



WORKFORCE NEEDS ASSESSMENT OF MISSOURI'S FOOD, AGRICULTURE AND FORESTRY INDUSTRIES

Executive Summary

JULY 2020

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Missouri's large and diverse agricultural sector is foundational to the state's economy. According to an analysis of Missouri's agriculture and forestry industries, the sector contributed over \$88 billion to the state's economy in 2016—approximately 15 percent of total state output.¹ As the global demand for food continues to rise, the State of Missouri has an ambitious goal of doubling its agricultural production over the next thirty years. Achieving this goal will require multiple strategies, including the development of a next-generation agricultural workforce.

Tackling the state's food, agriculture and forestry-related workforce challenges remain an important priority even though the ongoing economic consequences of COVID-19 remain unknown. This assessment draws on an analysis of labor market information, employer surveys, and key informant interviews. Combined, this research highlights the jobs that these employers need to fill over the next decade, and identifies the current and future workforce challenges they face. The report findings will inform the creation of a long-term workforce development strategy for Missouri's food, agriculture and forestry workforce.

Missouri's food, agriculture and forestry workforce.

In 2019, there were over 107,000 direct **wage and salary** jobs² in the 98 food, agriculture and forestry NAICS (North American Industrial Classification System) industries included in this study (a complete list of these industries is in Appendix B). These industries fall into four different categories:

- Production agriculture—12,500 jobs³ in 17 NAICS industries.
- Agricultural support and services—32,600 jobs in 14 NAICS industries.
- Food and beverage manufacturing—47,500 jobs in 47 NAICS industries.
- Forestry and wood products manufacturing—14,600 jobs in 20 NAICS industries.

Total wage and salary employment in 2019 was only slightly higher than in 2001 (106,500) due to the job losses that occurred during the last recession, particularly in forestry and wood products manufacturing. Surveys and interviews conducted during the first two months of 2020 revealed that most employers anticipated stability or slow growth, prior to the onset of the COVID-19 pandemic and the subsequent economic shock. The severity and duration of these economic shocks remains to be seen, but since food is a relatively inelastic good, we can assume that employment will remain steady over the long-term.

¹ [Economic Contributions of Missouri Agriculture and Forestry](#). Prepared by Decision Information Solution, December 2016.

² Wage and salary workers are employees that receive wages, salaries, commissions, etc. from their employers for their work. This employment is often referred to as a 'covered employment' because workers in these jobs are covered by the unemployment insurance (UI) program. This is the primary way that the US Bureau of Labor Statistics measures employment, as their data are drawn from the UI program's administrative records.

³ We recognize that there are significant numbers people involved in production agriculture that do not hold wage and salary jobs. For instance, data from the US Bureau of Economic Analysis, shows that there were approximately 86,500 farm proprietorships in the state of Missouri in 2018. Moreover, the US Census Bureau's non-employer statistics—which counts businesses with no paid employees and receipts greater than \$1,000 per year—showed that Missouri had roughly 6,000 non-employers in non-farm agricultural support activities, 7,700 non-employers in landscaping services, and over 700 non-employers each in both food manufacturing and wood products manufacturing in 2017. Nevertheless, this report focuses on the occupations within firms that have employees.

Over the past 20 years, the vast majority of job openings in food, agriculture and forestry has been the result of turnover (workers leaving or aging out of jobs), rather than growth. Over the next decade, these industries are projected to generate 13,000 annual openings.⁴ For many of these jobs, relatively lower wages may contribute to this turnover. The state median hourly wage for all occupations is \$17.88 (\$37,200 annually)⁵, and roughly 70 percent of the wage and salary jobs in food, agriculture and forestry pay \$18 per hour or less.

In aggregate only one out of every eight jobs (12 percent) in food, agriculture and forestry typically require some kind of post-secondary degree or certification, but many jobs need workers with extensive training and experience. Nearly 40 percent of food, agriculture and forestry jobs typically require workers to have moderate (1 month to 1 year) or long-term (more than 1 year) on-the-job training (OJT); a figure double the state share of jobs requiring similar levels of experience and OJT.

Industry staffing patterns allow us to determine patterns of occupational demand, which in turn enables us to identify occupations unique to food, agriculture and forestry, and occupations in-demand throughout the economy. For instance, food, agriculture and forestry-related industries employ more than 90 percent of the state's veterinarians, but less than 5 percent of Missouri's heavy and tractor-trailer truck drivers. This distinction is an important consideration for developing broader workforce strategies. Unique occupations require strategies that **create** workers to fill these jobs (e.g., engaging students, providing specialized training and education). By contrast, hiring for more in-demand occupations necessitates strategies that better position food, agriculture and forestry employers to **compete** for workers capable of filling these positions.

Food, agriculture and forestry employs a diverse set of occupations.

The diverse nature of activities in food, agriculture and forestry means that employers need workers who can perform a wide range of tasks. The tables below highlight the occupations with the most projected annual openings based on typical education requirements.

- Figure A shows that the greatest number of projected annual openings are for jobs that typically require lower and semi-skilled workers, and also have relatively low annual earnings.
 - Many of these occupations involve manual labor specific to industries such as landscaping services, meat processing or production agriculture.
 - Employers in other manufacturing sectors as well as distribution and logistics employ workers in similar occupations (e.g., hand packers and packagers; and first-line supervisors); food, agriculture and forestry employ from the same labor pool and therefore compete with these other sectors.

⁴ Unless noted otherwise, the analysis uses Economic Modeling Specialists International (EMSI) representation of U.S. Bureau of Labor Statistics data. The EMSI data combine U.S. Bureau of Labor Statistics employment payroll data from its Quarterly Census of Employment and Wages. EMSI then estimates data where BLS privacy standards do not allow it to disclose publicly. These estimates allow us to get greater industry and geographic data.

⁵ US Bureau of Labor Statistics, Occupational Employment Survey, May 2019.

Figure A: Common lower and semi-skilled occupations in food, agriculture and forestry (Min. 200 projected annual openings)

Occupation	2019 FAF Jobs	2019 Jobs in Missouri	Avg. Annual FAF Openings (19-29)	Median Annual Earnings	Create v. Compete	Prod. agriculture	Agri. support & services	Food & beverage MFG	Forestry & wood products MFG
Landscaping & groundskeeping workers	9,277	16,836	1,192	\$29,016	Create		X		
Crop, nursery, & greenhouse farmworkers & laborers	3,921	4,296	644	\$26,354	Create	X			
Meat, poultry, & fish cutters & trimmers	4,105	4,623	553	\$29,702	Create			X	
Hand laborers & freight, stock, & material movers	3,232	47,227	490	\$28,891	Compete		X	X	X
Veterinary assistants	2,036	2,285	348	\$26,957	Create		X		
Farm, ranch, & aquacultural animals farmworkers	1,835	2,393	289	\$28,080	Create	X			
Helpers--production workers	1,661	6,119	274	\$29,266	Compete			X	X
Hand packers & packagers	1,599	9,353	264	\$24,606	Compete	X		X	X
Industrial truck & tractor operators	2,123	12,479	259	\$34,112	Compete			X	X
First-line svprs. of production & operating workers	2,265	13,324	249	\$56,098	Compete			X	X

Source: Economic Modeling Specialist, Int'l (2019.4)

- Figure B shows that there are relatively fewer openings for jobs that require higher levels of training and experience, but not necessarily post-secondary education.
 - These occupations tend to require workers with greater experience (e.g., machine operators), ability to work independently (e.g., agricultural equipment operators, sales), and problem-solving skills (e.g., maintenance and repair, farm equipment mechanics and service technicians, and industrial machinery mechanics).
 - Workers with these skills are in-demand throughout the workforce, but given the specialized knowledge require to perform these jobs training remains a priority.

Figure B: Common middle-skill occupations in food, agriculture and forestry (Min. 100 projected annual openings)

Occupation	2019 FAF Jobs	2019 Jobs in Missouri	Avg. Annual FAF Openings (19-29)	Median Annual Earnings	Create v. Compete	Prod. agriculture	Agri. support & services	Food & beverage MFG	Forestry & wood products MFG
Food batchmakers	5,294	6,355	764	\$33,176	Create			X	
Packaging & filling machine operators	5,238	10,506	651	\$32,656	Create			X	
Paper Goods machine operators	2,895	3,409	289	\$43,410	Create				X
Sales reps., wholesale & MFG, except tech. & sci. products	2,008	25,444	217	\$56,888	Compete		X	X	X
General maint. & repair workers	1,834	28,140	194	\$36,150	Compete		X	X	X
Wood sawing machine operators	1,495	2,083	171	\$24,856	Create				X
Inspectors, testers, sorters, samplers, & weighers	1,297	9,945	167	\$39,416	Compete			X	X
Food cooking machine operators	1,132	1,353	163	\$28,683	Create			X	
Farmers, ranchers, & other ag. mgrs.	1,902	1,929	158	\$56,867	Create	X			
Woodworking machine operators, except sawing	1,261	1,929	147	\$27,893	Create				X
Team assemblers	1,334	24,982	145	\$36,504	Compete		X	X	X
Agricultural eqpt. operators	846	1,115	141	\$30,992	Create	X	X		
Mixing & blending machine operators	884	2,563	117	\$40,539	Compete		X	X	
Farm eqpt. mechanics & service techs.	1,155	1,402	111	\$36,400	Create		X		
Separating, clarifying, precipitating, & still machine operators	991	1,381	110	\$41,267	Create			X	
Industrial machinery mechanics	984	5,040	101	\$52,582	Compete		X	X	X

Source: Economic Modeling Specialist, Int'l (2019.4)

- Figure C shows openings in occupations that typically require a post-secondary degree or certification are more limited in number.
 - Occupations such as veterinarians and agricultural and food science technicians are specialized and require extensive post-secondary education.
 - Food, agriculture and forestry employers need to attract workers to fill managerial and office and administrative support occupations. They must also compete with other industries to meet their need for truck-drivers.

Figure C: Common food, agriculture and forestry occupations that typically require post-secondary degrees or certifications (Min. 35 projected annual openings)

Occupation	2019 FAF Jobs	2019 Jobs in Missouri	Avg. Annual FAF Openings (19-29)	Median Annual Earnings	Create v. Compete	Prod. agriculture	Agri. support & services	Food & beverage MFG	Forestry & wood products MFG
Heavy & tractor-trailer truck drivers	2,092	45,123	248	\$44,034	Compete	X	X	X	X
Veterinary technologists & techs.	1,479	1,605	146	\$29,661	Create		X		
General & operations mgrs.	1,570	46,803	143	\$81,494	Compete		X	X	X
Bookkeeping, accounting, & auditing clerks	910	29,536	104	\$36,774	Compete	X	X	X	X
Veterinarians	1,469	1,599	76	\$89,232	Create		X		
Industrial production mgrs.	510	3,422	42	\$97,302	Compete		X	X	X
Accountants & auditors	416	25,473	41	\$63,648	Compete	X	X	X	X
Agricultural & food science techs.	304	636	35	\$38,771	Create	X		X	

Source: Economic Modeling Specialist, Int'l (2019.4)

Strengthening Missouri's food, agricultural and forestry workforce requires addressing several critical issues.

While many food, agriculture and forestry employers experience some challenges trying to find workers for specific occupations, there are also a number of cross-cutting challenges that must be addressed in order to build a next-generation workforce. These issues include:

■ **Encouraging new workers to consider careers in food, agriculture and forestry.**

Exposing young workers to careers in food, agriculture and forestry is an important first step in constructing a talent pipeline. Organizations like 4-H and FFA are critical partners for promoting these careers for youth; 61 percent of survey respondents worked with these groups to promote careers in their industry. Agricultural education and career and technical education (CTE) programs also prepare students for these careers. However, not all students have access to these programs and retaining good teachers can prove challenging because the skills that make someone an effective agriculture or CTE teacher, also makes them qualified for more lucrative jobs in industry.

■ **Food, agriculture and forestry employers compete with other industries for workers of all skill levels.**

Half (51 percent) of the survey respondents indicates that the most difficult skills to find were reliability and general work readiness. In many instances, these employers compete directly for workers with higher paying employers in construction and other manufacturing industries. Population loss—particularly in Missouri's rural counties—exacerbates these challenges by limiting the total

number of workers from which employers can draw; 53 percent of the state's food, agriculture and forestry jobs were located in the 76 Missouri counties that had net population loss between 2010 and 2019.

■ ***Growing and maintaining a competitive workforce requires continued training and education.***

In response to the lack of qualified applicants, 78 percent of survey respondents hired less experienced workers and provided subsequent training primarily through OJT. Large and small employers have different workforce needs, as well as different abilities to meet those needs. Survey respondents with more than 50 employees were more likely to partner with post-secondary institutions for customized training and/or apprenticeships, due to greater training resources and/or more specialized needs. There was also a stated need for stronger basic business skills (e.g., budgeting, pricing services, marketing, or succession planning), particularly in industries with many smaller businesses. These skills are vital for farms, landscaping businesses or veterinary offices to become viable enterprises.

■ ***Greater use of automation and technology can alter workforce needs.***

New technologies and automated processes can alleviate staffing pressures, but 40 percent of survey respondents could not afford to automate their processes; another 35 percent indicated that insufficient broadband capacity prevented them from using technologies such as labor-saving mobile applications. These technologies can change the demand for jobs by increasing productivity and reducing overall headcount, but it can also increase demand for more skilled workers (e.g. maintenance staff). The COVID-19 pandemic is accelerating trends toward greater adoption of automated processes, particularly in food manufacturing.

Moving forward.

Missouri's private sector, state government, and education leaders will use the information presented in this report to develop a long-term workforce development strategy for Missouri's food, agriculture and forestry industries. Even in an era of constrained public resources, these leaders can address the challenges described above through greater communication and collaboration, and taking steps to:

- Expand efforts to promote food, agriculture and forestry careers and technical education,
- Organize statewide or regional sector strategies related to food, agriculture and forestry,
- Promote existing workforce programs and services, and
- Invest in rural communities, and particularly their broadband infrastructure.

Developing a next generation workforce for Missouri's food, agriculture and forestry industries will not happen overnight. However, this transformation can occur with strategies that address both short-term challenges and long-term needs.