

The teaching labs are more than adequate to teach basic food chemistry and microbiology. There is capability within the labs to run tests that are common within the food industry. Additionally, it is feasible to conduct the examination, identification, and propagation of yeast and bacteria cultures that are commonly used in the Food and Beverage industries.

## Teaching Laboratory Gaps

The consulting team assessed gaps based on lab equipment for two additional uses selected based on feedback from local employers, and local and non-local industry experts. Though in the long-run CGCC's level of engagement could increase, these were found to be acceptable starting points for engagement with the Food and Beverage industries.

- a) A fermentation/food science teaching program and;
- b) A commercial kitchen or pilot facility.

A short, but non-exhaustive list of gaps is listed in Table 51.

**Table 51: Equipment Needs for Additional CGCC Facility Usage**

Fermentation /Food Science Teaching Program	Commercial Kitchen / Pilot Brewery Testing
Hydrometers	Hydrometers
Refractometers	Refractometers
Hemocytometers	Hemocytometers
Autoclave	Industry specific dissolved O2 and CO2 meters
	UV Spectrophotometer
	Autoclave

Source: NW Food Solutions, October 2018

Hydrometers, refractometers, and hemocytometers (for yeast cell counting) are inexpensive to purchase and easy to obtain. Industry specific dissolved oxygen and CO2 meters and a UV spectrophotometer are more expensive and should be considered “nice to have” assets but not necessary to teach. Alternate methods including calculation are less expensive. In these cases, more manual equipment may be used instead.

An autoclave could be purchased for sterilization of instruments and media. Currently professors are using either a pressure cooker or pre-sterilized instruments and media. An autoclave is another “nice to have” asset as it could make sterilization tasks easier, safer, and, over time, save on the cost of purchasing disposable pre-sterilized instruments.

## Commercial Kitchen Review

The commercial kitchen is a 4,000 square foot facility which includes a teaching kitchen, a packaging room, a dishwashing room, a commercial kitchen, three storage rooms, and a walk-in cooler. It is adjacent to a commissary kitchen and parts of the commercial kitchen are used by the commissary staff to store and prepare food. From the records obtained by the consulting team, our understanding is that the commercial kitchen was originally instituted in 1999 as a business incubator for developing companies producing emerging and specialty foods. The facility had buy-in from the President's office and was run by CGCC through the Small Business Development Center (SBDC). At that time, the teaching section of the kitchen was also licensed to operate as a restaurant. As late as 2002, 17 companies were operating out of the kitchen, including one company from Portland. In 2018, 13 companies operated out of the kitchen.

The history of the kitchen is a major positive indicator in its feasibility to be used for additional purposes. As will be explained in this report, some aspects of the kitchen need to be updated or maintained. But the fact that it was originally established for this purpose means that it possesses the basic structure and

many of the assets required to operate it in this way. Table 52 contains a summary of specs for the Commercial Kitchen and Table 53 contains a list of Commercial Kitchen equipment.

**Table 52: Existing Commercial Kitchen Infrastructure**

Item	Quantity	Additional Specifications
Refrigerated Storage Room		Walk-in cooler
Dry Storage Rooms	3	Three dry storage rooms
Chemical Storage Area		No separate locked storage for chemicals
Janitorial Closet		2 sink janitorial closet
Teaching Kitchen area	1	
Packaging room	1	
Ware washing area	1	
Commercial Kitchen area	1	
Tables	5	
Rest Rooms		Available outside the area
Waste / Garbage Areas		Available outside the area
Fresh Water Supply/Sinks	3 sets	1 double sink and 1 triple sink for dishwashing and 1 single sink
Hose Bibs		None
Water Heater		Not observed
Drains		Floor drains throughout
Walls/Floors		Tile floors, tile and sheetrock walls
Hand washing sink	1	
Lighting		Fluorescent with plastic covers
Doors		Metal fire doors
Compressed Air		Independent unit
Receiving/Shipping		Loading dock located below the kitchen level with freight elevator to kitchen
Hood/Ventilation	4	4 Avtec ventilation hoods
Steam		Not observed
Filtered air		Not observed
Ice	1	Ice maker in the commissary kitchen
220 Electric		Yes
Fire suppression		Wet chemical fire suppression system
Exit lighting		Yes
Certifications		Oregon Department of Agriculture

Source: NW Food Solutions, October 2018

**Table 53: Existing Commercial Kitchen Equipment**

Equipment	Qty	Additional Specifications
Convection oven	3	Blodgett Mark V
Mixer	2	Kitchen aid commercial
Mixer	1	Hobart 30-quart dough mixer
Food Processor	1	Robot coupe
Cooker/Mixer	1	Groen steam jacketed floor kettle - 60 gallon with lightnin mixer
Mixer	1	ABM 20-gallon kettle with lightnin mixer
Refrigerator	2	Avantco / Delfield double door
Refrigerator/Freezer	1	Delfield double door
Freezer	1	Delfield double door

Equipment	Qty	Additional Specifications
Linear Scale	1	Weigh Pack
Scale	1	Hobart 75 Lb. capacity
Single Piston Depositor	1	Hinds Bock
Labeler	1	
Package Sealer	2	Midwest Pacific / Heat Seal
Dishwasher	2	CD Commercial Dishwasher Model L10 / CMA Commercial Dishwasher
Cookware		Assorted
Gas Stove	1	Wolf Regency
Grill	1	Star Mfg
Utensils		Assorted
Shelving		Assorted
Microwave	1	Amana Commercial
Fire extinguishers	1	

Source: NW Food Solutions, October 2018

## Condition of Existing Equipment and Infrastructure

The kitchen is very well appointed and includes much of the equipment that is seen in commercial kitchens throughout the Pacific Northwest. Some of the equipment is functional but older. Furthermore, the consulting team did not test each individual piece of equipment and we were therefore not able to tell which pieces of equipment are functioning vs. non-functioning. No equipment was observed to be tagged as “not functioning.” Facilities are large and appear to possess adequate space for storage. Utilities including gas, water, electric, air, and safety equipment (e.g.: fire suppression and exhaust fans) are installed and available. At the time of inspection, the equipment and surfaces were adequately clean.

The most obvious gap was the condition of the kitchen itself, as it has significant wear in places, particularly the floor. In places, floors are pitted and tiles are chipped. Ceiling HVAC vents are discolored and appear to require cleaning. Several pieces of equipment in the packaging area could use detailing to remove baked on, cooked on, or settled food and dust. Kitchen utensils in cupboards, like cutting boards, spatulas, pans, measuring devices, etc., are well worn. Interiors of cupboards do not appear to be labeled or organized. The observation of wear on the kitchen likely means it has been well used and may need some upgrades to the infrastructure.

## Commercial Kitchen Gaps

The consulting team assessed gaps between Commercial Kitchen current facilities and the needs of the community. As with the gaps addressed for the Teaching Laboratories, only a handful of the most pressing needs are assessed, based on the consulting team’s interviews with multiple community members. Gaps between what is offered and what is needed of the commercial kitchen were assessed for the following three categories:

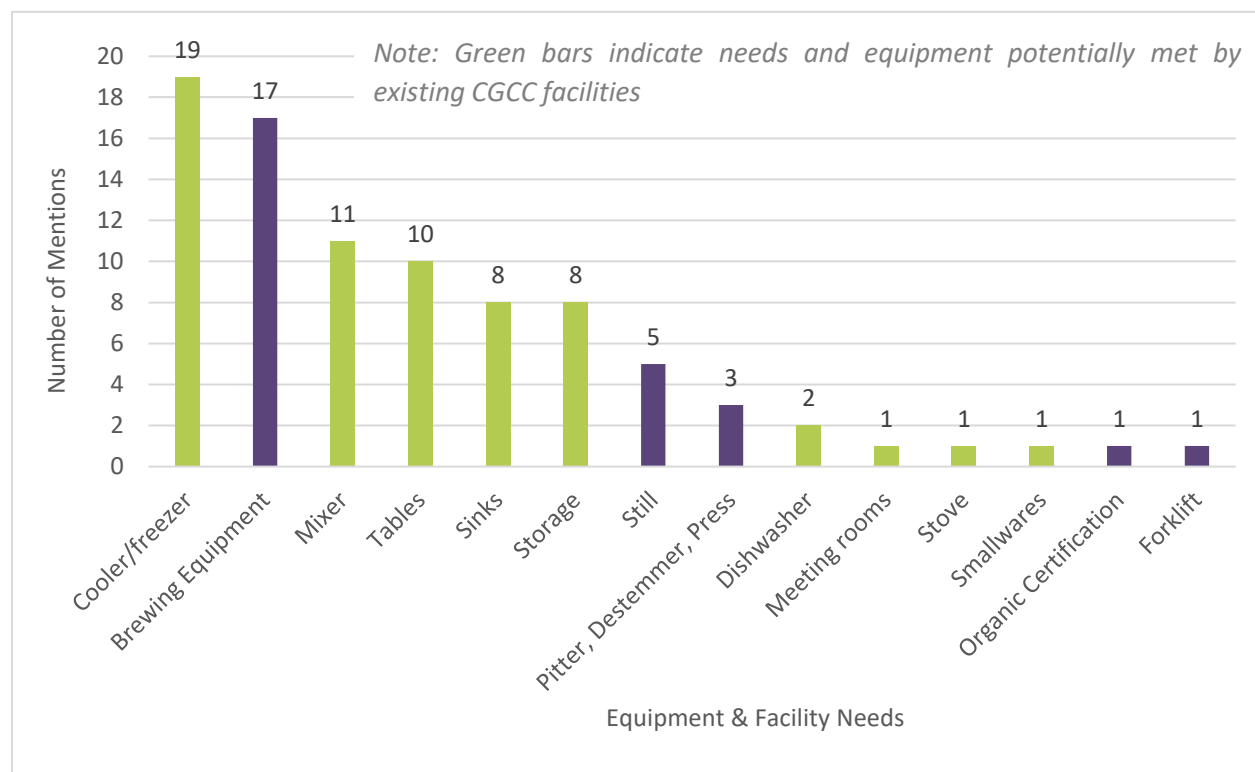
- a) Broader business and community use;
- b) Supporting workforce training; and
- c) Partnership with the Fermented Food and Beverage industries

## Feasibility of Broader Business & Community Use

Figure 19 contains a summary of equipment and facility needs from interviews and surveys performed by the consulting team.<sup>19</sup> The two largest requests were for brewing equipment and cooler/freezer space, followed by storage, sinks, tables, and mixers. The items with green bars below are facilities and equipment that are already satisfied by CGCC's commercial kitchen. Purple bars represent needs that are not currently fulfilled. It is important to note that green bars do not necessarily indicate that those respondents are currently using CGCC's facilities. In fact, it is very likely that these businesses are not using the facilities. Based on comments via interviews and survey responses, it appears that many (if not most) of the regional companies are unaware of CGCC's commercial kitchen facilities.

The results of our analysis indicate that there is strong demand for broader community use of the commercial kitchen. Some equipment may need to be updated and some finishes may need to be replaced to make the kitchen appealing and useable to these audiences. By and large, however, the greater need is in the area of marketing the availability of the facility.

**Figure 19: CGCC Commercial Kitchen Assets Compared to Regional Business Needs**



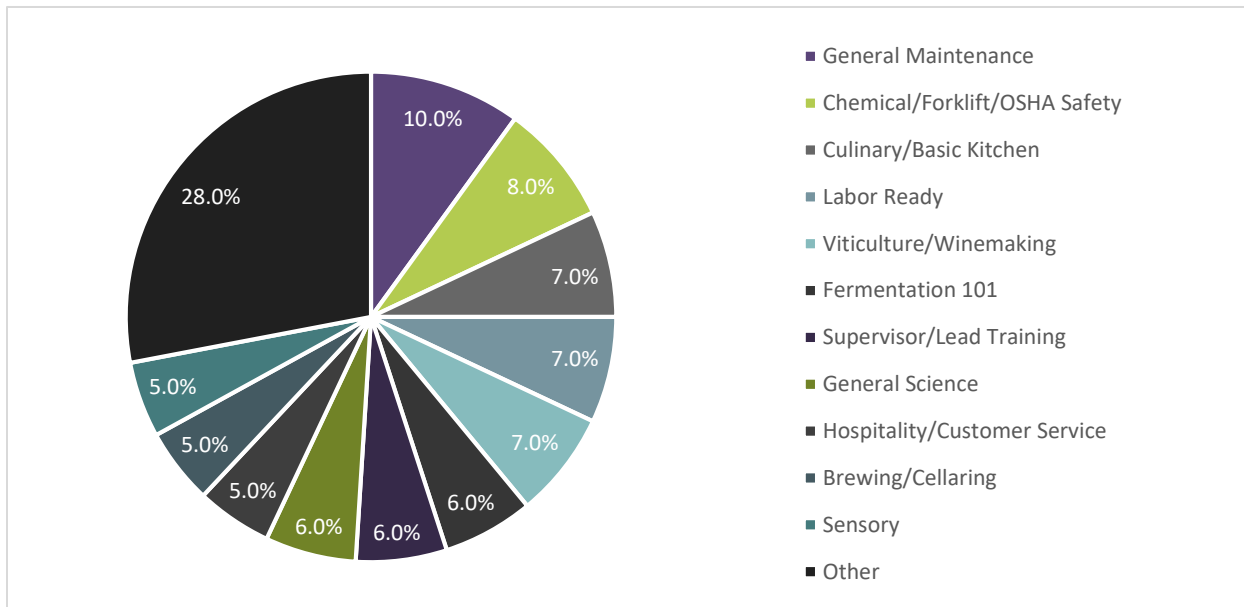
Source: TPMA & NW Food Solutions, November 2018

<sup>19</sup> Please note, this information is also included in Chapter 3. Employer Demand. But it is also summarized here due to its parallels related to the Commercial Kitchen.

## Feasibility of Supporting Workforce Training

The consulting team's survey and interviews of employers generated a broad list of skills and training that employers commonly look for in employment candidates. It is notable that many of the skilled training needs could, in part, be served through access to the existing commercial kitchen. These skills are outlined in Figure 20. Top results with overlap to the commercial kitchen include: chemical safety, general maintenance, culinary/basic kitchen, Fermentation 101, winemaking, hospitality, brewing/cellaring, sensory, and packaging.

**Figure 20: Top 10 Employer Skills Requested in Business Survey**



Source: TPMA & NW Food Solutions, November 2018

Examples of ways the existing commercial kitchen could be used to support the employer skills requests include, but are not limited, to the following:

- Demonstrating chemical safety and lock out/tag out safety using commercial kitchen equipment
- Engaging students in a preventive maintenance program and maintain commercial kitchen equipment
- Teaching culinary science, basic kitchen skills and sensory science in the teaching kitchen
- Teaching packaging science in the packaging kitchen
- Using the commercial kitchen space to teach aspects of winemaking, brewing, or cider making
- Using the commercial kitchen to teach manufacture of fermented foods like sauerkraut, pickles, kombucha, etc.
- Utilizing students in a hospitality/management program to manage the commercial kitchen day to day use, marketing, and organization.

Some additional equipment and facility upgrades may be needed to accommodate these trainings in the existing commercial kitchen. However, most of these upgrades would include small wares, utensils, and materials.



## Feasibility of Partnering with the Fermented Food & Beverage Industries

The Fermented Food and Beverage industry is growing nationally and with particular fervor in the Columbia Gorge region. Through prior relationships and through the contacts made with this Feasibility Study the network of businesses in this industry with CGCC is already fairly strong. Nearly 40% of the CGCC list of local food producers, manufacturers, and distributors are supporting or producing fermented food or beverage, including beer, wine, cider, yeast, mead, kombucha, kimchi, sauerkraut, bread, and cultured spreads. These factors point to the Fermented Food and Beverage industries being intriguing targets for partnership with CGCC.

In short, the consulting team finds that the commercial kitchen has the capability to support teaching of some aspects of fermented foods and beverages but lacks the full roster of equipment and facilities to support pilot production and hands-on teaching. Table 54 provides a list of equipment that would close the gap in augmenting CGCC's ability to create a pilot facility, along with a rough cost estimate for such equipment.

**Table 54: Fermentation Equipment & Cost Estimates**

Fermentation Production Equipment	Estimated Costs
<ul style="list-style-type: none"> <li>1 to 3 bbl brewhouse</li> <li>1 to 3 bbl fermentation tanks</li> <li>Heat exchanger</li> <li>Pumps</li> <li>Piping, clamps, valves</li> <li>1 to 3 bbl bright tanks</li> </ul>	\$11,000 to \$50,000 for pilot plant equipment depending on size and condition <sup>20</sup>
Assorted manual bottling and capping equipment	<\$200
Kegerator and kegs with taps and parts	\$500 to \$3,000 depending on size
Fruit press / Destemmer / Pitter	\$200 to \$1,500 depending on style and size
13 gallon still, mash pot, burner and accessories	\$1,500 to \$2,700 for a home kit
Vegetable slicers	under \$100
Small wares for fermenting (corks, weights, airlocks)	under \$200

Source: NW Food Solutions, October 2018

Beyond additions of equipment, additional changes to the facility would also be required. Fermented food and beverage facilities would require some reconfiguration of the existing kitchen space to segregate an area for fermentation activities. It would also require enhanced management of the space to ensure cross contamination of bacteria and yeast species do not occur. Brewing and distilling pilot equipment may also require 3 phase power, steam, glycol, natural gas, CO<sub>2</sub>, O<sub>2</sub>, and access to hot water for cleaning. It appears that gas and hot water are available at the existing facility, but an assessment would be needed to determine full utility needs for any sort of pilot brewing or distilling equipment. Lastly, a pilot brewing facility would require staffing a manager or supervisor to run the equipment, train and teach others to use the equipment, repair equipment as needed, and maintain the equipment and facilities in working order.

<sup>20</sup> Please note, the fermenters and bright tanks in a pilot brewery could also be used for cider, wine, mead, or kombucha.

## Commercial Kitchen Market Assessment

One of the key recommendations of this study is to enhance the usage of the commercial kitchen for broader business and community use. As such, it is important to understand the market for commercial kitchen rental facilities on the Gorge and in the Greater Portland area. Additionally, since Oregon State University's (OSU) Fermentation Science program is one of the national leaders in this field, the consulting team studied the operations of their organization in detail.

### Facility Cost Comparison

The kitchen is currently managed by the community college facilities staff. An advertisement on Gorge Grown website shows that the CGCC commercial kitchen rents for \$15/hour (see Appendix B for advertisement).<sup>21</sup> The consulting team's market review, demonstrated in Table 55, indicates that \$15 per hour is a competitive rate, at the lower end of rates in Portland and elsewhere in the state.

**Table 55: Regional Commercial Kitchen Rate Comparison**

Kitchen	Hourly Rate
Bohemian Kitchen – Portland	\$18/hour
Portland Mercado – Portland	\$14.5 to \$30/hour
Tabor Space – Portland	\$20 to \$25/hour
Kitchenhood Commissary – Portland	\$15 to \$25/hour
Stellaria Community Kitchen – Eugene	\$20/hour
Poa Café – Portland	\$20/hour
Renegade Kitchens – Salem	\$15 to \$24/hour
Divine Catering – Tigard	\$15/hour
Clearwater Plaza – Hood River	\$40/hour

Source: NW Food Solutions, October 2018

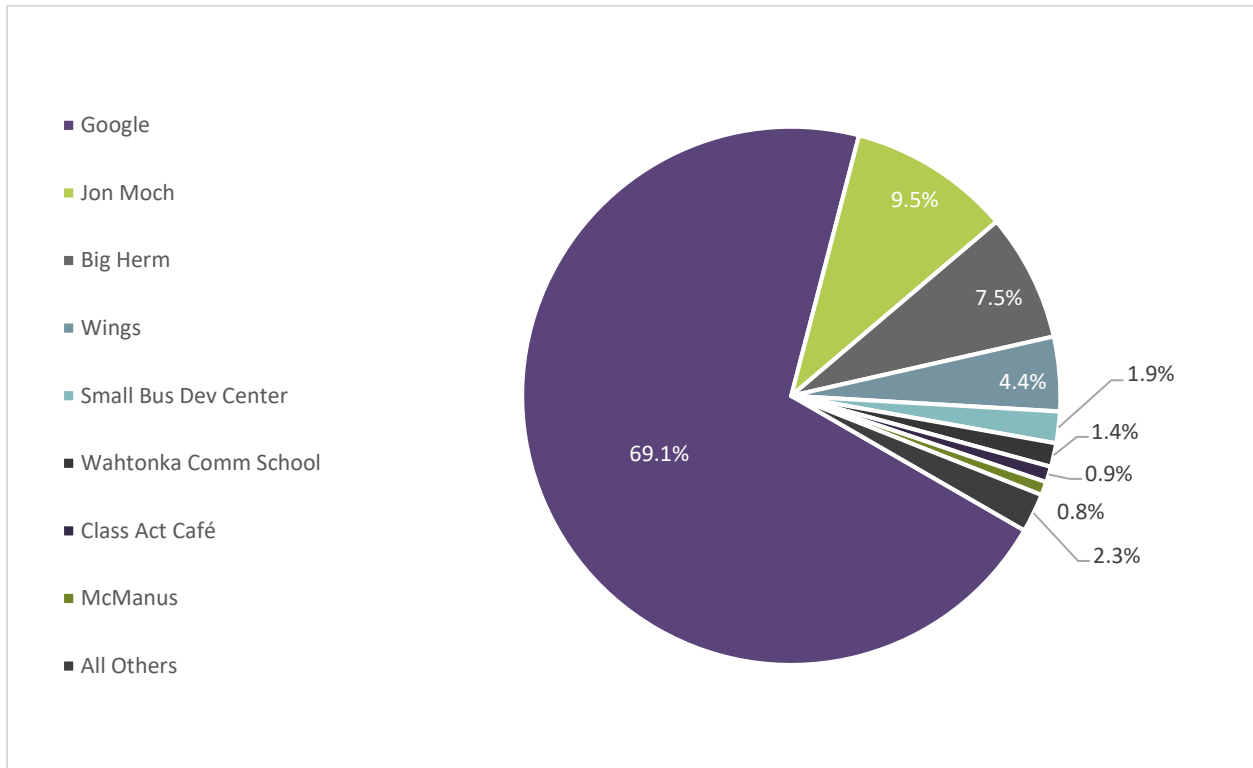
In the Gorge, the availability of commercial kitchen space is much lower, and compared with similarly equipped kitchen space in the Gorge, the CGCC kitchen hourly rate is low, (see Appendix B). In 2018, there were 13 companies who had utilized the kitchen. The primary use of companies using the kitchen in 2018 was to prepare meals for various commissaries (including the Google campus and the CGCC campus).

### Facility Utilization Rates

According to a report from the CGCC facilities group, current utilization of the commercial kitchen capacity is 12%, (see Appendix C for report). Total capacity, according to the report, is calculated at 6,086 hours. This capacity equates to the kitchen being available 7 days a week and 16 hours per day. Excess capacity in the commercial kitchen is 88%, which is equivalent to 5,347 hours for a yearlong period (see Figure 23).

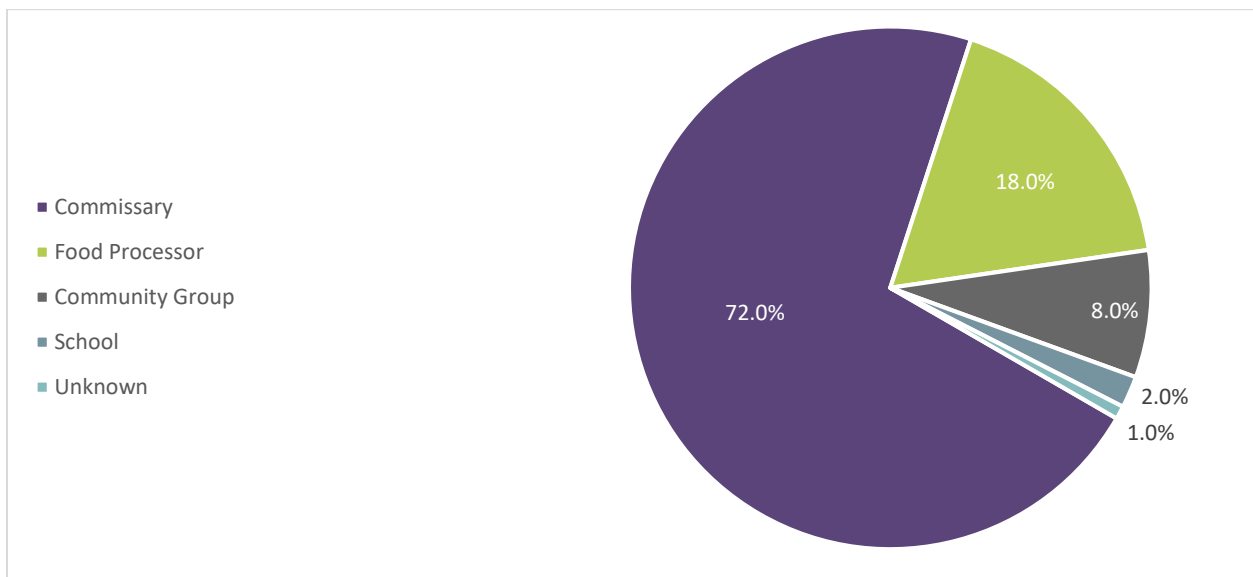
<sup>21</sup> <http://www.gorgegrown.com/wp-content/uploads/2018/05/Commercial-Kitchens-in-the-Gorge.pdf>

**Figure 21: Commercial Kitchen Time Utilization by Company in 2018**



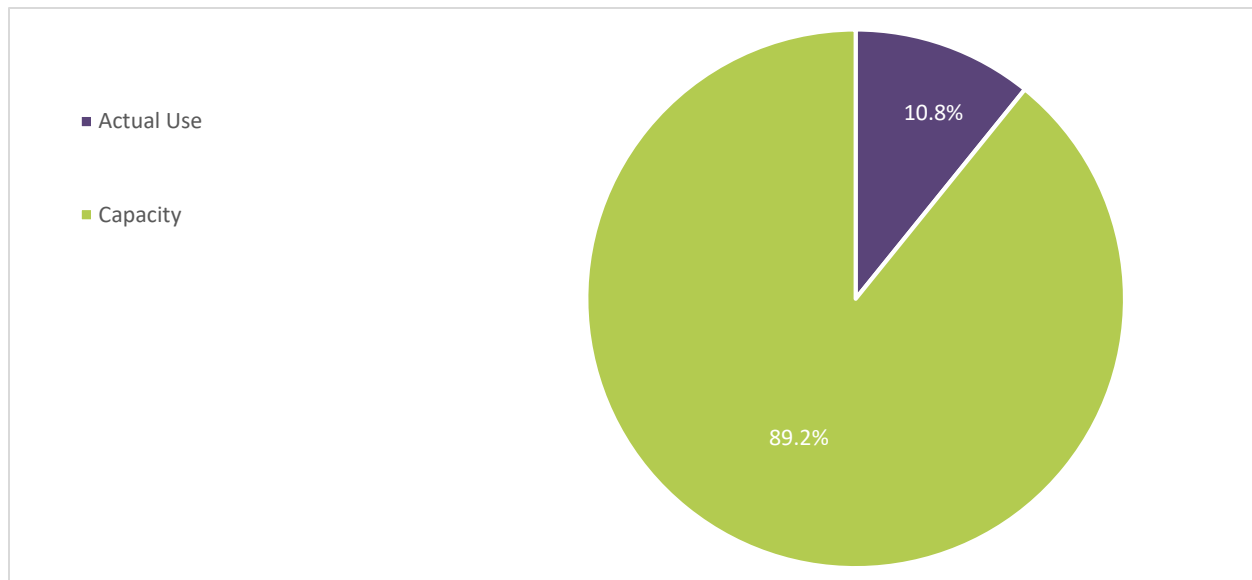
Source: NW Food Solutions based on data from CGCC, October 2018

**Figure 22: Commercial Kitchen Time Utilization by Company Type in 2018**



Source: NW Food Solutions based on data from CGCC, October 2018

**Figure 23: Commercial Kitchen Excess Capacity in 2018**



## Lessons from Oregon State University

In order to compare CGCC commercial kitchen facilities to another local university with food pilot facilities, the consulting team spoke with Jeff Clawson of the OSU Fermentation Science department. Jeff manages the current brewing pilot plant facility and previously managed pilot facilities for the Food Science department. OSU also runs a pilot winery, creamery, juice processing plant, and baking lab and supports a sensory science lab. Each pilot facility is supported by a pilot facility manager. The OSU brewing pilot plant is dedicated 20% to teaching, 30% to research, and 50% to business contract work. Fees to businesses for contract work generate enough income to pay for equipment upkeep and undergraduate assistance in running the facility. According to Jeff Clawson, dedicated management of the pilot brewing facility is essential to ensure equipment is run and maintained properly and business and university needs can be prioritized and met.

Two companies currently using the kitchen, are licensed for food processing in the kitchen. The Oregon Department of Agriculture (ODA) licenses Big Herm BBQ to work out of the kitchen. And the CGCC Commissary, Class Act Café, which is also using equipment in the commercial kitchen, is licensed by the Local Health Department.<sup>22</sup>

An important lesson for CGCC if it seeks to expand use of the Commercial Kitchen is to well understand the licensing requirements for different types of business entities. Depending on the situation, a pilot plant, commercial kitchen or the companies using such a facility can fall under either ODA or the local health department. If a business is primarily producing and serving food at a retail establishment, the local health department has jurisdiction. If the food is being produced, packaged, and sold at a later date, regulation falls under the Food and Drug Administration (FDA) and ODA. This means the facility likely needs to be registered with FDA and also have an ODA food plant license. There are exemptions for both FDA and ODA spelled out on their websites, such as non-profits entities. For mixed use facilities, the differentiation is dependent on the largest percentage of food production. ODA and the local health

<sup>22</sup> Verified through searching of the ODA and the local health dept databases for licensing information

departments have an MOU (memorandum of understanding) and usually arbitrate unclear situations on a case by case basis.

For example, OSU's food processing pilot plant falls under ODA. But Portland Mercado, a commercial kitchen in Portland, falls under the local health dept. Also, each individual food processing company working out of the commercial kitchen has to register with FDA and ODA. If CGCC plans to increase use of the kitchen by food processors, it will likely need to register with FDA/ODA. Right now, it appears the primary purpose of the kitchen is as commissary, and the health department has jurisdiction. However, it is the responsibility of individual food processors to maintain their own licensing and relationship with relevant authorities.

## 7. STUDENT DEMAND

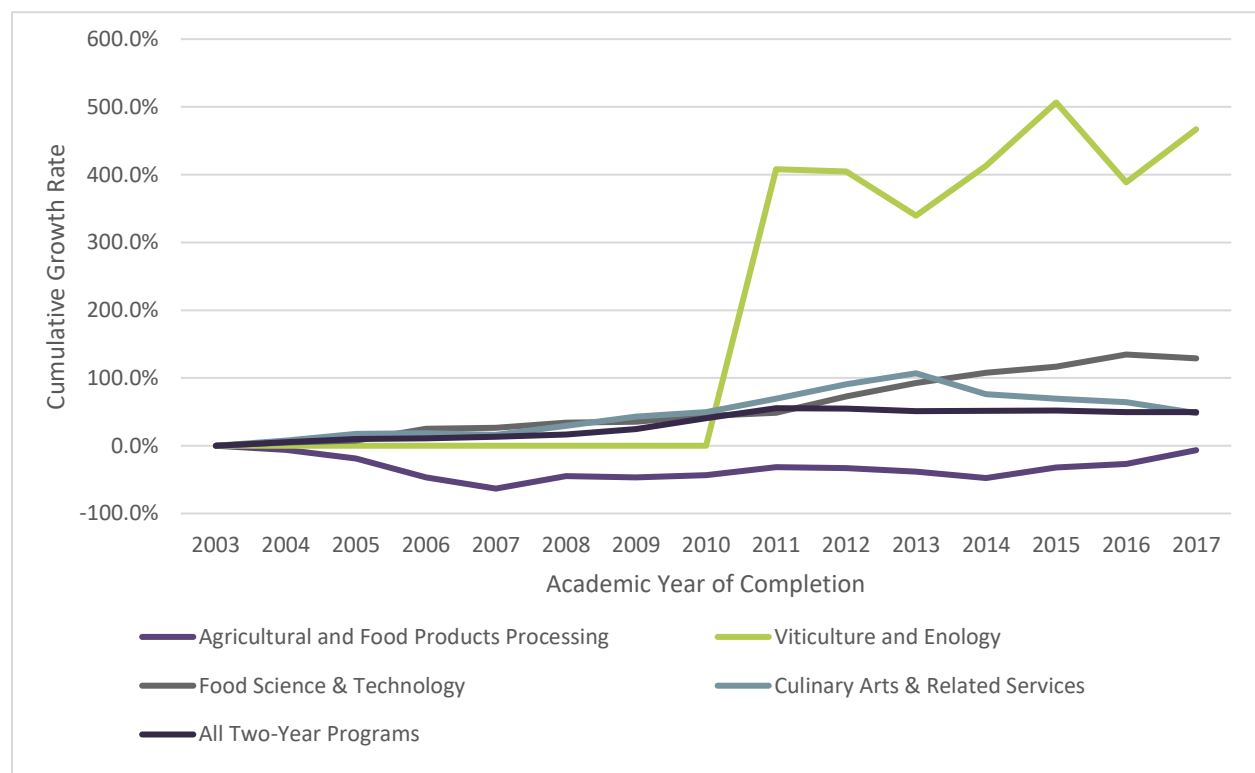
### National Trends in Student Demand

This section will describe both local indications for student demand, based on data from TPMA's student survey, as well as indications of demand from national trends. TPMA identified four program types that are most similar to those that could be offered by CGCC and reviewed student completion trends between 2003 and 2017. The National Center for Educational Statistics (NCES) classifies academic programs according to Classification of Instructional Program (CIP) codes. Every higher education institution that is eligible for Title IV funding is required to report completion statistics to the NCES via the Integrated Postsecondary Education Data System (IPEDS). Therefore, these data represent an accurate and reliable picture of student completion trends in the United States. The four most closely matching programs to those in consideration by CGCC include:

- 01.04: Agricultural & Food Products Processing
- 01.0309: Viticulture & Enology
- 01.10: Food Science & Technology
- 12.05: Culinary Arts & Related Services

Cumulative growth rates between for each of these programs are displayed in Figure 24, and the corresponding completion numbers and growth rates are displayed in Table 56.

**Figure 24: Cumulative Growth in Student Completions**



Source: Integrated Postsecondary Data System (IPEDS) & TPMA

**Table 56: National Student Completion Trends for Benchmark Programs**

Title	2015	2016	2017	'03-'17 Average Annual Growth Rate	Post- Recession Average Annual Growth Rate
Agricultural and Food Products Processing	139	149	191	(0.5%)	7.3%
Viticulture and Enology	370	298	346	10.7%	10.7%
Food Science & Technology	2,183	2,365	2,307	6.1%	6.8%
Culinary Arts & Related Services	35,643	34,536	31,218	2.9%	0.5%
All Related Programs	38,335	37,348	34,062	3.1%	1.0%
All Higher Education Programs	4,990,859	5,022,684	5,080,475	2.9%	2.5%
All Two-Year Programs	3,027,421	2,984,482	2,982,104	2.9%	2.3%

Source: Integrated Postsecondary Data System (IPEDS) & TPMA

Among the selected benchmark programs, Culinary Arts & Related Services is by far the most popular, providing ten times more completers annually than the other three programs combined. Between 2003 and 2017, the average annual growth rate for Culinary Arts & Related Services has been 3.0%, which is equivalent to the growth rate for all Higher Education programs. However, this statistic masks a concerning and more recent trend in student demand. Completions for Culinary Arts & Related Services were on a solid year-over-year growth trend until 2013; between 2013 and 2017 the annual number of completers for this program have decreased by over 12,000.

Conversely, Food Science & Technology and Viticulture and Enology programs have both experienced strong overall growth rates between 2003 and 2017. Viticulture and Enology was first issued an independent CIP code in 2010, and since that time has seen an average annual growth rate of 11%. That said, it remains a relatively niche program with just 346 completers nationally in 2017. Food Science & Technology is also a fairly niche program, with 2,307 completers in 2017. It too has seen healthy increases in completions, increasing by an average of 6% between 2003 and 2017. Agricultural & Food Products Processing is the smallest program of all those on the benchmark list, with just 191 completers in 2017. Prior to the Great Recession the program was decreasing in completers but since that time has rebounded, posting a 7% annual growth rate since 2009.

These statistics suggest that Culinary Arts is still a popular program in higher education (particularly Associate's degrees and Certificates) but student demand is on a downtrend as of the past five years. Programs with niche focus on food science, wine production, and food production have been growing rapidly in recent years but remain uncommon for most community colleges across the United States.

## Student Survey Summary

TPMA fielded a survey within the Columbia Gorge region between November 1<sup>st</sup> and November 29<sup>th</sup> of 2018. TPMA designed a single survey instrument which applied to students at Columbia Gorge Community College, with an initial filtering question that directed respondents who indicated they were not currently CGCC students out of the survey. Survey questions were designed by TPMA's staff with input from the Columbia Gorge Community College.

The average time for users to complete the questionnaire was 4 minutes, and 83% of those who opened the survey link fully completed it. The survey garnered a gross total of 41 responses. A total of 7 responses were excluded because the respondent was not currently a student at Columbia Gorge Community College. Following these adjustments, TPMA was left with a sample of 34 valid business representative responses.

For each question of the survey a graphic is displayed that contains the percentage of responses along with an "N," which represents the count of survey respondents who answered and did not skip the given question. In the body of this report, some of the questions have been truncated to make for a more readable narrative.

TPMA's survey for Columbia Gorge Community College aims to provide insight on students' perceptions of the Food & Beverage cluster and their college's ability to train students for those careers. More specifically, the survey focused on students' current employment; their majors; what they know of the Food & Beverage industry; and gauging their interest on CGCC courses, among other issues.

Students participating in the student-based survey represent the following cohorts:

**Table 57: Full-Time and Part-Time Students**

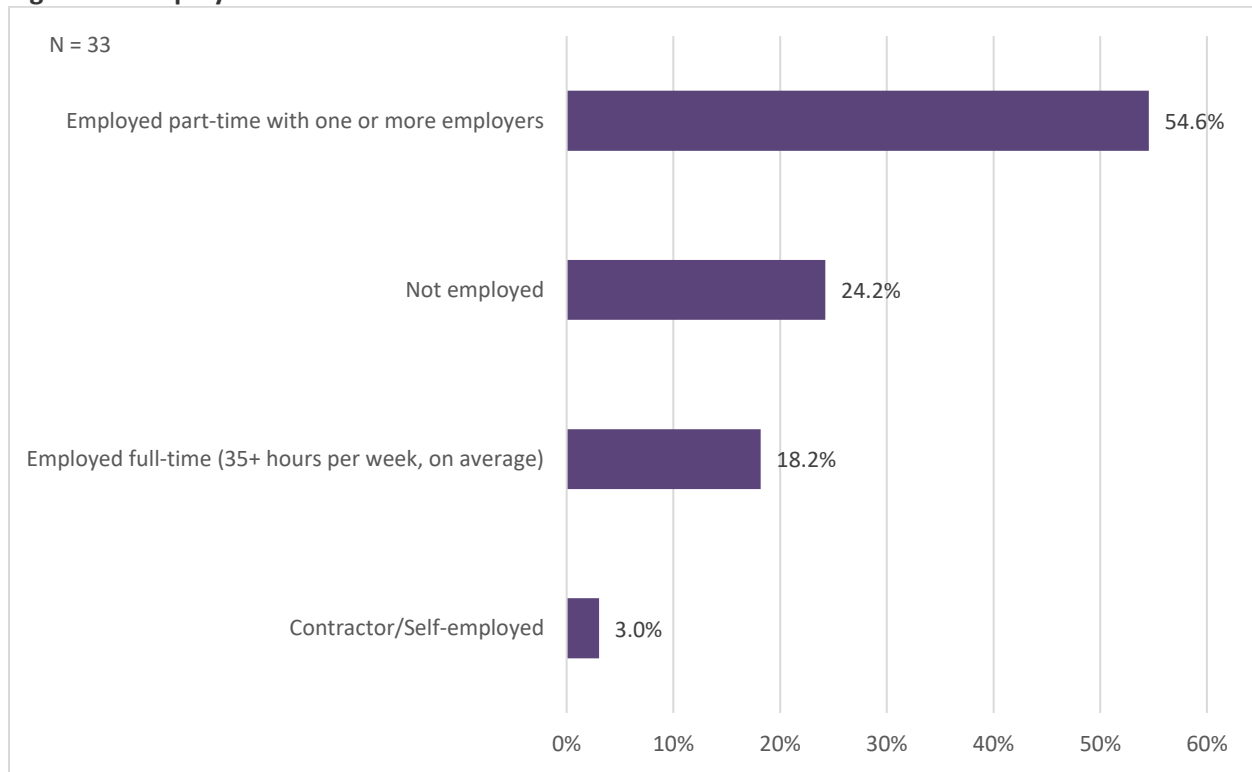
Cohort	Percentage
Full-time Student (12 or more credits per semester)	52.9%
Part-time student	47.1%

Source: TPMA, November 2018

The employment status of student respondents is varied. Fifty-five percent of students indicate they work part-time with one or more employers; whereas, only 3% of students say they are a contractor or self-employed. Students who indicate they are employed full-time are more commonly part-time students; whereas students who indicate they are employed part-time with one or more employer are more commonly full-time students.



**Figure 25: Employment Situations**



Source: TPMA, November 2018

Students were asked to identify their employer, indicating whether they are employed with a company directly involved in the Food & Beverage industry in the region. Fifty-seven percent of students indicate they are not employed with a company who has operations in the Food or Beverage industry. While no student respondents are employed with a company that is involved with food and beverage transportation and distribution, 24% of respondents indicate they are employed with a restaurant or drinking establishment.

**Table 58: Employment Status of Students**

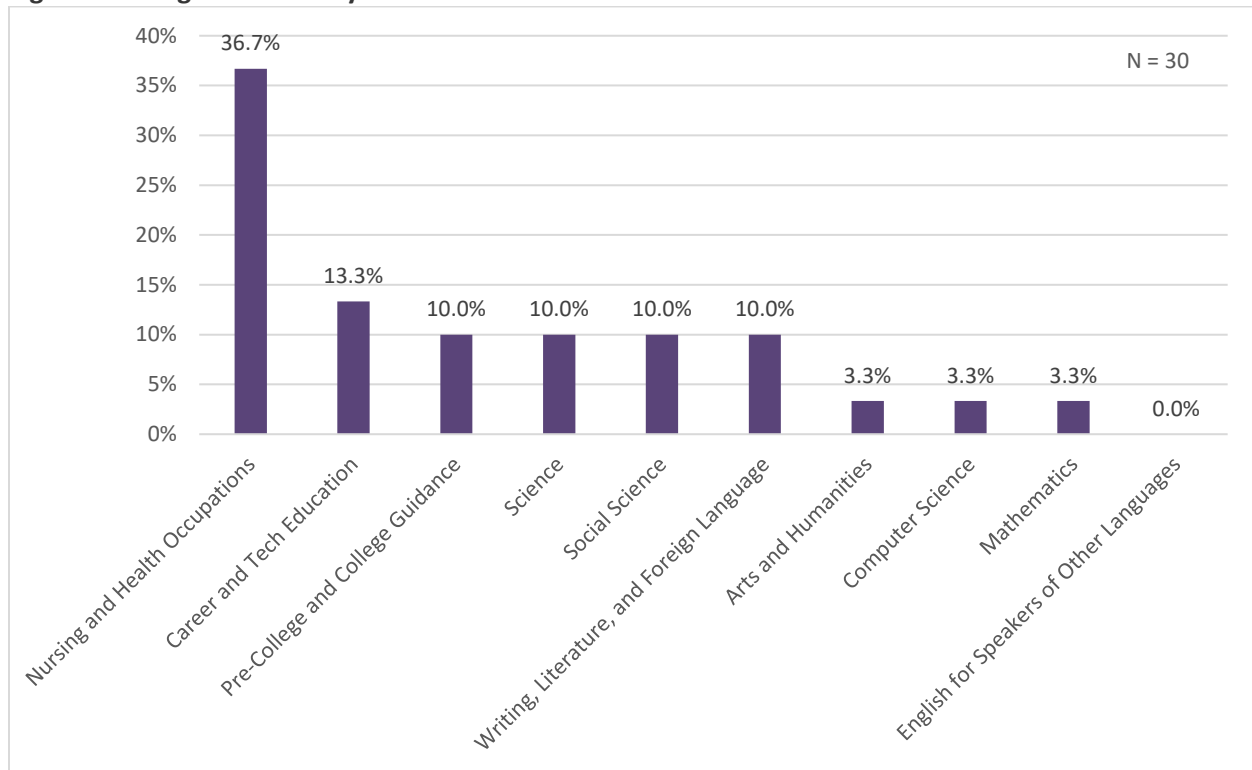
Employment	Responses
I am <u>not</u> employed with a food or beverage industry company	57.1%
I am employed with a restaurant or drinking establishment	23.8%
I am employed with a beverage manufacturing company (e.g.: winery, brewery, distillery, and non-alcoholic beverages)	14.3%
I am employed with a food manufacturing company	4.8%
I am employed with a food and beverage transportation and distribution company (e.g.: packing, warehousing, trucking, railroad, etc.)	0.0%

Source: TPMA, November 2018

When asked about their current program of study, over one-third (37%) of respondents indicated they were in a Nursing and Health-related program and 13% indicated their program of study was related to Career and Technical Education. Students who indicated they were enrolled in the Science program represented 10% of the responses in the survey – this is a major that parallels with many of the mid- to

advanced-occupations in the Food & Beverage industry. There were no student representatives in a program related to English for speakers of other languages.

**Figure 26: Programs of Study**



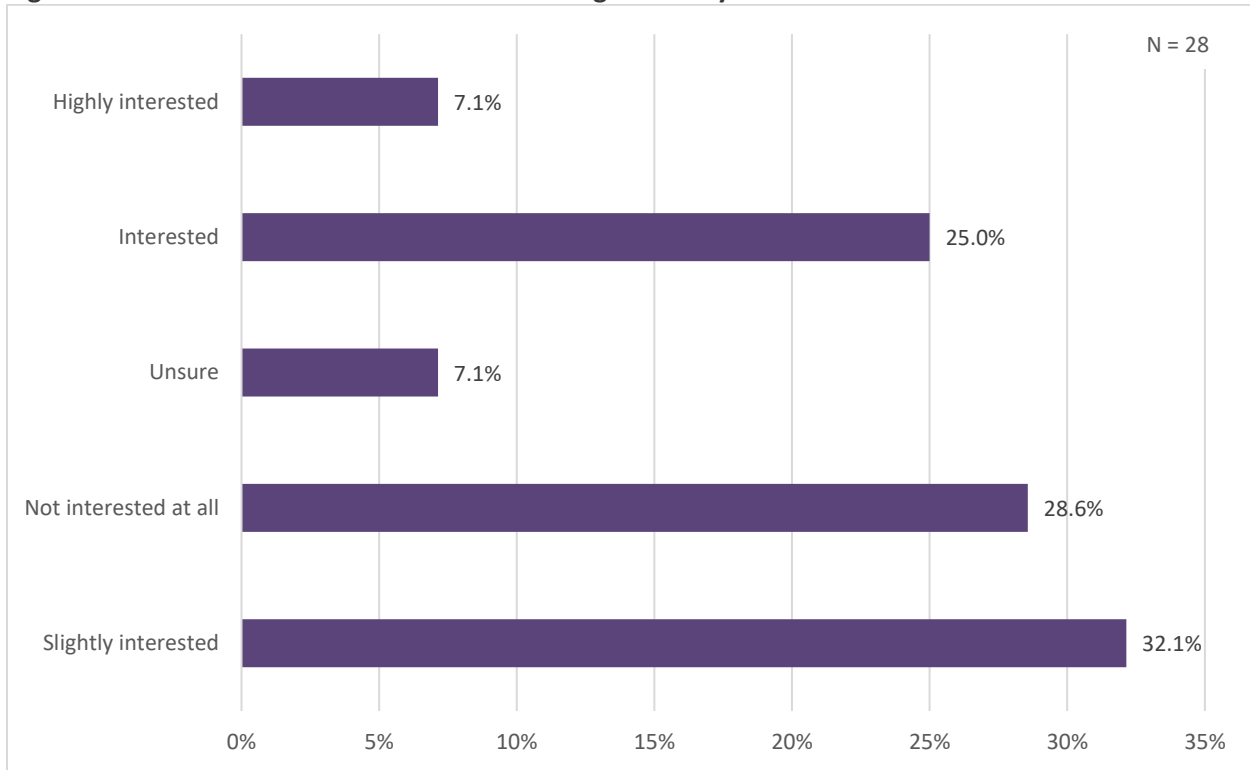
Source: TPMA, November 2018

Students were asked to identify the careers they associate with the phrase “food and beverage industry.” Nearly 66% of students identified careers like a Chef, Prep Cook, Waiter, Bartender, and Hostess associated with the industry. Others noted careers like Food and Beverage Manufacturing (9%) Brewing (6%), Winery (6%), and Food Packer (6%) as being associated with the industry.

Students were provided the following definition to provide context for further questions: “The food and beverage industry refers to companies which participate in the processing, production, packaging, and distribution of food and beverages, including eating and drinking establishments.”

Based on this, students were asked to rate their level of interest in pursuing a career in the food and beverage industry. Sixty-four percent of respondents indicated they had some level of interest in pursuing a career in the food and beverage industry.

**Figure 27: Level of Interest in the Food & Beverage Industry**



Source: TPMA, November 2018

**Table 59: Level of Interest in Food & Beverage Programming**

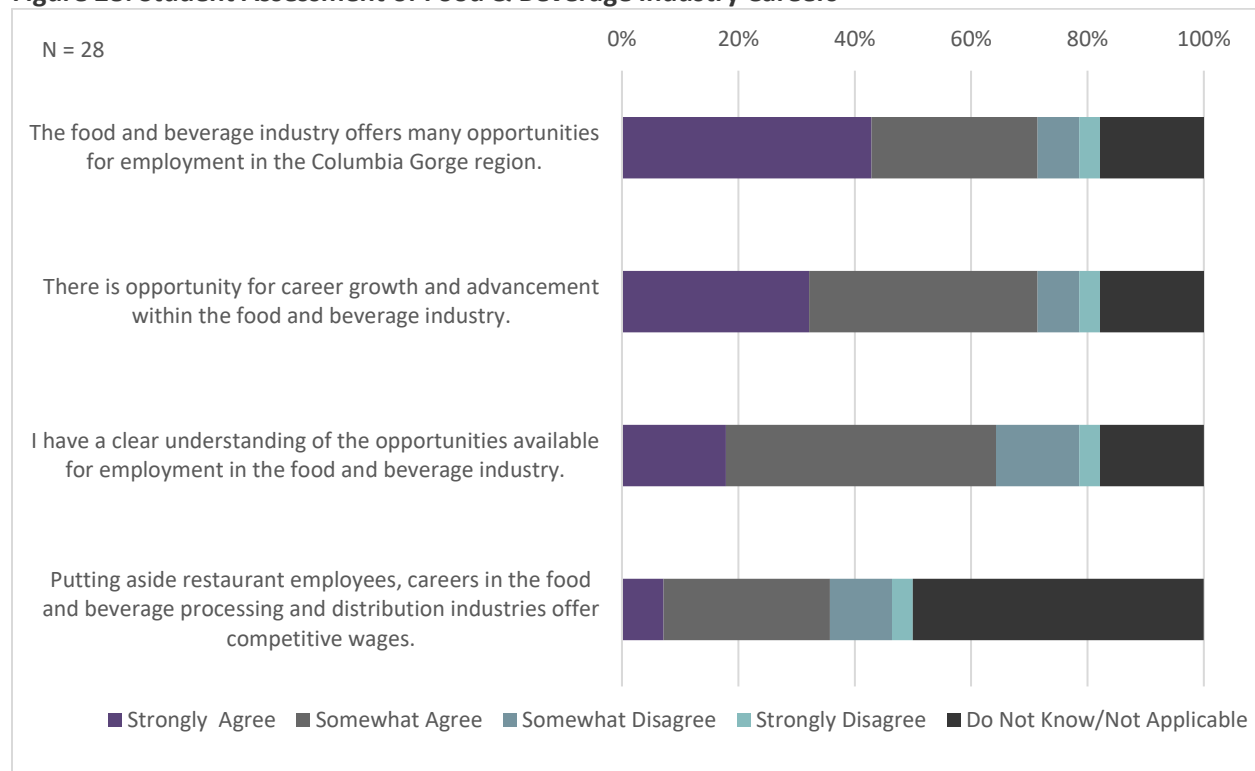
Interest-Level	Percentage
Slightly interested	32.1%
Not interested at all	28.6%
Interested	25.0%
Highly interested	7.1%
Unsure	7.1%

Source: TPMA, November 2018

Survey respondents were asked a series of Likert-scale questions where they indicated responses on a scale of “Strongly Disagree” to “Strongly Agree” on a series of statements.

Students were asked if they have a clear understanding of the opportunities available for employment in the Food and Beverage industry. Sixty-four percent of students indicated they “Strongly” or “Somewhat” agree that they have a clear understanding of the opportunities in the industry. When provided a similar statement, “The food and beverage industry offers many opportunities for employment in the Columbia Gorge region,” 71% of students indicated they “Strongly” or “Somewhat” agree. Of these respondents, nearly 53% were either employed with a beverage manufacturing, food manufacturing, or restaurant and drinking company. Of those who “Strongly” or “Somewhat” disagree, two-thirds were not employed with a food or beverage industry company.

**Figure 28: Student Assessment of Food & Beverage Industry Careers**



Source: TPMA, November 2018

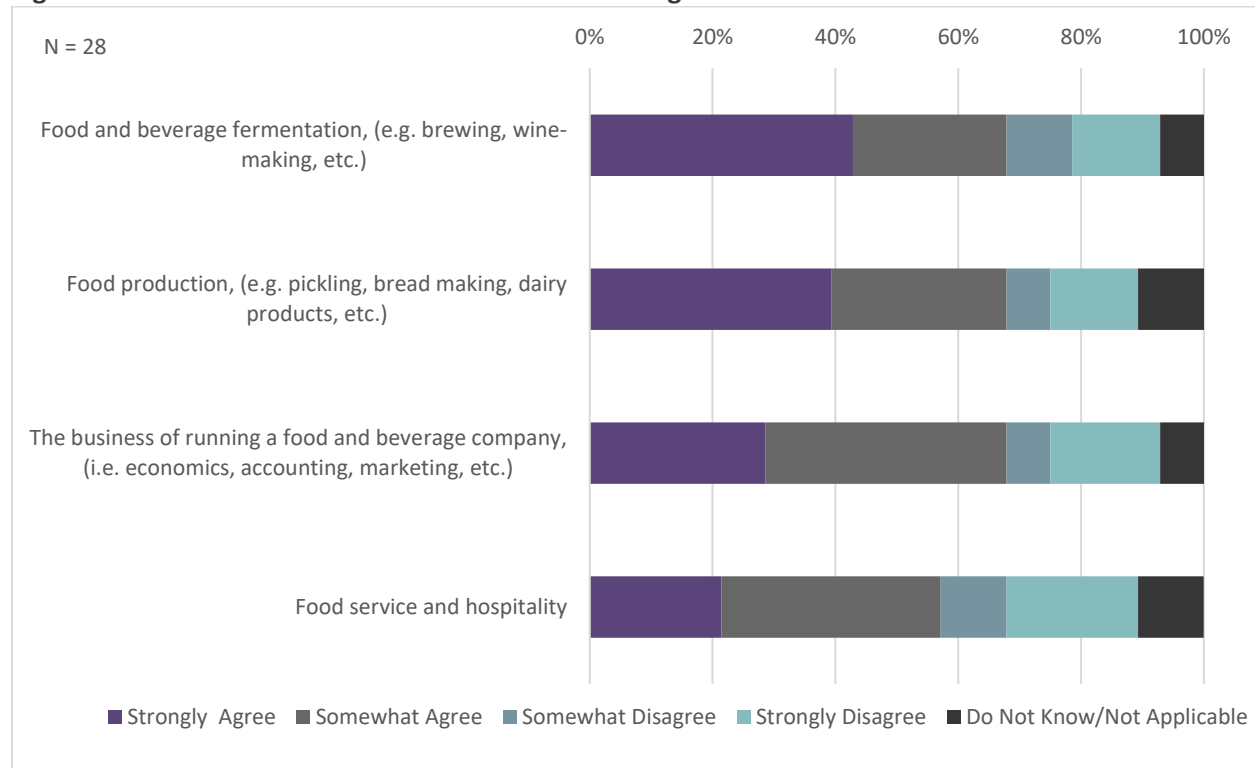
Similarly, 71% of students indicated they “Strongly” or “Somewhat” agree that there is opportunity for career growth and advancement within the food and beverage industry; whereas, nearly 20% indicated they were unsure. Three-fourths of the students in Career and Technical Education agree with this statement, whereas only one student studying science (a paralleling degree to the industry) indicated they agree. This indicates those within the industry are aware of the opportunities; however, there is more room to increase student awareness around career growth and advancement opportunities within the food and beverage industry.

When asked if a student’s program of study could lead to a career in the Food & Beverage industry, 71% of students “Strongly” or “Somewhat” disagree with this statement. Fifty percent of these respondents are students studying Nursing and Other Health Occupations. Other programs that indicate a disconnect among their field of study and the industry are students in Career and Technical Education and Social Science. Those who “Strongly” or “Somewhat” agree represented Social Science, Science, Career and Technical Education, and Arts and Humanities.

When asked to put aside restaurant employees, students were asked to assess whether careers in the Food and Beverage Processing and Distribution industries offer competitive wages. Fifty percent of students indicated they were “unsure,” with only 37% of students indicating they “Strongly” or “Somewhat” agree that these industries offer competitive wages. Seventy-one percent of those who were unsure if the industry offered competitive wages are not employed in the industry and may be unaware of the wages offered. Of the 37% who indicated agreement, 29% are currently employed in the industry and believe the industry offers competitive wages.

The next series of statements students were asked was to assess their interest in potential courses that CGCC could offer.

**Figure 29: Student Interest in Potential Course Offerings at CGCC**



Source: TPMA, November 2018

Interestingly, 68% of students “Strongly” or “Somewhat” agree they would be interested in CGCC offering courses focused on:

- Food and beverage fermentation (e.g. brewing, wine-making, etc.)
- Food production (e.g. pickling, bread making, dairy products, etc.)
- Food and beverage company (i.e. economics, accounting, marketing, etc.)

More students were “unsure” if they would want to take a course on Food Production, than taking a course in Food & Beverage Fermentation and Food & Beverage Company. There is more student interest in courses on beverage-related production as opposed to food-related production. Only 57% of students indicated they would be interested in taking a course focused on food service and hospitality, with nearly a third “Strongly” or “Somewhat” disagreeing on wanting to take a course in that discipline.

**Table 60: Student Assessment of the Food & Beverage Industry Full Results**

Assessment	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree	Do Not Know/Not Applicable
The food and beverage industry offers many opportunities for employment in the Columbia Gorge region.	42.9%	28.6%	7.1%	3.6%	17.9%
There is opportunity for career growth and advancement within the food and beverage industry.	32.1%	39.3%	7.1%	3.6%	17.9%
If CGCC offered a course focused on food and beverage fermentation, I would be interested (e.g. brewing, wine-making, etc.)	42.9%	25.0%	10.7%	14.3%	7.1%
If CGCC offered a course focused on food production, I would be interested (e.g. pickling, bread making, dairy products, etc.)	39.3%	28.6%	7.1%	14.3%	10.7%
I have a clear understanding of the opportunities available for employment in the food and beverage industry.	17.9%	46.4%	14.3%	3.6%	17.9%
If CGCC offered a course focused on the business of running a food and beverage company, I would be interested (i.e. economics, accounting, marketing, etc.)	28.6%	39.3%	7.1%	17.9%	7.1%
Putting aside restaurant employees, careers in the food and beverage processing and distribution industries offer competitive wages.	7.1%	28.6%	10.7%	3.6%	50.0%
If CGCC offered a course focused on food service and hospitality, I would be interested.	21.4%	35.7%	10.7%	21.4%	10.7%
My program of study could lead me to a career in the food and beverage industry.	3.6%	10.7%	21.4%	50.0%	0.0%

Source: TPMA, November 2018

Students were asked to provide thoughts and input related to the food and beverage industry in the region, and they identified the following:

1. Two students would like to see culinary-related programs be implemented
2. One student would like to see the area become a designated tourism spot for wine
3. One student does not feel the facility, in its current state, is equipped to support the food service classes

## APPENDIX A: STATISTICAL SUMMARY OF BENCHMARKING ANALYSIS

This Appendix accompanies Chapter 5: Benchmarking Analysis by providing further detail on the program names, content training methods and student outcomes for each benchmarked program. All data are from each college's website, and student outcomes data are from IPEDS.

**Table 61: Walla Walla Community College**

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Student Outcomes:
AAS	Associate in Applied Sciences Degree in Enology and Viticulture	90-100 credits	<ul style="list-style-type: none"> <li>• Introduction to Viticulture and Enology</li> <li>• Cultivated Plants</li> <li>• Basic Soil Science</li> <li>• Establishing a Vinifera Vineyard</li> <li>• Introduction to Quantitative Problem Solving for the Trades</li> <li>• Soils, Fertility, and Management</li> <li>• Communication in the Workplace</li> <li>• Maintaining a Vinifera Vineyard</li> <li>• Irrigation Principles</li> <li>• Drip Irrigation</li> <li>• Essentials of Winery Compliance</li> <li>• Sensory Analysis of Wine</li> <li>• Science of Winemaking 1 – Oenochem</li> </ul>	Lecture, lab, clinical	102 Year Certificate: 29 students; Associates 15 students
CERT	Viticulture Science Certificate	45 credits	<ul style="list-style-type: none"> <li>• Introduction to Viticulture and Enology</li> <li>• Cultivated Plants</li> <li>• Basic Soil Science</li> <li>• Introduction to Quantitative Problem Solving for the Trades</li> <li>• Irrigation Principles</li> <li>• Soils, Fertility, and Management</li> <li>• Communication in the Workplace</li> <li>• Maintaining a Vinifera Vineyard</li> <li>• Introduction to Quantitative Problem Solving for the Trades</li> <li>• Drip Irrigation</li> </ul>	Lecture, lab, clinical	
CERT	Fermentation Science Certificate	45-55 credits	<ul style="list-style-type: none"> <li>• Essentials of Winery Compliance</li> <li>• Sensory Analysis of Wine</li> <li>• Science of Winemaking 1 – Oenochem</li> <li>• Winemaking Practicum 1</li> <li>• Introduction to Technical Writing in the Workplace</li> <li>• Wine Marketing</li> <li>• Science of Winemaking II</li> <li>• Winery Operations Management</li> <li>• Science of Winemaking III</li> </ul>	Lecture, lab, clinical	
AS/BS	Associate of Arts and Science –	2-year credits: 54	<ul style="list-style-type: none"> <li>• Intro to Chemistry or General Chemistry I</li> <li>• Basic Soil Science</li> </ul>	Lecture, lab, clinical	

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Student Outcomes:
	Transfer to WSU for Enology and Viticulture	Degree credits: 109	<ul style="list-style-type: none"> <li>• Introduction to Viticulture and Enology</li> <li>• English Composition</li> <li>• Intro to Biochemistry or General Chemistry III</li> <li>• Maintaining a Vinifera Vineyard</li> <li>• Irrigation Principles</li> <li>• Drip Irrigation</li> <li>• Science of Winemaking I – Oenochem</li> <li>• Public Speaking</li> <li>• Majors Cellular</li> <li>• Majors Plant</li> <li>• Fundamentals of Microeconomics</li> <li>• Science of Winemaking II</li> <li>• Plant Physiology</li> <li>• Majors Animal</li> <li>• Science of Winemaking III</li> <li>• Intro to Statistics</li> <li>• Small Business Management</li> </ul>		
AAAS	Associate in Applied Sciences Degree in Wine Business	This degree track is currently undergoing modification.	<ul style="list-style-type: none"> <li>• This degree track is currently undergoing modification.</li> </ul>	Lecture, lab, clinical	
AAS	Energy Systems Technology with concertation in Cellar Maintenance	This degree track is currently undergoing modification.	<ul style="list-style-type: none"> <li>• This degree track is currently undergoing modification.</li> </ul>	Lecture, lab, clinical	

**Table 62: Chemeketa Community College**

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Student Outcomes:
AS	Winemaking Associate of Applied Science Degree	91 credits	<ul style="list-style-type: none"> <li>• Computing Concepts (or higher)</li> <li>• Intermediate Algebra+ (or higher)</li> <li>• College Algebra (or higher)</li> <li>• Introduction to Winemaking</li> <li>• Wine Appreciation</li> <li>• General Viticulture</li> <li>• Science of Winemaking</li> <li>• Fundamentals of Chemistry for Winemaking</li> <li>• Psychology of Human Relations (or higher)</li> </ul>	Hands-on learning, lecture, lab	N/A



			<ul style="list-style-type: none"> <li>• Selling and Marketing Wine (or higher)</li> <li>• Chemical Analysis of Must and Wine</li> <li>• Sensory Evaluation of Wine Components</li> <li>• Introductory Microbiology (or higher)</li> <li>• Fundamentals of Public Speaking (or higher)</li> <li>• Academic Composition (or higher)</li> <li>• Wines of the Pacific Northwest</li> <li>• Wine Production</li> <li>• Cooperative Work Experience</li> <li>• Wines of the World</li> <li>• Sensory Evaluation of Wine Varietals</li> <li>• Wine Clarification and Stabilization</li> <li>• Winery Process Planning and Design</li> <li>• Winemaking elective</li> <li>• Wine Aging, Filtration, and Bottling</li> <li>• Wine Studies Capstone</li> <li>• Winemaking elective</li> </ul>		
AS	Vineyard Management Associate of Applied Science Degree	91 credits	<ul style="list-style-type: none"> <li>• Computing Concepts (or higher)</li> <li>• Intermediate Algebra (or higher)</li> <li>• General Viticulture</li> <li>• Introduction to Winemaking</li> <li>• Soil Science</li> <li>• Winter Vineyard Practices</li> <li>• Science of Winemaking</li> <li>• Spring Vineyard Practices</li> <li>• Sensory Analysis of Wine Components</li> <li>• Vine Physiology</li> <li>• Vineyard Pest Management</li> <li>• Fundamentals of Oral Communication (or higher)</li> <li>• Summer Vineyard Practices</li> <li>• Vineyard Nutrition and Irrigation Management</li> <li>• Cooperative Work Experience</li> <li>• Psychology of Human Relations (or higher)</li> <li>• Fall Vineyard Practices</li> <li>• Cooperative Work Experience</li> <li>• Academic Composition+ (or higher)</li> <li>• Spanish in the Vineyard</li> <li>• Fundamentals of Chemistry for Wine</li> <li>• Vineyard Management electives</li> <li>• Wine Studies Capstone</li> <li>• Technical Writing</li> <li>• Vineyard Management</li> </ul>		
CERT	Vineyard Operations	38 credits	<ul style="list-style-type: none"> <li>• Elementary Algebra (or higher)</li> <li>• General Viticulture</li> </ul>		

	Certificate of Completion		<ul style="list-style-type: none"> <li>• Winter Vineyard Practices</li> <li>• Spring Vineyard Practices</li> <li>• Vine Physiology</li> <li>• Vineyard Pest Management</li> <li>• Summer Vineyard Practices</li> <li>• Vineyard Nutrition and Irrigation Management</li> <li>• Introduction to Composition (or higher)</li> <li>• Psychology of Human Relations (or higher)</li> <li>• Fall Vineyard Practices</li> </ul>		
CERT	Wine Hospitality and Operations Certificate	36 credits	<ul style="list-style-type: none"> <li>• Cooperative Work Experience</li> <li>• Wine Hospitality Operations Electives</li> </ul>		

**Table 63: Napa Community College**

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Student Outcomes:
AS	Degree in Viticulture	45 credits	<ul style="list-style-type: none"> <li>• BIOL 110 Survey of Biology</li> <li>○ Introduction to Chemistry, or Earth Science: Earth, Sea, and Sky</li> <li>• General Viticulture</li> <li>• Vineyard Soils, Fertilizers &amp; Irrigation</li> <li>• Vineyard Pruning</li> <li>• Grapevine Propagation</li> <li>• Fall Viticulture Operations</li> <li>• Spring Viticulture Operations</li> <li>• Vineyard Management</li> <li>• Integrated Pest Control for Grapes</li> <li>• Fundamentals of Enology</li> <li>• VWT Program Electives***</li> <li>○ VWT Independent Study and/or VWT Work Experience **</li> </ul>	Lecture, lab, clinical, work-based learning	1-year certification: 1 student; 1-2 year certificate: 3 students; Associate Degree: 19 students
	Degree in Winemaking	45 credits	<ul style="list-style-type: none"> <li>• Survey of Biology</li> <li>• Introduction to Chemistry</li> <li>• Intro to Organic &amp; Biological Chemistry</li> <li>• General Viticulture</li> <li>• Wines of the World</li> <li>• Wines of California</li> <li>• Laboratory Analysis of Musts &amp; Wines</li> <li>• Sensory Evaluation of Wine</li> <li>• Fundamentals of Enology</li> <li>• Advanced Winemaking</li> <li>• Winery Management</li> </ul>	Lecture, lab, clinical, work-based learning	

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Student Outcomes:
			<ul style="list-style-type: none"> <li>• Fund of Wine Chemistry &amp; Microbiology</li> <li>• Fall Winery Operations</li> <li>• Spring Winery Operations</li> </ul>		
	Degree in Wine Marketing and Sales	38 credits	<ul style="list-style-type: none"> <li>• Introduction to Business</li> <li>• General Viticulture</li> <li>• Wines of the World</li> <li>• Wines of California</li> <li>• Cultural Appreciation of Wine</li> <li>• Sensory Evaluation of Wine</li> <li>• Fundamentals of Enology</li> <li>• Wine Marketing</li> <li>○ Independent Study and/or Work Experience</li> <li>• 5 Business Elective</li> <li>• Program Elective</li> </ul>	Lecture, lab, clinical	
	Viticulture; Certificate of Achievement	30 credits	<ul style="list-style-type: none"> <li>• General Viticulture</li> <li>• Vineyard Soils, Fertilizers &amp; Irrigation</li> <li>• Laboratory Analysis of Musts &amp; Wines</li> <li>• Fundamentals of Enology</li> <li>• Fall Viticulture Operations</li> <li>• Spring Viticulture Operations</li> <li>• Vineyard Management</li> <li>• Winery Management</li> <li>• Fall Winery Operations</li> <li>• Spring Winery Operations</li> </ul>	Lecture, lab, clinical	
	Wine Marketing; Certificate of Achievement	21 credits	<ul style="list-style-type: none"> <li>• General Viticulture</li> <li>• Wines of the World</li> <li>• Wines of California</li> <li>• Cultural Appreciation of Wine</li> <li>• Sensory Evaluation of Wine</li> <li>• Fundamentals of Enology</li> <li>• Wine Marketing</li> </ul>	Lecture, lab, clinical	

**Table 64: Oregon State University**

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Student Outcomes
BS	Food Science	180 Credits	Core: <ul style="list-style-type: none"> <li>• Tech Writing, Science Writing, or English Comp</li> <li>• Public Speaking</li> <li>• General Chemistry</li> <li>• General Chemistry Lab</li> <li>• Organic Chemistry</li> <li>• Organic Chemistry Lab</li> <li>• Quantitative Analysis</li> </ul>	Lecture, lab, clinical, work-based learning	Bachelor's Degree: 45 students; Masters: 7 students; Doctor/PhD: 8 students

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Student Outcomes
			<ul style="list-style-type: none"> <li>• Principles of Biology</li> <li>• Elementary Biochemistry</li> <li>• General Microbiology</li> <li>• General Microbiology Lab</li> <li>• Introduction to Statistical Methods</li> <li>• General Physics</li> <li>• Differential Calculus</li> <li>• Integral Calculus</li> <li>• Food Safety and Sanitation</li> <li>• Industry Preparation/HACCP</li> <li>• Comm Food and Farm Science</li> <li>• Senior Seminar</li> <li>• Food Law</li> <li>• Food Chemistry</li> <li>• Food Systems Chemistry</li> <li>• Intro to Food Engineering Principles</li> <li>• Intro to Food Engr. Process Design</li> </ul> <p>Food Science Option:</p> <ul style="list-style-type: none"> <li>• General Physics</li> <li>• Intro. Statistical Methods</li> <li>• Sensory Evaluation of Food</li> <li>• Food Analysis</li> <li>• Processing Calculations</li> <li>• Food Processing Calculations</li> <li>• Food Microbiology</li> <li>• Complete three credits from among</li> <li>• Fruit and Vegetable Processing</li> <li>• Dairy Processing Lab</li> <li>• Animal Food Technology</li> </ul> <p>Electives:</p> <ul style="list-style-type: none"> <li>• Food Science Orientation</li> <li>• Intro. Wines, Beers and Spirits</li> <li>• Food Sci &amp; Tech in Western Culture</li> <li>• Wine in the Western World</li> <li>• Research</li> <li>• Internship</li> <li>• Innovation and Food Product Development</li> <li>• Brewing Science</li> <li>• Wine Production Principles</li> <li>• Fermentation Microbiology</li> <li>• Topics in Fermentation</li> <li>• Food Microbiology Lab</li> <li>• Food in Non-Western Culture</li> <li>• Toxic Substances in Foods</li> </ul>		
BS	Fermentation Science	180 Credits	<p>Core:</p> <ul style="list-style-type: none"> <li>• Tech Writing, Science Writing, or English Comp</li> <li>• Public Speaking</li> </ul>	Lecture, lab, clinical	

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Student Outcomes
			<ul style="list-style-type: none"> <li>• General Chemistry</li> <li>• General Chemistry Lab</li> <li>• Organic Chemistry</li> <li>• Organic Chemistry Lab</li> <li>• Quantitative Analysis</li> <li>• Principles of Biology</li> <li>• Elementary Biochemistry</li> <li>• General Microbiology</li> <li>• General Microbiology Lab</li> <li>• Introduction to Statistical Methods</li> <li>• General Physics</li> <li>• Differential Calculus</li> <li>• Integral Calculus</li> <li>• Food Safety and Sanitation</li> <li>• Industry Preparation/HACCP</li> <li>• Comm Food and Farm Science</li> <li>• Senior Seminar</li> <li>• Food Law</li> <li>• Food Chemistry</li> <li>• Food Systems Chemistry</li> <li>• Intro to Food Engineering Principles</li> <li>• Intro to Food Engr. Process Design</li> </ul> <p>Fermentation Option:</p> <ul style="list-style-type: none"> <li>• General Physics</li> <li>• Human Nutrition</li> <li>• Brewing Science</li> <li>• Wine Production Principles</li> <li>• Fermentation Microbiology</li> <li>• Food Analysis</li> <li>• Brewing Analysis</li> <li>• Wine, Production, Analysis and Sensory Evaluation</li> <li>• Seminar – Leadership Academy</li> </ul> <p>Electives:</p> <ul style="list-style-type: none"> <li>• Food Science Orientation</li> <li>• Intro. Wines, Beers and Spirits</li> <li>• Food Sci &amp; Tech in Western Culture</li> <li>• Wine in the Western World</li> <li>• Research</li> <li>• Internship</li> <li>• Sensory Evaluation of Food</li> <li>• Topics in Fermentation</li> <li>• Food Microbiology Lab</li> <li>• Food in Non-Western Culture</li> <li>• Toxic Substances in Foods</li> </ul>		
BS	Enology and Viticulture	180 Credits	<p>Core:</p> <ul style="list-style-type: none"> <li>• Tech Writing, Science Writing, or English Comp</li> </ul>	Lecture, lab, clinical,	

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Student Outcomes
			<ul style="list-style-type: none"> <li>• Public Speaking</li> <li>• General Chemistry</li> <li>• General Chemistry Lab</li> <li>• Organic Chemistry</li> <li>• Organic Chemistry Lab</li> <li>• Quantitative Analysis</li> <li>• Principles of Biology</li> <li>• Elementary Biochemistry</li> <li>• General Microbiology</li> <li>• General Microbiology Lab</li> <li>• Introduction to Statistical Methods</li> <li>• General Physics</li> <li>• Differential Calculus</li> <li>• Integral Calculus</li> <li>• Food Safety and Sanitation</li> <li>• Industry Preparation/HACCP</li> <li>• Comm Food and Farm Science</li> <li>• Senior Seminar</li> <li>• Food Law</li> <li>• Food Chemistry</li> <li>• Food Systems Chemistry</li> <li>• Intro to Food Engineering Principles</li> <li>• Intro to Food Engr. Process Design</li> </ul> <p>Enology &amp; Viticulture Option:</p> <ul style="list-style-type: none"> <li>• Plant Physiology</li> <li>• Biology of Horticulture</li> <li>• Grapevine Growth and Physiology</li> <li>• Principles and Practices Vineyard Production</li> <li>• Soil Science</li> <li>• Soil Science Laboratory</li> <li>• Wine Production Principles</li> <li>• Win Production Analysis and Sensory Evaluation</li> <li>• Fermentation Microbiology</li> <li>• Seminar- Senior leadership Academy</li> <li>• Intro. Plant Pathology</li> <li>• Intro. Pest Management</li> <li>• Food Science Orientation</li> <li>• Intro Wines, Beers, Spirits</li> <li>• Food Science and Tech in Western Culture</li> <li>• Research</li> <li>• Internship</li> <li>• Sensory Evaluation of Foods</li> <li>• Topics in Fermentation</li> <li>• Temp. Tree Fruit, Berries, Grapes, Nuts</li> <li>• Plant Nutrition</li> <li>• Food Microbiology</li> </ul>	work-based learning	

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Student Outcomes
			<ul style="list-style-type: none"> <li>• Food Microbiology Lab</li> <li>• Food in Non-Western Culture</li> </ul>		

**Table 65: SUNY Morrisville State College**

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
Bachelor's	Brewing	N/A	<ul style="list-style-type: none"> <li>• 10 courses offered, four are full practicum</li> </ul>	Lecture, lab, practicum, work-based learning	N/A

**Table 66: Portland State University**

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
Certificate	Food, Beverage & Goods Leadership Certificate	24 Credits	<ul style="list-style-type: none"> <li>• Consumer Packaged Goods</li> <li>• Retailing</li> <li>• Data Analytics &amp; Visualization</li> <li>• Food Industry Practicum or Internship</li> </ul> <p>One course in the following:</p> <ul style="list-style-type: none"> <li>• Professional Selling</li> <li>• Advanced Managerial Accounting</li> <li>• Sales Management</li> <li>• Merchandise Management</li> </ul>	Lecture, lab, work-based learning opportunity	N/A

**Table 67: Washington State University**

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
Certificate	Enology Certificate	20 Months	<ul style="list-style-type: none"> <li>• Wine Production</li> <li>• Wine Chemistry</li> <li>• Winery Equipment</li> <li>• Wine Microbiology</li> <li>• Sensory Evaluation of Wine</li> <li>• V &amp; E Interface</li> <li>• Winery Sanitation</li> <li>• Business Planning and Economics of Starting a Winery</li> <li>• Compliance and Labeling</li> <li>• Winery Marketing</li> </ul>	Lecture, lab	<p>Viticulture and Enology – Bachelor's Degree: 19 students</p> <p>Food Science – Bachelor's Degree: 12, Master's Degree: 7 students, Doctorate: 4 students</p>
Certificate	Viticulture Certificate	20 Months	<ul style="list-style-type: none"> <li>• Anatomy and Physiology</li> <li>• Soil and Nutrient Management</li> <li>• Grapevine Irrigation</li> <li>• Viral Diseases</li> <li>• Growing Grapes</li> </ul>	Lecture, lab	

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
			<ul style="list-style-type: none"> <li>• Disease Management</li> <li>• Weed Management</li> <li>• Insects and Biological Control</li> <li>• Economics of Growing Grapes</li> <li>• Viticulture-Enology Interface</li> <li>• Application Technology</li> <li>• And three 'Grape Camps'</li> </ul>		
Doctorate	Food Science	78 Credits	<ul style="list-style-type: none"> <li>• Food chemistry/analysis</li> <li>• Food microbiology/safety</li> <li>• Food processing/engineering</li> <li>• Scientific writing</li> <li>• Oral seminar</li> <li>• Other food science courses</li> <li>• Statistics</li> <li>• Other non-food science course</li> <li>• Research (45 credits)</li> </ul>	Lecture, lab, clinical, work-based learning opportunity	
Graduate Degree	Food Science	31 Credits	<ul style="list-style-type: none"> <li>• Food chemistry/analysis</li> <li>• Food microbiology/safety</li> <li>• Food processing/engineering</li> <li>• Scientific writing</li> <li>• Oral seminar</li> <li>• Other food science courses</li> <li>• Statistics</li> <li>• Research (10 credits)</li> </ul>	Lecture, lab, clinical, research assignment	
Bachelor's Degree	Wine Business Management	122 Credits	<ul style="list-style-type: none"> <li>• Introduction to Chemistry</li> <li>• Introduction to Botany</li> <li>• Introduction to Wines and Vines</li> <li>• Sensory Evaluation of Food and Wine</li> <li>• French Culture</li> <li>• Entrepreneurship</li> <li>• Professional Development</li> <li>• Introduction to Beverage Management</li> <li>• Beverage Management</li> <li>• Foodservice Systems and Control</li> <li>• Hospitality Leadership and Organizational Behavior</li> <li>• Career Management</li> <li>• Food and Beverage Operational Analysis</li> <li>• Food and Beverage Strategies</li> <li>• Service Operations Management</li> </ul>	Lecture, lab, clinical, 400 hours of industry experience	
Bachelor's Degree	Winemaking (Viticulture and Enology)	120 Credits	<ul style="list-style-type: none"> <li>• Roots of Contemporary Issues</li> <li>• Written Communication</li> <li>• Introductory Writing</li> <li>• Communication</li> </ul>	Lecture, lab, clinical	



Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
			<ul style="list-style-type: none"> <li>• Dev. Effective Com. or Com. in Info. Soc</li> <li>• Quantitative Reasoning: Intro to Stat Methods</li> <li>• Inquiry in the Social Sciences</li> <li>• Fund of Micro or Fund of Macro</li> <li>• Inquiry in the Humanities</li> <li>• Inquiry in the Creative and Professional Arts</li> <li>• Inquiry in the Natural Sciences</li> <li>• Intro to Cell Bio &amp; Genetics</li> <li>• Intro to Chem or Prin. Of Chem I</li> <li>• Diversity Integrative Capstone</li> <li>• Critical Thinking in Vineyard &amp; Winery Mgmt</li> <li>• Intro to Organismal or Intro to Botany</li> <li>• Chem Related to Life Sciences or Princ. Of Chem II</li> <li>• Cultivated Plants</li> <li>• Crop Growth and Development</li> <li>• Soil: A Living System</li> <li>• General Entomology</li> <li>• Ecological &amp; Integrated Pest Management</li> <li>• Diseases of Fruit Crops or General Plant Pathology</li> <li>• Crop Env. Interactions or Adv. Hort Crop Phys.</li> <li>• Professional Work Exp. Internship in Winery</li> <li>• Intro to Vines &amp; Wines</li> <li>• Viticulture</li> <li>• Winery Operations &amp; Equipment</li> <li>• Advanced Viticulture</li> <li>• Sensory Eval of Food &amp; Wine</li> <li>• Chem &amp; Biochem. Fruit &amp; Wine</li> <li>• Wine Microbiology &amp; Processing</li> <li>• Intro to Plant Physiology</li> <li>• Postharvest Biology &amp; Technology</li> <li>• Organic Chemistry I</li> <li>• Intro Microbiology</li> <li>• Intro Biochemistry</li> <li>• Seminar</li> </ul>		

**Table 68: Penn State Berks**

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
Certificate	Winemaking Certificate	27 Credits	<ul style="list-style-type: none"> <li>• Introduction to Wine Production</li> <li>• Sensory Evaluation</li> <li>• Winery Regulations</li> <li>• Wine Chemistry</li> <li>• Fining, Filtration &amp; Bottling</li> <li>• Wine Juice &amp; Handling Equipment</li> <li>• Fermentation</li> <li>• Wine Sanitation</li> <li>• Harvest Winery Equipment</li> </ul>	Lecture, lab, clinical	N/A

**Table 69: Yakima Community College**

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
AAS	Vineyard Technology	99 credits	<ul style="list-style-type: none"> <li>• Terroir</li> <li>• Soils</li> <li>• Integrated Pest Management</li> <li>• English Composition I</li> <li>• Introduction to Washington Wines</li> <li>• Introduction to Plant Science</li> <li>• General Viticulture</li> <li>• Intermediate Algebra</li> <li>• Essentials of Winemaking</li> <li>• Public Speaking</li> <li>• Approved Humanities Electives</li> <li>• Arts Electives</li> <li>• Economics in Agriculture</li> <li>• Winemaking</li> <li>• General Chemistry with Lab</li> <li>• Co-op Field Experience I</li> <li>• Farm Management</li> <li>• General Chemistry with Lab II</li> <li>• Introduction to Stats</li> <li>• Sustainable Agriculture</li> <li>• Vineyard Management</li> <li>• General Chemistry with Lab III</li> </ul>	Lecture, lab, clinical, incubator	Viticulture and Enology – Associates Degree: 2 students; Undergraduate Certificate: 4 students
AAS	Winery Technology	99 credits	<ul style="list-style-type: none"> <li>• Introduction to Washington Wines</li> <li>• Introduction to Plant Science</li> <li>• General Viticulture</li> <li>• Beginning Algebra</li> <li>• Safety &amp; Labor Management</li> <li>• Terroir</li> <li>• Preparatory Chemistry</li> <li>• Written Business Communication</li> <li>• Essentials of Winemaking</li> <li>• Wine Sensory</li> </ul>	Lecture, lab, clinical, work-based learning opportunity	

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
			<ul style="list-style-type: none"> <li>• Biology for Non-majors with Lab</li> <li>• Winery Operations II</li> <li>• Winery Compliance</li> <li>• Advanced Winemaking</li> <li>• Approved Elective</li> <li>• Winery Business Management</li> <li>• Vineyard Management</li> <li>• Approved Electives</li> <li>• Principles of Chemistry with Lab</li> <li>• Co-op Field Experience I</li> <li>• Winery Operations I</li> <li>• Winemaking</li> <li>• Business Math</li> </ul>		
Certificate	Vineyard Technology	43 Credits	<ul style="list-style-type: none"> <li>• Introduction to Washington Wines</li> <li>• Safety &amp; Labor</li> <li>• Introduction to Plant Science</li> <li>• Essentials of Winemaking</li> <li>• General Viticulture</li> <li>• Soils</li> <li>• Vegetable/Row Crop Production</li> <li>• Winemaking</li> <li>• Vineyard Management</li> <li>• Preparatory Chemistry</li> </ul>	Lecture, lab, clinical, incubator	
Certificate	Wine Sales Certificate	18 Credits	<ul style="list-style-type: none"> <li>• Introduction to Washington Wines</li> <li>• Essentials of Winemaking</li> <li>• Terroir</li> <li>• Marketing</li> <li>• Wine Marketing</li> </ul>	Lecture, lab, clinical, incubator	
Certificate	Winery Technology	43 Credits	<ul style="list-style-type: none"> <li>• Introduction to Washington Wines</li> <li>• Safety &amp; Labor Management</li> <li>• Introduction to Plant Science</li> <li>• Essentials of Winemaking</li> <li>• General Viticulture</li> <li>• Winemaking</li> <li>• Vineyard Management</li> <li>• Winery Compliance</li> <li>• Wine Sensory</li> <li>• Advanced Winemaking</li> <li>• Preparatory Chemistry</li> </ul>	Lecture, lab, clinical, incubator	

**Table 70: South Puget Sound Community College**

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
AAS	Craft Brewing and Distilling	~84 Credits	<ul style="list-style-type: none"> <li>• Legal Issues I - Permitting and Design</li> <li>• Legal Issues II - Compliance and Labeling</li> </ul>	Lecture, lab, clinical	N/A

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
			<ul style="list-style-type: none"> <li>• Raw Materials and Processing I - Grain</li> <li>• Raw Materials and Processing II - Fruit &amp; Honey</li> <li>• Raw Materials and Processing III - Hops &amp; Fermentation</li> <li>• Equipment Design and Maintenance</li> <li>• Packaging and Processing</li> <li>• Business Operations</li> <li>• Applied Chemistry for the Beverage Industry</li> <li>• Search Schedule</li> <li>• Beverage Chemistry/Biochemistry (QC/QA)</li> <li>• Accounting for Small Business Owners</li> <li>• Starting and Managing a Small Business</li> <li>• Flavor and Recipe Development for Brewing</li> <li>• Craft Brewing</li> <li>• Flavor and Recipe Development for Distilling</li> <li>• Craft Distilling</li> <li>• Flavor and Recipe Development for Cider</li> <li>• Business Math</li> <li>• Technical Mathematics</li> <li>• Principles of Management: Diversity</li> <li>• English Composition</li> </ul>		

**Table 71: Nash Community College**

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
AAS	Brewing, Distillation and Fermentation	67 Credits	<ul style="list-style-type: none"> <li>• Writing &amp; Inquiry</li> <li>• Quantitative Literacy</li> <li>• BDF Safety &amp; Sanitation</li> <li>• Beverage Tech &amp; Calculations</li> <li>• Specialty Crops</li> <li>• Survey of Fermented Products</li> <li>• Craft Beer Brewing</li> <li>• Beverage Tour &amp; Tasting Management</li> <li>• Industrial Safety</li> <li>• General Psychology</li> </ul>	Lecture, lab	N/A

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
			<ul style="list-style-type: none"> <li>• Legal Issues - Fermentation</li> <li>• Introduction to Communication</li> <li>• Critical Thinking</li> <li>• Fermentation Production</li> <li>• Craft Beverage Microbiology</li> <li>• Beverage Management</li> <li>• HR Management - Hospitality</li> <li>• Sensory Evaluation</li> <li>• Craft Beverage Chemistry</li> <li>• Beverage Marketing &amp; Sales</li> <li>• Introduction to Entrepreneurship</li> <li>• Cost Controls - Food &amp; Beverage</li> </ul>		

**Table 72: Siebel Institute of Technology**

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
Certificate	Advanced Brewing Theory Program	6 weeks, 210 hours	<ul style="list-style-type: none"> <li>• Raw Materials and Wort Production</li> <li>• Beer Production and Quality Control</li> <li>• Packaging and Process Technology</li> </ul>	Lecture	N/A
Certificate	International Diploma In Brewing Technology Program	12 weeks, 420 hours	<ul style="list-style-type: none"> <li>• Raw Materials and Wort Production</li> <li>• Beer Production and Quality Control</li> <li>• Packaging and Process Technology</li> <li>• Business of Brewing and Technical Case Stud</li> <li>• Applied Brewing Techniques</li> <li>• European Brewery Study Tour</li> </ul>	Lecture, Hands-on International Experience	
Certificate	Master Brewer Program	20 weeks, 700 hours	<ul style="list-style-type: none"> <li>• Raw Materials and Wort Production</li> <li>• Beer Production and Quality Control</li> <li>• Packaging and Process Technology</li> <li>• Business of Brewing and Technical Case Stud</li> <li>• European Brewery Study Tour</li> <li>• Advanced Applied Brewing Techniques</li> </ul>	Lecture, Hands-on International Experience	

**Table 73: Appalachian State University**

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
Bachelor's Degree	Fermentation Sciences	122 Credits	<ul style="list-style-type: none"> <li>• Principles of Fermentation Sciences</li> <li>• Social Implications of Fermented Beverages</li> <li>• Reading &amp; Writing in Fermentation Sciences</li> <li>• Facility Design &amp; Operation</li> <li>• Sensory Analysis of Wine &amp; Beer</li> <li>• Viticulture: Vine Physiology and Vineyard Establishment</li> <li>• Principles of Wine Production</li> <li>• Winery Operations &amp; Analysis</li> <li>• Principles of Brewing Science</li> <li>• Brewing Production &amp; Analysis</li> <li>• Intro Chemistry I &amp; Lab</li> <li>• Intro Chemistry II &amp; Lab</li> <li>• Fundamentals of Organic Chemistry &amp; Lab</li> <li>• Quantitative Analysis</li> <li>• Biochemistry I</li> <li>• Biological Concepts I</li> <li>• Cell Biology</li> <li>• Microbiology</li> <li>• Principles of Microeconomics</li> <li>• Statistical Data Analysis I</li> <li>• Calc with Analytic Geom I</li> <li>• Basic Food Science</li> <li>• Survey of Accounting</li> <li>• Introduction to Business</li> <li>• Principles of Marketing</li> </ul>	Lecture, lab	N/A

**Table 74: Robert Morris University**

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
Associate in Applied Science Degree, Culinary Arts	Institute of Culinary Arts	2 years	<ul style="list-style-type: none"> <li>• Culinary Fundamentals I</li> <li>• Meat &amp; Poultry</li> <li>• Baking &amp; Pastry</li> <li>• Seafood</li> <li>• Restaurant Trends</li> <li>• Restaurant A la Carte</li> <li>• American Cuisine</li> </ul>	Lab, lecture, hands-on work experience	Associates Degree: 32 students

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
			<ul style="list-style-type: none"> <li>• Taste of the World</li> <li>• Culinary Externship</li> <li>• Menu Management</li> <li>• Restaurant Operations Management</li> </ul> <p>General Education Core</p> <ul style="list-style-type: none"> <li>• Free Elective</li> <li>• Experience-Based Learning Career Strategies</li> <li>• College as Career</li> <li>• Developing Professional Presence</li> <li>• Associate Degree Requirements Met</li> </ul>		
Bachelor of Professional Studies Degree, Advanced Culinary and Hospitality Management	Institute of Culinary Arts	Four years; 52 credits	<ul style="list-style-type: none"> <li>• Project Management</li> <li>• Role of the Professional in Society</li> <li>• Service Marketing</li> <li>• Facilities Management</li> <li>• Financial Planning for Professionals</li> <li>• Professional Studies Strategy (Capstone Course)</li> </ul> <p>Concentration Courses</p> <ul style="list-style-type: none"> <li>• Advanced Restaurant a la Carte</li> <li>• Restaurant &amp; Hospitality Strategies</li> <li>• Purchasing &amp; Cost Control</li> <li>• Human Resource Management for the Hospitality Industry</li> <li>• Advanced Menu Management &amp; Facility Design</li> </ul> <p>Thematic Sequence Electives</p> <ul style="list-style-type: none"> <li>• Thematic Sequence I 12 – Communication</li> <li>• Thematic Sequence II 12 – Quantitative</li> <li>• Thematic Sequence III 12 – People &amp; Society</li> </ul>	Lab, lecture, hands-on work experience	

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
			<ul style="list-style-type: none"> <li>Thematic Sequence IV 16 – Concentration Related</li> </ul> <p>Thematic Sequences must include:</p> <ul style="list-style-type: none"> <li>EBL 300 Personal Narrative &amp; Branding</li> <li>EBL 400 Life-Long Career Strategy</li> <li>ICP 350 Intermediate ICenter Project</li> <li>ICP 450 Advanced ICenter Project (taken from their website)</li> </ul>		

**Table 75: The Restaurant School at Walnut Hill College**

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
Associate of Science degree in Culinary Arts	Culinary Arts	(18 Months) Total Credits  Major 64.0  General Education 32.5  Total 96.5  Clock Hours 1500	<ul style="list-style-type: none"> <li>Introduction to Culinary Arts</li> <li>Eggs, Dairy, &amp; Pasta</li> <li>Vegetables &amp; Starch</li> <li>Introduction to Culinary Techniques</li> <li>Fish</li> <li>Shellfish</li> <li>Introduction to Culinary Ingredients</li> <li>Market Production</li> <li>World Dining Production</li> <li>Poultry</li> <li>Meat- Beef &amp; Veal</li> <li>Meat- Lamb &amp; Pork</li> <li>Meat- Variety &amp; Game</li> <li>Tour of France</li> <li>Internship</li> <li>Breads &amp; Pastry</li> <li>Cake &amp; Desserts</li> <li>Sanitation</li> <li>Introduction to Wines</li> </ul> <p>General Education Courses</p> <ul style="list-style-type: none"> <li>American Courts and Legal System</li> <li>Foundations in Research</li> <li>Indispensable Employee</li> <li>Exploring Psychology</li> </ul>	Hands-on training, lecture, work-based learning	Restaurant/Food Services Management – Associate: 26 students; Bachelor's 17 students  Baking and Pastry Arts – Associate: 67 students; Bachelor's: 22 students  Culinary Arts/Chef Training – Associates: 110 students; Bachelor's 65 students



Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
			<ul style="list-style-type: none"> <li>• The Leading Supervisor</li> <li>• English Composition</li> <li>• Culture of France</li> <li>• First Year Freshman Seminar</li> <li>• Understanding World Cultures</li> <li>• Shaping American Cultures</li> <li>• College Math</li> <li>• Nutrition for a Healthy Life</li> <li>• Strategies for Success</li> <li>• Introduction to Computer Applications</li> <li>• Purchasing and Cost Controls</li> </ul>		
Associate of Science degree in Pastry Arts	Pastry Arts	(18 Months)  Total Credits  Major 59.5 General  Education 34.5  Total 94.0  Clock Hours 1505	Pastry Arts Courses: <ul style="list-style-type: none"> <li>• Introduction to Culinary Techniques</li> <li>• Culinary for Hospitality Professionals</li> <li>• Appetizing Starts</li> <li>• Introduction to Cooking Techniques</li> <li>• Looking to the Sides</li> <li>• Internship</li> <li>• Intro to Pastry Techniques</li> <li>• Professional Bread Baking</li> <li>• Introduction to Pastry Arts</li> <li>• Cake Baking &amp; Decorating</li> <li>• Retail Pastry Production</li> <li>• Ice Cream/Bavarian/Mousse</li> <li>• Chocolates &amp; Confections</li> <li>• Advanced Pastry Decorations</li> <li>• European Tortes and Gateux</li> <li>• Wedding Cakes</li> <li>• Sanitation</li> <li>• Introduction to Wines</li> </ul> General Education Courses <ul style="list-style-type: none"> <li>• American Courts and Legal Systems</li> <li>• Foundations in Research</li> <li>• Indispensable Employee</li> <li>• Exploring Psychology</li> <li>• The Leading Supervisor</li> <li>• English Composition</li> </ul>	Hands-on training, lecture, work-based learning	

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
			<ul style="list-style-type: none"> <li>• Culture of France</li> <li>• Purchasing and Cost Control</li> <li>• First Year Freshman Seminar</li> <li>• Understanding World Cultures</li> <li>• Shaping American Cultures</li> <li>• College Math</li> <li>• Nutrition for a Healthy Life</li> <li>• Strategies for Success</li> <li>• Introduction to Computer Applications</li> <li>• Purchasing and Cost Control</li> </ul>		
Associate of Science degree in Restaurant Management	Restaurant Management	(18 Months) Total Credits  Major 66.5  General Education 33.0  Total 99.5  Clock Hours 1530	<ul style="list-style-type: none"> <li>• Property Operations</li> <li>• Culinary for Hospitality Professionals</li> <li>• Introduction to Cooking Techniques</li> <li>• Le Plat</li> <li>• Management Florida Resort Tour</li> <li>• Introduction to Dining Room Service 1</li> <li>• Bartending</li> <li>• Introduction to Hospitality</li> <li>• Restaurant Operations</li> <li>• ServeSafe Alcohol and Beer</li> <li>• Internship</li> <li>• Dessert Fundamentals</li> <li>• Tableside Service</li> <li>• Sanitation</li> <li>• Introduction to Wines</li> </ul> <p>General Education Courses:</p> <ul style="list-style-type: none"> <li>• American Courts and Legal System</li> <li>• Foundations in Research</li> <li>• English Composition</li> <li>• Exploring Psychology</li> <li>• The Leading Supervisor</li> <li>• Culture of Florida and the Bahamas</li> <li>• First Year Freshman Seminar</li> <li>• Understanding World Cultures</li> <li>• Shaping American Cultures</li> </ul>	Hands-on training, lecture, work-based learning	

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
			<ul style="list-style-type: none"> <li>• College Math</li> <li>• Nutrition for a Healthy</li> <li>• Strategies for Success</li> <li>• Introduction to Computer Applications</li> </ul>		
Bachelor of Science degree in Culinary Arts	Culinary Arts	(36 Months) Total Credits Major 129.0  General Education 66.0  Total 194.5  Clock Hours 3100	<ul style="list-style-type: none"> <li>• Concept Development</li> <li>• Introduction to Culinary Arts</li> <li>• Eggs, Dairy &amp; Pasta</li> <li>• Vegetables &amp; Starch</li> <li>• Introduction to Culinary Techniques</li> <li>• Fish</li> <li>• Shellfish</li> <li>• Introduction to Culinary Ingredients</li> <li>• Market Production</li> <li>• World Dining Production</li> <li>• Poultry</li> <li>• Meat – Beef &amp; Veal</li> <li>• Meat – Lamb &amp; Pork</li> <li>• Meat – Variety &amp; Game</li> <li>• Tour of France</li> <li>• Internship</li> <li>• Breads &amp; Pastry</li> <li>• Cakes &amp; Desserts</li> <li>• Sanitation</li> <li>• Introduction to Wines</li> </ul> General Education Courses <ul style="list-style-type: none"> <li>• American Courts and Legal System</li> <li>• Foundations in Research</li> <li>• Indispensable Employee</li> <li>• Exploring Psychology</li> <li>• The Leading Supervisor</li> <li>• Culture of France</li> <li>• First-Year Freshman Seminar</li> <li>• Understanding World Cultures</li> <li>• Shaping American Cultures</li> <li>• College Math</li> <li>• Nutrition for a Healthy Life</li> <li>• Strategies for Success</li> </ul>	Hands-on training, lecture, work-based learning	

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
			<ul style="list-style-type: none"> <li>• Introduction to Computer Applications</li> <li>• Purchasing and Cost Control</li> </ul> <p>Major Specific Courses:</p> <ul style="list-style-type: none"> <li>• Italian Rustica/Spanish</li> <li>• Cont Plating Arrangements</li> <li>• Taste/Flavors/Devils Food</li> <li>• New Style County French</li> <li>• The Chef's Palate</li> <li>• Menu Planning</li> <li>• Exper Immersion 1</li> <li>• Exper Immersion II</li> <li>• American Road/Cuisine</li> <li>• Modernist Cuisine</li> <li>• Amuse Bouche</li> <li>• Freestyle Cooking</li> <li>• Tour of England</li> <li>• Hospitality Design</li> <li>• Internship</li> <li>• Desserts</li> <li>• Product Development</li> <li>• Fermentation</li> <li>• Test Kitchen</li> <li>• Emerging World</li> <li>• Vegetables Center Plate</li> <li>• Charcuterie/Salami 2.5</li> </ul> <p>General Education Courses:</p> <ul style="list-style-type: none"> <li>• Applied Marketing</li> <li>• Presentations</li> <li>• Leadership</li> <li>• Accounting</li> <li>• Sustainability in Life and Work</li> <li>• Ethics</li> <li>• Philosophy as a Way of Life</li> <li>• Sociology of Popular Culture</li> <li>• Communication and Interpersonal Relations</li> <li>• Current Issues in Society</li> <li>• Analysis of Film and Literature</li> <li>• Culture of England</li> <li>• Perspectives on Civilization</li> <li>• Critical Thinking &amp; Psychology</li> </ul>		

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
			<ul style="list-style-type: none"> <li>Advanced Nutrition</li> </ul>		
Bachelor of Science degree in Pastry Arts	Pastry Arts	(36 Months) Total Credits Major 123.0 General Education 67.5 Total 190.5 Clock Hours 3155	Pastry Arts Courses: <ul style="list-style-type: none"> <li>Introduction to Culinary Techniques</li> <li>Culinary for Hospitality Professionals</li> <li>Appetizing Starts</li> <li>Introduction to Cooking Techniques</li> <li>Looking to the Sides</li> <li>Tour of France</li> <li>Internship</li> <li>Intro to Pastry Techniques</li> <li>Professional Bread Baking</li> <li>Introduction to Pastry Arts</li> <li>Cake Baking &amp; Decorating</li> <li>Retail Pastry Production</li> <li>Ice Cream/Bavarian/Mousse</li> <li>Chocolates &amp; Confections</li> <li>Advanced Pastry Decorations</li> <li>European Tortes and Gateux</li> <li>Wedding Cakes</li> <li>Sanitation</li> <li>Introduction to Wines</li> </ul> General Education Courses <ul style="list-style-type: none"> <li>American Courts and Legal System</li> <li>Foundations in Research</li> <li>Indispensable Employee</li> <li>Exploring Psychology</li> <li>The Leading Supervisor</li> <li>Culture of France</li> <li>First-Year Freshman Seminar</li> <li>Understanding World Cultures</li> <li>Shaping American Cultures</li> <li>College Math</li> <li>Nutrition for a Healthy Life</li> <li>Strategies for Success</li> </ul>	Hands-on training, lecture, work-based learning	

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
			<ul style="list-style-type: none"> <li>• Introduction to Computer Applications</li> <li>• Purchasing and Cost Control</li> </ul> <p>Major Specific Courses:</p> <ul style="list-style-type: none"> <li>• Applied Marketing</li> <li>• Art and Presentation</li> <li>• Menu Planning</li> <li>• Hospitality Design</li> <li>• Tour of England</li> <li>• Internship</li> <li>• Artisan Breads</li> <li>• Artisan Breads</li> <li>• Advanced Boulangerie 1</li> <li>• Advanced Boulangerie 2</li> <li>• The Art of the Chocolatier</li> <li>• Celebration Cakes</li> <li>• Celebration Cakes 2</li> <li>• Sugar Artistry</li> <li>• Advanced Confections</li> <li>• The Savory Bakeshop</li> <li>• Pastry Freestyle 1</li> <li>• Pastry Freestyle 2</li> <li>• Contemporary Dessert Styling</li> </ul> <p>General Education Courses:</p> <ul style="list-style-type: none"> <li>• Applied Marketing</li> <li>• Presentations</li> <li>• Leadership</li> <li>• Accounting</li> <li>• Sustainability in Life and Work</li> <li>• Ethics</li> <li>• Philosophy as a Way of Life</li> <li>• Sociology of Popular Culture</li> <li>• Communication and Interpersonal Relations</li> <li>• Current Issues in Society</li> <li>• Analysis of Film and Literature</li> <li>• Culture of England</li> <li>• Perspectives on Civilization</li> <li>• Critical Thinking &amp; Psychology</li> <li>• Advanced Nutrition</li> </ul>		

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
Bachelor of Science degree in Restaurant Management	Restaurant Management	(36 Months) Total Credits Major 123.5  General Education 66.0  Total 189.5  Clock Hours 3140	<ul style="list-style-type: none"> <li>• Property Operations</li> <li>• Culinary for Hospitality Professionals</li> <li>• Introduction to Cooking Techniques</li> <li>• Le Plat</li> <li>• Management Florida Resort Tour</li> <li>• Introduction to Dining Room Service</li> <li>• Bartending</li> <li>• Introduction to Hospitality</li> <li>• Restaurant Operations</li> <li>• ServeSafe Alcohol and Beer</li> <li>• Internship</li> <li>• Dessert Fundamentals</li> <li>• Tableside Service</li> <li>• Purchasing/Cost Control</li> <li>• Sanitation</li> <li>• Introduction to Wines</li> <li>• Advanced Wine</li> </ul> <p>General Education Courses:</p> <ul style="list-style-type: none"> <li>• American Courts and Legal System</li> <li>• Foundations in Research</li> <li>• English Composition 2</li> <li>• Exploring Psychology</li> <li>• The Leading Supervisor</li> <li>• Culture of Florida and the Bahamas</li> <li>• First Year Freshman Seminar</li> <li>• Understanding World Cultures</li> <li>• Shaping American Cultures</li> <li>• College Math</li> <li>• Nutrition for a Healthy Life</li> <li>• Strategies for Success</li> <li>• Introduction to Computer Applications</li> </ul> <p>Major Specific Courses:</p> <ul style="list-style-type: none"> <li>• Art and Presentation</li> <li>• American Regional Cuisine</li> <li>• Tour of England</li> <li>• Hospitality of Design</li> <li>• Management Dynamics</li> <li>• Applied Marketing</li> </ul>	Hands-on training, lecture, work-based learning	

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes
			<ul style="list-style-type: none"> <li>• Spirits &amp; Wine Lists</li> <li>• Customer Service</li> <li>• Event and Entertainment Planning</li> <li>• Convention Service and Sales</li> <li>• Menu Planning</li> <li>• Risk Management</li> <li>• Customer Service</li> <li>• Human Resource Management</li> <li>• Internship</li> <li>• Catering</li> <li>• Certified Specialist of Wines Part 1</li> <li>• Certified Specialist of Wines Part 2</li> </ul> <p>General Education Courses:</p> <ul style="list-style-type: none"> <li>• Public Presentations</li> <li>• Leadership</li> <li>• Sustainability in Life and Work</li> <li>• Ethics</li> <li>• Philosophy as a Way of Life</li> <li>• Sociology of Popular Culture</li> <li>• Current Issues in Society</li> <li>• Analysis of Film and Literature</li> <li>• Culture of England</li> <li>• Accounting</li> <li>• Communication/ Interpersonal Relationship</li> <li>• Perspectives on Civilization</li> <li>• Critical Thinking &amp; Psychology</li> <li>• Advanced Nutrition</li> </ul>		



**Table 76: San Diego Culinary Institute**

Award Offered	Program Title	Program Length	Program Content:	Training Methods	Program Outcomes <sup>23</sup>
Advanced Professional Diploma	Cuisine Commis Culinary Program	<p>FULLTIME DAY CLASSES: Monday/Wednesday/Friday, 8AM - 5PM (approx. 8 month completion time)</p> <p>PART-TIME DAY CLASSES: Tuesday/Thursday, 8AM - 5PM (approx. 11 month completion time)</p> <p>EVENING CLASSES: Monday through Thursday, 6PM - 10PM (approx. 11 month completion time)</p> <p>Our Pastry Program is only offered Mondays through Fridays, 7AM - 4PM and takes approximately 8 months to complete.</p>	<p>Course Overview</p> <p>Three main course sequences:</p> <p>1. The Introductory Lecture Series: this series of courses introduces the students to the kitchen, business, and theory concepts that they will study throughout the program.</p> <p>2. The Lab Series: over 80% of your coursework will take place in the kitchen/classroom. You will study first simple concepts and prepare simple plates that will become progressively more challenging as you go.</p> <p>3. The Externship: at the conclusion of your program, you will use your skills in a live professional kitchen under the tutelage of an experienced Executive Chef, committed to furthering your education.</p>	Lecture, lab, hands-on work experience	<p>Baking and Pastry – Diploma – 68 students</p> <p>Culinary arts/chef training – 1-2 year certificate: 20 students</p>
Advanced Professional Diploma	Pastry Program	<p>FULLTIME DAY CLASSES: Monday/Wednesday/Friday, 8AM - 5PM (approx. 8 month completion</p>	Courses not listed	Lecture, lab, hands-on experience	

<sup>23</sup> IPEDS

		time)			
		PART-TIME DAY CLASSES: Tuesday/Thursday, 8AM - 5PM (approx. 11 month completion time)			
		EVENING CLASSES: Monday through Thursday, 6PM - 10PM (approx. 11 month completion time)			
		Our Pastry Program is only offered Mondays through Fridays, 7AM - 4PM and takes approximately 8 months to complete.			

## APPENDIX B: COMMERCIAL KITCHENS AVAILABLE IN THE COLUMBIA GORGE

The following table was accessed from the Gorge Grown website on November 30, 2018.

Commercial Kitchens in the Gorge				
Kitchen	Address	Contact Info	Rate	Equipment
Clearwater Executive Plaza	220 Clearwater Lane Hood River	Lorena Lowell (541) 386-2005 <a href="mailto:delishdelivered@gmail.com">delishdelivered@gmail.com</a>	\$200/day or \$40/ hr, plus 50% deposit	Pots, pan, mixing utensils, grinder/ blender, packaging equipment, stainless steel sinks, stainless steel table, dishwasher, scale, food processor, microwave, griddle, commercial mixer, convection oven, electric range,  Freezer, cold, & dry storage available for \$20/day
Columbia Gorge Community College Kitchen	400 E. Scenic Dr Suite 2.108 The Dalles, OR	Suzanne Burd <a href="mailto:sburd@cgcc.edu">sburd@cgcc.edu</a>	\$15/ hour	Blogett convection ovens, Hobart mixers, Robot Coupe food processor, 60-gallon, cooker/mixer, refrigerators, freezers, walk-in cooler, dry storage space, bottle-filler, industrial scale, labeling machine, package sealers, demonstration/teaching area, loading/unloading dock
Elk Crossing - Nook of Treasures & Sweets	502 A Street Lyle, WA	Sandra Colleen (509) 365-2022 <a href="mailto:noonoftreasures@gmail.com">noonoftreasures@gmail.com</a>	Negotiable	Stainless steel sinks, meat slicer, dishwasher, scale, microwave, griddle, propane stove
Hood River Armory	1590 12 <sup>th</sup> St. Hood River, OR	Dave Arnold (541) 386-3161	\$125-\$175/ day	This kitchen cannot not be used for production of commercial food products- only be used as a demonstration/teaching kitchen. Commercial dish washer, multi compartment stainless steel sinks, double door refrigerator, single door freezer, industrial gas 4 burner stove and oven, tilt grill and strainer, water boiler, commercial grade mixer (+attachments), heating and cooling tables, dry storage racks, hot table, steam table
Hood River Fairgrounds	3020 Wy'East Rd	Clara Rice (541) 354-2865	\$50/day	Three ovens; one electric and one gas stove, refrigerator/freezer, no pots, pans or other supplies

# APPENDIX C: CGCC COMMERCIAL KITCHEN UTILIZATION REPORT FOR 2018

## Location Utilization

Based on events from 6:00 A.M. to 11:00 P.M., between Jan 01 2018 and Dec 31 2018. There are 6,205.00 total hours in the report period, (O).

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)
Total Possible Hours for Location: 6,086.00	Max	Fill	Reg. Head	Exp. Head	Selected	Hours per	Number of	Total Hours	Contact	Time	Class Seat	Station	Net
Total Blackout Hours: 119	Capacity	Ratio	Count	Count	Head Count	Meeting	Meetings	Used	Hours	Utilization	Utilization	Utilization	Utilization
<b>Commercial Kitchen</b>	<b>30</b>	<b>0</b>											
Big Herm				2	2	4.50	1	4.50	9.00	0.07%	6.67%		
Big Herm's				2	2	6.00	1	6.00	12.00	0.1%	6.67%		
Big Herm's				2	2	12.00	1	12.00	24.00	0.2%	6.67%		
Big Herm's BBQ				2	2	3.00	1	3.00	6.00	0.05%	6.67%		
Big Herm's BBQ				2	2	7.00	1	7.00	14.00	0.12%	6.67%		
Big Herms BBQ					0	8.00	3	24.00	0.00	0.39%	0%		
Blue Zones Week - Cooking Demonstration					0	1.33	1	1.33	0.00	0.02%	0%		
Blue Zones Week - Cooking Demonstration					0	1.33	1	1.33	0.00	0.02%	0%		
Civic Auditorium				5	5	4.00	1	4.00	20.00	0.07%	16.67%		
Class Act Cafe					0	7.00	1	7.00	0.00	0.12%	0%		
Cousin's				2	2	2.00	1	2.00	4.00	0.03%	6.67%		
Google				6	6	8.00	4	352.00	2,112.00	5.78%	20%		
Google				5	5	8.50	1	8.50	42.50	0.14%	16.67%		
Google				2	2	8.50	18	153.00	306.00	2.51%	6.67%		
Google				4	4	8.50	1	8.50	34.00	0.14%	13.33%		
Jon Moch (chef/owner)					0	72.00	1	72.00	0.00	1.18%	0%		
Kiwanis Steak Feed Food prep					0	2.50	1	2.50	0.00	0.04%	0%		
Kiwanis Steak Feed prep					0	2.00	1	2.00	0.00	0.03%	0%		
McManus				2	2	6.00	1	6.00	12.00	0.1%	6.67%		
NWCSD21				7	7	4.00	1	4.00	28.00	0.07%	23.33%		
SBDC				5	5	8.00	1	8.00	40.00	0.13%	16.67%		
SBDC Food Prep				5	5	4.00	1	4.00	20.00	0.07%	16.67%		
SBDC Food Prep				5	5	2.00	1	2.00	10.00	0.03%	16.67%		
WCS					0	3.50	3	10.50	0.00	0.17%	0%		
Wings				4	4	5.00	1	5.00	20.00	0.08%	13.33%		
Wings AAANWS					0	4.00	7	28.00	0.00	0.46%	0%		
Subtract overlap hours:								(0.00)					
Utilization Summary for Location:								738.17	2,713.50	12.13%	7.95%	1.49%	0.18%
											(avg)		

## Location Utilization

### Column A

Total Possible Hours for Location is calculated by taking the total possible hours for the report period (O) defined by the user report parameters and subtracting the total blackout hours for the location during that same time period.

### Column B & C

Maximum Capacity and Fill Ratio are values that may be provided for a location. The location utilization computations cannot be made where Maximum Capacity has not been specified.

### Column D & E

Registered Head Count and Expected Head Count are values that may be provided during event creation or editing. If these values have not been provided, location utilization calculations will not be complete.

### Column F

Selected Head Count is the value used in all subsequent report calculations that require a head count. The selected head count will be the registered head count for an event if defined. If the registered head count is not defined for an event, the selected head count will be the expected head count. If the report parameter (Sum Bound Head Count) is checked, the selected head count will be the sum of all overlapping bound event head counts.

### Column G

Hours per Meeting is the duration in hours for one occurrence of the event. The pad time is added to the event end time and occurrence times are adjusted to fit within the report parameters prior to calculating the duration. When adding the pad time to the end time of an occurrence, the result will not be allowed to overlap any other event in the same location or extend beyond the report end time.

### Column H

Number of Meetings is the number of times this event occurs during the report period.

### Column I

Total Hours Used is the total number of hours for all occurrences of this event during the report period. This is the product of (column G), Hours per Meeting, and (column H), Number of Meetings.

### Column J

Contact Hours is the product of (column I), Total Hours Used, and (column F), Selected Head Count.

### Column K

Time Utilization is the percentage of hours that the location is used for this event during the report period compared to the total hours for the location in the report period. This is the quotient of (column I), Total Hours Used, divided by (column A), Total Hours for Location. This value is expressed as a percentage.

### Column L

Class Seat is the percentage of seats used for each occurrence of an event compared to the Maximum Capacity of the location. Class Seat Utilization is calculated by taking (column F), Selected Head Count, divided by (column B), Maximum Capacity, multiplied by 100. This value is expressed as a percentage.

### Column M

Station Utilization is the percentage of actual total contact hours compared to the total contact hours possible for the location during the Report Period. The total possible contact hours is the (column B), Maximum Capacity, multiplied by (column A), Total Hours for Location. This value is expressed as a percentage.

### Column N

Net Utilization is the product of Time Utilization and Station Utilization. This value is expressed as a percentage.

### Column O

The Total Hours per Report Period (O) is computed from the date and time range entered when the report was printed.