2019 Workforce Assessment of Michigan's Local and Regional Food System

Workforce education and training opportunities

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MICHIGAN STATE UNIVERSITY | Center for Regional Food Systems

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Racial equity statement of MSU Center for Regional Food Systems

CRFS recognizes that racism in the food system is historic, ongoing, and systemic. As we collaborate with partners to advance food systems rooted in local regions and centered on food that is healthy, green, fair, and affordable, we emphasize racial equity as a foundation of our work. Read the Racial Equity Statement of the MSU Center for Regional Food Systems to learn more: foodsystems.msu.edu/racial-equity-statement

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Executive Summary

This report is the fourth in a series summarizing a 2019 workforce assessment of Michigan's local and regional food system, looking specifically at workforce and training opportunities.

The local and regional food system can be defined in a number of ways. For the purposes of this study, the local and regional food system encompasses organizations that produce, process, or distribute food from Michigan that is available to Michigan consumers and/or organizations that support this system.

The project research included:

- **A scan of Michigan's food system jobs.** We collected and analyzed secondary labor market data to identify local and regional food systems employment; demand; projected growth; median wages; and worker demographics.
- **An employer's perspective of Michigan's local and regional food system workforce.** This included:
  - Surveying employers to better understand employment and skill shortages and critical factors related to current and future workforce demand, and
  - Interviewing local and regional food system stakeholders to complement the survey data to better understand the current and future mix of jobs, potential career pathways, and availability of and gaps in education and training needs.
- **A scan of education and training opportunities in Michigan's local and regional food system.** From this, we created an inventory of education and training programs for local and regional food system jobs.

Michigan's local and regional food system workforce education and training scan

The Michigan local and regional food system education and training scan showed a notable gap in food system educational opportunities at the K-12 level, given that the labor market data and employer feedback suggested many food system jobs require only a high school diploma (55%) or no more than two years of experience (44%).

Education and training needs were identified by local and regional food systems businesses in a survey conducted in 2019[1] as part of the larger workforce assessment. Survey respondents suggested the areas of greatest training needs include:

- **Customer relations/customer service** for warehouses, storage and distribution, and retail and food service businesses.
- **Day-to-day operations, food handling, safety procedures, and sales and marketing** across all business sectors. Sales and marketing training was especially needed in food processing.

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[1] Barry, J., La Prad, J., Hughes, A., Freeman, M., Wojciak, K., Bair, R., Pirog, R. (2019). *2019 Workforce assessment of Michigan's local and regional food system: Developing Michigan's local and regional workforce: Challenges and opportunities identified by surveying business owners.* Michigan State University Center for Regional Food Systems. https://foodsystems.msu.edu/resources/2019-workforce-assessment-employer-survey

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- **Machine operation, organic farming, safety procedures, animal handling, and trade skills training** for food production business operations.

Alongside the education and training scan report,[2] a directory of 789 local and regional food system education and training opportunities in Michigan is to be published.[3] A summary of this directory that highlights the number of education opportunities in each Michigan county, grouped by career pathway, can be found in Appendix A in the full report. Appendix B in the full report shows examples of occupations and the related training programs in each career pathway.

The Corporation for a Skilled Workforce (CSW) collected data on 744 Michigan-based education and training programs related to food systems. Industry-recognized certificates made up the highest concentration of credential type (240). These certificates are most commonly awarded by community colleges or technical schools. Food systems input and services had the greatest number of programs by career pathway sector due to the diverse nature of this category.

A high school diploma or vocational training were the most requested education types (55%) in job posting data. Survey data showed that 58% of local and regional food systems employer respondents require at least a high school diploma for their entry-level roles. Labor market data appeared to validate these findings, when analysis of 207 Standard Occupational Classification (SOC) occupations in food systems showed that 71% require no formal credential or a high school diploma.[4]

As might be expected, the geographic concentration of training programs for local and regional food systems is higher in densely populated areas of Michigan.

There were four key observations in this education and training scan:
- There are gaps, and thus opportunities, at the secondary education level to improve education and training for the workforce. We observed a notable gap in local and regional food system education opportunities at the K-12 level, given that the labor market data and employer feedback suggest that many local and regional food system jobs hire people with a high school diploma or vocational training (55%) and no more than two years of experience (44%).

- There are gaps, and thus opportunities for training, in wholesale food distribution, supply chain logistics, inventory management, storage, and food processing and manufacturing.

- Not all trainings offered had a specific focus on local and regional food systems in food system curriculum. Trainings such as culinary, agri-science, retail sales, and equipment maintenance were less likely to contain education with a specific local and regional food focus but were documented due to the transferability of skills. Further curriculum review would be valuable to more accurately assess the local and regional focus of the programs.

- There appear to be gaps in geographical coverage of training opportunities across Michigan. Our analysis showed very limited youth programming and education opportunities in the Upper Peninsula of Michigan. In general, the northeast and central/east portion of Michigan's Lower Peninsula appear to lack opportunities in food systems education and training. The more highly populated areas in Michigan are home to a higher density of education and training programs.

[2] Barry, J., La Prad, J., Hughes, A., Freeman, M., Wojciak, K., Bair, R., Pirog, R. (2019). *2019 Workforce Assessment of Michigan's Local and Regional Food System: Workforce education and training opportunities.* Michigan State University Center for Regional Food Systems. https://foodsystems.msu.edu/resources/2019-workforce-assessment-education-scan
[3] Directory forthcoming at https://foodsystems.msu.edu/michigan-food-workforce
[4] Emsi. (2018). *Traditional Labor Market Information* [Data set]. https://www.economicmodeling.com/data/

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Opportunities and recommendations to develop the local and regional food system education and training opportunities for the state of Michigan are described in the full report.

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Introduction

Michigan's local and regional food system development work is designed to improve lives and provide equitable outcomes for all. It is rooted in communities, and through those communities seeks:

- Improved health through better healthy food access, and
- Economic development through increased sales for Michigan businesses and better jobs.

Local and regional food system development in Michigan has centered on building collaborative infrastructure around the goals of the Michigan Good Food Charter,[5] a document that provides a roadmap for health and economic development outcomes. As this work has progressed, it has become increasingly important to understand the workforce behind local and regional food systems and how to ensure that workforce grows and develops.

Availability of quality jobs is critical to improving communities and the economy. Of Michigan's nearly 4 million households, 14% are below the Federal Poverty Level.[6] Over 1 million (29%) of Michigan's households are categorized as Asset Limited, Income Constrained Employed (ALICE), people who work to make a living but still have insufficient income to make ends meet.[6] To make ends meet, the Michigan ALICE report identifies that a single adult needs to earn $21,036 and a family of 4 (2 adults, 1 infant and 1 preschooler) needs to earn $61,272 to be above the ALICE bracket.[6]

Alongside the need for quality jobs is the need to have communities trained and qualified to fill those jobs. This research reviewed available jobs and training opportunities. We identified potential training gaps and sought to better understand how people are employed in local and regional food system and what their training and educational opportunities are.

Michigan State University (MSU) Center for Regional Food Systems (CRFS), collaborated with Kalamazoo Valley Community College (KVCC), MSU Extension (MSUE) and a Corporation for a Skilled Workforce (CSW) to examine the local and regional food system workforce landscape in Michigan and the education and training needs for growth.

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[5] Colasanti, K., Cantrell, P., Cocciarelli, S., Collier, A., Edison, T., Doss, J., George, V., Hamm, M., Lewis, R., Matts, C., McClendon, B., Rabaut, C., Schmidt, S., Satchell, I., Scott, A., Smalley, S. (2010). *Michigan Good Food Charter*. Michigan State University Center for Regional Food Systems. https://www.canr.msu.edu/resources/michigan-good-food-charter
[6] Michigan Association of United Ways. (2019). *ALICE in Michigan: A financial hardship study.* (2019 Michigan Report). http://www.uwmich.org/alice

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Other agriculture and food workforce assessment studies have been conducted across the country, including Michigan,[7,8] Washington,[9] Massachusetts,[10] Vermont,[11] Kansas,[12] and California.[13] A study specifically of the local and regional food system workforce was completed in Massachusetts[6] and Vermont.[7]

This paper is the fourth of a series of publications and webinars that report on our Michigan findings. This report provides an overview of the research methods and findings. Subsequent reports will provide more detail in each of the research areas.

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[7] Michigan Workforce Development Agency. (2013). *Agriculture Cluster Workforce Analysis.* https://milmi.org/Portals/198/publications/Cluster2013/Cluster_Agriculture.pdf

[8]Michigan Workforce Development Agency. (2014). *2014 Cluster workforce updates – Agriculture.* https://milmi.org/Portals/198/publications/ClusterUpdates2014/ClusterUpdates_Agriculture.pdf

[9] Economic Security Department Washington State. (2017) *2017 Agricultural Workforce Report.* https://esdorchardstorage.blob.core.windows.net/esdwa/Default/ESDWAGOV/labor-market-info/Libraries/Industry-reports/Annual-Ag-Report/2017%20Agricultural%20Workforce%20Report.pdf

[10] Massachusetts Food Policy Council. (2015). *Massachusetts Local Food Action Plan.* https://mafoodsystem.org/plan

[11] Tippett, H., & Meunier, W. (2013). *Charting a Path: Food system workforce needs assessment.* https://www.vtfarmtoplate.com/assets/resource/files/Charting%20a%20Path_03_18_13.pdf

[12] Kansas Department of Agriculture. (2015). *Workforce Needs for the Agriculture Industry in Kansas.* https://agriculture.ks.gov/docs/default-source/default-document-library/2015-kda-workforce-needs-assessment-survey-final-report.pdf?sfvrsn = 0.

[13] Sacramento Area Council of Governments. (2016). *Food and Agriculture: Cluster and workforce needs assessment — Sacramento Capital Region.* https://www.sacog.org/sites/main/files/file-attachments/coe-los_rios_food_and_ag-web.pdf

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Goals and objectives

The goal of the assessment was to better understand the landscape of the local and regional food system workforce in Michigan and to seek possible gaps and opportunities in education and training.

CSW was contracted to collect and report on data under the direction of a steering committee composed of staff from CRFS, KVCC and MSUE.

The project research included:

- **A scan of Michigan's food system jobs.** We collected and analyzed secondary labor market data to identify local and regional food systems employment; demand; projected growth; median wages; and worker demographics.

- **An employer's perspective of Michigan's local and regional food system workforce.** This included:
    o Surveying employers to better understand employment and skill shortages and critical factors related to current and future workforce demand, and
    o Interviewing local and regional food system stakeholders to complement the survey data to better understand the current and future mix of jobs, potential career pathways, and availability of and gaps in education and training needs.

- **A scan of education and training opportunities in Michigan's local and regional food system.** From this, we created an inventory of education and training programs for local and regional food system jobs.

The CSW team used primary data collected from employers, workers, educators/training providers, and other relevant stakeholders within Michigan's local and regional food system in the spring of 2019. In addition, they collated secondary data sets and information from sources including Emsi[14] and Burning Glass Technologies.[15]

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[14] Emsi. (2019). Emsi 2019.2 – QCEW Employees, Non-QCEW Employees, and Self-Employed dataset. https://kb.economicmodeling.com/whats-the-complete-list-of-sources-emsi-uses-2/?hilite=%27data%27%2C%27sources%27

[15] Burning Glass Technologies. (2019). *Proprietary Dataset.* https://www.burning-glass.com/products/research-projects

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Defining the local and regional food system

Local and regional food systems can be defined in a number of ways. For the purposes of this workforce assessment study, the local and regional food system encompasses organizations that produce, process, and/or distribute food from Michigan that is available to Michigan consumers and/or organizations that support this system.

- *Produced* refers to crops grown or animals raised in Michigan.
- *Processed* refers to food products processed or manufactured in Michigan using primarily Michigan-produced foods.
- *Distributed* goods are ones that originate in Michigan but may cross state boundaries.
- *Consumption* is the end point for Michigan food products. Consumers can be individuals, households, or institutions. These consumers do not need to be in Michigan, but the majority should be in the Upper Great Lakes region.

The purpose of this definition was to provide boundaries for this work. It was created by CSW, MSU CRFS, MSUE, and KVCC.

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Core industries within the local and regional food system

This workforce assessment as a whole looked at the key occupations within five industry groups that make up the food system: food production, farm inputs, food manufacturing and processing, wholesale distribution, and food retail sales. A mix of current employment statistics was used to conduct the analysis.

Our sources included:

- Economic Modeling Specialist, Inc.'s (Emsi) 2019.2 – QCEW Employees, Non-QCEW Employees and Self-Employed datasets
- Job posting data from Burning Glass Technologies' proprietary dataset

When using labor market data, we sought data from core industries associated with local and regional food. Bureau of Labor Statistics North American Industry Classification System (NAICS) codes for these core industries were used to pull available labor market data from Emsi[16] and Burning Glass Technologies.[17] The selection of core industries was supported and influenced by food systems literature, including MSU's "A Replicable Model for Valuing Local Food Systems,"[18] Vermont's Farm to Plate Strategic Plan (Chapter 2, "Getting to 2020: Goals and Indicators"),[19] the Michigan Good Food Fund,[20] and the Michigan Department of Agriculture and Rural Development.[21]

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[16] Emsi. (2019). Emsi 2019.2 – QCEW Employees, Non-QCEW Employees, and Self-Employed dataset. https://kb.economicmodeling.com/whats-the-complete-list-of-sources-emsi-uses-2/?hilite=%27data%27%2C%27sources%27

[17] Burning Glass Technologies. (2019). *Proprietary Dataset.* https://www.burning-glass.com/products/research-projects
[18] Miller, R., Mann, J., Barry, J., Kalchik, T., Pirog, R., & Hamm, M. (2015) A Replicable Model for Valuing Local Food Systems. *Journal of Agricultural and Applied Economics, 47*(4). https://doi.org/10.1017/aae.2015.19

[19] Vermont Farm to Plate. (2013). *Jobs and Establishments. In Vermont's Farm to Plate Strategic Plan* (Chapter 2). https://www.vtfarmtoplate.com/getting-to-2020/17-jobs-and-establishments

[20] Michigan Good Food Fund. http://migoodfoodfund.org/about
[21] Michigan Department of Agriculture and Rural Development. (2016). Michigan's Food & Agriculture Industry. https://www.michigan.gov/documents/mdard/MDARD_Food__Ag_Brochure_2016_553426_7.pdf

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Description	NAICS Code	Industry
Food production	111	Crop production
	112	Animal production and aquaculture
	114	Fishing, hunting, and trapping
Farm inputs	1151	Support activities for crop production
	1152	Support activities for animal production
	54194	Veterinary services
Manufacturing and food processing	311	Food manufacturing
	3121	Beverage manufacturing
Wholesale distribution	4244	Grocery and related product merchant wholesalers
	4245	Farm product raw material merchant wholesalers
	42491	Farm supplies merchants wholesalers
	49312	Refrigerated warehousing and storage
	49313	Farm product warehousing and storage
Retail and service	4451	Grocery stores
	4452	Specialty food stores
	4453	Beer, wine, and liquor stores
	7223	Special food services (*e.g.,* catering and mobile food truck/carts)
	7225	Restaurants and other eating places

Allied industries associated with the local and regional food system also were included. These allied industries are important to food systems but are not directly involved in the lifecycle of a food product. Many allied industries also are mentioned in the literature (including the Vermont career pathways report[22]) and include:

- Waste Management and Food Recovery
- Education and Training Providers
- Advocacy Groups
- Farm Equipment/HVAC/Cooling Repair Services
- Regulation of Agricultural Marketing and Commodities (food inspection)
- Community Food Services (*e.g.,* food banks, social services)
- Financial Institutions (*e.g.,* agriculture-specific lenders)
- Large allied consumers, including schools, hospitals, residential facilities, prisons, and other institutions

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[22] Tippett, H., & Meunier, W. (2013). *Charting a Path: Food system workforce needs assessment.* https://www.vtfarmtoplate.com/assets/resource/files/Charting%20a%20Path_03_18_13.pdf

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Employers' perspectives on Michigan's local and regional food system workforce

Education and training needs were identified by local and regional food systems businesses in a survey conducted in 2019[23] as part of a larger workforce assessment.

To summarize, survey respondents were asked to rank their current training needs from a list of common food system skills (Figure 1). The areas of greatest training needs include:

- **Customer relations/customer service** for warehouses, storage and distribution, and retail and food service businesses.

- **Day-to-day operations, food handling, safety procedures, and sales and marketing** across all business sectors. Sales and marketing training was especially needed in food processing.

- **Machine operation, organic farming, safety procedures, animal handling, and trade skills training** for food production business operations.

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[23] Barry, J., La Prad, J., Hughes, A., Freeman, M., Wojciak, K., Bair, R., Pirog, R. (2019). *2019 Workforce assessment of Michigan's local and regional food system: Developing Michigan's local and regional workforce: Challenges and opportunities identified by surveying business owners.* Michigan State University Center for Regional Food Systems. https://foodsystems.msu.edu/resources/2019-workforce-assessment-employer-survey

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Figure 1. Training Needs by Skill and Sector (Average Score provided by Survey Respondents; *n* = 94)
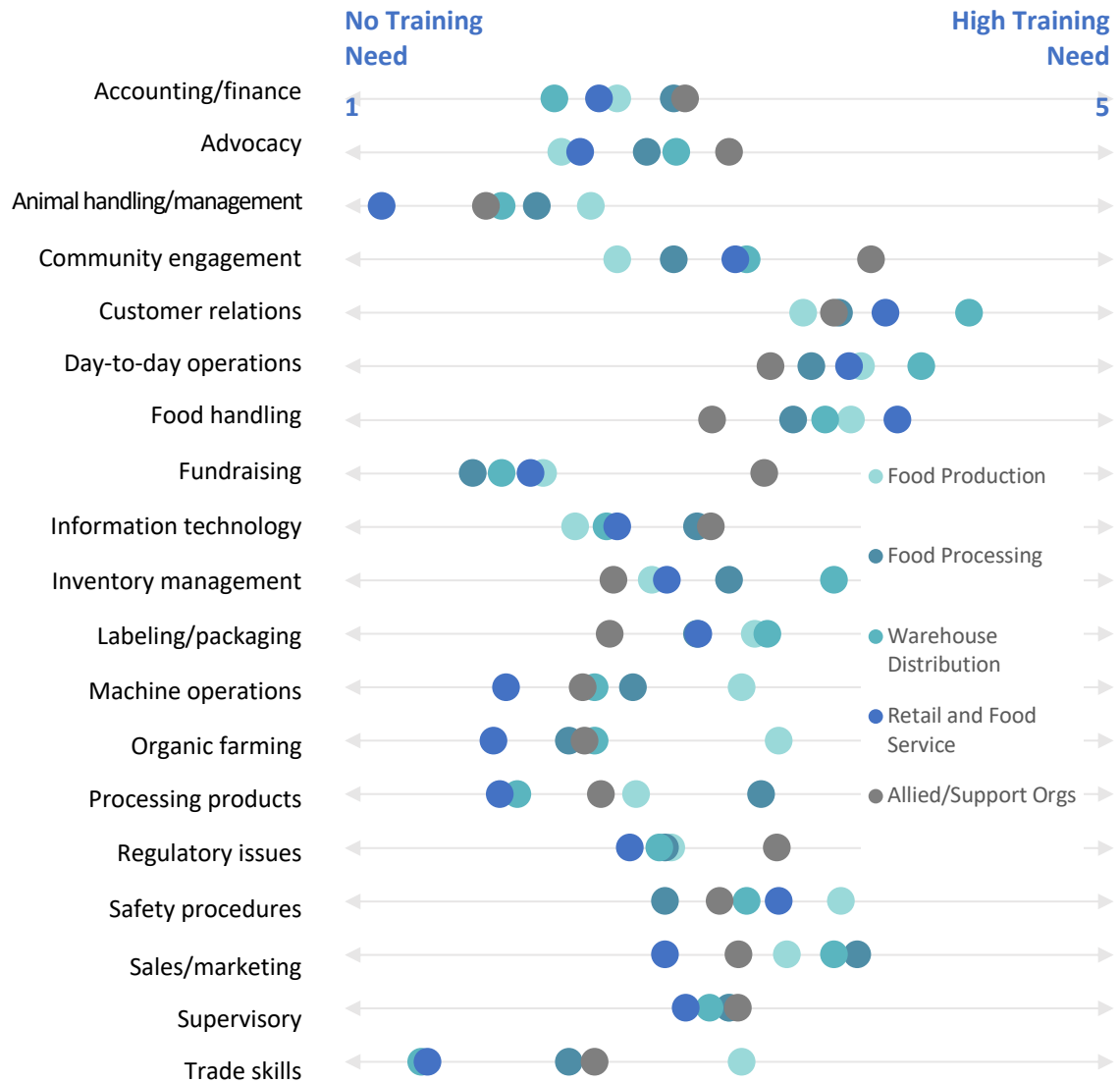
As shown in Figure 2, no respondents in the survey listed either an industry credential or a graduate degree as an educational requirement at any level of employment in current job openings (*n* = 103). The majority of entry-level roles require at least a high school diploma (58%). From Figure 2 we see that in job openings by the employers surveyed, the level of education required rises with the seniority of the role. Across the seniority levels, however, approximately 20% to 23% of survey respondents do not have any formal education requirements for their organization's roles.

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Figure 2. Typical Education Requirements in Current Local and Regional Food System Job Openings (*n* = 103)

Legend: ■ High school ■ Associates ■ Bachelors ■ No Educational Requirement

Role	High school	Associates	Bachelors	No Educational Requirement
Senior level role	11%	10%	59%	20%
Mid level role	24%	33%	21%	22%
Entry level role	58%	4%	15%	23%

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A scan of Michigan's education and training opportunities for the local and regional food system

In addition to surveying and interviewing employers on education and training needs, CSW collected data on 789 Michigan-based education and training programs related to food systems. Where possible, researchers documented programs that were focused specifically on the local and regional food system.

Identifying regionally tailored programs was difficult due to limitations in the capacity to review individual course curriculum. The programs we identified range from after-school youth programs, such as 4-H, to workforce training and certificate and degree programs at community colleges and four-year universities. Figure 3 summarizes the number of education and training programs by career pathway and by level of education.

A directory of the local and regional food system education and training opportunities we looked at in Michigan will be published separately from this report.[24] A summary of this directory highlighting the number of education opportunities in each Michigan county, grouped by career pathway, can be found in Appendix A.

The career pathways were defined as follows:

- **Food inputs and services:** occupations that support services or resources used as inputs in the food system.
- **Food production:** occupations involved in the growing and raising of foods.
- **Food processing or manufacturing:** roles involved in the processing of raw food and the manufacturing of food products.
- **Wholesale food distribution or storage:** the large-scale sales of regional food, as well as the storage, transportation, and supply chain within the food system.
- **Retail food distribution:** sales and distribution of food directly to individual consumers in a retail setting.
- **Consumer demand and marketing:** the building of brand and awareness of food system products.
- **Food preparation and service:** the preparation, cooking, and serving of food.
- **Healthy food access and health management:** occupations that support nutrition and health, as well as promote and coordinate access to food for individuals or institutions.
- **Natural resource management:** the management of food system waste, or the quality, conservation, and/or preservation of the natural resources required in food production.

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[24] Directory forthcoming at https://foodsystems.msu.edu/michigan-food-workforce

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Figure 3. Local and Regional Food Systems Education and Training Programs by Career Pathway and Credential Type

Career pathway	K-12	Workforce training*	Industry-recognized certificate	Associate degree	Bachelor's degree	Graduate degree (master's or doctorate)	Other**	Total
Food system inputs & services	1	2	89	72	82	39	16	301
Food production	43	12	18	20	14	8	1	116
Food processing & manufacturing			37	22	8	1		68
Retail food distribution			9	18	1	2		30
Food access & health management			1	2	14	15	3	35
Food preparation & service	6	5	44	41	15	1		112
Wholesale food distribution & storage			27	10				37
Natural resource management			9	10	15	13	4	51
Advocacy & public policy			5	4	4	1	1	15
Consumer demand & marketing			3	12	3	1		19
Financing and technical assistance		3		2				5
Total	50	22	242	213	156	81	25	789

*Workforce training provided by non-academic institutions that may not result in an industry-recognized certificate
**Includes post-baccalaureate certificates and apprenticeships

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Industry-recognized certificates made up the highest concentration of credential type (242). These certificates are most commonly awarded by community colleges or technical schools. The length of certificate trainings depends upon the unique program and could range from a few months to up to two years. Two-year associate degrees were the second most common credential type (213 programs), followed by bachelor's programs (156), and graduate degrees (81). These figures may include the same program being offered at multiple sites, with each site counted individually.

Food Systems Input and Services had the greatest number of programs by career pathway sector due to the diverse nature of this category. This career pathway grouping encompasses all the supportive services and resource inputs that facilitate the food system from veterinary services to soil preparation to machine maintenance. The technical nature of these careers also could explain the high number of formal training opportunities in this sector.

Three years of job posting data from Burning Glass Technologies[25] shows a high school diploma or vocational training was the most requested education level (55%) by employers (Figure 4) but that some employers (up to 45%) are looking for a higher level of postsecondary education. Survey data (Figure 2) showed that 58% of local and regional food systems employer respondents require at least a high school diploma for their entry-level roles. Labor market data validates the survey findings and the job posting data; analysis of 207 SOC occupations in food system industries showed 71% require no formal credential or required a high school diploma as their highest educational credential.[26] In the same analysis, 26% typically required an associate degree or higher.[26] The rest typically required a short-term postsecondary certificate/credential. Roles requiring more education than a high school diploma included jobs such as chemical engineers, veterinarians, food scientists, or accountants.

There are limitations in the job posting data used. Burning Glass's data is sourced from online job postings and may not capture all job vacancies in the food system. For example, survey respondents often cited employee referrals or word of mouth as how they commonly source workers. This may be truer in food production, which had a lower sample in the job posting data (*n* = 136), 51% of which requested a bachelor's degree (Figure 5). Beyond data limitations, higher educational credentials in job postings may reflect an employer's aspirational desire for candidate qualifications or perhaps a shift toward formal credentials not yet reflected in current employment data.

Regardless of education, most job postings do not require more than five years of previous work experience.

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[25] Burning Glass Technologies. (2019). *Proprietary Dataset.* https://www.burning-glass.com/products/research-projects
[26] Emsi. (2018). *Traditional Labor Market Information*. https://www.economicmodeling.com/data/

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Figure 4. Education and Levels of Experience Requested in Food System Industries

Legend:
- 9+ years of experience
- 6 to 8 years of experience
- 3 to 5 years of experience
- 0 to 2 years of experience

Categories (bottom to top):
- High school or vocational training: 11%, 44%
- Bachelor's degree: 2%, 15%, 11%
- Associate degree: 3%, 7%
- Master's degree
- Doctoral degree
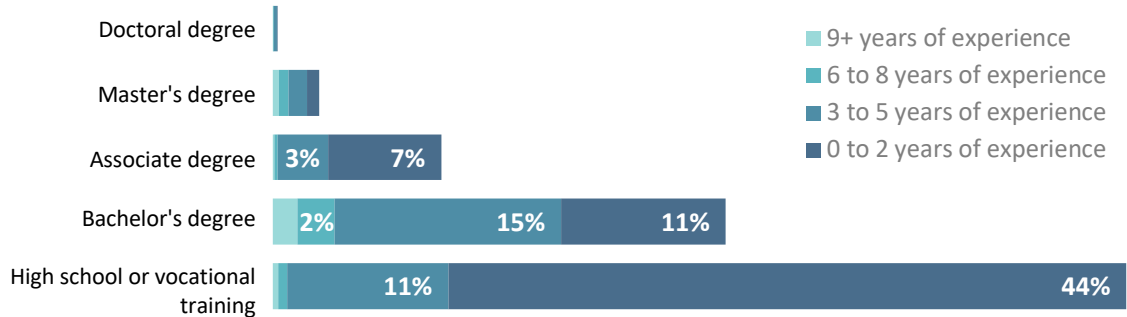
Note: N = 36,505; Burning Glass Technologies 2016-2018

Figure 5. Proportion of Job Postings by Industry Sector That Require a Bachelor's Degree

- Food production & inputs: 51%
- Manufacturing & processing: 34%
- Warehousing & distribution: 30%
- Food retail: 30%
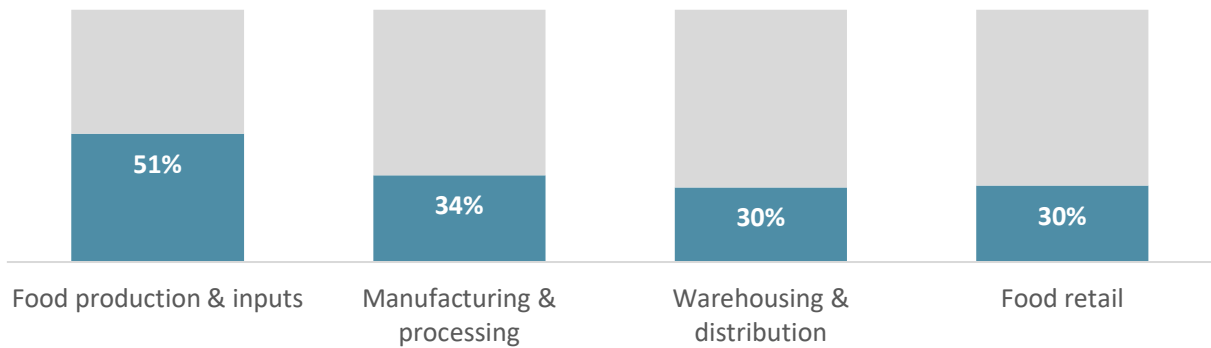
Note: n = 11,397; Burning Glass Technologies 2016-2018

Figure 6 shows that the geographic concentration of training programs for local and regional food systems is higher in densely populated areas of Michigan. As might be expected, northeastern lower Michigan and the Upper Peninsula have fewer counties with training programs. Wayne County (metro Detroit) and Ingham County (Lansing area) have the highest concentrations of education and training programs. Offering online resources to reach areas where the population is less dense should be a consideration in increasing the accessibility of programs.

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Figure 6. Concentration of Local and Regional Food Systems Training Programs by County and Qualification

K-12

Certificate

Associate degree

Bachelor's degree

# of programs

1   116

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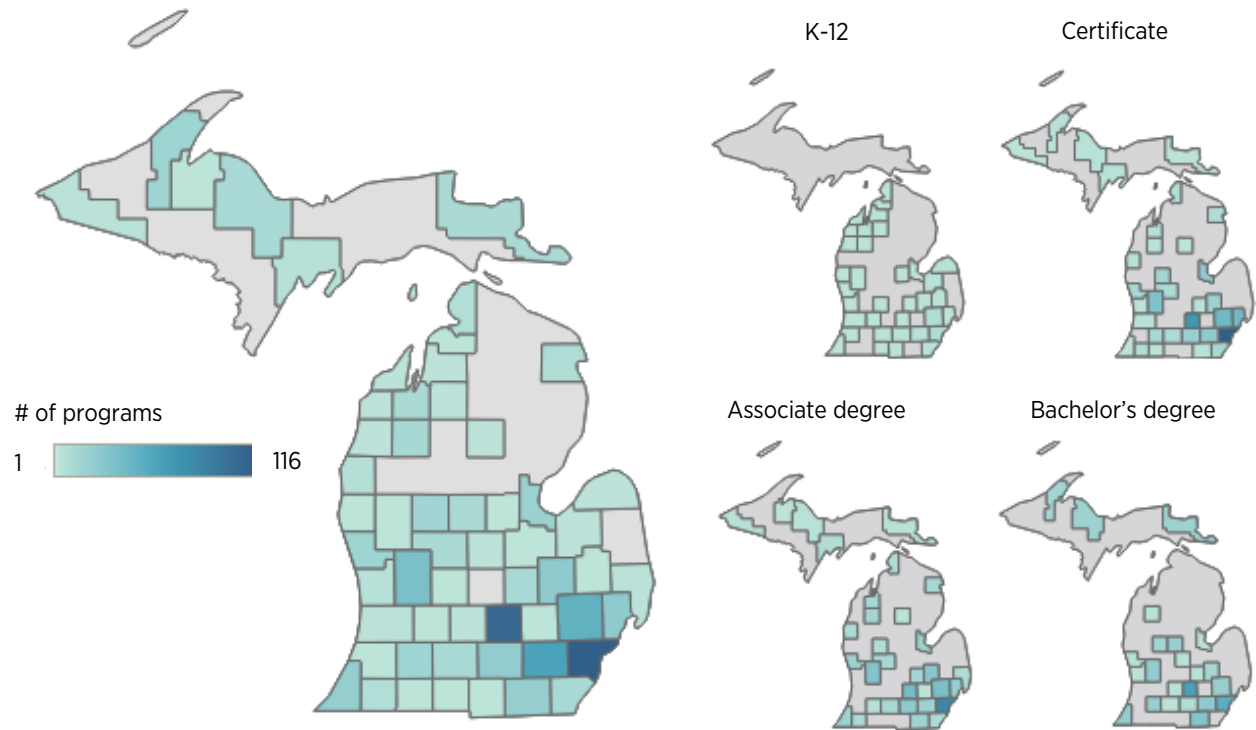
Key observations

Gaps and opportunities at the secondary education level

We observed a notable gap in food system educational opportunities at the K-12 level, given that the labor market data and employer feedback suggested many local and regional food system jobs do not require more than a high school diploma (55%) and/or more than two years of experience (44%) (Figure 3). This indicates that food systems programs aimed at youth are ideal to prepare individuals with the skills they will need to enter a food system career.

It is necessary to look more closely at career and technical education (CTE) programs provided by different school systems at the K-12 level to see where and how any of this training supports learning about the regional food system and the respective career pathways. A few interviewees suggested there is a big emphasis on high tech and manufacturing CTE programs, but none knew of food CTE programs.

Secondary (K-12) educational opportunities appear to be limited to careers within food production and food preparation. The most common programs in these categories include gardening/farming and culinary arts. It also was reported that some high school agriculture programs go into production, but not into enough depth for all the different fields in agriculture.

Several stakeholders mentioned that students are not introduced to food processing in high school, resulting in educators and employers finding it difficult to recruit people into training programs and the field. While many culinary programs in the state give students tools to be a baker or to work in a restaurant, for example, equivalent skills are lacking for food processing. Food processing programs could build upon existing culinary training and use facilities that are already available.

Youth programs — including K-12, CTE, and after-school programs — also appear to be concentrated in southeastern Michigan. We found no local and regional food system youth programming in the Upper Peninsula (Figure 8). Some of this may be due to the difficulty in finding reliable information on youth programs, and it would be worth exploring this further.

The initial inventory conducted in this study shows a heavy concentration of postsecondary programs. These types of programs are more easily identifiable in publicly available datasets, which highlights the limitations of gathering information on youth-serving programs provided by nonprofit organizations, K-12 academic institutions, and non-academic institutions.

The forthcoming directory of education and training opportunities will illustrate the number of education opportunities in each county and career pathway.

Gaps and opportunities for training in wholesale food distribution, storage, and food processing and manufacturing

Training programs for wholesale food distribution and storage appeared limited to vehicle operations, such as classes in heavy truck driving. Beyond transportation, supply chain logistics, inventory management, and cold storage are areas important to the food system where relevant training opportunities are limited. Food processing and manufacturing also have a low number of associated

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trainings. In the interviews and survey,[27] employers and food systems experts cited a need for processing skills and specific training, coaching, and mentoring, with a lack of training opportunities available to meet that need. Others noted there is a need for education and training for small restaurants and food processors to grow and scale up. In addition to a mix of access to land/space and small business financing, these businesses require technical assistance and training.

The focus of curriculum on local and regional foods

Much of the training provided in food production by nonprofit institutions had a definite focus in local and regional foods, while training in sectors such as culinary sciences and agri-sciences were less likely to have a specific local and regional food system focus. Training in sectors such as retail sales and equipment maintenance was not guaranteed to have any focus in food systems; however, we documented these due to the transferability of these skills into the many local and regional food system careers. Project constraints limited the ability to review the individual curriculums for each training program in the inventory, particularly the postsecondary trainings sourced from secondary datasets. Further curriculum review may be needed to more accurately assess the local and regional focus of these programs. If gaps arise, this may be an area of opportunity for new training development tailored to the local and regional food system.

Allied sectors such as finance, education, and advocacy also were unlikely to be tailored to the food system in general and less so to local and regional food. For this reason, they were excluded from deeper analysis.

Gaps in geographical coverage

The counties with large universities have the greatest concentration of education and training programs related to food systems career pathways. Wayne County — with several community colleges and universities throughout metro Detroit — had the highest concentration of programs, with 116. Ingham County, home of Michigan State University, had 107 food system-related training opportunities; however, even though measures were taken to fix incorrect categorization, there may be some overstatement here if MSU Extension programs offered elsewhere were miscategorized to Ingham County. After MSU, Washtenaw County, home of the University of Michigan, had the next highest concentration of programs, with 59. A more detailed list of program offerings in each county (summarized by the career pathway category) is found in Appendix A.

K-12 and youth programs are overrepresented in the southeast part of the state. Certificate programs followed by associate degree programs had a more diverse distribution across the state. In general, the northeast and central/east portion of Michigan's Lower Peninsula appears to lack access to education and training.

Appendix B shows examples of occupations and the related training programs in each career pathways category. This appendix only represents examples of commonly occurring education programs; for the full list please see the education and training program inventory directory.[28]

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27 Barry, J., La Prad, J., Hughes, A., Freeman, M., Wojciak, K., Bair, R., & Pirog, R. (2019). *2019 Workforce assessment of Michigan's local and regional food system: Developing Michigan's local and regional workforce: Challenges and opportunities identified by surveying business owners.* Michigan State University Center for Regional Food Systems. https://foodsystems.msu.edu/resources/2019-workforce-assessment-employer-survey
28 Directory forthcoming at https://foodsystems.msu.edu/michigan-food-workforce

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Recommendations and opportunities for action

During interviews conducted for the 2019 Michigan local and regional food system workforce assessment, CSW asked Michigan food system educators, planners, and other professionals for their ideas about how to close some of the gaps in education, training, and workforce development. Recommendations from food system stakeholders in Massachusetts and Vermont also were reviewed.[29,30]

Recommendations include:

- **Expand training and support services for targeted areas of the local and regional food system**. Possible examples:
    - o Further define employer workforce needs within specific communities and work with community and statewide educators to deliver appropriate training and career counseling.
    - o Develop new program content, accelerated learning options, and more apprenticeship, internship, and cooperative hands-on learning experiences. This could include giving academic credit for work experience, developing assessments for testing out of courses (e.g., prior learning assessments), and removing age constraints on education.
- **Develop solutions in partnership with business to help meet hiring, retention, and training needs.** Possible examples:
    - o Design, develop, and deliver a competency-based curriculum, and coordinate a credentialed training program that addresses employer interests across the local and regional food system for all levels of personnel. Promoting a program in high schools with a successful model such as that of MAT2, Michigan's advanced technology training program,[31] where students can get both classroom instruction and on the job training to enter the workforce in high schools, would be of value.
    - o Some study respondents suggested a new public job/labor exchange focused solely on Michigan food and agriculture career information and job postings.
- **Provide better information about food system jobs, career pathways, and education and training opportunities.** Possible examples:
    - o Develop and implement a communications strategy including education, outreach, recruitment, internships, and web-based tools to grow and sustain an interest in jobs across the food system and agriculture industry.
    - o Create a better career pathways data system for education and career development that can be used practically for industry, education institutes, government organizations, and the potential and existing workforce.
- **Form cross-sector partnerships to improve food system job readiness, access, and quality.** Possible examples include:
    - o Improve and strengthen the knowledge base and role of guidance and career counselors to help students identify and pursue careers in the food system.

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[29] Massachusetts Food Policy Council. (2015). *Workforce Development, Education, Training, and Employment Analysis*. https://mafoodsystem.org/static/plan/pdfs/appendicies.pdf
[30] McCarty, E., and the Vermont Farm to Plate Network Career Profiles Task Force. (2019). *Exploring Food System Careers.* https://www.vtfarmtoplate.com/assets/resource/files/ExploringFoodSystemCareers.pdf
[31] MAT2 Michigan Advanced Technician Training Program. https://www.mitalent.org/mat2

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- o Establish regular, coordinated meetings between business owners and educators and between secondary and postsecondary school administrators for greater sharing of resources (e.g., model curriculum) between high schools and CTE institutions, and a "rebranding" of food system career opportunities to address misperceptions about food systems jobs.
- **Integrate business assistance, workforce development support, and training for food systems businesses.** Possible examples include:
    - o Promote establishment of employer identification programs such as a "Preferred Employer" program that supports employers in recruitment services and training. This could be a partnership established between the Michigan Department of Agriculture and Rural Development (MDARD) and industry.
    - o Address labor gaps by tapping nontraditional sources of talent, using existing, proven employment models and creating new ones. These labor sources include disadvantaged/at-risk youth and adults, people with disabilities, refugees, immigrants, veterans, returning citizens, people receiving public assistance, and others.

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Appendix A

Number of Education Programs in Each County by Career Pathway Category

County	Food preparation and service	Food processing or manufacturing	Food production	Food systems inputs and services	Natural resources	Retail food distribution	Wholesale food distribution or storage	Consumer demand or marketing	Food access and health management	Advocacy and public policy	Financing and technical assistance	Total
Allegan	1	1	1									
Alpena	1	1		4	1	1						8
Antrim			2									
Baraga				1								1
Barry			1									
Bay		1	1	10	2	2		2				18
Benzie			2									
Berrien	1		10	4					6			21
Branch			1									
Calhoun	1	2	2	6						2		13
Cass			4	3								
Charlevoix			1									1
Chippewa		2	1	4	3							
Delta			1	1	4							6
Eaton				2								
Emmet			5			1	1					7
Genesee	6	3	1	8	2	1	3	1				
Gogebic					2	1						3
Grand Traverse	3	2	6		1							
Gratiot				2								2
Hillsdale			1									
Houghton				8	8							16
Huron	1		1									
Ingham	2	2	29	46	11	9		2	5	3	4	113
Ionia			1									

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County	Food preparation and service	Food processing or manufacturing	Food production	Food systems inputs and services	Natural resources	Retail food distribution	Wholesale food distribution or storage	Consumer demand or marketing	Food access and health management	Advocacy and public policy	Financing and technical assistance	Total
Isabella	1	1		4	2		2		2	1		13
Jackson	9	4	2	4		3	3	1				26
Kalamazoo	6	3	2	5				1	1			18
Kalkaska			2									2
Kent	7	4		18	3	1	1	1		1		36
Lapeer			1									1
Leelanau			2									2
Lenawee	4			10		1	3	1	1	1		21
Livingston	1											1
Macomb	8	6		12			2					28
Manistee			2									2
Marquette	1	1	1	7	1							11
Mason			2	4		1						7
Mecosta	3			9		1			2			15
Midland			1									1
Monroe	2	5	2	2								11
Montcalm		1	2	6			1					10
Multiple counties, statewide and online	6	5	2		1							14
Muskegon	3		2	6		1	3	1				16
Newago			1									1
Oakland	10	3	1	29		1	3	1				48
Oceana			1									1
Ottawa			1	1	1				1			4
Roscommon				2								2
Saginaw			1									1
Shiawassee	3		1	2		1	3	1				11
St. Clair	1	1		2								4

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County	Food preparation and service	Food processing or manufacturing	Food production	Food systems inputs and services	Natural resources	Retail food distribution	Wholesale food distribution or storage	Consumer demand or marketing	Food access and health management	Advocacy and public policy	Financing and technical assistance	Total
St. Joseph		1										1
Tuscola			2									2
Van Buren			1									1
Washtenaw	4	5	3	28	8	2	2	2	5	3	1	63
Wayne	24	14	8	49	1	3	6	4	12	4		125
Wexford	3		2	2		1	3	1				12
Total	112	68	116	301	51	30	37	19	35	15	5	789

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Appendix B

Examples of Jobs, Careers and Educational Pathways for Each Food System Sector

Advocacy and Public Policy

Organizations, products and programs	Jobs and careers	Education and training programs
Advocacy organization Consulting organization Government agencies Non-profit organizations Regulatory authority Trade associations and co-ops	Advocacy and outreach staff Consultants Educators Lawyers Policymakers and government staff	Community organizing and advocacy Either a 16-credit certificate or 60-credit AA degree in Community Leadership at Henry Ford College

Consumer Demand and Marketing

Organizations, products and programs	Jobs and careers	Education and training programs
Agriculture and culinary tourism Consumer education and marketing Food system media General food system education Local food directories	Marketing consultants Merchandizing specialist Sales representative	Merchandising, Buying and Retail Management Merchandising and Buying Operations Certificate from Washtenaw Community College (CC)

Financing and Technical Assistance

Organizations, products and programs	Jobs and careers	Education and training programs
Accounting services Agricultural loan officers Consulting Farm and food incubators Finance managers Funders, lenders, and investors Regulations and permits Technology solutions	Farm and business management advisors Feasibility and planning (human resources, infrastructure, land access, legal and estate planning, marketing, packaging and safety, production/processing technical assistance)	Business or business marketing Associate degree at Lansing CC

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Food Inputs and Services

Organizations, products, and programs	Jobs and careers	Education and training programs
Agricultural equipment Animal feed producer or supplier Beekeeper supplier Compost producer or supplier Custom cropping Feed store Fertilizer supplier Land access/conservation Livestock breeder Maple sugaring supplies and equipment Nursery/greenhouse and season extension Pest and disease control Regulatory authority Seed producer or supplier Soil/mulch producer or supplier	Agricultural engineers Agricultural and processing inspectors Applied agricultural or conservation science Applied food science Farm equipment mechanics and service technicians Feed, seed, and equipment dealers Food safety administrative, scientific, and other professional positions HVAC and cooling equipment maintenance and operators Large animal veterinarians Microbiologists Science and engineering research and education Quality assurance managers and auditors Veterinary medical officer	Environment Health, Science, and Engineering • Bachelor's or associate degree in environmental science • Certificate in sustainability studies from Michigan Technological University Maintenance and Technology • Engine machinist certificate at Lansing CC Alternative fuel vehicle technology/technician certificate Regulatory, Quality, and Safety • Certificate or associate degree in quality control and safety technologies/technicians at Sienna Heights University Veterinary and Animal Care • Bachelor's in pre-veterinary studies from MSU

Food Preparation and Service

Organizations, products and programs	Jobs and careers	Education and training programs
Dining service/cafeteria Fast food, deli Food trucks Restaurant/café	Chefs, cooks, and food service Food service managers/directors Institutional food service teams	Culinary Arts and Chef Training • Culinary Arts/hospitality high school training from Oakland Schools Technical Campuses • Institutional food workers Associate of Arts (AA) from Washtenaw CC

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Food Processing and Manufacturing

Organizations, products and programs	Jobs and careers	Education and training programs
Bakery Brewery, winery Cheese, other dairy processing, fluid milk, ice cream, yogurt Cider mill, cidery/hard cider Chocolatier Coffee roasters, tea Co-packer/contract manufacturer Distillery/spirits Food incubator Grain mill, maltery Maple candy/sugar Meat processing Non-alcoholic beverages Shared-use commercial kitchen Slaughterhouse Specialty foods/snacks	Baker Butchers, meat cutters, slaughterers, and meat packers (small-scale or custom and mid-scale) Caramel maker Cheesemaker Food entrepreneur Produce and food inspectors Produce manager Production manager Quality assurance managers and auditors	Baking and Pastry • Baking and pastry arts/baker/pastry chef certificate or AA from Mott CC (among others) Brewing and Distillation • Brewing and distillation technology certificate or AA from Schoolcraft College Food Processing and Management • Fundamentals of food processing certificate at Michigan Manufacturing Technology Center • Manufacturing engineering technology/technician AA from multiple community colleges

Food Production

Organizations, products, and programs	Jobs and careers	Education and training programs
Beef, lamb, goat, pork, poultry Corn, soy, sugar beets Dairy, eggs Fish/seafood Fruits, berries Grains, hops, herbs Honey/apiary, maple syrup Mushrooms, nuts, oilseeds Vegetables Vineyard (grapes)	Animal breeders Dairy and hog farmers Diversified vegetable farmers Farmers and other agricultural enterprise owners Farmworkers Farm managers and other agricultural managers Organic dairy farmers Produce and food inspectors Production manager Quality assurance managers and auditors	Agricultural Operations, Economics, Management, and Production • Certificate or associate degree in viticulture and enology from North Central Michigan College • Sustainable/eco-friendly agriculture at Tuscola Intermediate School District Animal Sciences, Husbandry and Production • Animal/livestock husbandry and production certificate at MSU Young Farmer/4-H Programs • Animal science, agriculture, entrepreneurship certificate from MSU Extension/4-H

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Healthy Food Access and Health Management

Organizations, products and programs	Jobs and careers	Education and training programs
Child nutrition programs/meal sites Community/public garden Cooking/nutrition classes Fitness/nutrition programs Food bank/pantry/shelf Gleaning programs Locavore/Community group Senior meal site/nutrition programs Soup kitchen/meal site Supplemental assistance programs	Dietitians and nutritionists Emergency food organization operators or staff Insurance and healthcare professionals Nutrition directors Public health practitioners	Nutrition and dietetics • AA through graduate degrees in human nutrition from MSU

Natural Resource Management

Organizations, products and programs	Jobs and careers	Education and training programs
Compost producer or supplier Food scrap drop off location Natural resource management/conservation Private hauler Regulatory authority Waste management district/facility	Composting facility owners or operators Conservation and forestry workers Solid waste management: food-system-specific positions Water quality technician	Natural resource economics, Conservation and management • AA in Natural Resources and Conservation from Gogebic CC Waste management • Online Solid Waste Certificate from Solid Waste Association of North America Water quality and management • Water Quality, Wastewater Treatment Management AA or certificate from Bay de Noc CC

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Retail Food Distribution

Organizations, products and programs	Jobs and careers	Education and training programs
Bars/pubs Beer, wine, liquor store Butcher shop Caterer Convenience, country, grocery, and natural/health food store Co-op CSA Farmers market Farm stand/farm store Online market Specialty foods store	Customer service Grocery store category buyers Grocery store proprietors Food and beverage marketing Specialty enterprise: managers or supervisors Specialty enterprise: technical assistance Specialty food entrepreneurs Specialty food production workers	Food Service Operation and Management • BA in Foodservice systems administration/management from Central Michigan University Retail Sales and Marketing • AA in General merchandising, sales, and related marketing operations from Baker College Packaging and Product Development • AS or certification in product development prototyping from Wayne County CC District

Wholesale Food Distribution or Storage

Organizations, products, and programs	Jobs and careers	Education and training programs
Aggregation facility/food hub Broker/sourcer Cold/refrigerated storage facility Distributor Dry storage facility	Food hub directors Food hub distribution warehouse managers Operations managers Other distribution warehouse managers Quality assurance managers/auditors Truck drivers and sales workers	Vehicle Operations • AA or certificate in medium/heavy vehicle and truck technology/technician from Baker College

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