PA MEP
PENNSYLVANIA MANUFACTURING
EXTENSION PARTNERSHIP

Food Manufacturing Industry Landscape Report

Food Manufacturing: NAICS 311

DVIRCA
REIMAGINE MANUFACTURING

Helping Manufacturers Grow Profitably Since 1988

Contents

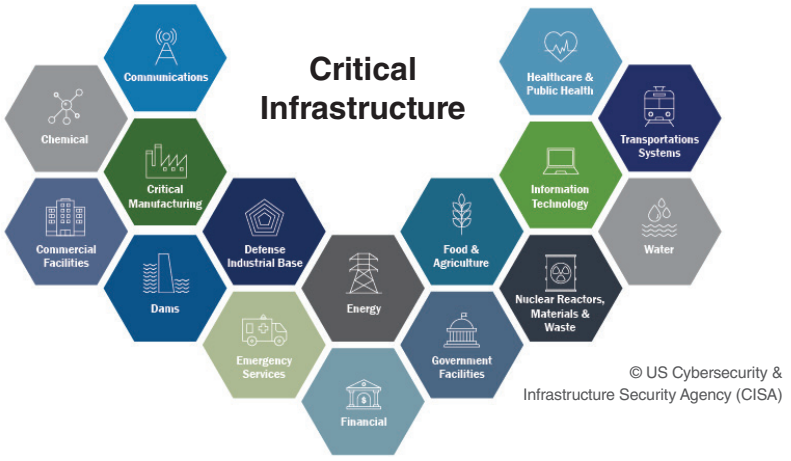
Food Manufacturing (NAICS 311)

North American Industry Classification System (NAICS) code 311 represents the Food Manufacturing industry, a vital segment encompassing operations dedicated to the production and processing of ingredients, food, and edible products.

The source of this manufacturing is of animal or vegetable origin from livestock and agriculture, with establishments in this industry processing and producing food products from these raw materials. Once they have been processed into finished products, the establishments work with wholesalers or retailers for distribution.

The Food Manufacturing industry is foundational to various industries, as it contributes to the production of a wide range of products across many critical industries. Involved in the production of raw materials, such as agriculture and livestock, the industry's outputs and byproducts are foundational to critical industries, including those depicted in the image below. The interdependence between the Food Manufacturing industry and critical food and agriculture is clear. Food Manufacturing and the byproducts it creates are a crucial component of U.S. health, healthcare, and food security. Related components include those yielding byproducts used in the production of pharmaceuticals and other consumables, as well as edible products.

Moreover, the Food Manufacturing industry intersects with lifeline functions, particularly in the areas of water, healthcare and public health, and food and agriculture. The water-intensive nature of food manufacturing highlights its reliance on water resources. Critical manufacturing, including tool, equipment, and vehicle manufacturing, is required for the Food Manufacturing process. Additionally, the industry relies heavily on transportation systems, which serve as a vital resource for processing/production and logistics/distribution.



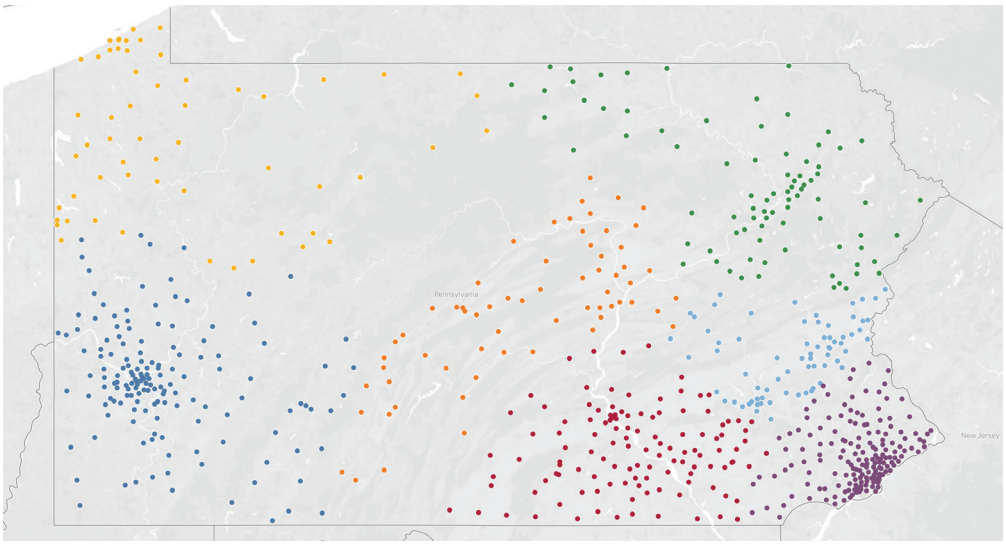
The Food Manufacturing industry is linked to a number of sub-industries. Water is indispensable for Food Manufacturing and is critical for its processing and production. Chemicals play a critical role in the industry's manufacturing operations; preservatives and additives enable product stability and longevity. These interdependencies emphasize the Food Manufacturing industry's significance in supporting and sustaining the broader critical infrastructure landscape in the United States.

This report will cover Food Manufacturing activity throughout the state, with segmentation by the seven Industrial Resource Centers' (IRC's) geographical territories. The IRCs are a network of seven private, nonprofits located strategically throughout the state that works with manufacturers to respond to changing market conditions, adopt new technology, and create strategies to remain competitive in today's global economy. IRCs play a crucial role in supporting the U.S. defense sector by providing expertise and assistance to enhance the security, resilience, and function of critical infrastructure sectors in Pennsylvania. PA MEP is comprised of the seven centers listed below.

- **Catalyst Connection:** Serving Lawrence, Beaver, Washington, Greene, Fayette, Somerset, Cambria, Indiana, Armstrong, Butler, Allegheny, and Westmoreland counties.
- **Delaware Valley Industrial Resource Center (DVIRC):** Serving Chester, Montgomery, Delaware, Philadelphia, and Bucks counties.
- **Innovative Manufacturers' Center (IMC):** Serving Lycoming, Montour, Northumberland, Union, Snyder, Clinton, Centre, Mifflin, Juniata, Huntingdon, Blair, and Bedford counties.
- **MANTEC:** Serving Adams, Cumberland, Dauphin, Franklin, Fulton, Lancaster, Lebanon, Perry and York counties.
- **Manufacturers Resource Center (MRC):** Serving Lehigh, Berks, Carbon, Schuylkill, and Northampton counties.
- **Northeastern PA Industrial Resource Center (NEPIRC):** Serving Tioga, Bradford, Sullivan, Columbia, Luzerne, Wyoming, Susquehanna, Lackawanna, Wayne, Pike, and Monroe counties.
- **Northwest Industrial Resource Center (NWIRC):** Serving Erie, Crawford, Mercer, Venango, Warren, Forest, Clarion, McKean, Elk, Jefferson, Clearfield, Cameron, and Potter counties.

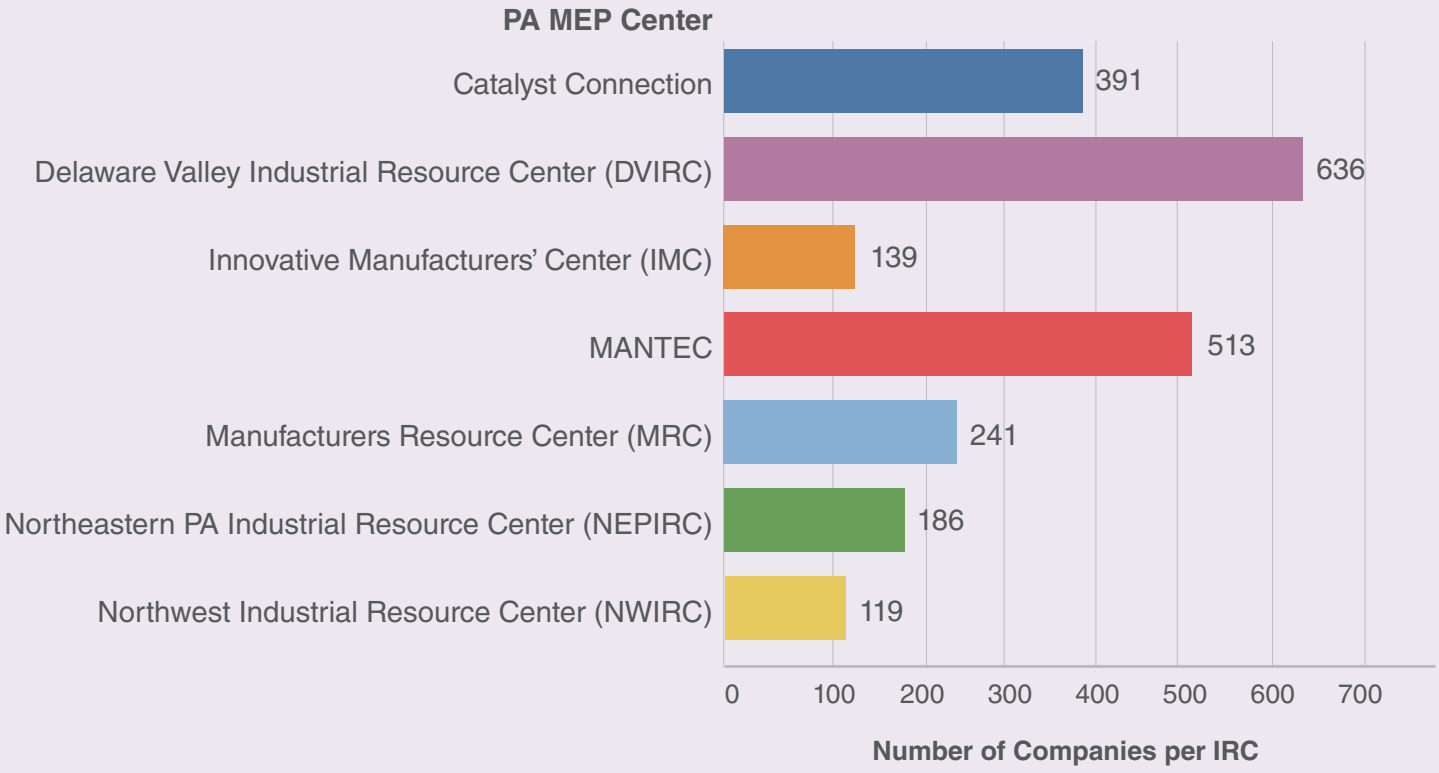
Food Manufacturing (NAICS 311)

Pennsylvania Food Manufacturing Entities Segmented by IRC



PA IRC Center

- Catalyst Connection
- Delaware Valley Industrial Resource Center (DVIRC) and Bucks County
- Innovative Manufacturers' Center (IMC)
- MANTEC
- Manufacturers Resource Center (MRC)
- Northeastern PA Industrial Resource Center (NEPIRC)
- Northwest Industrial Resource Center (NWIRC)



Food Manufacturing Landscape

Industry Summary

Food Manufacturing is vital to the strength of Pennsylvania's economy, with more than 2,100 total entities in operation.

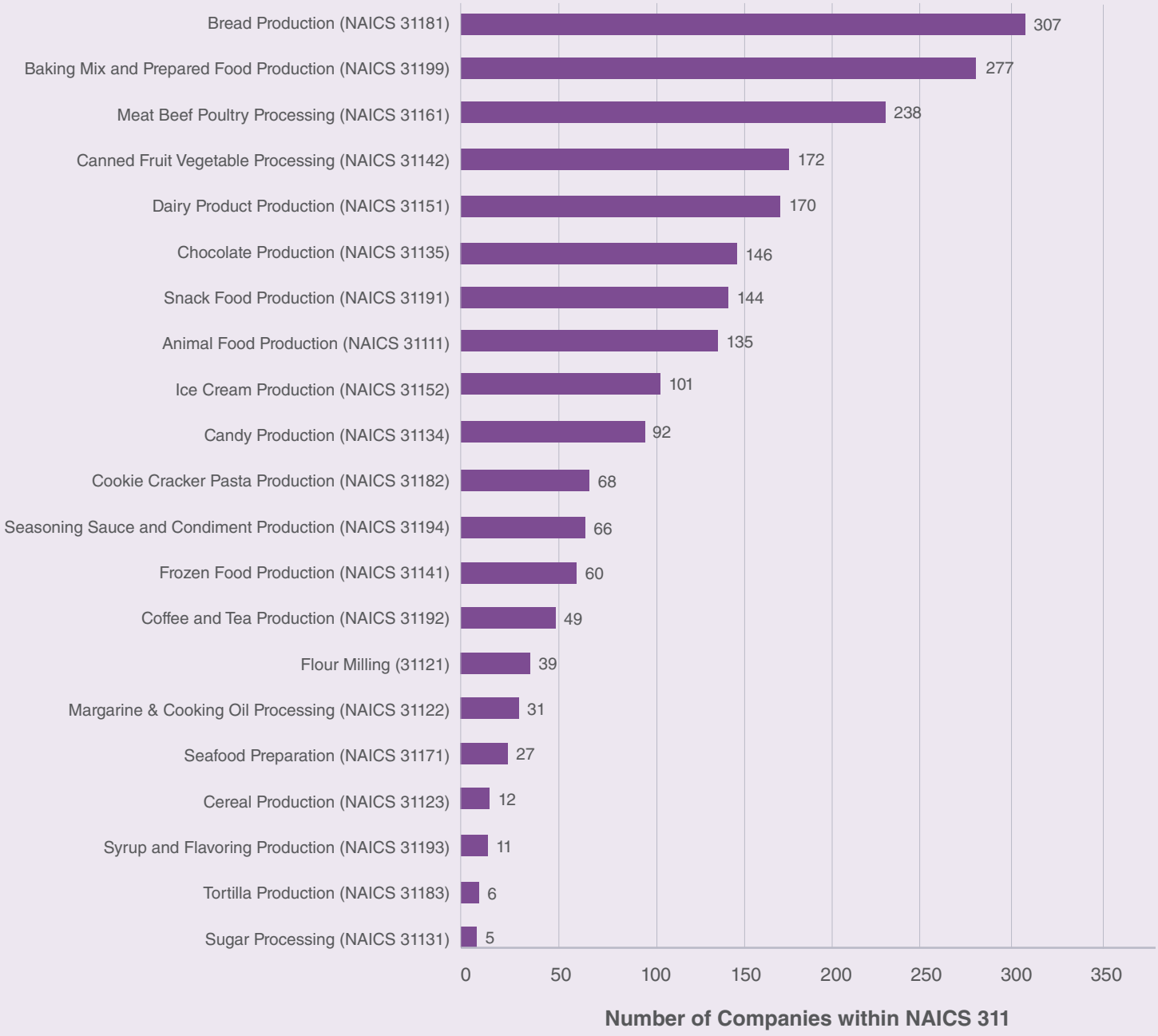
- According to the U.S. Census Bureau, Pennsylvania exported over $2 billion worth of Food Manufacturing products in 2023.[1]
- The Hershey Company is particularly dominant, contributing nearly $11 billion toward Pennsylvania's Gross State Product.[2]
- Pennsylvania is a key player across various Food Manufacturing NAICS codes. Two of these include Dairy Product Manufacturing (3115), where the state is a leading producer, and Confectionery Manufacturing (3113), where Pennsylvania claims iconic companies such as Hershey and Just Born.[3]

The Food Manufacturing industry is comprised of the 22 five-digit NAICS subsectors listed below.

Extended NAICS Codes: 311

31111	Animal Food Production
31121	Flour Milling
31122	Margarine and Cooking Oil Processing
31123	Cereal Production
31131	Sugar Processing
31134	Candy Production
31135	Chocolate Production
31141	Frozen Food Production
31142	Canned Fruit and Vegetable Processing
31151	Dairy Product Production
31152	Ice Cream Production
31161	Meat, Beef and Poultry Processing
31171	Seafood Preparation
31181	Bread Production
31182	Cookie, Cracker and Pasta Production
31183	Tortilla Production
31191	Snack Food Production
31192a	Coffee Production
31192b	Tea Production
31193	Syrup and Flavoring Production
31194	Seasoning, Sauce and Condiment Production
31199	Baking Mix and Prepared Food Production

Pennsylvania Food Manufacturing Segmented by Five-Digit Description



Industry Demographics

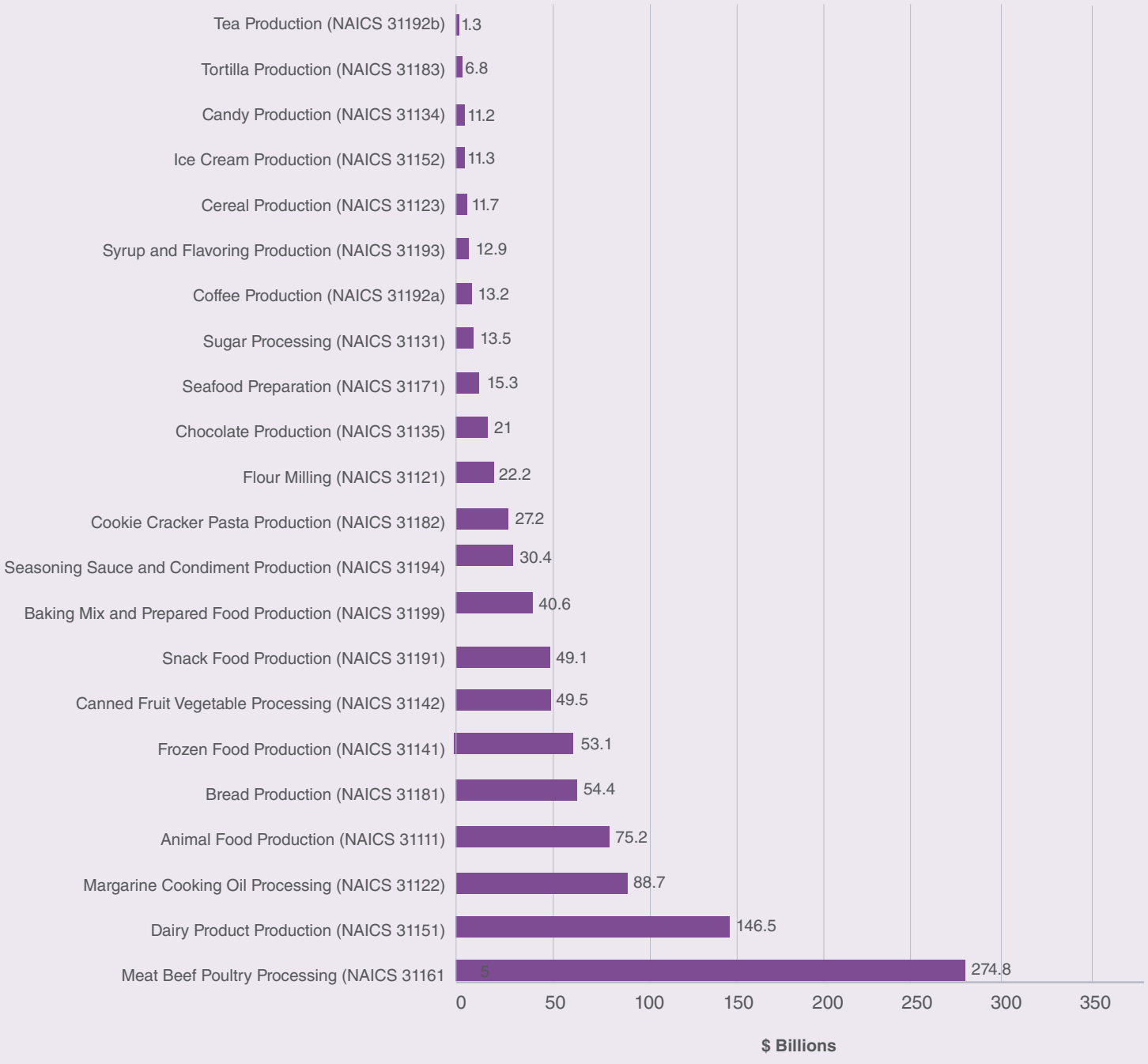
This section provides Food Manufacturing industry demographics, including market size, revenue distribution across segments, establishment statistics, and critical market trends shaping the landscape. This exploration extends to industry profits, drivers, and the influence of external factors, providing an overview of the current state and future trajectory.

Food Manufacturing (NAICS 311) PA Real Gross Domestic Product: $11.4 billion (2022)[4]

Food Manufacturing (NAICS 311) U.S. Gross Domestic Product: $311.89 billion (2022)[5]

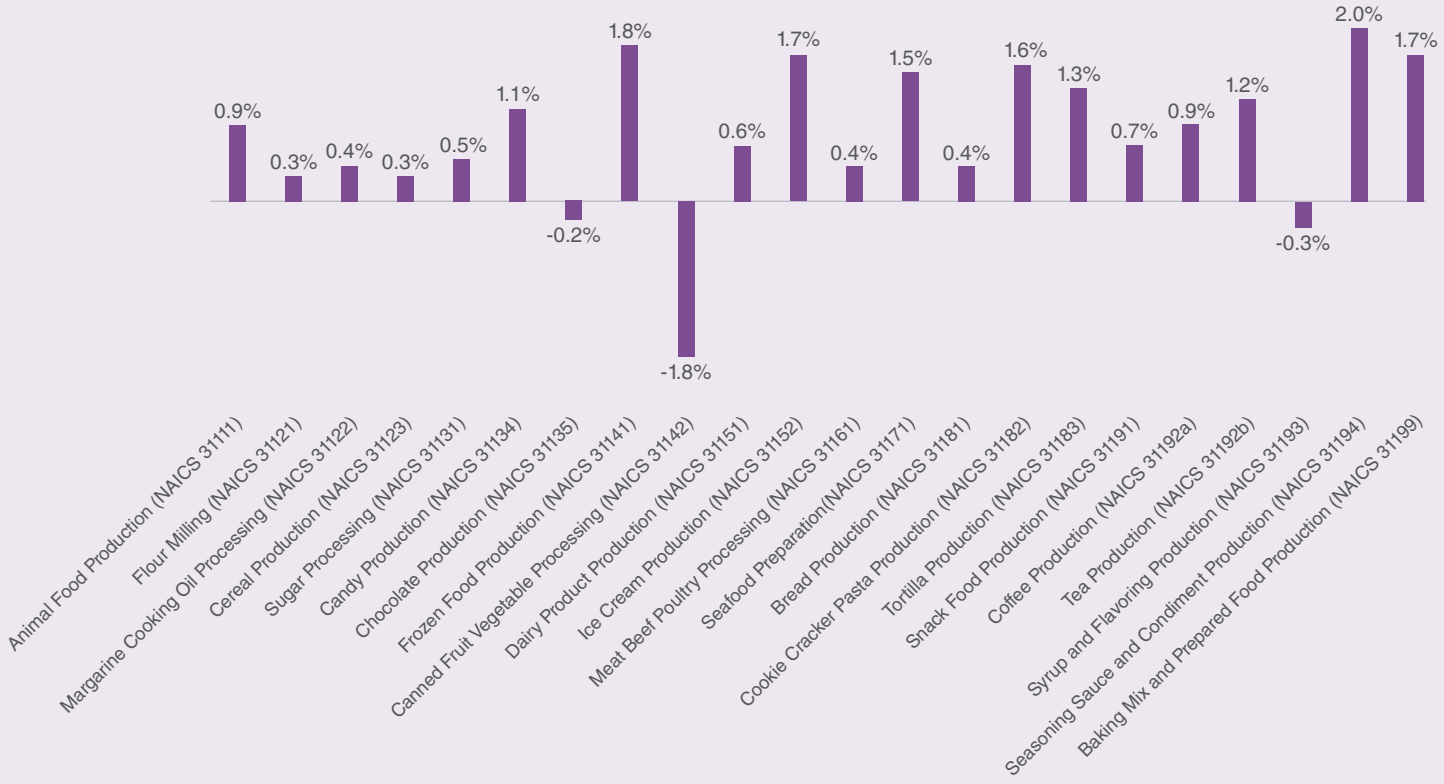
*Compound Annual Growth Rate (CAGR) provides a smoothed estimate of growth over a specific period, accounting for year-by-year fluctuations and compounding effects, to provide a longer-term outlook for an industry.

U.S. Food Manufacturing Revenue by Segment



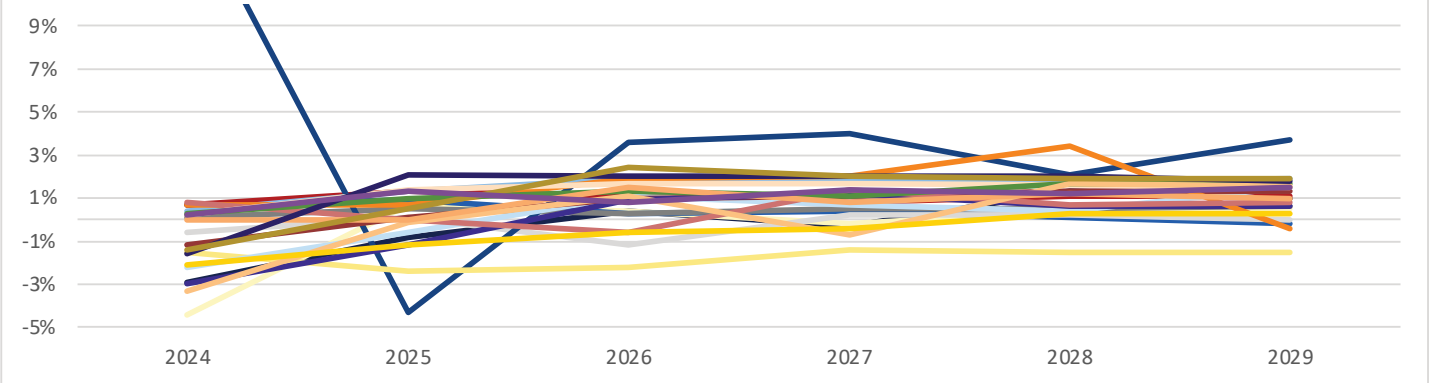
Industry Demographics

Growth Rate (2024-2029)



Industry Demographics

Growth Rate (2024-2029)



- Flour Milling (NAICS 31121)
- Cereal Production (NAICS 31123)
- Candy Production (NAICS 31134)
- Frozen Food Production (NAICS 31141)*
- Dairy Product Production (NAICS 31151)
- Ice Cream Production (NAICS 31152)
- Seafood Preparation(NAICS 31171)
- Cookie Cracker Pasta Production (NAICS 31182)
- Snack Food Production (NAICS 31191)
- Syrup and Flavoring Production (NAICS 31193)
- Baking Mix and Prepared Food Production (NAICS 31199)
- Margarine Cooking Oil Processing (NAICS 31122)
- Sugar Processing (NAICS 31131)
- Chocolate Production (NAICS 31135)
- Canned Fruit Vegetable Processing (NAICS 31142)
- Animal Food Production (NAICS 31111)
- Meat Beef Poultry Processing (NAICS 31161)
- Bread Production (NAICS 31181)
- Tortilla Production (NAICS 31183)
- Coffee Production (NAICS 31192a)
- Seasoning Sauce and Condiment Production (NAICS 31194)
- Tea Production (NAICS 31192b)

Steady Growth: Attributed to incremental innovation and incorporating health-conscious choices.

- Candy Production
- Ice Cream Production
- Tortilla Production
- Tea Production
- Cookie, Cracker and Pasta Production

Fluctuating Growth: Volatility in supply chains and consumer behavior forcing industries to continuously adapt to evolving the market and demands.

- *Frozen Food Production: The demand for frozen food declined as health-conscious products gained popularity. However, it has rebounded due to acquisitions of smaller producers offering higher-quality, healthier options.
- Seasoning Sauce and Condiment Production
- Seafood Preparation
- Syrup and Flavoring Production
- Margarine and Cooking Oil Processing

Minimal Growth: Due to increasing demand for alternatives, and market saturation for standard products.

- Animal Food Production
- Flour Milling
- Chocolate Production
- Canned Fruit Vegetable Processing
- Dairy Product Production
- Meat Beef Poultry Processing
- Bread Production
- Coffee Production

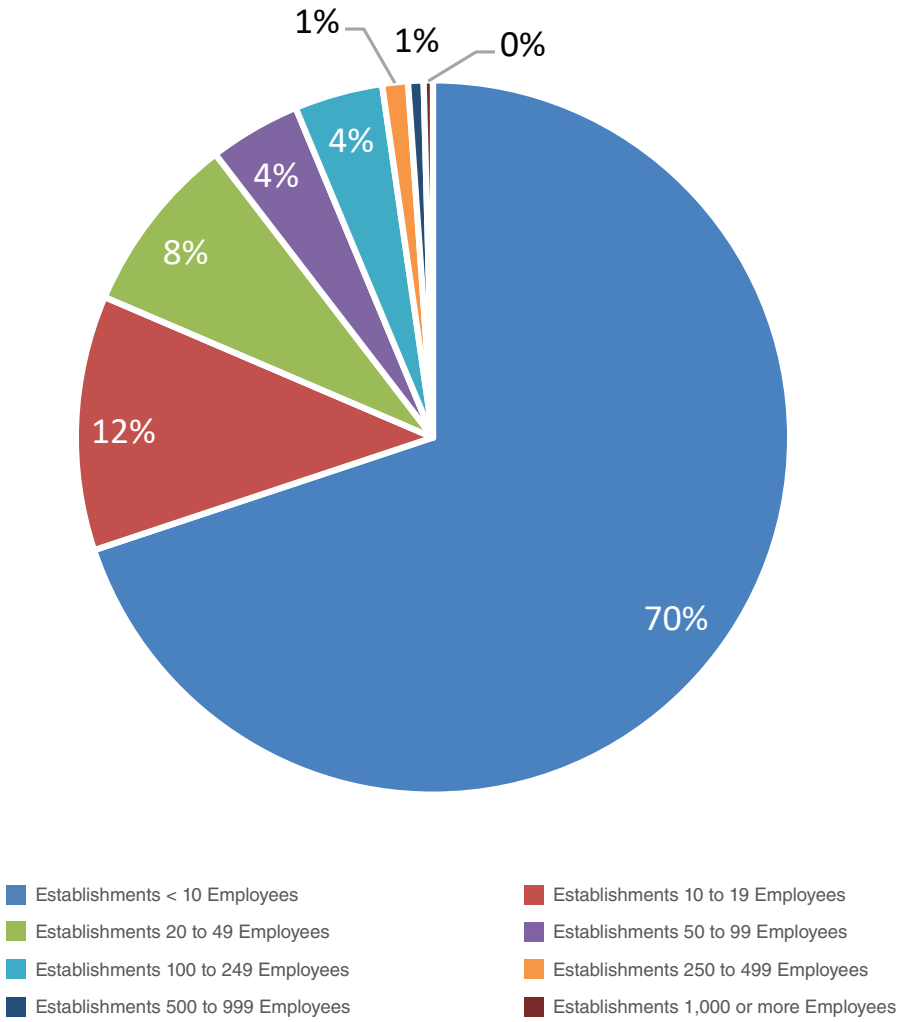
Recovery After Decline: Industries that rebounded with healthier, more convenient, or premium versions.

- Snack Food Production
- Baking Mix and Prepared Food Production
- Sugar Processing
- Cereal Production

Industry Demographics

PA Employee Distribution by Establishment Size

There are over **73,000** total employees in the Food Manufacturing industry in PA. This figure can be segmented by the establishment size of each worker's employer:



Industry Demographics

Workforce Trends

- United States
  - Labor productivity index (output per hour, one unit of output) – 1.2% annual decrease in 2023, which also fell 2.0% from 2021 to 2022.[6]
  - Labor index (total labor hours, hours worked) – 0.6% annual decrease in 2023, following a 1.1% gain from 2021 to 2022.[7]
  - Output index – 1.8% annual decrease in 2023.[8]
  - The number of jobs in the industry is projected to decline nationally by 0.1% from 2022 to 2032.[9]
- Pennsylvania
  - 2.75% increase in employment from 2022 to 2023, with each subsector within Food Manufacturing gaining almost 100 jobs over the period.[10]
  - 2.4% increase in average annual wage from 2022 to 2023, calculated as an average between all subsectors within Food Manufacturing.[11]

External Market Forces

- Barriers to entry in the food manufacturing industry vary by scale. Large enterprises face substantial challenges, including evolving regulations such as greenhouse gas reporting and the Food Quality Protection Act (FQPA), which impose complex compliance requirements. These regulations, combined with the high costs of large-scale operations, make entry difficult. Small businesses, while more agile and better able to align with shifting food trends and consumer preferences, still face similar regulatory hurdles. However, their primary challenge lies in high startup costs of equipment and operations as well as the lack of significant brand recognition to support growth and efforts such as distribution[12]
- The chemical, packaging, and agriculture industries are closely linked to Food Manufacturing. When these industries grow, the Food Manufacturing industry benefits; downturns in these sectors, meanwhile, negatively impact Food Manufacturing performance.[13]

Innovations in Technology

- Industry 4.0: The integration of digital technologies like simulations, Internet of Things (IoT), Artificial Intelligence (AI), and Big Data can benefit Food Manufacturers directly. Benefits can be environmental (increased quality and safety), social (reduced energy consumption and waste), and economic (increased productivity and efficiency).[14]
- Industry 4.0 in Food Manufacturing: AI and IoT investments can help to automate processes, increase output, enhance profitability, and mitigate contamination risks. AI-driven maintenance reduces downtime, while IoT sensors ensure food safety by monitoring key factors like humidity and temperature. AI and big data also optimize the supply chain, improving demand forecasting and logistics, and minimizing waste.[15]
- Automation in Food Manufacturing creates a new level of food safety when coupled with AI. Reducing contamination risks and increasing quality control will provide customers with higher quality at lower risk and price.[16]
- Blockchain in Food Manufacturing creates complete transparency through the supply chain, assuring vendors, consumers, and trade associations of the quality and standards they uphold.[17]
- Food Manufacturing has a higher average of worker injuries when compared to other manufacturing industries. To combat this, ergonomics is a key consideration to ease weight and alleviate pressures that can cause or contribute to injuries, which cost the industry billions annually.[18]

Mergers & Acquisitions

- The domestic and global Food Manufacturing industry is becoming increasingly concentrated as major players consolidate.
- Through the American Rescue Plan, the United States Department of Agriculture (USDA) is investing $110 million, mainly in independent processing plants. The investment started in 2023 and will work toward sustainability goals by using more local producers and work toward food independence.[19]
- In 2023, The Hershey Company agreed to acquire two manufacturing facilities (in Bethlehem Pennsylvania and Indiana) from Weaver Popcorn, which was already a co-manufacturer for Hershey's SkinnyPop brand.[20]

Industry Demographics

Renewable Energy and Sustainable Practices

- Food Manufacturing is transitioning to a greener future by reducing waste through value-added products. What was once considered waste is now repurposed into consumables or fuel sources, supporting sustainability efforts.[21]
- Sustainable Processing and Food Packaging: Consumers are increasingly focused on sustainability, with packaging becoming a key area of concern. In response, many brands are adopting biodegradable materials, driven by strong consumer demand for ethically produced goods and environmentally responsible practices. As a result, sustainable packaging aligns with zero-waste initiatives, reducing harmful waste and meeting consumer preferences.[22]
- Danone is investing millions of dollars to become carbon net zero by 2050; the company's facilities around the world will be operated under 100% renewable energy and will target the reduction of certain pollutants, including methane emissions.[23]
- According to the USDA and the United States Environmental Protection Agency (EPA), food loss will be halved by 2030 through the Food Loss and Waste Reduction Goal.[24]
- The shift toward sustainable, local practices in Food Manufacturing will create new job opportunities. The American Rescue Plan Act will benefit thousands of producers and generate hundreds of full-time jobs.[25]
- The 2023 Billion-Ton Report (BT23) indicates that the U.S. has the potential to triple its biomass fuel production, exceeding 1 billion tons annually. Food production byproducts represent a significant portion of this potential. Notably, Pennsylvania consistently ranks among the top dozen states in biomass production, producing nearly 400,000 tons/year, further highlighting its role in this growing sector.[26]
- Rising population and demand have driven the adoption of hydroponics as a supplemental method to traditional farming, reducing water and resource usage. From 2024 to 2032, the hydroponics market is projected to grow at a 20.3% CAGR, surpassing $23 billion, with significant implications for indoor farming and Food Manufacturing.[27]
- Hydroponics and smart manufacturing are transforming supply chains by increasing yields with fewer rejects, allowing for larger export loads. Additionally, the ability to produce locally reduces transit distances, making logistics and transportation more cost-effective and efficient.[28]
- Food Manufacturing is making significant strides in modernization, with the adoption of smart factories that use advanced software and equipment, including Manufacturing Execution Systems (MES) and Enterprise Resource Planning (ERP). These technologies enable facilities to capture and process data more quickly and efficiently to make faster, more accurate decisions.[29]

Supply Chain

- Supply chain disruptions in 2020 to 2021 exposed weaknesses in logistics and processes, compounded by raw material shortages. During the COVID-19 emergency, 38% of adults experienced food insecurity.[30]
- In 2024, Pennsylvania solidified its position as a key hub for Food Manufacturing, with the capability to reach 40% of the U.S. population and 60% of the Canadian population within a one-day drive. This strategic advantage positions the state for continued growth and increased prominence in the industry.[31]
- U.S. Food Manufacturers exporting to the European Union face several challenges. As of 2022, tariffs of up to 20% can increase competition in the EU market. Additionally, differing regulations require U.S. companies to adjust ingredients and production processes to comply with EU standards, adding operational complexity.[32]
- Labor risks in 2020 to 2021 posed new threats of food contamination, forcing the closure of several operations. Though additional food safety processes have been added, labor risks and safety concerns can disrupt supply chain operations.[33]

Revenue Trends

- U.S. Animal Food Production revenue is expected to continue to grow, reaching $75.2 billion with a CAGR of 0.9%.[34]
- Flour Milling in the U.S is projected to increase at a CAGR of 0.3%, to $22.2 billion.[35]
- Margarine and Cooking Oil Processing is expected to report a CAGR of 6.3% from 2020 through 2024, followed by 0.4% growth to 2029, reaching $88.7 billion.[36]
- Cereal Production is expected to recover slightly, with a CAGR of 0.3%, reaching $11.7 billion.[37]
- Sugar Processing is experiencing a prolonged period of revenue growth, with a CAGR of 1.5% from 2019 to 2024, and is projected to continue increasing at 0.5% through 2029, reaching $13.5 billion.[38]

Industry Demographics

- Candy Production fell at a rate of -2.5% per year from 2019 to 2024 but is expected to recover slightly, with a 1.1% CAGR through 2029, reaching $11.2 billion.[39]
- Chocolate Production is expected to slow slightly, with a CAGR of -0.2% for the period, taking it to $21 billion.[40]
- Frozen Food Production is projected to increase at a 1.8% CAGR, reaching $53.1 billion.[41]
- Canned Fruit and Vegetable Processing will fall to $49.5 billion (a CAGR of -1.8% for the period).[42]
- Dairy Production is projected to increase, with a CAGR of 0.6%, to $146.5 billion.[43]
- Ice Cream Production is anticipated to post a CAGR of 1.7%, to $11.3 billion.[44]
- Meat, Beef and Poultry Processing revenue forecasts a CAGR of 0.4% for the period, reaching $274.8 billion.[45]
- Seafood Preparation is expected to increase to $15.3 billion (a CAGR of 1.5%).[46]
- Bread Production will likely increase to $52.4 billion, with a CAGR of 2.4%.[47]
- Cookie, Cracker, and Pasta Production is expected to increase at a CAGR of 1.6%, to $27.2 billion.[48]
- Tortilla Production growth is projected to see a 1.3% CAGR, to $6.8 billion.[49]
- Snack Production is also likely to grow from 2024 to 2029, with a 0.7% CAGR driving revenue to $49.1 billion.[50]
- Coffee Production's expected 0.9% CAGR will push revenue to $13.3 billion in 2029.[51]
- Tea Production is anticipated to increase at a CAGR of 1.2%, to $1.3 billion.[52]
- Syrup and Flavoring Production will fall slightly; the projected $12.9 billion revenue in 2029 represents a CAGR of -0.3%.[53]
- Seasoning Sauce and Condiment Production is projected to increase during 2024 to 2029 to $30.4 billion, with a CAGR of 2%.[54]
- Baking Mix and Prepared Food Production revenue projects continued growth to $40.6 billion (a CAGR of 1.7%).[55]

Workforce Challenges

- Food Manufacturing has been slow to adopt automation due to the complexity of its processes and the high cost of capital equipment. With accelerated demand during 2020 to 2021, initial automation efforts focused on packaging and transportation. This approach enabled a gradual transition to more complex automation while maintaining jobs and addressing industry demands for increased production efficiency and improved cleanliness.[56]
- Microplastics in Food Manufacturing: The U.S. Food and Drug Administration (FDA) reports increasing levels of micro- and nanoplastics in various food groups, though concentrations remain below harmful thresholds. These plastics result from environmental contamination where the food is grown or sourced, with no evidence linking them to packaging or processing during the manufacturing process.[57]
- In Pennsylvania, the agriculture and food industry employs one in every 10 workers, totaling nearly 580,000 jobs. From 2021 to 2031, the state is projected to see more than 75,000 new and replacement job openings in these sectors.[58]
- Impact of Immigration on Food Manufacturing: Immigrants play a key role in the U.S. workforce, helping to address labor shortages. In 2023, 47.6 million immigrant-origin workers made up 36% of the workforce in the food and personal services sectors.[59]
- A worker shortage and anticipated skills gap prompted large companies to adopt AI and digital platforms such as Augmented Reality (AR), which are used to improve onboarding, safety, and self-guidance processes. This implementation delivered significant results, including a 27% reduction in equipment downtime and a 76% decrease in training time for new hires in 2022.[60]
- Food Manufacturing experienced elevated unemployment levels between 2020 and 2021, peaking at 14.8% but falling to 3.6% in 2022. To address the workforce gap, producers implemented various strategies, including the creation of an efficient training pipeline to facilitate knowledge transfer from senior employees to new hires.[61]
- Modernized Food Manufacturing facilities can leverage digital twin technology, allowing the facility to visualize, predict, and optimize plant production with a real-time digital replica. Proactive problem-solving and continuous improvement are enabled by IoT sensors, data analytics, and machine learning algorithms.[62]

Industry Demographics

- Wages as a percentage of total revenue in 2023:
  - Animal Food Production: 5.9% [63]
  - Flour Milling: 6.4% [64]
  - Margarine & Cooking Oil Processing: 2.5% [65]
  - Cereal Production: 8.4% [66]
  - Sugar Processing: 8.3% [67]
  - Candy Production: 13.9% [68]
  - Chocolate Production: 11.7% [69]
  - Frozen Food Production: 11.2% [70]
  - Canned Fruit Vegetable Processing: 10.2% [71]
  - Dairy Product Production: 6.9% [72]
  - Ice Cream Production: 12.3% [73]
  - Meat Beef Poultry Processing: 10.4% [74]
  - Seafood Preparation: 11.9% [75]
  - Bread Production: 17.8% [76]
  - Cookie Cracker Pasta Production: 11.6% [77]
  - Tortilla Production: 16.4% [78]
  - Snack Food Production: 7.9% [79]
  - Coffee Production: 9% [80]
  - Tea Production: 14.5% [81]
  - Syrup and Flavoring Production: 5.7% [82]
  - Seasoning Sauce and Condiment Production: 10.7% [83]
  - Baking Mix and Prepared Food Production: 13.5% [84]

Consumer Trends

- Consumer purchasing habits have increasingly shifted toward health and wellness, with a growing demand for plant-based and functional foods offering specific health benefits, as well as low-sugar or sugar-free alternatives. This trend is reshaping the landscape of Food Manufacturing to align with evolving consumer preferences.[85]
- Sustainability and Ethical Consumption: Consumers are increasingly demanding more sustainable practices, prompting manufacturers to adapt. A significant trend shaping Food Manufacturing is the use of locally sourced ingredients, which influences production and distribution methods. In 2022, 27% of consumers reported actively seeking locally produced foods, equating to $9 billion.[86]
- Global Flavors: The growing popularity of international snacks and meals has driven U.S. manufacturers to adapt to evolving consumer preferences. Increasing demand for foreign flavors and styles is pushing Food Manufacturing companies to adjust their offerings to meet this trend.[87]
- Higher Quality Product: Consumers are growing increasingly cautious about the ingredients used in products. Research highlighting the harmful effects of certain chemical additives has fueled consumer skepticism. As a result, there is a rising demand for products that promote health, such as those containing gut probiotics, while also reducing the use of additives. This shift is becoming a significant influence on consumer preferences and is shaping trends in Food Manufacturing.[88]
- Tech-Driven: A growing number of consumers are prioritizing personalized nutrition to meet their individual needs. With the vast amount of food and personal health data now available, there has been a push for food offerings to align with these personalized efforts. Smart kitchens are playing a key role in advancing food health data, using the IoT to support data-driven shopping, meal planning, and preparation. This shift is influencing innovation within Food Manufacturing.[89]
- Transparent Labeling: Consumers are increasingly critical of labels and how food is sourced/prepared. In 2023, 72% of respondents from a Purdue study stated transparency is extremely important when purchasing food items.[90]
- Altered State: Freeze-drying traditional candies and foods is gaining popularity as consumers seek new consumption styles and natural products with longer shelf lives. The freeze-dried foods market is projected to grow at a 6.3% CAGR from 2024 to 2032, reaching $55.9 billion.[91]
- Flash-Freezing: Flash-freezing has gained popularity for preserving nutrients and freshness by rapidly freezing food, especially seafood, vegetables, and ready-to-eat meals. This method aligns with growing consumer demand for fresher, healthier options, driving changes in Food Manufacturing.[92]

Industry Demographics

- Frozen food demand has experienced volatility since 2018, with a significant surge in 2020 to 2021 driven by a shift toward home-based meal preferences. However, demand has since declined as consumers prioritized healthier options. More recently, demand has begun to recover, supported by acquisitions of smaller producers offering products that align more closely with health-conscious preferences.[93]

Cost Trends

Present:

- One of the key raw inputs for Food Manufacturing (food and ingredients) is heavily influenced by weather and climate conditions, which are beyond the control of producers. As a result, these variables can significantly impact Food Manufacturing costs, introducing volatility to the supply chain and production processes.
- Food prices are highly volatile, with a 1% drop in global harvests driving an average 8.5% increase in commodity prices, posing significant challenges for Food Manufacturing.[94]
- Adjacent markets that impact food production also have a direct effect on Food Manufacturing. A rise in natural gas prices, for example, influences the cost of fertilizers, and a 1% increase in fertilizer prices results in a 0.45% rise in food prices, largely due to the effect on overall manufacturing costs.[95]
- Energy: Food Manufacturing requires a substantial amount of energy, resulting in significant emissions. According to the Department of Energy, Food Manufacturing accounts for 6% of total industrial emissions.[96]
- Wages for all employees in Food Manufacturing in Pennsylvania increased in 2023, with annual wages rising by 4%.[97]

Future:

- Food commodities and raw materials saw a 40% year-on-year increase, reaching all-time highs in 2022. This significant growth has had major implications for manufacturers, making it challenging to operate, as the increased costs tighten profit margins.[98]
- Due to the rise in raw material prices, Food Manufacturers have had to put in place risk reduction techniques; some Food Manufacturers have been developing schedules to maximize production while costs are low. Tracking data related to all necessary ingredients, and buying and producing when ingredients are least expensive are helping reduce the risk for Food Manufacturers.[99]
- The U.S. exports more raw materials related to Food Manufacturing than it imports; however, the value of imports has surpassed that of exports, resulting in a negative trade balance. Food Manufacturers must navigate this challenge while continuing to meet evolving consumer preferences.[100]
- With Food Manufacturing accounting for 8% of greenhouse gases and a population expected to increase 16% through 2050, Food Manufacturers must prepare differently, including working toward net-zero greenhouse gas emissions.[101]

Industry Profits and Drivers

Industry Drivers

Agriculture:

- Rising interest rates have emerged as a new challenge for those in the agriculture industry, with rates reaching double digits. However, many in the industry are able to weather the higher rates due to two consecutive years of record net cash flow. This factor helps mitigate the impact of higher borrowing costs for agriculture and Food Manufacturing stakeholders.[102]
- When large agricultural corporations or farms experience fluctuations in supply or demand, it creates a ripple effect throughout the Food Manufacturing sector. This impact is significant because 20% of farms control 70% of the total U.S. farmland, while four major firms control 63% of the retail market for food products.[103]
- Chemical: Chemicals are vital to Food Manufacturing, providing preservatives and antioxidants, enabling equipment sanitation and protecting ingredients from harmful pathogens.[104]
- Packaging: Packaging is crucial in Food Manufacturing, impacting consumer spending while ensuring proper distribution, regulatory compliance, and product quality. Effective packaging extends shelf life, supporting both industry standards and consumer satisfaction.[105]

Industry Demographics

- Transportation and Logistics: Transportation is critical for Food Manufacturers, ensuring timely delivery of raw materials and finished products while meeting strict food safety standards. Efficient logistics are essential to maintaining production quality, especially for refrigerated goods, where cold chain management is crucial to preserving product safety and freshness.[106]
- Oil and Gas: Oil and gas are essential to Food Manufacturing, meeting the industry's high energy demands and supplying key materials for plastic packaging. Additionally, the transportation crucial to the food supply chain relies heavily on the oil and gas sector, making energy and logistics two critical industry drivers.

Demand for Food

- Growing sustainability concerns are driving increased demand for alternatively sourced products, leading to a surge in the market for plant-based offerings within Food Manufacturing. This shift reflects a broader consumer preference for environmentally friendly options, prompting Food Manufacturers to expand their plant-based product lines to meet this demand.[107]
- The plant-based food industry is expected to increase at a CAGR of 12.2% from 2023 to 2033.[108]
- As decarbonization efforts expand, alternative proteins are projected to account for 11% of global protein consumption by 2035, representing a market value of $11 billion. [109]
- With the growth of decarbonization and plant-based food trends, ingredient sourcing in Food Manufacturing is being restructured. The demand for alternative ingredients from various sources is rising and is expected to become standard industry practice, driven by sustainability and consumer preferences.[110]

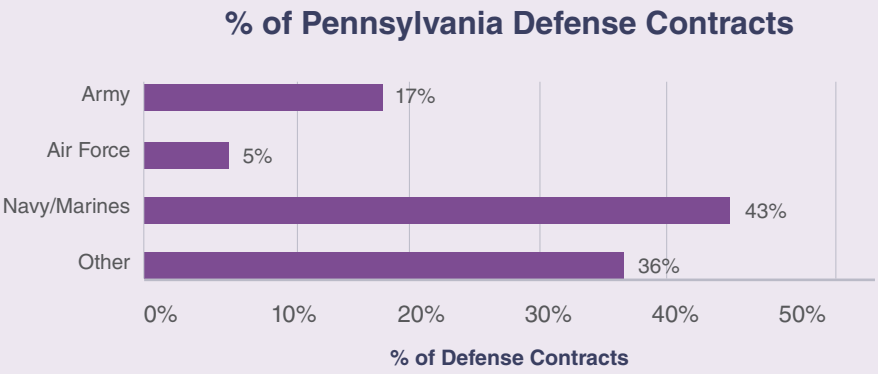
Macroeconomic Conditions

- In November 2023, the U.S. dollar weakened by 3.7%, marking its sharpest monthly decline in a year. This will significantly increase the cost of imported raw materials, while enhancing the competitiveness of exported ingredients, giving Food Manufacturers a strategic advantage in global markets. This shift profoundly impacts both cost structures and international competitiveness in the industry.[111]
- Inflationary Pressures: Rising costs and geopolitical conflicts have significantly contributed to inflation in Food Manufacturing. Low supply and high prices of raw materials are driving higher production costs. Additionally, escalating energy costs (fueled by conflict), and increased transportation expenses, (compounded by recent labor shortages), have further exacerbated the situation, creating ongoing challenges for Food Manufacturers.
- Consumer Health Trend: Consumer demand has shifted in recent years toward healthier options like organic and plant-based products, driven by a focus on sustainability. However, higher production and R&D costs, premium raw materials, and expensive certifications to verify organic and health claims make these products costly to produce. The industry's push for sustainability has also required modernization, further increasing operational expenses and consumer prices.
- Throughout 2024, the Producer Price Index (PPI), which measures inflation from a manufacturing perspective, has been steadily increasing, with June 2024 reaching a 10 year high of 204.7. If these price increases are not passed to consumers, manufacturers will have smaller margins.[112]

Key National Defense Trends Affecting Food Manufacturing

Defense and Aerospace:

- Pennsylvania received $17.9 billion in state defense contracts in 2023.[113]
- Defense contracts comprised 1.9% of state GDP in 2023.[114]
- Pennsylvania received 3.2% of total U.S. defense spending.[115]



- Challenges in sourcing raw materials, combined with rising fuel costs due to conflict, significantly drive up Food Manufacturing expenses. These supply chain vulnerabilities are also accelerating efforts to reshore production.
- Food Defense: During conflicts, military partners work closely with the FDA to safeguard the food supply from international contamination, leveraging IoT and advanced food safety protocols to rigorously track and monitor product lifecycles.
- Food Manufacturing is vital to military readiness, as prepackaged, meals-ready-to-eat (MREs) are essential for domestic and international operations, with demand increasing during times of conflict.
- Increased collaboration between the Food Manufacturing industry and the military has led to the development of more specialized MREs. For example, the Natick Soldier Systems Center partnered with manufacturers to create Close-Combat Assault Rations (CCAR), designed for high mobility and extended shelf life to meet specific military needs.[116]
- All MREs are sourced from U.S. Food Manufacturers. The MRE market is anticipated to expand at a robust 15% CAGR from 2024 to 2030, reaching an estimated value of $4.2 billion.[117]
- The Distributed Bioindustrial Manufacturing Investment Program (DBMIP), launched by the DoD in early 2024, aims to strengthen domestic supply chains by advancing biotechnology in the Food Manufacturing sector. The program focuses on using biotechnology to produce essential supplies, such as food, closer to military operations.[118]

Food Manufacturing Buyers and Suppliers Relationships

Suppliers

Vegetable Farming
Hay & Crop Farming
Corn Farming
Refrigeration Equipment Wholesaling
Industrial Machinery & Equipment Wholesaling
Pump & Compressor Manufacturing
Fish & Seafood Aquaculture
Orange & Citrus Groves
Sugarcane Harvesting
Mushroom Production
Metal Can & Container Manufacturing
Plastic Products Miscellaneous Manufacturing
Glass product Manufacturing
Chicken Egg Production
Utilities
Livestock Production Support Services

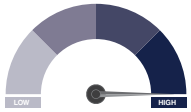
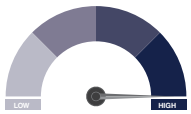
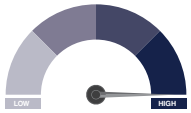
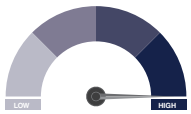
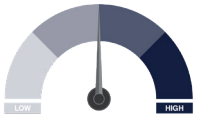
Food Manufacturing

Buyers

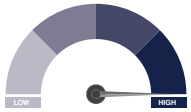
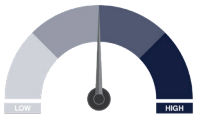
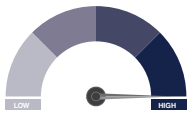
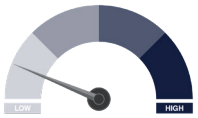
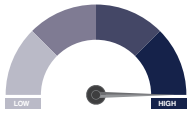
Pet Stores
Grocery Wholesaling
Dairy Farms
Fish & Seafood Wholesaling
Supermarkets & Grocery Stores
Single Location Full-Service Restaurants
Chain Restaurants
Street Vendors
Confectionery Wholesaling
Convenience Stores
Specialty Food Stores
Gas Stations with Convenience Stores
Fast Food Restaurants
Coffee & Snack Shops
Community Food Services
Hotels & Motels
Dairy Wholesaling
Breweries
Distilleries
Food Service Contractors
Juice Production
Soda Production
Soft Drink, Baked Goods & Other Grocery Wholesaling
Public Schools
Private Schools
Hospitals
Beef & Pork Wholesaling
Leather Tanning & Finishing
Meat Markets

* Industries within Critical Infrastructure highlighted in **RED**

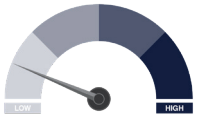
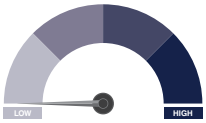
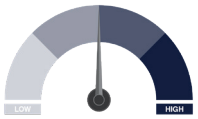
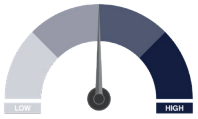
Food Manufacturing Impact on Critical Industries

Critical Industry Sector as defined by Cybersecurity & Infrastructure Security Agency (CISA)	What the Critical Industry Provides to Food Manufacturing	Impact of Critical Industry on Food Manufacturing	U.S. Growth Rate (2023)
Communications – interconnected industry using terrestrial, satellite, and wireless transmission system	- Real-time tracking of food shipments ensures supply chain efficiency, meeting demand while reducing waste by minimizing food travel time. - IoT technologies enable comprehensive product traceability, enhancing quality control and reducing the risk of illness by monitoring the environment and timeline of perishable food items. - Marketing and engagement for local food sourcing promotes the use of nearby Food Manufacturers and farms, reducing waste and alleviating pressure on the supply chain by leveraging local options. - Effective crisis management facilitates communication, ensuring that food is optimally used during national crises.		1.43%
Chemical - manufactures, stores, uses, and transports potentially dangerous chemicals	- Preservatives: Chemical additives are used to extend the shelf life of food products. - Flavor enhancers: Additives are used in food processing to achieve desired taste profiles. - Colorants: Chemical additives are applied to attain the preferred color and visual presentation of food products. - Sweeteners: Artificial sweeteners are added to enhance sweetness without raising sugar levels in food products. - Nutritional additives: Chemical compounds are incorporated to boost the nutritional value of food products.		-1%
Commercial Facilities - diverse range of sites that draw large crowds of people for shopping, business, entertainment, or lodging	- Distribution and Retail: Facilitating the sale and delivery of finished food products to the consumer. - Storage and Warehousing: Providing long-term storage solutions, including refrigeration for perishable items, to preserve food quality. - Food Safety: Ensuring compliance with federal inspections to maintain product quality and prevent foodborne illnesses in Food Manufacturing.		3.4%
Critical Manufacturing - significant manufacturing industries that may be susceptible to manmade and natural disasters	- Equipment and Machinery: Producing essential equipment and machinery for Food Manufacturing and processing operations. - Automation and Robotics: Developing automation solutions to modernize and streamline Food Manufacturing facilities. - Materials and Packaging: Manufacturing various packaging solutions to preserve, market, and distribute food products effectively.		-2%
Dams - delivers critical water retention and control services	- Water Supply: Dams ensure a reliable and consistent water source, which is essential for Food Manufacturing processes. - Hydroelectric Power: Supply alternative energy to Food Manufacturing facilities, supporting progress toward decarbonization goals.		6%
Defense Industrial Base - research and development, design, production, delivery, and maintenance of military weapons systems, subsystems, and components or parts, to meet U.S. military requirements	- Supply Chain and Logistics Support: Ensuring military food demands are met and facilitating distribution during emergencies. - Technology and Innovation Transfer: Many advancements in Food Manufacturing, including food preservation techniques, automated packaging, and tracking methods, originated from military R&D efforts.		8%

Food Manufacturing Impact on Critical Industries

Critical Industry Sector as defined by Cybersecurity & Infrastructure Security Agency (CISA)	What the Critical Industry Provides to Food Manufacturing	Impact of Critical Industry on Food Manufacturing	U.S. Growth Rate (2023)
Emergency Services - community highly-skilled, trained personnel, along with the physical and cyber resources, that provide a wide range of prevention, preparedness, response, and recovery services	- Disaster Response and Recovery: Distributing essential food items to affected populations during emergencies. - Public Health and Safety Enforcement: Collaborating with regulatory bodies to manage and reduce the risk of foodborne illnesses in Food Manufacturing.		5.8%
Energy - protects a multifaceted web of electricity, oil, and natural gas resources and assets to maintain steady energy supplies	- Energy Production: Generating the energy needed to power large Food Manufacturing facilities. - Cold Storage and Refrigeration: A significant portion of energy in Food Manufacturing is dedicated to climate control for preserving products and maintaining quality. - Regulations and Initiatives: As major energy consumers, Food Manufacturing facilities are at the forefront of regulatory efforts and initiatives aimed at driving sustainable change.		9.3%
Financial Services - depository institutions, providers of investment products, insurance companies, other credit and financing organizations, and the providers of the critical financial utilities and services that support these functions	- Access to Capital: Food Manufacturing facilities require significant investments or loans, typically provided by financial services. - Insurance: Given the perishability of food products, insurance is vital for Food Manufacturers to protect against potential losses. - Risk Management: Services offering tools and strategies to help Food Manufacturers mitigate uncontrollable risks such as crop failures, equipment malfunctions, and supply chain disruptions. - Mergers and Acquisitions: The Food Manufacturing industry is dominated by large parent companies that frequently engage in mergers and acquisitions to expand operations.		7.7%
Food and Agriculture - composed of farms, restaurants, and registered food manufacturing, processing, and storage facilities	- Suppliers: Farms provide the essential raw materials used by Food Manufacturers. - Buyers: End users, including restaurants, depend on Food Manufacturers for their products. - Innovation: Collaboration between agriculture and Food Manufacturing to enhance food quality and safety.		3.1%
Government Facilities - a wide variety of buildings, located in the United States and overseas, that are owned or leased by federal, state, local, and tribal governments	- Regulatory Oversight and Compliance: Government agencies, such as the USDA and FDA, regulate food safety standards for Food Manufacturing. - Public Health and Safety Programs: Organizations like the Centers for Disease Control and Prevention (CDC) collaborate closely with Food Manufacturers to reduce foodborne illnesses.		1.6%
Healthcare and Public Health - protects all sectors of the economy from hazards such as terrorism, infectious disease outbreaks, and natural disasters	- Occupational Health Programs: Initiatives designed to ensure the safety and well-being of Food Manufacturing workers, minimizing injury and contamination risks. - Nutritional Research and Standards: This sector supports nutrition research and the development of industry-wide nutritional standards. - Crisis Response: Services that collaborate with Food Manufacturers to mitigate and manage issues during times of crisis.		6%

Food Manufacturing Impact on Critical Industries

Critical Industry Sector as defined by Cybersecurity & Infrastructure Security Agency (CISA)	What the Critical Industry Provides to Food Manufacturing	Impact of Critical Industry on Food Manufacturing	U.S. Growth Rate (2023)
Information Technology - produce and provide hardware, software, and information technology systems and services	- Automation and Process Control: IT systems create software to run robotics and automated procedures in Food Manufacturing facilities. - Supply Chain Management: IT services create and manage the software crucial to the food supply chain - Data Analytics: IT services can analyze data to predict trends and demands, streamlining the food supply chain and reducing waste. - Cybersecurity: Food Manufacturing facilities are susceptible to cyberattacks; IT services mitigate these efforts.		8.2%
Nuclear Reactors, Materials and Waste - America's civilian nuclear infrastructure	- Energy Supply: Nuclear power serves as a substantial energy source for Food Manufacturers. - Food Sterilization: Nuclear technology is employed to eliminate bacteria, viruses, and parasites in food, enhancing safety and reducing health risks. - Waste Heat Utilization: Waste heat generated by nuclear reactors can be harnessed for low-temperature processes, helping to reduce overall energy demand in Food Manufacturing.		1.4%
Transportation Systems - Aviation, Highway and Motor Carrier, Maritime Transportation System, Mass Transit and Passenger Rail, Freight Rail, and Postal and Shipping	- Supply Chain Efficiency: Transportation systems facilitate the movement of raw materials to Food Manufacturers and the distribution of finished products to markets. - Geographical Reach: Transportation systems enable Food Manufacturers to serve both local and global customers efficiently. - Waste Management: Transportation systems play a critical role in minimizing waste in Food Manufacturing and promoting recycling efforts.		8.8%
Water - public drinking water systems and wastewater treatment systems	- Crucial to Supply: Water is essential for the agriculture industry, which provides raw materials to Food Manufacturing. - Water Usage: Many Food Manufacturing processes rely heavily on water to produce finished products. - Regulatory Compliance: Food Manufacturers must adhere to stringent standards to ensure the safe and responsible use of water in production. - Sustainable Practices: Given the high levels of waste in Food Manufacturing, innovative methods are necessary to reduce water usage and promote recycling efforts.		6.8%

Supply Chain Partners

As part of the Food Manufacturing supply chain, the Food Manufacturing industry inputs raw materials to be processed and refined for the creation of consumables. End users include wholesalers, distributors, retailers, processing establishments, government agencies, and others. Below is an overview of the major input supplier and end-use industries, organized alphabetically:

Major Supply Industries

- **Crop Services (NAICS 11511):** Supplies raw materials to Food Manufacturers to be processed, including grains, fruits, seeds, vegetables, and other goods.
- **Food Product Machinery Manufacturing (NAICS 333241):** Provides machines necessary for food processing and packaging.
- **Hydroelectric Power (NAICS 22111c):** Provides clean and reliable energy for various processes, including heating and washing cycles for Food Manufacturing.
- **Lighting Equipment Manufacturing (NAICS 33512):** Provides lighting solutions and products for Food Manufacturing plants.
- **Other Basic Organic Chemical Manufacturing (NAICS 32519):** Supplies food additives, preservatives, and flavorings.
- **Paperboard Container Manufacturing (NAICS 32221):** Supplies boxes, cartons, and containers for food packaging.
- **Refrigerated Warehousing and Storage (NAICS 49312):** Provides cold storage for perishable items.
- **Support Activities for Crop Production (NAICS 11511):** Provides pest control, planting, and harvesting services for food production.
- **Water Supply and Irrigation Systems (NAICS 221310):** Provides water supply, which is critical to Food Manufacturing plants for sanitation and processing.

Major Demand Industries: Food Manufacturers are vital partners to American defense contractors and the DoD in support of the Defense Industrial Base (DIB). Food Manufacturers also supply other critical infrastructure sectors, including:

- **Correctional Institutions (NAICS 922140):** Require large amounts of food to feed personnel and incarcerated individuals.
- **Emergency and Other Relief Services (NAICS 624230):** Provide ready-to-eat meals and packaged products for disaster relief.
- **Elementary and Secondary Schools (NAICS 611110):** Institutions require a steady supply of food at reasonable costs.
- **Full-Service Restaurants (NAICS 722511):** Require a large variety of ingredients and other Food Manufacturing products.
- **General Medical and Surgical Hospitals (NAICS 622110):** Consume significant supplies of food products for patients, including dietary-restrictive options.
- **National Security and International Affairs (NAICS 9281):** The military requires large amounts of processed, packaged, and preserved food.
- **Pharmaceutical Preparation Manufacturing (NAICS 325412):** Some Food Manufacturers supply specialized dietary products or supplements.
- **Supermarkets and Other Grocery Stores (NAICS 445110):** Primary source for retail food products.
- **Services for the Elderly and Persons with Disabilities (NAICS 624120):** Providing food products to groups with specific dietary needs.
- **Warehouse Clubs and Supercenters (NAICS 452910):** Large retail stores offer a variety of Food Manufacturing products in bulk.

Leading Pennsylvania Manufacturers within NAICS 311

This section documents the leading players within NAICS 311 with operations in Pennsylvania, segmented by the jurisdictions of each IRC partner and sorted alphabetically. Leading companies were selected based on revenue estimates.

Southeastern PA Region

Delaware Valley Industrial Resource Center (DVIRC)

- Arnold Foods Company, Inc. (Horsham)
- BBU, INC. (Horsham)
- Dietz & Watson, Inc. (Philadelphia)
- Herr Foods Incorporated (Nottingham)
- Keystone Food Products, Inc. (West Chester)
- Philadelphia Macaroni Company, (Philadelphia)
- Zentis North America, LLC (Philadelphia)

Southwestern PA Region

Catalyst Connection

- AOG, LLC, TruFood (Pittsburgh)
- Galliker Dairy Company (Johnstown)
- Heinz Frozen Food Company (Pittsburgh)
- Martin's Famous Pastry Shoppe, Inc. (Pittsburgh)
- The Kraft Heinz Company (Pittsburgh)

South Central PA Region

MANTEC

- Farmers Pride, Inc. (Fredericksburg)
- Hanover Foods Corporation (Hanover)
- Knouse Foods Cooperative, Inc. (Peach Glen)
- Sechler Family Foods, Inc (Fredericksburg)
- The Hershey Company (Hershey)
- Turkey Hill LLC (Conestoga)
- UTZ Brands, Inc. (Hanover)
- Zausner Foods Corp. (New Holland)

Lehigh Valley PA Region

Manufacturers Resource Center (MRC)

- Ateeco, Inc. (Shenandoah)
- F M Brown's Sons Incorporated (Reading)
- Giorgio Foods, Inc. (Reading)
- Just Born, Inc. (Bethlehem)
- R.M. Palmer Company LLC (Reading)
- Tate & Lyle Solutions USA LLC (Reading)

Northeast PA Region

Northeastern PA Industrial Resource Center (NEPIRC)

- Euro Foods, Inc. (Freeland)
- Gertrude Hawk Chocolates, Inc. (Dunmore)
- Nardone Brothers Baking Company Inc (Wilkes Barre)
- Tasty Baking Company (Bartonsville)
- Wise Foods, Inc. (Berwick)

Central PA Region

Innovative Manufacturers' Center (IMC)

- CCK, INC. (Tyrone)
- Delgrosso Foods Inc. (Tipton)
- Furman Foods, Inc. (Northumberland)
- TableTrust Brands LLC (Mifflintown)

Northwest PA Region

Northwest Industrial Resource Center (NWIRC)

- Ainsworth Pet Nutrition Parent, LLC (Meadville)
- Better Baked Foods, LLC (North East)
- Joy Cone Co. (Greenville)
- Maple Donuts, Inc (Lake City)

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