

Economic Contribution of the Food and Beverage Industry

*A Report by the Committee for Economic Development
of The Conference Board*



Economic Contribution of the Food and Beverage Industry

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Economic Contribution of the Food and Beverage Industry

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Executive Summary

The food sector plays an essential role in the US economy, accounting for about 5 percent of gross domestic product, 10 percent of total US employment, and 10 percent of US consumers' disposable personal income (DPI). The food sector has total sales of \$1.4 trillion, including food consumed at home and away from home.

To deliver food to consumers, a complex food value chain extends from farm producers to food consumers and includes production, processing, packaging, storage, transportation, and retail sales. This report focuses on the **food and beverage industry** within the food value chain. This industry transforms raw farm commodities from over 2 million farms into consumer food and beverage products marketed through nearly 680,000 retail stores and foodservice outlets.

The food and beverage industry meets the continuous needs of 320 million American consumers, as well as many consumers overseas, by managing food supplies from widely dispersed farms that often produce only once a year. The food and beverage industry coordinates with farm producers and other actors in the food value chain to provide the product quality that consumers demand. Thus, it provides the primary link between farm production and food retailing.

This report examines the role of the food and beverage industry within the food system and in regional economies; how the food and beverage industry contributes to growth and innovation in the food system; how the food and beverage industry responds to emerging and dynamic consumer demand; and the role of public policy in shaping the market environment for the food industry.

Providing a stable source of employment

Of the total \$1.4 trillion in food sector sales, the food and beverage industry alone generates \$164 billion in value added and accounts for 15.3 cents out of every consumer food dollar. This value added is paid out in \$83 billion in total salary and benefits (which includes pretax employee wages plus employer and employee costs for employee benefits), \$10 billion in taxes, \$62 billion in property income, and \$9 billion for imported inputs. Food manufacturing tends to have relatively high payments to salaries and benefits compared with other food sector industries. Salaries and benefits account for half of the value added in food manufacturing.

The food and beverage industry has nearly 27,000 establishments employing 1.46 million workers and accounts for about 13 percent of all US manufacturing employment and about 1 percent of all US nonfarm employment. The industry is dominated by bakeries and tortilla manufacturing (39 percent of establishments and 18 percent of employees) and by animal slaughter and processing (14 percent of establishments and 33 percent of employees). The food and beverage industry has been more stable in terms of employment and labor income than other manufacturing industries in the United States, due to the consistent demand for food and the competitive prices of raw commodities.

Playing an important role in local economies

The food and beverage industry is present in every state and often provides a major contribution to the state's economy. The states with the greatest total numbers of employees in the food and beverage industry are, in descending order: California, Texas, Illinois, Pennsylvania, Wisconsin, Georgia, Ohio, Iowa, North Carolina, New York, Minnesota, Arkansas, and Missouri.

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Food and beverage industry employment as a share of employment reveals the relative importance of this industry in some states with smaller populations. The food and beverage industry accounts for more than 20 percent of all manufacturing employment in Hawaii, Nebraska, Delaware, Idaho, Iowa, and South Dakota. The states where food and beverage industry employment is 2 percent or more of total nonfarm employment are: Nebraska, Iowa, Idaho, Wisconsin, South Dakota, and Kansas.

The relatively labor-intensive nature of food processing leads to strong economic multiplier impacts on local economies. In seven different states, recent studies show that every dollar of food and beverage industry output generates between \$0.40 and \$1.35 of additional economic activity. Every job in the food and beverage industry generates between one and three additional jobs in local and regional economies as employees spend their wages on local goods and services. At the national level, economic multiplier impacts are larger, as these indirect impacts ripple through the economy. One study estimates that US food manufacturing generates over \$4.00 of additional value added in the economy for each dollar of value added in the industry and five additional jobs for every industry job.

Contributing to innovation in the food system

The food and beverage industry innovates to add value and to meet evolving consumer demand at home and abroad. Food industry research expenditures have nearly doubled during the past decade, and the US industry spends \$5.4 billion annually on research or 3 percent of industry value added. Venture capital firms invest another \$3 billion to fund innovations in food market and processing technologies.

The food and beverage industry has responded to the dynamics of consumer demand and food retailing by introducing new product offerings

that meet growing demands from consumers for healthfulness and quality. At least 40 percent of new foods and beverages are formulated with positive nutrition or health attributes, and many more innovations are on the horizon as new technologies allow improvements in product quality and reduce waste in the food supply chain.

Responding to increased demand for US exports

The food and beverage industry has also contributed to growth in US exports, with expanded sales in the international market. Processed food products now account for more than half of food and agricultural exports from the United States. Consumer-oriented and intermediate products together account for \$70 billion of agricultural exports, more than the \$63 billion in bulk or raw commodity exports. There has been particularly rapid growth in exports of dairy products, pork products, prepared foods, and nonalcoholic beverages during the past 20 years. Much of the growing demand for processed food exports is in emerging economies.

Growth in food exports generates multiplier effects throughout the US economy. The food and beverage industry is part of this activity and a source of additional economic impact through links to suppliers. Every dollar of demand for US food exports stimulates another \$1.27 in economic activity. Much of the economic activity generated by agricultural exports is in food processing, services, transportation, and wholesale sectors.

Contributing to food affordability

The food and beverage industry has contributed to the affordability of food for consumers through long-run innovations that have increased and diversified food supplies. For example, the industry has provided more and varied store-brand products during the recent recession, providing lower-cost alternatives to consumers.

Consumer food expenditures have been a declining share of DPI over many decades; as of 2014, it is 9.7 percent. A global comparison shows that US consumers spend the smallest share of income on food, and much less than consumers in other countries with comparable income levels.

The food and beverage industry supplies retailers serving markets for **“food at home,” or FAH**, which includes supermarkets, convenience stores, and big-box stores, and **“food away from home,” or FAFH**, which includes restaurants and food served by businesses and the government. Consumers have increased their food expenditures for FAFH over the past 20 or more years, and total food expenditures in current dollars are nearly equal for FAH and FAFH. Out of a total of \$1.4 trillion in sales, \$728 billion is for FAH and \$731 billion is for FAFH. In 2014, sales of FAFH exceeded those for FAH for the first time.

Addressing increasingly sophisticated consumer demand

US consumption patterns have shifted over time toward less total meat, more low-fat milk, and less sugar. Fruit and vegetable consumption has remained constant or declined, while consumption of grains has increased. Such changes have implications for the food and beverage industry, as processing must restructure and invest over time to supply a different mix of products with different kinds of processing.

The food and beverage industry also meets demands for convenience or additional processing of foods, although demand in some categories is shifting toward fresher products with minimal processing. Indeed, organic food sales were estimated at \$35 billion in 2014, or 4 percent of total food sales. Still, about two-thirds of FAH expenditures are for moderately or high value-added foods.

The industry has also increased its coordination with farm producers to ensure the changing quality attributes that consumers demand.

As consumers seek greater quality, variety, and freshness in food products, these demands must be coordinated along the food value chain from farm to consumer. The food and beverage industry plays a key role in making sure that the food system meets retailer specifications and consumer demands; for example, it works with producers to make sure that crop varieties have appropriate flavor or processing characteristics, or that meat animals are raised without growth hormones.

Meeting societal goals: public policy and the industry’s role

A strong food sector and food industry are vital to national security. The food and agriculture sector contributes to society’s goals for ensuring adequate, secure food supplies; food system sustainability; and nutritious diets. Within the sector, the food and beverage industry is engaged in several initiatives toward furthering these goals, often in partnership with public or nonprofit partners, who provide transparency and accountability. Such initiatives include commitments from industry to support food banks and food access, to reduce food waste and greenhouse gas emissions, and to reduce empty or extra calories in diets.

The US government plays an important role in providing food assistance to low-income Americans. The US Department of Agriculture spends over \$100 billion annually—7 percent of total US food sales—on various food assistance programs to ensure food security (reliable access to enough sustenance) and promote better nutrition, and reaches 14 percent of the US population. These programs include Supplemental Nutrition Assistance Program (SNAP), with \$74 billion in expenditures in 2015 reaching 46 million participants; Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), with \$6 billion in expenditures and 8 million participants; and the National School Lunch Program (NSLP) and School Breakfast Program (SBP), with over \$7 billion in expenditures and 40 million meals served daily.

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Food assistance programs shape the market environment by increasing food expenditures, setting standards for products used in programs, and setting requirements for participating retailers. These outcomes shape the market environment and opportunities for the food and beverage industry. For example, over half of increased food expenditures through SNAP go to increased value added in the food industry, and standards for products in WIC and NSLP programs have increased demand for whole grains.

The federal government regulates food safety to minimize hazards in food; nutrition labeling to provide consumers with consistent information to make healthy choices; and food product claims, including shelf labeling and advertising, to ensure claims are not misleading. The federal government also sets standards for products used in certain nutrition assistance programs. In the past five years, several new regulations have been introduced to update standards to reflect the latest scientific knowledge about nutrition and food hazards. A recent congressional mandate to disclose genetically modified ingredients on food product labels came about in response to consumer concerns and demand for information in a consistent format. In addition to mandatory standards, the USDA also partners with the private sector to provide certification services for voluntary quality standards, most notably organic certification. This standardization facilitates market transactions and provides consumers with confidence in product labeling. These regulations and standards shape opportunities, costs, and innovation in the food and beverage industry.

Looking to the future

The food and beverage industry is a significant and stable contributor to the US economy; it plays a leading role as an employer in many regional economies. The industry's economic activities generate substantial economic impact both within regional economies and in the US economy. The industry's efficiency, continuous innovation over time, and response to changing consumer demand has helped to ensure the affordability and quality of the US food supply, as well as the competitiveness of US food exports. While demand for food changes with population, consumers continue to seek greater quality, variety, and services such as additional food preparation and individualized meals for specific nutritional needs, as well as assurances about the environmental impacts of food production. Response to these changes requires significant investment by the food and beverage industry in research and development, plants and equipment, and consumer outreach. Government programs and regulations, a long-standing feature in food markets, evolve with new demands from society and new science, and the food and beverage industry must adapt continually. The food and beverage industry will continue to play a major role in responding to dynamic consumer demands and public concerns through innovation and coordination with others in the value chain.

Introduction

The food sector from farm to consumer plays an essential role in the US economy, accounting for about 5 percent of gross domestic product, 10 percent of total US employment, and 10 percent of US consumers' disposable personal income.¹ As such, it is a significant and stable contributor to economic well-being, through its role in regional economies and in ensuring the affordability of food. In addition to meeting consumer demand for a necessity, the sector also plays an important role in public health and nutrition, environmental sustainability, and the availability of adequate food supplies at the household and national levels.

This report focuses on the food and beverage industry within the food and agriculture sector. This industry includes what is commonly called food processing or food manufacturing—everything from washing and packing fruit to the complex process of assembling a frozen entrée (see “What is the food and beverage industry?,” page 10, for more details).

The purpose of this report is to show the role of the food and beverage industry within the food value chain and in regional economies; how the food industry contributes to growth and innovation in the food system; how the food industry responds to emerging and dynamic consumer demand; and the role of public policy in shaping the food market and environment.

The report draws on secondary data available from government sources, including the US Census Bureau and the US Department of Agriculture (USDA), and on the economic literature regarding the food and beverage industry. Data are limited to the most recent available from authoritative sources and provide a foundation for understanding the economic footprint of the industry and the changing market environment. Inferences are made based on these data and on published studies; no original modeling has been done to test hypotheses or scenarios. Complete details regarding data sources are provided in each section.

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What is the food and beverage industry?

For the purposes of this report, the focus is on the economic activities that occur in the food system between farm production and food wholesaling and retailing. The North American Industry Classification System (NAICS) codes are used by the Economic Census, which is the source for many of the data presented in this report.

For food, we use information for NAICS code 311 – Food Manufacturing, which NAICS defines as follows:

Industries in the Food Manufacturing subsector transform livestock and agricultural products into products for intermediate or final consumption. The industry groups are distinguished by the raw materials (generally of animal or vegetable origin) processed into food products. The food products manufactured in these establishments are typically sold to wholesalers or retailers for distribution to consumers.

Food Manufacturing includes:

3111 – Animal food manufacturing

3112 – Grain and oilseed milling

3113 – Sugar and confectionery product manufacturing

3114 – Fruit and vegetable preserving and specialty food manufacturing

3115 – Dairy product manufacturing

3116 – Animal slaughtering and processing

3117 – Seafood product preparation and packaging

3118 – Bakeries and tortilla manufacturing

3119 – Other food manufacturing

For the beverage industry, we use data for NAICS code 31211 – Soft Drink and Ice Manufacturing. We exclude the manufacture of alcoholic beverages and the manufacture of tobacco products, which account for other industries in code 312.

The terms “food processing” (often used in USDA publications) and “food manufacturing” (used in Economic Census data) are interchangeable from the perspective of this report.

Market Environment for the Food and Beverage Industry

Background and Economic History

The food and beverage industry grew rapidly in the late nineteenth and early twentieth centuries, as part of the transformation of the US economy from primarily rural to primarily urban. The population became mostly urban in the 1920s, and thus food systems emerged to process, store, transport, and market food to urban populations. An increasing share of the consumer's food dollar over time has gone to pay for services beyond the farm such as processing, transportation, and retailing. In 1929, about a fifth of food was produced at home, but this share had dropped to less than 5 percent by the 1960s and has been less than 2 percent since the 1990s.² Consumers now obtain food from a wide variety of retail and foodservice outlets, and they spend half of their food dollars away from home.

The increasing food supply at affordable prices combined with the introduction of new food technologies played an important role in health, productivity growth, and long-term growth of the US economy in the early twentieth century. As more of the population became better nourished, they became stronger and more resistant to disease. Early twentieth-century refrigeration technology made shipping meat and dairy easier, and consumption of these foods increased, contributing to meeting protein needs. The rise of the canning industry also increased vegetable intake, particularly in winter, which reduced vitamin deficiencies. Together, these developments led to improved nutrition, which in turn led to long-run improvements in labor productivity and hence economic growth.³

In addition to cold storage, refrigerated transport, and canning, other innovations included freezing, and in later decades, dehydration, heat processing, and controlled and modified atmosphere packaging, among others.⁴ As the agriculture and food sectors grew more efficient

at producing and delivering food, agriculture itself became a smaller part of the economy as other sectors were able to grow faster. Resources moved out of agriculture and into manufacturing and industry, and eventually into an expanding services sector. As consumer income grew, more dollars were spent on nonfood items, and the share of consumer income spent on food has declined steadily over time from 20 percent in the 1930s to less than 10 percent in 2014.⁵ The food market is now a “mature” market with value growth linked to population, as most consumers have enough to eat, and now look for greater quality and variety. As a result of growing efficiency in the food sector and diminishing marginal demand for more food, the agriculture and food sector now accounts for less than 5 percent of GDP. And while food sales continue to increase with population growth, they have grown only modestly in per capita terms.

Innovations continue to be made in how food is grown, processed, and delivered to consumers. For example, the tools of modern biotechnology are being used to remove allergens from nuts and reduce product spoilage. Scientists are working to remove the genes from peanuts that produce allergenic elements, in order to prevent accidental deaths from allergic reactions.⁶ Advances are also under way to prevent browning in apples or potatoes, so as to improve shelf life and flavor. In addition, this advance has the potential to reduce food waste and loss (known in the industry as “shrink”) in the supply chain.⁷ Marketing and delivery innovations are being made that use information technology to track products and whole genome sequencing to understand the sources of food safety hazards.

Many of the food products and brands that emerged early in the food system's development became long-standing favorites, so that many food brands are more than 100 years old now.

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These include Quaker, Kellogg's, Baker's, Pepsi, Coca-Cola, Pillsbury, Jell-O, and Folgers. As of 2015, the food industry includes at least 10 companies with food sales over \$20 billion as well as many small innovators producing products to meet emerging demands for quality, variety, and specialty products. Industry jobs range from entry level or "first" jobs to highly specialized roles requiring a PhD. Growing sophistication in process controls and in marketing means that food processing now requires more highly skilled employees in food production plants as well as in digital marketing, e-commerce, and research and development. As the rest of this report discusses, the industry is an important part of the food sector and an important source of economic activity in many parts of the country.

The Food and Beverage Industry in the Food Value Chain

A complex food system connects food producers with consumers through a value chain starting with farm production and ending on consumers' plates. Figure 1 (page 13) provides a graphic illustration of the food value chain from farm to table.

Farmers produce commodities that may be consumed with minimal processing (e.g., fresh vegetables), provide inputs into processed products or beverages (e.g., sugar), or serve as inputs into other farm commodities, such as feed for livestock. At the first level beyond the farm, the food industry includes meat slaughter and processing, oilseed crushing and refining, sugar refining, dairy processing, and grain milling. At the next level, the food industry utilizes raw or partially processed commodities to create final consumer goods—everything from bread to frozen pizza to fruit juice (see Figure 2, "Italian Wedding Soup: From Farm to Retail," page 14, for the many supply sources and products used).

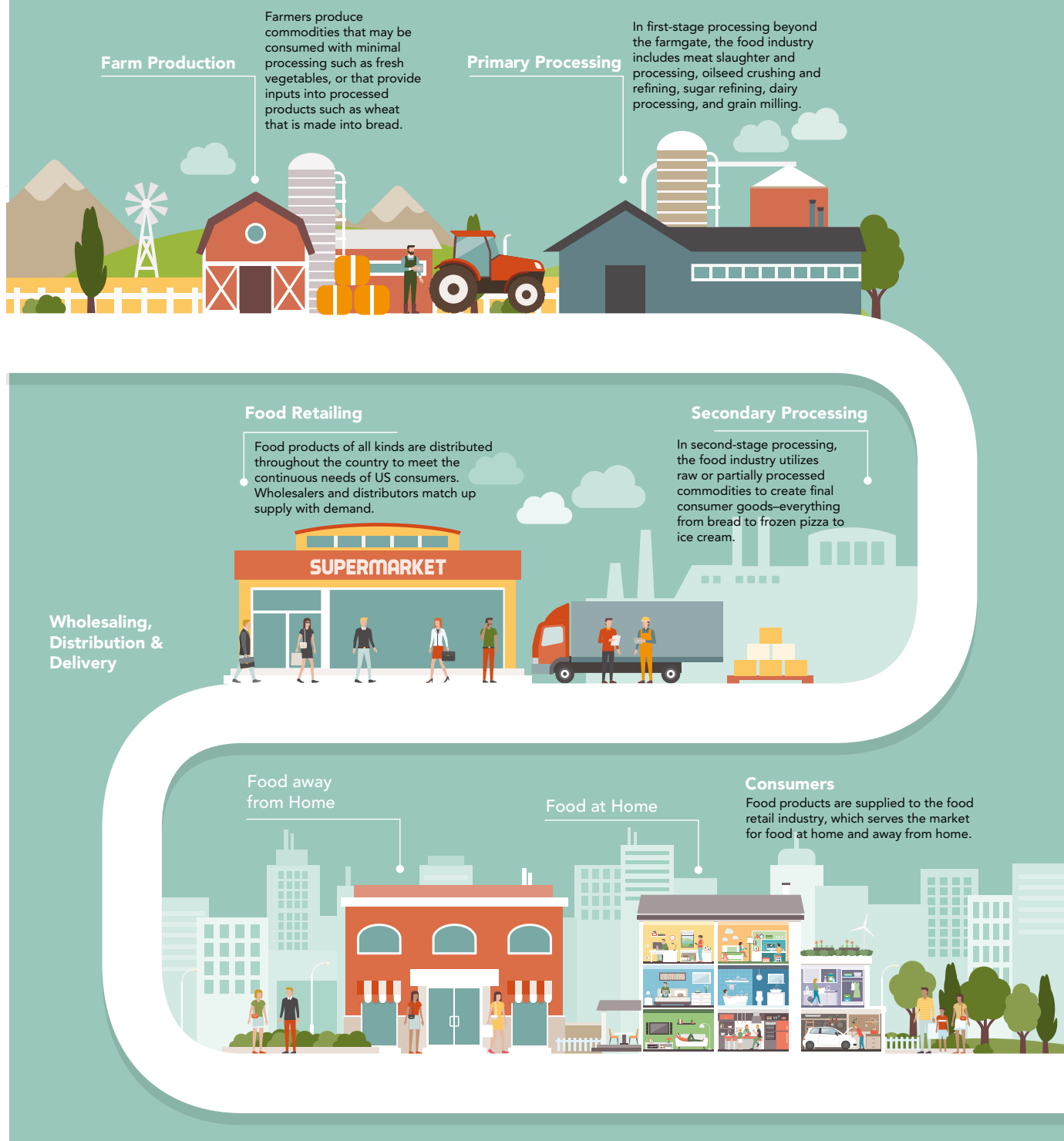
Food products produced by the food and beverage industry then are delivered to wholesalers or directly to retailers, which deliver food to consumers. Supermarkets, supercenters, convenience stores, drugstores, mass merchants, gas stations, and other stores sell food to consumers for preparation and consumption at home (the **food at home (FAH)** market). Restaurants, fast food outlets, cafeterias, businesses, education, hospitals, and other institutions prepare and serve food to consumers in the **food away from home (FAFH)** market. The food retail sector thus encompasses a wide variety of retail outlets and economic activities (see "Economic Multiplier Impacts from the Food and Beverage Industry in Local Communities," page 30, for further detail about the retail industry).

As a land-based industry, agricultural production is widely dispersed throughout the United States, as are the 320 million US food consumers who are served by the food system, as well as the many consumers in other countries who buy US food products. Furthermore, most farm commodities are produced only seasonally. Thus, the food value chain relies on extensive infrastructure to transport and store food. In addition to transforming raw commodities into food products, the food and beverage industry plays a critical role in managing the transformation of food across geographic space and over time to meet consumer demand. First-stage processing facilities in rural areas transform raw commodities so that they are in a form that is easier to transport and store. Second-stage processors ensure year-round supply by storing ingredients between harvest periods or through making the final product storable (e.g., frozen vegetables).

During recent decades, the degree of coordination along the value chain has increased as retailer and consumer demands have become more particular.

Figure 1

The Food Value Chain

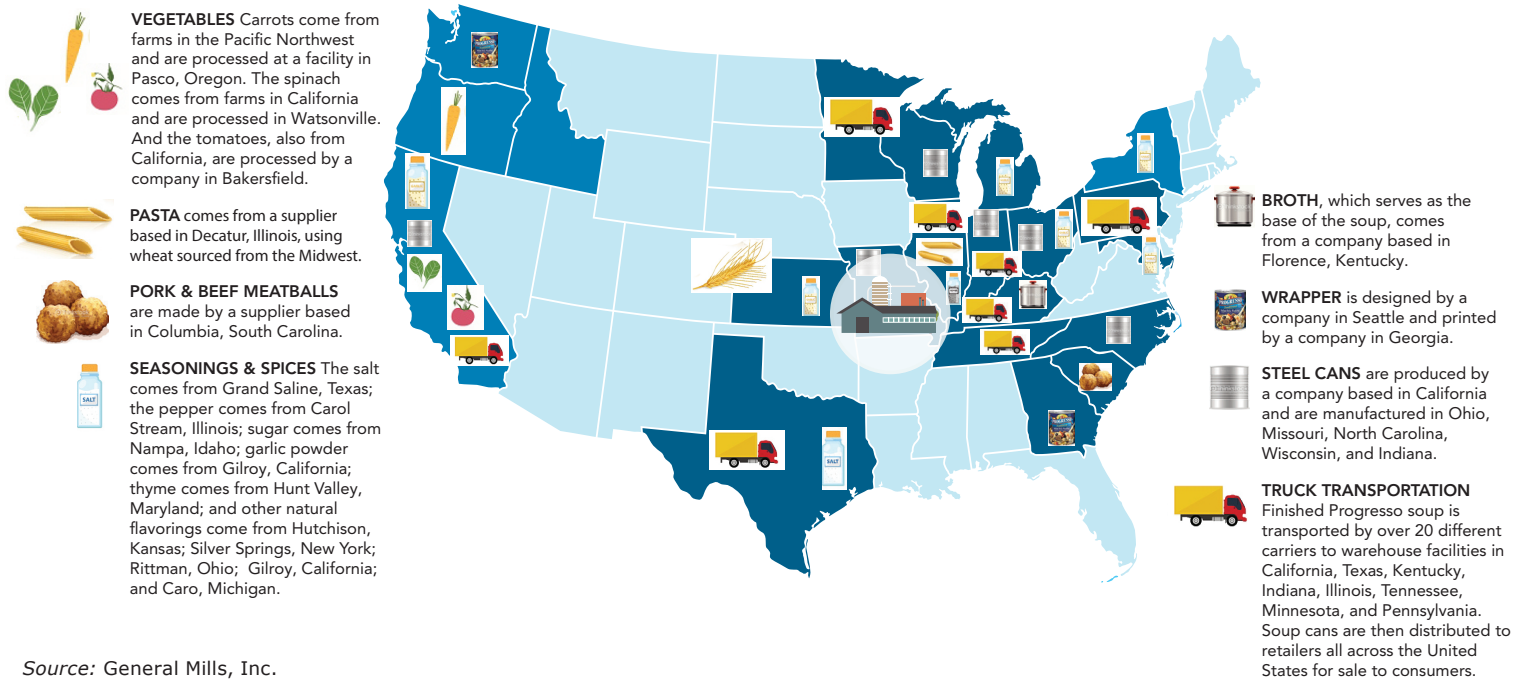


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Figure 2

Italian Wedding Soup: From Farm to Retail

Progresso Italian Wedding Soup is made from several ingredients sourced from all over the United States. Those ingredients are brought together and produced at the Progresso Soup Plant in Hannibal, Missouri. The plant employs almost 1,000 people and produces millions of cans per year.



Source: General Mills, Inc.

The food and beverage industry plays a critical role in transmitting these demands. Food processors may contract directly with farm producers to specify quality attributes demanded for particular markets. For example, organic products require specific production practices, which must be verified for consumers. Another example is the growing demand for poultry produced without antibiotics in some foodservice markets, which requires poultry processors to work with producers to support and

certify this production practice. Other examples include certification of food safety or other farm practices for fruit and vegetable growers supplying some retail grocery chains. While such product contracts or requirements vary widely across commodities, in general, processors can be a source of technical expertise, price risk sharing or cost sharing, and assured market access for producers.⁸ See “How Nestlé works with farmers,” page 15, for specific examples of this cooperation.

How Nestlé works with farmers

Two examples from Nestlé show how one food company works with producers to meet the complex demands for quality in food markets.

Example: Nestlé cultivates long-term relationships for dairy sourcing to ensure products meet consumer expectations.

In the past, dairy was a commodity-driven world where people would just buy what they needed for that year. Today, Nestlé looks ahead to what consumers will want two years from now, or five years from now—whether that’s organic, pesticide free, non-GMO, rBST free, and so on. This requires preparing farmers and suppliers to be ready to meet future specifications and standards, and building long-term market relationships.

Nestlé sources directly from dairy farmers or farmer-owned dairy cooperatives. Larger dairy co-ops have multiple customers including Nestlé, but for some individual farmers, Nestlé agrees to buy all of their milk and is responsible for selling what is not used. Thus, Nestlé assures the market for these dairy farmers.

Nestlé works with farmers to improve efficiency and sustainability, by conducting on-farm assessments covering everything from animal care to soil erosion to water quality. This helps farmers to see where progress is needed and to make an action plan for these areas.

Example: Nestlé works with Tree Top strawberry producers to get the right size and flavor for its Dreyer’s® strawberry ice cream, made in Bakersfield, California.

The bulk of American strawberries are grown in California. Production in California is continuous—there is no single season for strawberry production. From the field, strawberries have two potential paths—to fresh or processed markets. The first berries, which tend to be larger in size, are sold on the fresh market. This fruit is picked every three days while slightly green so that it is the perfect ripeness once sold.

Later in the harvest, the strawberries begin to shrink in size. These strawberries are picked less frequently—around every six days—to allow the fruit to develop a sweeter taste profile before being frozen and used for products like ice cream.

Before being transported to Nestlé’s facility in Bakersfield, California, the strawberries go through testing for appearance, color, taste, and safety elements. That includes making sure that no mold, yeast, or harmful bacteria are present.

Once safely transported, the strawberries must be carefully thawed. The frozen strawberries arrive with a certificate of analysis to confirm they have passed quality and safety checks. It takes about a week to temper the strawberries under refrigeration. Once they are ready, the strawberries are placed into a fruit feeder that disperses them into a flowing stream of frozen ice cream.

Source: Nestlé

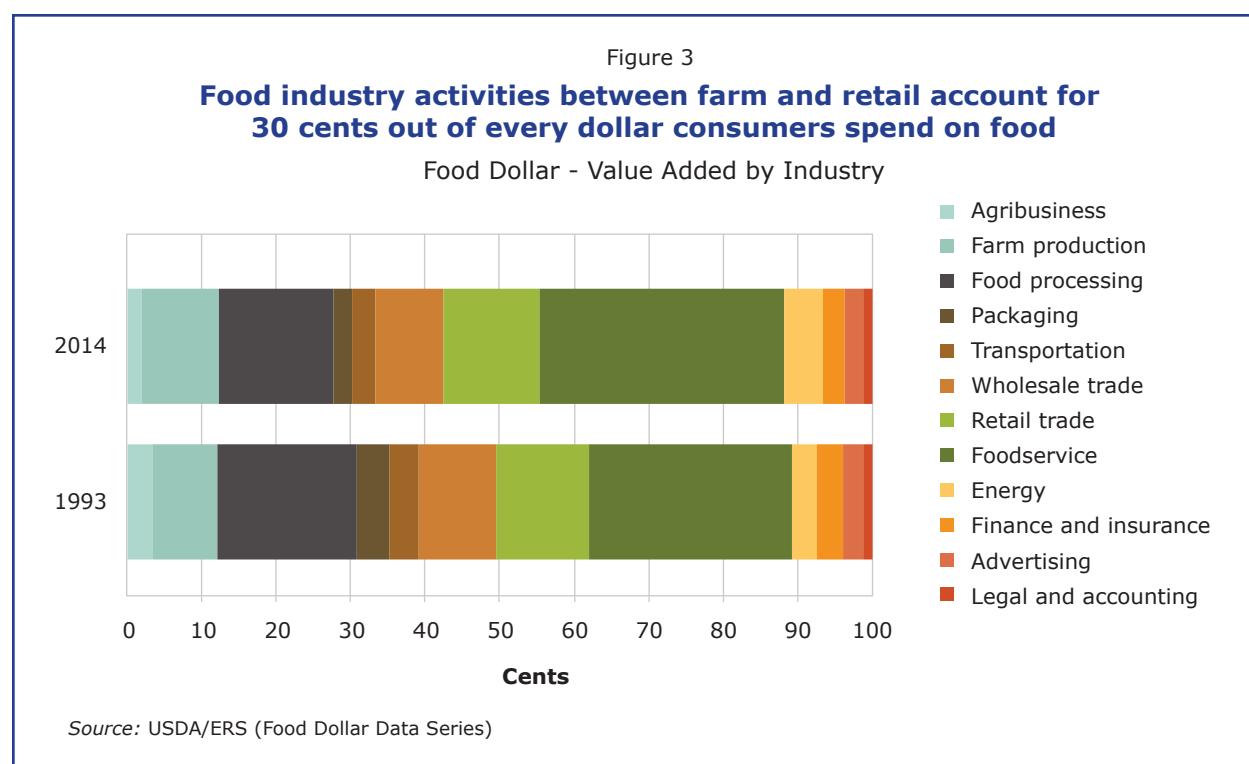
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How the consumer food dollar is allocated among the food value chain industries

The share of the consumer dollar that goes to various industries in the food value chain is shown in Figure 3. The USDA estimates these shares based on Economic Census I/O tables, and allocates a dollar spent on food to the various industries that provide services in the food value chain, based on computations of value added.⁹

The USDA Economic Research Service defines 12 different industries in the food value chain as follows. In each case, the industry includes subcontracting firms outside of these classifications.

- Agribusiness—all establishments producing farm inputs (except those described in other industry groups) such as seed, fertilizers, farm machinery, and farm services.
- Farm Production—all establishments classified within the agriculture, forestry, fishing, and hunting industry.
- Food Processing—all establishments classified within the food manufacturing industries.
- Packaging—all establishments classified within the packaging, container, and print manufacturing industries.
- Transportation—all establishments classified within the freight services industries.
- Wholesale Trade—all nonretail establishments that resell products to other establishments for the purpose of contributing to the US food supply.
- Retail Trade—all food retailing and related establishments.
- Foodservice—all eating, drinking, and related establishments.
- Energy—oil and coal mining, gas and electric utilities, refineries, and related establishments.
- Finance and Insurance—all financial services and insurance carrier establishments.
- Advertising—all advertising services and related establishments.



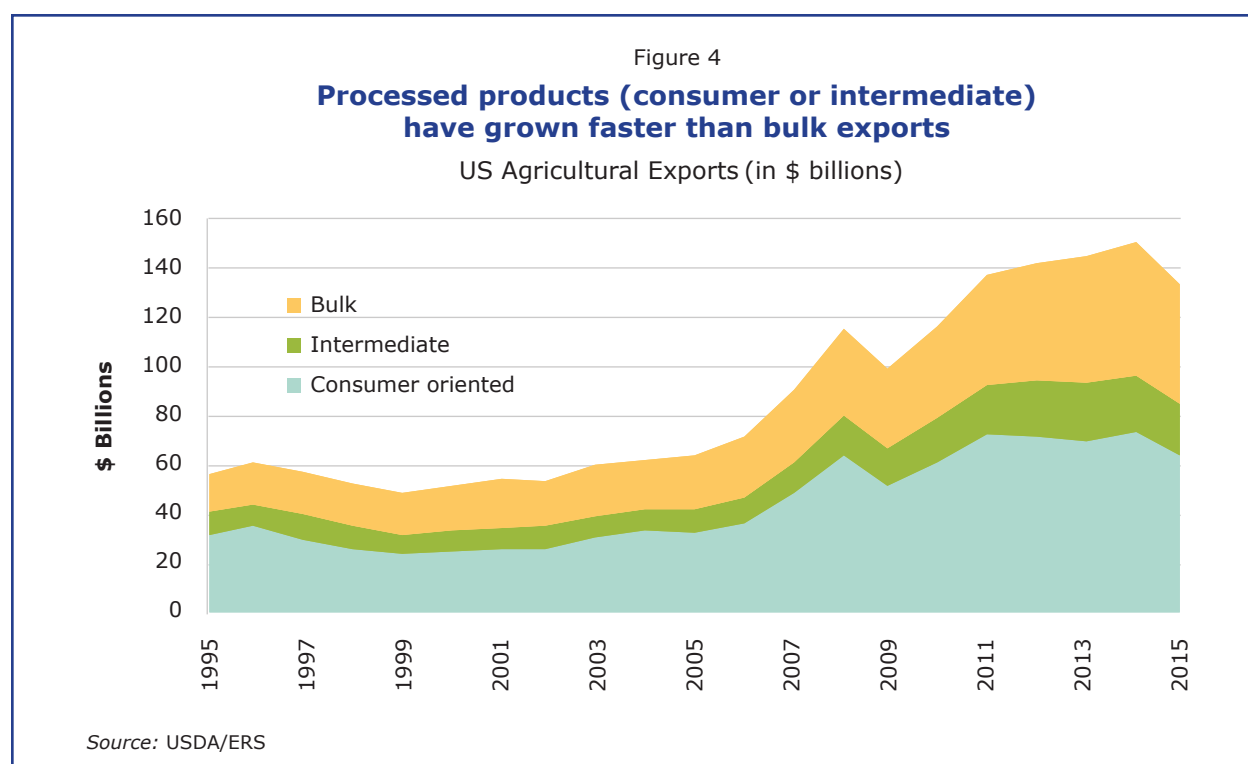
- Legal and Accounting—establishments providing legal, accounting, and bookkeeping services.

In Figure 3, the food processing industry corresponds to the food manufacturing industry as defined in “What is the food and beverage industry?,” page 10, and does not include the beverage industry. The “food dollar” is a dollar spent on food, including both FAH and FAFH, excluding beverages, both nonalcoholic and alcoholic. As of 2014, farm production and agribusiness (farm inputs) account for 12.4 cents out of every consumer dollar spent on food. Food processing, packaging, transportation, and wholesale trade account for another 30.1 cents. The largest share of the consumer dollar goes to food retailing, either the retail trade (serving the FAH market) or the foodservice industry (serving the FAFH market). Together these retail industries account for 45.6 cents of every consumer dollar spent on food. The remaining 11.9 cents go to energy, financial services, advertising, and legal/accounting services.

Most industry shares of the consumer food dollar have remained fairly constant over the last two decades, with two exceptions. The share going to food processing has declined, from 18.8 cents of the consumer’s food dollar in 1993 to 15.3 cents in 2014. Over the same time period, a greater share of the consumer dollar has gone to foodservice (the FAFH retail industry), as consumers buy more meals at restaurants, fast food outlets, or in institutional settings. The foodservice industry share has increased from 27.3 cents in 1993 to 32.7 cents in 2014.

Food exports and imports

The US food system also extends beyond our borders, as some foods are imported, and a substantial share of US food and feed production is exported. The food processing industry plays a major role in this international marketplace. The growth in exports of consumer-oriented products within US agricultural exports is shown in Figure 4.



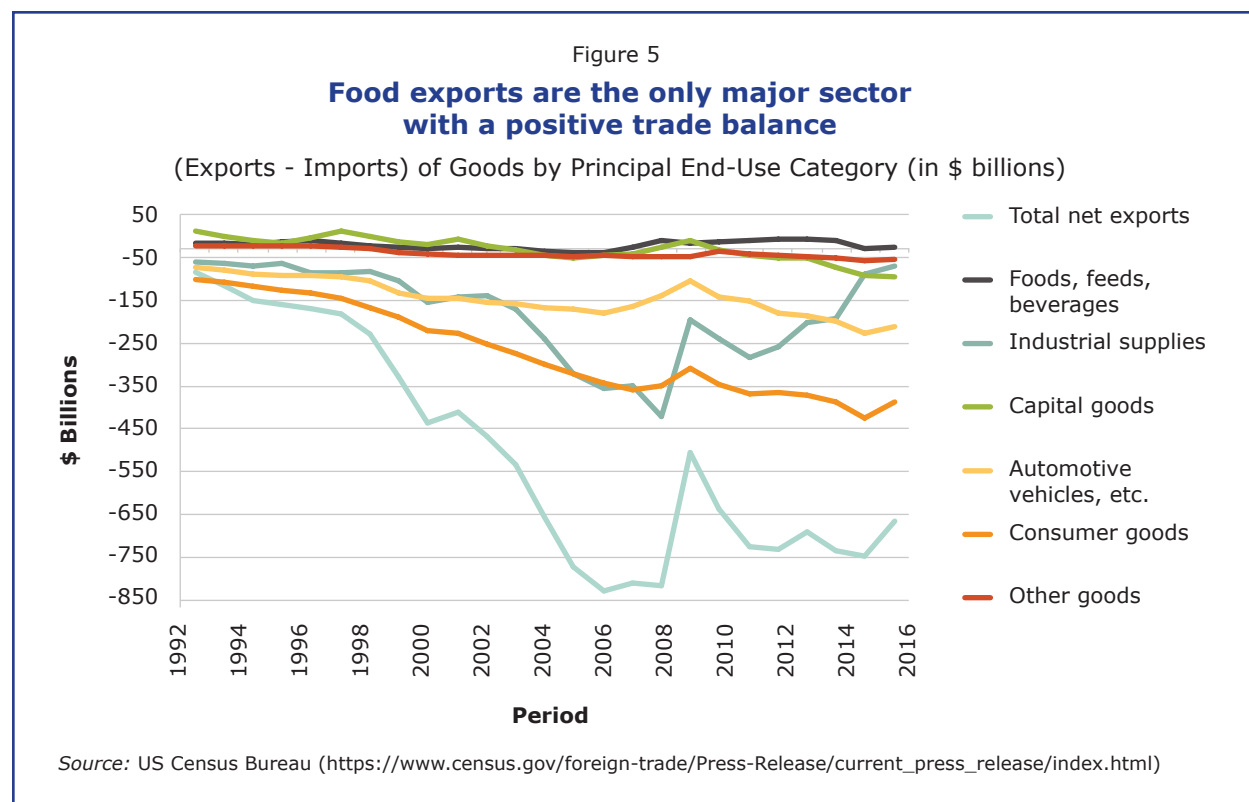
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- *Consumer-oriented food products*, as defined by the USDA, are food products intended for the final consumer. These include dairy products, prepared foods, and meats.
- *Intermediate products* are typically food ingredients, such as soybean oil, that have been processed from raw commodities.
- *Bulk commodities* are farm products, such as corn for feed.

Consumer-oriented and intermediate products together accounted for \$70 billion of agricultural exports in 2015, more than the \$63 billion in bulk or raw commodity exports that same year. The growth in particular product exports has been dramatic—for example, dairy product exports increased 400 percent during the past two decades. Other rapid export growth categories include tree nuts, pork products, prepared foods, and nonalcoholic beverages.¹⁰ Economic growth in emerging economies has been one important driver of this expansion. Through providing these

intermediate and consumer-oriented goods at internationally competitive prices, the food and beverage industry has played an important role in US agricultural export growth in recent years.

Exports and imports of food products constitute a relatively small share of total exports and total imports compared with the other major end-use commodities, basically because food expenditures have been a fairly modest and declining share of total household budgets (DPI) in most countries. Food products stand out in the trade data, however, in that both exports and imports of food have remained relatively stable even through recessions (food being a necessity good). In fact, food is the *only* major export category that shows *positive* net exports today (and has for most of the past decade), reflecting strong US comparative advantage in this sector. The long-standing US advantage is due to our extensive land resources and strong farm productivity edge. But the growth in processed foods shows a different strength, arising from the food manufacturing sector's efficiency and innovation.



Imports also play an important role in the food value chain. Of course some products such as bananas and coffee are not produced in the United States, and the entire domestic supply must be imported. But imports of other foods have been increasing as well. According to the USDA, imports of fish and shellfish, many fresh fruits and vegetables, fruit juices, some tree nuts, and salad and cooking oils account for particularly large shares of domestic consumption.¹¹ The food and beverage industry may rely on imported food ingredients to meet demand when domestic production is out of season, to provide cheaper substitutes for domestic production, or to satisfy growing demand for ethnic and non-traditional foods.

Food Consumer Expenditures and Food Demand

How and where consumers spend their food dollars are major factors shaping the food system and demand for the food and beverage industry's products. Changes in food expenditures, consumption patterns, and demand for quality attributes have had significant impacts on the food value chain, and as a result, on the food and beverage industry. This section provides a review of trends in consumer food expenditures and consumption.

Food expenditures

The food sector supplied over \$1.4 trillion worth of food in 2014. Total expenditures on food were the third most important category in total consumer expenditures, after health care (\$1.9 trillion) and housing (\$2.1 trillion). Consumers spent 9.7 percent of disposable personal income (DPI) on food in 2014, and the share of DPI spent on food has declined gradually over many decades. For example, it was greater than 20 percent of DPI in the 1930s and was 13.2 percent in 1980. However, the percent of DPI spent on food has remained fairly flat since 2000, fluctuating between 9.8 percent and 9.5 percent. The long-term decline in

the share of income spent on food demonstrates the relative affordability of food in the United States for most consumers.¹²

Further evidence of the affordability of food in the United States is found in an international comparison of expenditures for food at home (FAH). This shows that US consumers spend the smallest share—only 6.2 percent of total consumer expenditures goes to FAH (these international data have a slightly different basis from the US data cited above, as they are based on consumer expenditures rather than disposable personal income, and measure only purchases of food for consumption at home). This US share is much lower than in countries with comparable levels of income—in the United Kingdom, consumers spend 8.6 percent on food; in Canada, 9.2 percent; and in France, 13.3 percent.¹³

Although food spending has declined as a share of DPI, food expenditures have grown over time and have grown faster for food away from home (FAFH) than for FAH (Figure 6, page 21). Of the \$1.4 trillion spent on food in 2014, \$728 billion was spent for FAH and \$731 billion was spent for FAFH. This was the first time ever that FAFH expenditures exceeded those for FAH. The growth in food expenditures during the past two decades has been largely due to increased demand for FAFH. Consumers are paying more for the services associated with that market. While recessions have slowed the growth in FAFH spending, the long-term trend continues.

Note that these FAFH expenditures include purchases by consumers, governments, businesses, and nonprofit organizations. For example, these expenditures include the dollar value of domestic food purchases by military personnel and their dependents at military commissary stores and exchanges, the value of commodities and food dollars donated by the federal government to schools, and the value of food purchased by airlines for serving during flights. These types of FAFH expenditures, while small, have also increased over time.

Economic Contribution of the Food and Beverage Industry

Where consumers spend their food dollars also has shifted both for FAH and FAFH. Supermarkets are still the primary place consumers buy food for use at home, with 65 percent of FAH expenditures (\$574 billion). But the share of warehouses, clubs, and supercenters has increased from virtually zero in 1980 to 17 percent in 2014 (\$146 billion); e-commerce is also a growing trend for food. Shares of food purchased from other sources have stayed fairly constant (e.g., convenience stores at around 2 to 3 percent; expenditures paid directly to farmers or processors at around 6 percent).

Expenditures on FAFH occur primarily in full-service restaurants (54 percent in 2014, or \$291 billion). Limited service restaurants (e.g., fast food) account for another 30 percent (\$253 billion in current dollars). Both kinds of restaurants have seen substantial growth since 1990 in expenditures—from \$81 billion for limited service and \$89 billion for full service. The remaining roughly one-fifth of FAFH expenditures in 2014 were in a variety of outlets, including schools, hotels, vending machines, and military commissaries.

In response to increased competition from other segments in food retail and foodservice, supermarkets have expanded their offerings. More store-brand (private-label) products have been introduced and sold in the past few years, and these products can provide a larger profit margin to retailers. Some supermarket chains have responded to growing consumer demand for organic or locally sourced food by creating special store sections or promoting locally sourced items. Some supermarkets have expanded the variety of ready-to-eat entrées and meals in their prepared food departments (e.g., rotisserie chickens and prepared salads).¹⁴

Food consumption

In addition to changes in where consumers purchase their food, there have also been changes in what they have chosen to eat over the last 20 years. More chicken is consumed than either pork or beef due to long-run growth in demand for this protein, but total consumption of all three has declined since 2006.

The consumption of whole milk has been replaced by low-fat milk, while at the same time cheese consumption has increased dramatically. Fruit and vegetable consumption has declined slightly, and the share that is consumed in processed form has declined. Sweetener consumption has also declined.¹⁵

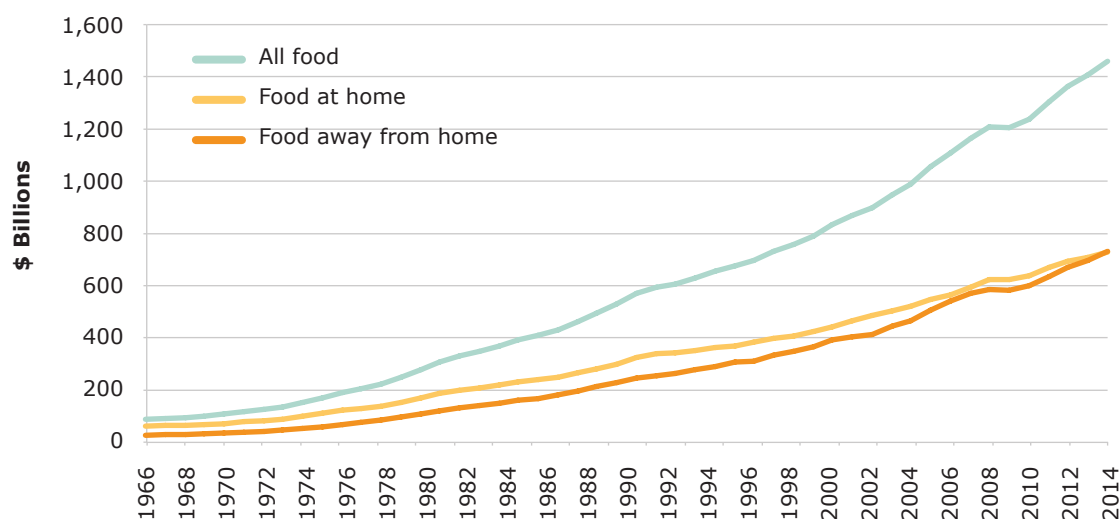
These trends have implications for the food and beverage industry. As demand for certain types of foods shifts, so does the demand for processing. Meat slaughter and processing for pork and beef remain stable while poultry processing has expanded capacity. The increased production of cheese has led to more availability of whey, a byproduct, which is now used in protein bars and also exported. Fruit and vegetable processing has shifted toward more minimal processing with the growth in packaged salads and stir-fry kits, and decline in demand for canned goods. Soft drink production has shifted toward bottled water and diet soda with declining demand for sweetened drinks. These trends require continued investment in innovation by the industry.

Another major food trend is the more than 10 percent annual growth in demand for organic products, both fresh and processed. Organic food sales were estimated at \$35 billion in 2014, or 4 percent of total food sales. Produce accounted for 43 percent of US organic food sales in 2012, followed by dairy (15 percent), packaged/prepared foods (11 percent), beverages (11 percent), bread/grains (9 percent), snack foods (5 percent), meat/fish/poultry (3 percent), and condiments (3 percent). Organic products are consumed at least occasionally by a majority of US consumers.¹⁶

Food consumption data report consumption in terms of food commodities. There is less information available regarding more complex processed food product consumption and purchases. Such demand is crucial to generating value-added opportunities for the food and beverage industry. In general, it can be expected that demand for processed products will increase with rising incomes and higher opportunity cost of labor when there is greater employment outside the home.¹⁷

Figure 6

**As of 2014, consumers spend more
on food away from home than food at home**



Source: USDA/ERS

One recent study used retail scanner data to look at the importance of the food and beverage industry's products in consumer food budgets. The study found that more than three-quarters of purchased FAH calories came from highly processed (61 percent) and moderately processed (16 percent) foods and drinks in 2012. There has been little change in this pattern since 2000.

The study defined highly processed as “multi-ingredient industrially formulated mixtures,” which includes items such as soda, sausages, ready-to-eat dishes, ice cream, and candy. Moderately processed foods are directly recognizable as original plant or animal source food, and they include items such as sweetened fruit juices, cheese, and potato chips. The researchers note, “Highly processed food purchases are a dominant, unshifting part of US purchasing patterns.”¹⁸

Economic Contribution of the Food and Beverage Industry

Economic Footprint of the Food and Beverage Industry

Firms, Employees, and Locations in the Food System

To serve the needs of over 320 million food consumers, the US food system is served by a large number of producers and participants. This section reviews the number of firms, establishments, and labor participants involved in the various stages of the food value chain. Particular detail is provided regarding the food and beverage industry, its activities, and its geographic distribution.

Farm sector

Participants in the farm sector include farm owner/operators and hired farmworkers. In 2014, there were 2,076,275 farms in the United States. Most farms are family owned and operated, and most also rely on nonfarm earnings to support household income. About 90 percent of farms have gross cash farm income of less than \$350,000 annually. Most production—68 percent—occurs on the 9 percent of farms classified as midsize or large-scale family farms, which also account for 51 percent of all farmland. Farm and ranch families make up just 2 percent of the US population.¹⁹

Hired farmworkers include field crop workers, nursery workers, livestock workers, farmworker supervisors, and hired farm managers. Hired farmworkers (including agricultural service workers) make up a third of all those working on farms; the other two-thirds are self-employed farm operators and their family members. The majority of hired farmworkers are found on the nation's largest farms, with sales over \$500,000 per year.²⁰

The annual average number of people employed as hired farmworkers, including agricultural service workers, was 1,063,000 in 2012. Of these, 576,000 were full-year positions, 199,000 were part-year positions, and an estimated 288,000

were agricultural service workers brought to farms by contractors. Employment is highly seasonal: in January 2011, there were 808,000 workers, while in July the figure stood at 1,184,000. Hired farmworkers make up less than 1 percent of all US wage and salary workers.

Food-related industries post-farm

The Economic Census provides information on the number of employees, establishments, and annual payroll by industry. Table 1 (page 23) shows these figures from the 2007 and 2012 Economic Census, for industries within the food and beverage value chain. As the Economic Census is conducted every five years, 2012 data are the most recent available.

The food and beverage industry employed a total of 1.46 million workers in 2012, a decline from 1.53 million in 2007. There were 26,807 food and beverage industry establishments in 2012, slightly fewer than 26,882 in 2007. Annual payroll in the food manufacturing industry was \$54.7 billion in 2012, an increase from \$50.4 billion in 2007.

To put these numbers in context, the food and beverage industry accounts for about 13 percent of all US manufacturing employment and about 1 percent of all US nonfarm employment. The decline in employees mirrors the downward trend in all manufacturing employment, but food and beverage industry employment declined by only 5 percent, while all manufacturing employment declined 16 percent between 2007 and 2012. And, the increase in payroll in food and beverage industry goes against the trend of a declining overall manufacturing payroll. Taken together, these data show that the food and beverage industry is a relatively stable industry, reflecting the strong domestic market for food products in the United States. As such, these activities and jobs are likely to remain within the country.

Table 1

Post-farm employees, establishments, and payroll, 2007 and 2012

	2007			2012		
	Number of employees	Number of establishments	Annual payroll (\$ millions)	Number of employees	Number of establishments	Annual payroll (\$ millions)
Industry						
Animal food manufacturing	46,227	1,767	\$1,976	44,873	1,690	\$2,220
Grain and oilseed milling	53,290	790	2,728	52,766	807	2,959
Sugar and confectionery product manufacturing	69,403	1,841	2,774	69,717	1,856	3,015
Fruit and vegetable preserving and specialty food manufacturing	172,034	1,610	6,090	166,050	1,704	6,545
Dairy product manufacturing	131,375	1,584	5,700	130,980	1,597	6,448
Animal slaughtering and processing	503,590	3,773	14,695	487,072	3,597	15,458
Seafood product preparation and packaging	38,968	652	1,161	32,876	597	1,261
Bakeries and tortilla manufacturing	283,899	10,312	8,917	258,345	10,552	9,487
Other food manufacturing	165,452	3,287	6,347	159,296	3,219	7,264
Food manufacturing	1,464,238	25,616	\$50,388	1,401,968	25,619	\$54,657
Soft drinks and ice manufacturing	70,018	1,266	3,139	59,942	1,188	N/A
Total food and beverage industry	1,534,256	26,882	\$53,527	1,461,910	26,807	
Grocery wholesalers	761,492	35,650	\$27,852	779,251	33,794	\$34,226
Food stores	2,725,974	123,598	\$52,771	2,750,459	124,014	\$58,272
Food services	9,273,896	524,697	\$120,251	9,701,096	556,882	\$141,284

Note: NAIC codes: Food Manufacturing (311); Soft Drinks and Ice Manufacturing (31211); Grocery Wholesalers (4244); Food Stores (445, excluding 4453 liquor stores and adding 446191 food health supplement stores); Food Services (722, excluding 7224 Drinking Places serving alcoholic beverages). Alcoholic beverage industries are excluded from these data.

Source: Economic Census (<https://www.census.gov/econ/snapshots/>); accessed on: 11/21/16.

Economic Contribution of the Food and Beverage Industry

Table 1 shows more total employees are in the downstream industries than in food and beverage industry. Grocery wholesalers employ 0.8 million workers in 33,794 establishments and pay out \$34 billion in payroll. By far the largest industry footprint is found in food retailing. Food stores serving the FAH market employ 2.8 million workers earning \$58 billion, and number 124,014. Foodservice for the FAFH market employs 9.7 million workers earning \$141 billion in 556,882 establishments. These retailing employment numbers mirror the trends in the food dollar shares discussed earlier and reflect the growing demand for foodservice.

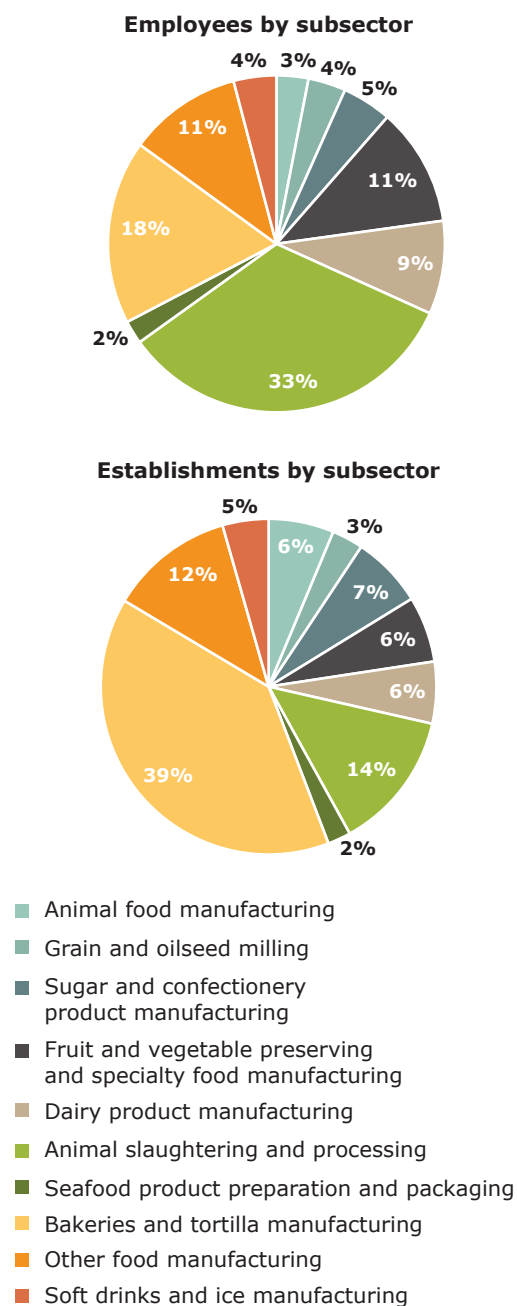
What and where in the food and beverage industry

The food manufacturing industry is made up of many different kinds of activities and subsectors. The Economic Census reports food manufacturing subsectors that include animal food (for pets); grain and oilseed milling; sugar and confectionery product manufacturing; fruit and vegetable preserving and specialty food manufacturing; dairy product manufacturing; animal slaughtering and processing; seafood product preparation and packaging; bakeries and tortilla manufacturing; and other food manufacturing (includes snacks, seasonings, dressings, syrups, coffee and tea products). This is a highly varied group of activities that includes first-stage processing of raw commodities all the way to the creation of complex final products.

Table 3 (page 29) provides details on the industry subsectors within the food and beverage industry, and Figure 7 shows the shares of establishments and employees by subsector. Bakeries and tortilla manufacturing account for the largest share of establishments (39 percent), followed by animal slaughtering and processing (14 percent), and other food manufacturing (12 percent). The remaining subsectors each account for 7 percent or less. The share of employees has a different distribution, with 33 percent in animal slaughtering and processing, followed by 18 percent in bakeries and tortilla manufacturing, 11 percent in fruit and vegetable processing, 11 percent in other food manufacturing, and 9 percent in dairy product manufacturing.

Figure 7
Most establishments are in the bakery subsector, while most employees are in meat processing

Food and Soft Drinks Manufacturing



Source: Economic Census 2012, US Census Bureau

Table 2

State employment in food and beverage manufacturing, and as a percentage of all manufacturing and all nonfarm employment

	Number of employees			Percentage	
	Food & beverage manufacturing	All manufacturing	Total nonfarm	% FBMI of manufacturing employment	% FBMI of total nonfarm employment
Alabama	32,995	232,650	1,885,100	14.18%	1.75%
Alaska	*	12,450	334,600		
Arizona	11,451	131,941	2,463,500	8.68	0.46
Arkansas	*	153,706	1,176,500		
California	161,699	1,163,341	14,761,400	13.9	1.1
Colorado	18,505	114,632	2,313,000	16.14	0.8
Connecticut	*	163,847	1,637,500		
Delaware	8,070	26,355	419,400	30.62	1.92
District of Columbia	*	1,361	734,800		
Florida	30,937	277,089	7,396,900	11.17	0.42
Georgia	60,451	333,837	3,954,000	18.11	1.53
Hawaii	5,413	11,440	606,300	47.32	0.89
Idaho	15,250	52,084	622,300	29.28	2.45
Illinois	75,620	542,004	5,750,300	13.95	1.32
Indiana	34,813	452,513	2,901,600	7.69	1.2
Iowa	49,380	203,722	1,508,800	24.24	3.27
Kansas	27,394	152,423	1,357,400	17.97	2.02
Kentucky	26,834	213,545	1,810,800	12.57	1.48
Louisiana	15,361	136,327	1,926,900	11.27	0.8
Maine	*	49,238	598,100		
Maryland	13,118	100,079	2,573,700	13.11	0.51
Massachusetts	22,025	234,168	3,311,200	9.41	0.67
Michigan	32,964	514,058	4,033,700	6.41	0.82
Minnesota	46,130	297,884	2,729,800	15.49	1.69
Mississippi	*	132,789	1,102,300		
Missouri	40,171	243,208	2,685,200	16.52	1.5
Montana	2,153	15,729	440,300	13.69	0.49
Nebraska	35,127	92,409	968,800	38.01	3.63
Nevada	*	38,123	1,144,800		
New Hampshire	*	66,636	634,300		

* Data are not available at the state level due to a small number of observations.

(Table continues on next page.)

Economic Contribution of the Food and Beverage Industry

Table 2

State employment in food and beverage manufacturing, and as a percentage of all manufacturing and all nonfarm employment (continued)

	Number of employees			Percentage	
	Food & beverage manufacturing	All manufacturing	Total nonfarm	% FBMI of manufacturing employment	% FBMI of total nonfarm employment
New Jersey	29,493	230,697	3,890,300	12.78%	0.76%
New Mexico	4,506	26,731	804,200	16.86	0.56
New York	48,630	426,621	8,795,100	11.4	0.55
North Carolina	49,778	403,593	3,986,300	12.33	1.25
North Dakota	*	23,541	429,000		
Ohio	53,482	627,124	5,201,800	8.53	1.03
Oklahoma	17,222	133,064	1,614,100	12.94	1.07
Oregon	21,459	151,990	1,639,900	14.12	1.31
Pennsylvania	65,213	543,641	5,725,800	12	1.14
Rhode Island	*	39,608	465,400		
South Carolina	17,765	207,396	1,864,200	8.57	0.95
South Dakota	8,911	41,931	414,000	21.25	2.15
Tennessee	35,772	293,646	2,715,000	12.18	1.32
Texas	91,200	767,024	10,878,300	11.89	0.84
Utah	15,335	108,264	1,250,400	14.16	1.23
Vermont	5,449	31,487	304,500	17.31	1.79
Virginia	29,264	228,197	3,735,800	12.82	0.78
Washington	34,945	248,192	2,919,200	14.08	1.2
West Virginia	3,257	48,686	773,000	6.69	0.42
Wisconsin	63,181	436,777	2,780,500	14.47	2.27
Wyoming	*	10,094	288,900		

* Data are not available at the state level due to a small number of observations.

Source: US Bureau of Labor Statistics, data from November 4, 2016.

Overall, these data show the importance of the meat processing subsector and the bakery subsector, reflecting the importance of grains and meats in US food consumption patterns.

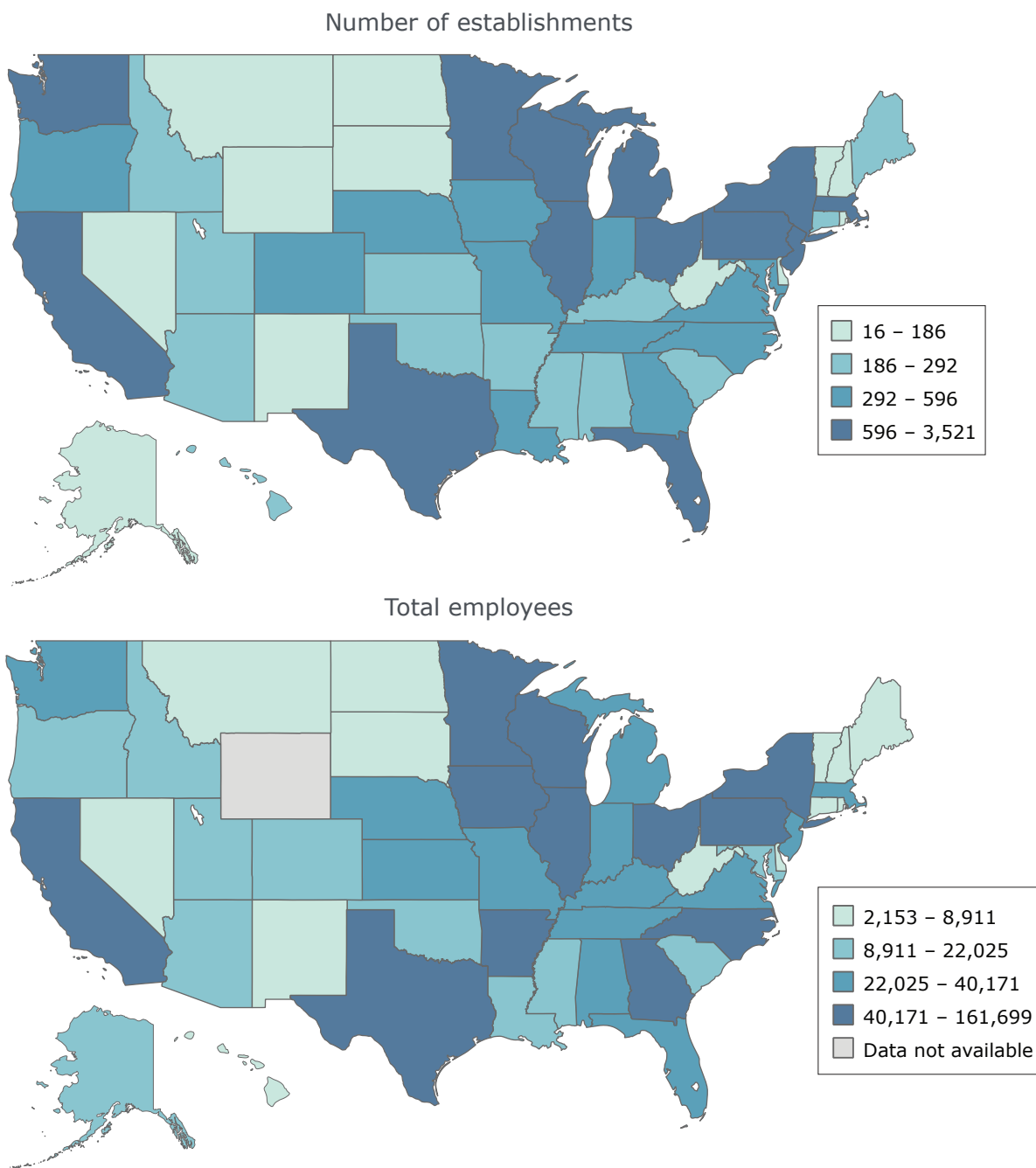
The geographic distribution of food and beverage manufacturing reflects both the distribution of commodity production and the US population. Figure 8 (page 27) shows maps with the numbers of establishments and employees by state. The states with the most food and beverage manufacturing

establishments are (in descending order): California, New York, Texas, Pennsylvania, Illinois, Florida, Wisconsin, Ohio, New Jersey, Michigan, Washington, Minnesota, and Massachusetts (all of these states have more than 600 establishments). Most of these states are large population centers so there are significant markets for food manufacturing output, but a few reflect the regional importance of farm production, such as dairy in Wisconsin, apples in Washington, and wheat in Minnesota.

Figure 8

**California has the largest number of employees
in the food and beverage industry (161,699)**

Food and beverage manufacturing establishments and employees, by state, 2012



Economic Contribution of the Food and Beverage Industry

The states with the greatest numbers of employees in the food and beverage industry are (in descending order): California, Texas, Illinois, Pennsylvania, Wisconsin, Georgia, Ohio, North Carolina, Iowa, New York, Minnesota, Arkansas, and Missouri (all of these have more than 40,000 employees in the food and beverage industry).

Clearly, there are a few states that are food and beverage industry powerhouses. California has over 3,500 establishments and nearly 162,000 employees in the industry, far exceeding other states (Table 2, page 25, has information on food and beverage industry employees by state), and Texas, Florida, New York, Pennsylvania, Wisconsin, Illinois, and Ohio are all important centers for the food and beverage industry. Food and beverage industry employment as a share of employment reveals the relative importance of this industry even in some states with smaller populations; it accounts for more than 20 percent of all manufacturing employment in Hawaii, Nebraska, Delaware, Idaho, Iowa, and South Dakota. The states where food and beverage industry employment is 2 percent or more of total nonfarm employment are: Nebraska, Iowa, Idaho, Wisconsin, South Dakota, and Kansas. The importance of the food and beverage industry to local economies is discussed further in “Economic Multiplier Impacts from the Food and Beverage Industry in Local Communities,” page 30.

Direct Economic Activity Associated with the Food and Beverage Industry

To better understand the contributions of the food and beverage industry to the economy, this section reviews the value added generated by the industry and the payments from the industry to four primary factors—salary and benefits, property income, output taxes, and imports—using data from the USDA/ERS “Food Dollar” series. Input-output analysis generates estimates of industry value added and the corresponding allocations to these primary factors. For establishments contributing to the US food supply, value added

for an establishment equals the proceeds from the sale of outputs minus the outlays for commodities purchased from other establishments. The sum of value added by all establishments is the total value of domestic food purchases.

The USDA/ERS Food Dollar data take annual US consumer expenditures on domestically produced food and allocate these expenditures to the industries in the supply chain (including contracted services with non-supply chain industries). Industry groups are establishments grouped together by type of product or service provided. Twelve industry groupings are examined based on the importance of their contributions to the market value of food: agribusiness; farm production; food processing; packaging; transportation services; energy; wholesale trade; retail trade; foodservice; finance and insurance; advertising; and legal and accounting services. For subcontracting establishments—those not classified into one of the 12 industry groups—value-added contributions are allocated across the 12 industry groups in proportion to the value of goods or services provided to each industry group. In these data, “food processing” corresponds to the term “food manufacturing” used elsewhere in this report. (The beverage industry is not included in this analysis, since the Food Dollar series does not provide separate information on nonalcoholic beverages.) Primary factor payments are also provided for each industry group.²¹ Total industry value added is equal to the compensation charged by all establishments to buyers of their products for the services provided by the industry group’s primary factors of production.

Table 3 (page 29) presents information about the value added and payments to factors for all 12 of the industries in the food value chain in 2014. (Note that the corresponding shares of the food dollar, or percent of food sector value added, are shown in Figure 3, page 16.) The food and beverage industry accounts for nearly \$164 billion in total value added, out of total food expenditures of \$1.1 trillion for all domestically produced food and \$1.2 trillion for food expenditures including imports used in food production.²²

Table 3

Value added by industry within the food value chain and payments to primary factors, 2014
(\$ thousands)

	Salary and benefits	Output taxes	Property income	Imports	Total value added
Total	\$522,646	\$94,476	\$392,469	\$63,660	\$1,073,066
Agribusiness	5,824	699	10,887	4,563	21,912
Farm production	16,430	839	84,502	9,759	111,566
Food processing	83,090	9,658	62,449	8,699	163,702
Packaging	11,072	605	7,160	7,769	26,606
Transportation	18,800	1,268	12,035	2,357	34,324
Wholesale trade	48,636	16,443	33,343	(647)	97,777
Retail trade	73,655	23,121	38,250	3,230	138,265
Food services	219,209	34,827	90,568	6,081	350,681
Energy	9,438	4,449	22,298	18,522	54,805
Finance and insurance	17,182	1,395	13,578	1,531	33,739
Advertising	11,942	691	12,365	1,500	26,505
Legal and accounting	7,367	482	5,034	295	13,185
Total food dollar	0	0	0	0	\$1,213,023
Domestic food dollar	0	0	0	0	\$1,073,066

Industry definitions:

Agribusiness—all establishments producing farm inputs (except those described in other industry groups) such as seed, fertilizers, farm machinery, and farm services, and all subcontracting establishments.

Farm production—all establishments classified within the agriculture, forestry, fishing, and hunting industry.

Packaging—all establishments classified within the packaging, container, and print manufacturing industries, and all subcontracting establishments.

Transportation—all establishments classified within the freight services industries and all subcontracting establishments.

Wholesale trade—all nonretail establishments that resell products to other establishments for the purpose of contributing to the US food supply and all subcontracting establishments.

Retail trade—all food retailing and related establishments and all subcontracting establishments.

Foodservice—all eating, drinking, and related establishments and all subcontracting establishments.

Energy—oil and coal mining, gas and electric utilities, refineries, and related establishments and all subcontracting establishments.

Finance and insurance—all financial services and insurance carrier establishments and all subcontracting establishments.

Advertising—all advertising services and related establishments and all subcontracting establishments.

Legal and accounting—establishments providing legal, accounting, and bookkeeping services and all subcontracting establishments.

Primary factor definitions:

Salary and benefits—The pretax employee wages plus employer and employee costs for employee benefits.

Output taxes—The value of excise, sales, property, and severance taxes (less subsidies), customs duties, and other nontax government fees levied on establishments.

Property income—The pretax income or capital gain accruing to owners of nonlabor primary factors of production.

Imports—Food and nonfood commodities that are imported from international sources and are used by US food supply chain industries producing for the US market.

Source: USDA/ERS Food Dollar Data Series (<http://www.ers.usda.gov/data-products/food-dollar-series/>)

Economic Contribution of the Food and Beverage Industry

Total value added for the industries between farm and retail is \$322 billion, which includes food processing together with the closely related industries of packaging, transportation, and wholesaling. The food processing industry is the second-largest industry in the value chain, behind foodservice (the retail FAFH industry), which generates \$351 billion in value added. Retail trade and farm production are third and fourth, with \$138 billion and \$112 billion, respectively.

Food processing's \$164 billion in value added is paid out in \$83 billion in salary and benefits, \$9.7 billion in taxes, \$62 billion in property income, and \$8.7 billion for imported inputs (Table 3, page 29). The structure of payments to different primary factors varies among the 12 industries in the food value chain. Food processing tends to have relatively high payments to salaries and benefits and lower payments to taxes and property income than other industries. The \$83 billion in salary and benefits includes pretax employee wages plus employer and employee costs for employee benefits, including subcontracting industries that supply inputs into food processing. This figure of \$83 billion is higher than the 2012 payroll reported in Table 1, page 23, which includes only wages. The salary and benefits payments in Table 3 represents a more complete measure of the returns to labor generated by food processing. The \$83 billion in salary and benefits from the food processing industry accounts for half of the value added in food processing, and 15 percent of the total salary and benefits of \$523 billion generated in the food value chain. Food processing generates the second-largest salary and benefit payment among the industries in the food value chain, after foodservice and ahead of retail trade and wholesale trade.

The food processing industry's tax payments of \$9.7 billion are fourth among the 12 industries in the value chain, after retail and wholesale industries. These tax payments are excise, sales, property, and severance taxes (less subsidies), customs duties, and other nontax government fees levied on establishments. These payments do not include any of the income-based taxes, which come out of payments to labor and capital.

Taxes account for 6 percent of food processing value added, in contrast to foodservice, where taxes account for 10 percent of industry value added.

Property income of \$62 billion in food processing is third highest among food value chain industries, after foodservice and farm production. These returns to owners of nonlabor primary factors (land, capital) are 38 percent of food processing value added and 16 percent of all property income generated in the food value chain. Imports into food processing are a small share of the food processing industry's value added. Payments for imports are highest within the energy industry's contributions to the food dollar.

These data allow us to understand how value added in the food manufacturing industry compares to other industries in the value chain in terms of value added and payments to factors. Food processing is the second-largest industry in the food value chain, as measured by total value added and by payments for salaries and benefits. The share of payments to labor is relatively high, and in the next section, the role of these payments in generating local economic impacts is examined.

Economic Multiplier Impacts from the Food and Beverage Industry in Local Communities

In this section, the total impact of the food and beverage industry is considered, through a review of studies that use input-output analysis to track how small changes in one part of the economy resonate throughout the entire economy. The nature of these multiplier impacts is reviewed. Next, studies that examine the impact of changes in final demand for the food sector are reviewed to see how such demand changes affect the national food and beverage industry. For an in-depth understanding of regional impacts of food and beverage industry activities, studies that have measured the multiplier impacts from the food and beverage industry in individual states are reviewed. These studies show the unique economic role of the food and beverage industry in many local economies.

A brief review of economic multiplier impacts²³

Consider the example of a new food processing plant opening in a small town. This new economic activity introduces new or additional levels of spending and employment in the local economy. This new spending in turn causes a multiplier effect throughout the economy. The impact of the new food processing plant is composed of three parts: direct, indirect, and induced.

Direct A new plant beginning its operations contributes directly to the local economy by selling food products, paying employees' wages and salaries, and generating returns to the plant owner. These are the direct economic effects.

Indirect The new food processing plant also has business-to-business transactions, such as the purchase of raw commodities from farms, trucking services to deliver products to wholesalers or retailers, purchase of power supplies and other utilities, insurance, plant equipment repairs, and maintenance, among others. These business-to-business transactions create additional economic activity, which is the indirect effect. For example, a farmer selling commodities to the food plant then uses the income to pay farm production costs. See "Food industry connections to local and regional suppliers: an example from Buffalo, New York," page 34, for an example of these business-to-business linkages for one cereal products plant.

Induced Another type of new economic activity resulting from the new food processing plant comes about through the wages and salaries paid to employees as well as to the plant owners. Plant owners and employees spend their income at local stores and other local businesses, an induced effect. A local clothing store owner, for example, could use part of the money the plant employees spend on clothes to pay store employees, who in turn also spend money locally.

Multiplier effects of changes in food demand at the national level

It is useful to understand how the agriculture and food sector stimulates economic activity throughout the US economy. There are two primary sources of demand for agricultural and food products: domestic consumers and global markets. USDA/ERS estimates multiplier impacts for the food sector arising from two different sources of increased demand: food assistance benefits and exports.

SNAP (Supplemental Nutrition Assistance Program, formerly The Food Stamp Program) provides benefits to qualifying low-income households that are tied to food purchases for use at home. Benefits are determined by household income relative to food budget needs and vary across participating households. Because benefits must be used to purchase food for consumption at home, they stimulate food demand. SNAP benefits thus increase food expenditures, which then result in multiplier impacts. USDA/ERS estimates that an additional \$1.0 billion of SNAP benefits results in a total of \$1.8 billion of new economic activity, and 9,800 new jobs from direct effects.²⁴ Over half of additional SNAP benefits go to increased value added in the food manufacturing sector, which shows the importance of increases in food demand for the food and beverage industry.

Exports Growth in agricultural and food product exports is another source of demand and also generates significant additional economic activity. USDA/ERS provides annual estimates of the multiplier impacts of agricultural exports.²⁵ In 2014, each dollar of agricultural exports stimulated another \$1.27 in economic activity. Thus, the \$150.0 billion sales of agricultural exports overseas in 2014 produced an additional \$190.6 billion in supporting or indirect economic activity in the United States, including \$89.4 billion in activities required to facilitate these agricultural and food exports, including computer and financial services, warehousing and distribution, packaging, and additional processing.

Economic Contribution of the Food and Beverage Industry

In terms of employment, agricultural exports in 2014 required 1,132,000 full-time civilian jobs, which included 808,000 jobs in the nonfarm sector.

Exports of processed food products generate greater economic activity than the export of raw bulk commodities. Much of the economic activity generated by agricultural exports is in food processing, services, transportation, and wholesale sectors, reflecting the importance of these sectors in supporting agricultural and food exports.

State- and national-level multiplier impacts from the food and beverage manufacturing industry

The land grant universities in many states or other agricultural institutions have carried out economic impact analyses of the agricultural and food sector. These studies typically use the IMPLAN model, which is based on Economic Census I/O tables, disaggregated to provide local detail about economic linkages. Some state-level studies have focused specifically on food processing, while others examine the agriculture and food processing sector as a whole. We have focused on results specific to the food and beverage industry in each state.²⁶

Table 4 provides a summary of findings regarding the direct and total economic impact of the food and beverage industry in selected states, based on recent studies. Studies reported are for leading states in terms of establishments and employment. Direct economic impact is the value of the industry's outputs or sales; total economic impact shows this direct impact plus indirect and induced economic impacts. The ratio of the total to direct is the economic multiplier associated with the activity.

California has the largest food and beverage industry of any state, with output of \$105 billion in 2012 (Table 4). The food and beverage industry is the third-largest manufacturing industry in the state, and its direct economic activity generates total economic activity of \$221 billion in California—9 percent of the state's GDP. The output multiplier for the food and beverage industry in California is 2.11, meaning that every dollar of activity in food and beverage industry results in more than twice that amount in additional economic activity. There are about 198,000 people employed in the California food and beverage industry, but 760,000 employed in all activities that result from the food and beverage industry.

Table 4

State-level studies of the economic impact of the food and beverage industry

State	Year	Output (\$ billions)			Employment (1,000 jobs)		
		Direct	Total	Multiplier	Direct	Total	Multiplier
California	2012	\$105	\$221	2.11	198	760	3.84
Washington	2013	8	18	2.35	25	85	3.36
Wisconsin	2012	37	68	1.83	62	260	4.16
Michigan	2007	15	25	1.7	41	134	3.28
New York	2011	32	50	1.56	60	170	2.83
Florida	2007	21	36	1.71	43	166	3.88
Nebraska	2010	24	34	1.41	41	108	2.64

Sources: Sexton et al. (2015); Community Attributes Inc. (2014); Deller (2014); Knudson et al. (2010); Schmidt (2014); Hodges et al. (2008); Thompson et al. (2012).

The employment multiplier of 3.84 is even greater than the output multiplier: every job in the food and beverage industry results in nearly three additional jobs in other economic activities in the state.

Other states in Table 4 have food and beverage industry industries of varying sizes and with different economic multiplier impacts. Output multipliers range from 1.41 in Nebraska to 2.35 in Washington. These differences reflect variances in the structure of state economies and the size of the food and beverage industry relative to the rest of the state's economy. But all show the strong potential of the food and beverage industry to generate economic activity—every dollar of additional food and beverage industry output generates between \$1.40 and \$2.35 of *total* economic activity. The labor multipliers are all higher, ranging from 2.64 in Nebraska to 4.16 in Wisconsin. Every job in the food and beverage industry generates additional jobs as employees spend their wages on local goods and services.

Some examples from these state-level studies illustrate where and how these economic impacts take place. In Wisconsin, food processing and the agriculture sector helped to blunt the effects of the Great Recession because demand for food products remained relatively stable, as did the farm production base in Wisconsin. The food processing sector thus provided greater stability in employment and income than other sectors, which faced greater international competition. The agriculture and food sector in the Wisconsin economy accounts for 11.9 percent of employment, 10.9 percent of labor income, 10.9 percent of total income, and 16.1 percent of industrial sales in 2012. Within the agriculture and food sector, the Wisconsin food and beverage industry contributed 259,600 jobs, \$12.9 billion to labor income (wages, salaries, and proprietor income), \$21.2 billion to total income, and \$67.8 billion to industrial sales.

Food processing contributes more to the state's economy than on-farm activity, due to the strength and size of the processing industry related to dairy and meat.

Nebraska is another state where the food and agriculture sector is a significant contributor to the state's GDP. Including direct and indirect economic impacts, the sector accounts for more than a fourth of the Nebraskan economy. Income, including proprietor income, wages, salaries, and benefits, generated by the agricultural production complex was also a quarter of the total generated in the state, and the food and agriculture sector also accounted for nearly a quarter of the state's total employment. These economic activities and employment are supported by a strong food processing sector, particularly in meat processing, soybean crushing, and animal food production.

In Washington, food processing supports the survival of farming and rural communities. A fifth of all agriculture jobs in Washington state rely on demand from food processors. For certain crops, such as potatoes, grapes, and apples, local processors are the most important market. Food processing plants in rural areas serve as leading sources of employment in rural communities. Processors also play a role in facilitating market coordination, for example by working with farmers on production and storage techniques. Food processors in Washington state and elsewhere are also innovating to deliver new products to consumers (e.g., bagged cut-vegetable medleys) or to adopt mechanized procedures for sorting and handling.

When examining these effects for a local or regional economy, it is important to understand that eventually the economic activity “leaks” out of the area, as money is spent on goods and services produced elsewhere. The smaller the area that is being measured as a local economy, the greater the “leakages” out, as new income is spent on items that cannot be produced locally. This means that multiplier effects are smaller when measured for smaller geographic areas.

Economic Contribution of the Food and Beverage Industry

Food industry connections to local and regional suppliers: an example from Buffalo, New York

Company: General Mills

Products: Cheerios, Gold Medal Flour, Chex Cereal

Plant Location: Buffalo, New York

Supplier Focus: Sonwil Distribution

The General Mills plant in Buffalo, New York, has been in operation for over 100 years.

In that time, the plant has built relationships with suppliers in the local community that often span generations.

General Mills works with over 120 suppliers based in Buffalo that support the plant with expertise in mechanical engineering, electrical engineering, transportation (rail and truck),

equipment manufacturing, cleaning and sanitation, security services, accounting, machinery and tooling, health and worker safety materials and supplies, and even safety footwear and uniforms.

For over two decades, for example, General Mills has worked with Sonwil Distribution Center, Inc., a family-owned and -operated logistics solutions firm headquartered in Buffalo—with additional locations in Carlstadt, New Jersey, and Reno, Nevada—that has been serving regional, national, and international clients for more than 70 years. Sonwil provides both transportation services for finished product as well as warehousing and distribution capacity to ship finished product across the United States and into Canada.

Source: General Mills, Inc.

At the national level, total economic impact can be expected to be greater, as the effects are felt throughout the economy. A 2009 study of multiplier impacts in the food and beverage industry found substantial indirect and induced effects in both value added and employment.²⁷ Every dollar in value added in the food manufacturing industry was associated with an additional \$4.60 in value added in other industries, and every job in food manufacturing was associated with five additional jobs. The corresponding figures for beverage manufacturing were additions of \$5.60 in value added and five additional jobs.

Food and Beverage Industry Innovation and Research

Innovations in food products brought about the modern food and beverage industry, and the industry continues to introduce many new products every year. Its investments in research and development (R&D) have been increasing in recent years.

These innovations and investments support the continued efficiency and competitiveness of the food and beverage industry at home and abroad. Such investments also support continued growth and employment in the food sector.

New food and beverage product introductions

New product introductions in food and beverages have been on an upward trend since the early 1990s, increasing from around 10,000 each year to over 25,000. Food product introductions are about half of all new introductions of consumer packaged goods, and until the recent recession exceeded introductions of new nonfood products. A total of 26,240 new food and beverage products were introduced in 2010 (the most recent year available through USDA/ERS), compared to 26,244 nonfood consumer packaged product introductions. To put this into perspective, the average supermarket carries about 40,000 different items. While many new products have limited markets, the potential for product turnover is quite high.

The data and discussion below are based on a USDA/ERS analysis of the proprietary data source, Datamonitor.²⁸ In these data, a new product is defined as having at least one of the following:

- New package size
- New packaging format
- Newly available in the United States
- Significant reformulation (for example, a drink mix is reformulated to contain 47 percent less sugar)
- New name
- Entirely new product or product line
- New flavor(s) of an existing product line

In 2010, over a quarter of new food product introductions were in candy, gum, and snacks (25.8 percent of products introduced), and over a fifth were in beverages (21 percent). The remainder were a variety of food product categories, with condiments, processed meat, fruit and vegetables, meals and entrées, and dairy each accounting for 6 to 8 percent of all products. A look at product claims or tags on labels reveals important aspects of consumer demand. Some of the most common claims include “natural,” “premium,” and “single serving,” each accounting for claims or tags on 6 to 8 percent of new products.

An important market development has been the growth in so-called private label products, or store brands. These are products marketed by retail chains and include labels such as Kroger’s Private Selection, Target’s Archer Farms, Costco’s Kirkland Signature, and Publix’s GreenWise Market. These brands have expanded at a faster pace than more expensive national brands, accounting for over 6 percent of product introductions in 2010, up from less than 1 percent in 2001. Lower prices associated with these store brands appealed to consumers during the recent recession. Responding to store chain specifications shows the flexibility of the food and beverage industry in responding to consumers and market conditions.

New products meet growing demand for health and nutrition

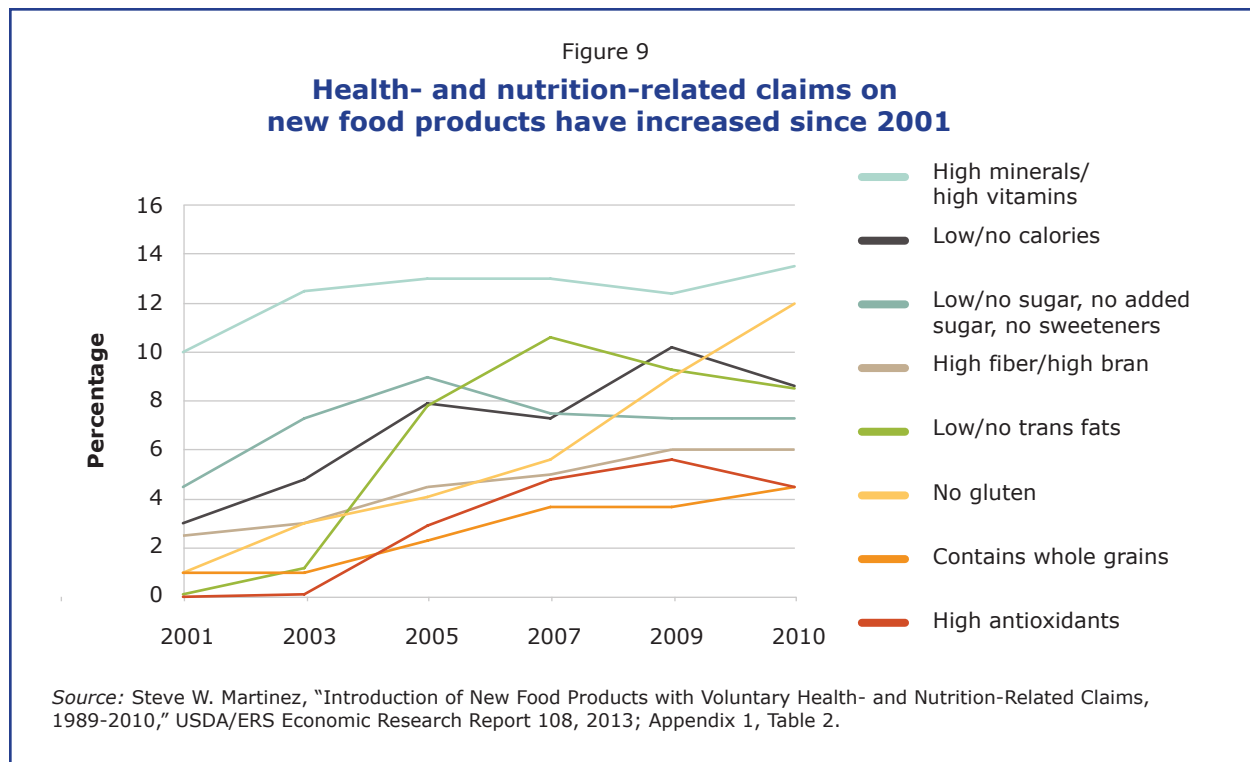
Health and nutrition is the most important category for new product claims. Use of health-related claims as a group has increased since 2000.²⁹ These claims are regulated by the US Food and Drug Administration (FDA) under the Nutrition Labeling and Education Act of 1990 (discussed in “Government Regulations and the Food and Beverage Industry,” page 41). In 2010, 43 percent of new foods and beverages claimed to be low in fat, high in fiber, or formulated with some other positive nutrition or health attribute. Figure 9 (page 36) shows the growth in several health- and nutrition-related claims as a percentage of new products from 2001 to 2010.

The largest share of health- and nutrition-related claims was made on breakfast cereal (90 percent), snacks (59 percent), soup (56 percent), and dairy (55 percent). The use of these claims on product introductions reflects growing consumer awareness about health and nutrition, as well as changing dietary concerns.

One example of an emerging nutritional issue is the role of trans fats in promoting inflammation and coronary heart disease. As the risks of consuming trans fats became better understood by the early 2000s, the FDA mandated disclosure of trans fat content on food product nutrition labels by 2006. Food companies moved quickly to introduce new products with low or no trans fats, and the amount of trans fat in new food products declined sharply between 2005 and 2010.³⁰ Thus, reformulation of products to reduce trans fat content is one example where industry research efforts met the challenge of new dietary science.

One question is whether products with labels promoting healthier content actually provide better nutrition. USDA/ERS compared the nutrient content of new products carrying health claims with other new food products.

Economic Contribution of the Food and Beverage Industry



They found that new products with a health- and nutrition-related claim contained smaller quantities, on average, of six ingredients that Americans are advised to eat less of, such as sodium and added sugars, compared with all new products. New products claiming no trans fats also contained less saturated fat, sodium, and calories, so the reductions in trans fats were not compensated for by increases in these less desirable ingredients.

Food and beverage industry research and development

Globally, the food and beverage industry invested over \$18 billion in R&D in 2012 (the latest year for which data are publicly available). Research is focused on new product development or improved processing methods.³¹ The amount the global industry spends on R&D increased rapidly during the 2000s; it has more than doubled since 2002. Most of this research takes place in high-income

countries, but growth in developing country food industry research has increased in recent years, particularly in China.³² Food and beverage industry companies in the United States invested \$5.4 billion in R&D in 2013, about a third of the global total. US food and beverage R&D has grown more slowly than the global total, not quite doubling over the decade from 2003 to 2013.³³ This R&D spending is about 3 percent of the industry's estimated \$164 billion in value added.

A relatively new source of funding for food innovation is emerging from venture capital firms that are investing in the development of new food technologies. Of relevance to the food and beverage industry, venture capital funding in 2014-15 includes \$2 billion for food e-commerce, and a total of \$884 million for food manufacturing technologies, food safety and traceability, novel methods of producing protein foods, and waste technology.³⁴ These investments are a new source of innovation in the food value chain.

Public Policy and the Food and Beverage Industry

The Food and Beverage Industry's Contribution to Society and National Goals

Food security going back to prehistoric times has been critical to the existence of mankind, societies, and nations. National sovereignty cannot be maintained without a stable and reliable supply of food and water. A country simply cannot exist as a self-governing state without it, nor can the military operate without a stable supply chain of food to support the nation's troops. The United States has moved from an agrarian economy to a knowledge-based economy only because the food industry is so robust, efficient, and reliable that it is taken for granted; in fact, fewer resources support a larger population and higher GDP than ever before in our history. Food security is among the base necessities in Maslow's hierarchy of needs, which by extension makes it indispensable to national existence, national defense, and the strength of the military.

Food production is deeply embedded with the land, water, and natural resources of the country, which has shaped public attitudes toward the sector for many decades. This section discusses three national issues for the food system: the links between diet and health, the sustainability of food production, and the food security³⁵ of households and individuals. A comprehensive review of these issues is beyond the scope of this report. The purpose here is to show how the food and beverage industry, among many other private and public actors, is responding to these issues. The focus is on specific examples of industry efforts to address these issues. Often, industry commitments are made in partnership with public or nonprofit institutions that can provide a platform for monitoring and supporting industry efforts. Such partnerships are an increasingly common way to address public goals that require multiple actors to find solutions.

Quality of diets

It is well-recognized that diet quality is linked to the risk of chronic diseases such as cardiovascular disease, diabetes, and cancer. A rising rate of obesity is linked to these outcomes as well, and two-thirds of US adults are overweight or obese.³⁶ The economic burden of these diseases is estimated to be a fifth of total US health care costs, with at least half of those costs paid by Medicare and Medicaid.³⁷ And, in spite of decades of nutrition guidance, US diets continue to diverge from dietary guidelines.

In this context, there is increased attention to policies surrounding nutrition education, food standards, food marketing, and food access. The food and beverage industry is helping to address this issue through its product offerings and product advertising. As discussed above, food industry firms have developed new products with healthier formulations. To promote such products, the industry has sought approval of science-based health claims that appear on packaging and in advertising, under the guidelines of the 1990 Nutritional Labeling and Education Act. In addition to these efforts, there are several initiatives have industry-wide support and commitment.³⁸ Since 2006, 18 of the industry's major companies have adopted voluntary guidelines regarding food advertising to children, through the Children's Food & Beverage Advertising Initiative of the Better Business Bureau. Also since 2006, the healthfulness of drinks marketed and sold in schools has improved as the result of a self-regulatory program launched in 2006 by the Alliance for a Healthier Generation and the American Beverage Association. In 2014, the soft drink industry committed to reducing calories consumed from soft drinks by 20 percent nationwide by 2025 and to focus on 10 communities where rates of obesity are highest.

Economic Contribution of the Food and Beverage Industry

In 2010, 16 major food companies committed to sell 1.5 trillion fewer calories overall by 2015. An independent assessment of progress commissioned by the Robert Wood Johnson Foundation found an 11 percent reduction in calories sold between 2007 and 2012, which translates to a reduction of 78 calories per consumer per day.³⁹

Food system sustainability

While much of the attention to the relationship between the food production system and the environment has been focused on farm production, in recent years the focus has widened to include resource use throughout the food value chain. Attention has shifted to the role of food waste and loss in resource utilization, greenhouse gas emissions, and food security. The food industry has made major efforts to reduce food losses and increase efficiency, especially in the use of energy and water. Such efforts can save both money and resources, and position companies to stay in business as resources become more scarce.

The United States, through agreement under the United Nations Sustainable Development Platform, supports the sustainable development goal to “halve per capita global food waste at the retail and consumer level, and reduce food losses along production and supply chains by 2030”⁴⁰ through the US Food Loss and Waste 2030 Champions effort, led by the USDA and the US Environmental Protection Agency. In 2015, several major companies pledged to join this effort and are working with these agencies to monitor and evaluate their efforts. For example, Kellogg Company reports reducing waste sent to landfill by more than 60 percent since 2005. Other pledgers include General Mills, PepsiCo, Unilever, and Walmart.

In 2015, 114 major companies, including many food companies, made a commitment to reduce greenhouse gas emissions, through a partnership among several nonprofit organizations, including World Resources Institute and World Wildlife Fund.

For example, Kellogg Company has committed to a 15 percent reduction in emissions (metric ton of carbon dioxide equivalent per metric ton of food produced) by 2020 from a 2015 base year. Kellogg also has a long-term target of a 65 percent absolute reduction in emissions by 2050 from a 2015 base year and to reduce absolute value chain emissions by 50 percent from 2015 to 2050. Another effort through partnership with nonprofit organizations involves seven major food companies in a commitment to reduce use of scarce water resources. For example, PepsiCo will work with its agricultural suppliers to improve the water efficiency of its direct agricultural supply chain by 15 percent by 2025 (compared to 2015) in high-water-risk sourcing areas, including India and Mexico. Another example is the partnership between General Mills and the Xerces Foundation to support pollinator health and address bee colony declines, through bee health research, building habitats, and using certified organic products in their Cascadian Farms brand.⁴¹

Food security

Food security for all citizens is a national goal of long standing. The USDA defines food security for households as having access at all times to enough food for an active, healthy life for all household members. This is assessed through an annual survey that asks households to evaluate their ability to put food on the table. In 2015, 12.7 percent of US households were food insecure at least some time during the year. This includes 5.0 percent with very low food security, meaning that the food intake of one or more household members was reduced and their eating patterns were disrupted at times during the year because the household lacked money and other resources for food.⁴² Children were food insecure in 7.8 percent of US households in 2015. Food insecurity has declined from a recent high of 14.9 percent in 2011, during the Great Recession.

USDA Food and Nutrition Service programs play a major role in addressing food insecurity. The food and beverage industry and the food retail sector have private initiatives to address food insecurity as well. Many food industry companies and food retailers work with the nonprofit Feeding America to donate to food banks. Another example is Kellogg Company's Breakfasts for Better Days signature global cause platform. The company has committed to creating 3 billion better days for people by 2025—which includes a goal to provide 2.5 billion servings of food in partnership with food banks across the globe.⁴³

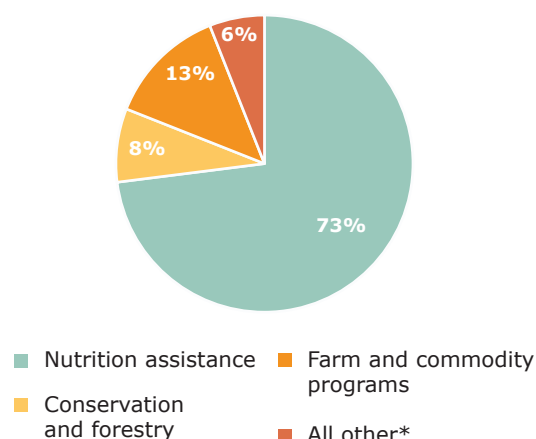
Government Programs and the Food and Beverage Industry

The primary government programs for food and agriculture are administered through the USDA. Programs address farm incomes, resource use, rural development, agricultural markets and exports, food safety, food security, and nutrition. With annual outlays of \$148 billion in 2016, 73 percent of USDA expenditures go toward food assistance and nutrition. Figure 10 shows USDA outlays by program area.

The roughly one-quarter of USDA expenditures for farm and conservation programs are focused on supporting farm incomes and conserving natural resources. These programs generally do not influence food markets directly, as most analysts find they have little impact on consumer prices.⁴⁴ Government programs have their greatest impact on food markets, and on the food and beverage industry, through the food assistance and nutrition programs. These programs have a long history, dating to the New Deal era. Over time, they have expanded their coverage to address food insecure households (SNAP) and the special needs of women, infants, and children (WIC) and to provide nutrition for all school children (School Breakfast and National School Lunch Programs) and for children and seniors in institutional settings (Child and Adult Care Food Program).

Figure 10
73% of USDA expenditures go toward food assistance programs

USDA Outlays, 2016



*Includes rural development, research, food safety, marketing and regulatory, and departmental management functions

Source: USDA

Table 5 (page 40) shows USDA expenditures and the number of participants in 2015. SNAP, formerly known as food stamps, accounts for the largest share of expenditures (\$74 billion) and reaches nearly 46 million people. Benefits are determined by household income relative to food budget needs and must be used to purchase FAH. WIC serves 8 million women, infants, and children by providing \$6.2 billion worth of vouchers for approved products to meet the specific nutritional needs of this population. The National School Lunch and School Breakfast Programs serve a combined 45 million meals daily, with program outlays of nearly \$17 billion. Most meals served are to students who qualify for either free or reduced-price meals. The Child and Adult Care Food Program provides 2 billion meals annually to low-income participants in group care settings at a cost of \$3.3 billion.

Economic Contribution of the Food and Beverage Industry

Table 5

USDA food assistance programs expenditures and participation, 2015

Program	Annual expenditures (\$ billions)	Participation (millions)	Participation unit
SNAP (Supplemental Nutrition Assistance Program)	\$73.9	45.8	Average monthly participants
WIC (Special Supplemental Nutrition Program for Women, Infants, and Children)	6.2	8	Average monthly participants
National School Lunch Program	13	30.5	Average daily meals
School Breakfast Program	3.9	14	Average daily meals
Child and Adult Care Food Program	3.3	2,014.3	Annual meals served
All programs	\$104.1		

Source: USDA/ERS, The Food Assistance Landscape: FY 2015 Annual Report, EIB-150.

USDA food assistance programs influence the food market in three important ways:

1. **They increase food expenditures.** The American Recovery and Reinvestment Act (ARRA) included a provision that increased SNAP benefits by nearly 14 percent in April 2009 (benefit increases ended in October 2013). This short-term increase allowed recent observations regarding how SNAP influences food expenditures. One study found that for every additional dollar received in benefits, the average participating household will spend an additional 53 cents on food.⁴⁵ The increase is not 1-to-1, as SNAP benefits free up other sources of income to be redirected to nonfood purchases. Still, the impact on food purchases is substantial and demonstrates a much higher marginal propensity to consume food from SNAP than from an equivalent amount of cash transfer.
2. **They influence retailer choices.** To accept SNAP benefits or WIC vouchers as payments for food products, retailers must be licensed by the USDA. Requirements include offering a variety of food products, including healthy alternatives. In 2009, stores accepting WIC

were required for the first time to carry fresh fruits and vegetables, as well as whole-grain alternatives. One study found a marked increase in the availability of healthy alternatives, particularly whole-grain products, in low-income neighborhood grocery and convenience stores as a result of this requirement.⁴⁶ Such policies influence the demand for whole grains, for example, and thus the demand for food processing of certain kinds.

3. **They create incentives for product development and formulation.** Standards are set for eligible products in the WIC program, and the food industry responds to these standards. For example, the amount of sugar in WIC-eligible breakfast cereals is limited, and at least some cereal products are formulated with these standards in mind, in order to qualify for WIC vouchers. Standards are also set for school lunches and breakfasts, leading food industry providers of products to local programs to develop products that meet the standards. For example, new standards requiring whole grains in school lunches led Domino's to formulate a whole-wheat pizza crust for the school lunch market.

Government Regulations and the Food and Beverage Industry

The US government has played a role in regulating food markets for over a century, addressing food safety, product adulteration, and labeling requirements. Regulations in these areas have set standards that apply to all firms and are intended to address issues of public safety and health in a consistent and transparent manner. These regulations are administered primarily by the USDA and the FDA, but as many as 15 different federal agencies have some responsibility for food issues. This section illustrates government regulation of the food industry through a review of selected new regulations introduced during the past five to 10 years, addressing food safety, nutrition, and labeling. Voluntary government programs, such as organic certification, also play an important role in food markets, and these are briefly reviewed.

Table 6 (page 42) provides information about selected regulations in three categories: food safety, food labeling, and food assistance. These regulations are mandatory for the institutions or firms included within their scope. As such, a cost-benefit analysis is required for the implementing agency, in order to balance additional industry costs with the benefits to society, such as improved public health.

Food safety regulation was significantly expanded with the Food Safety Modernization Act (FSMA) in 2011. FSMA applies to regulations carried out under the FDA (which regulates all foods other than meat products, which are regulated by the USDA's Food Safety and Inspection Service). Important features of FSMA include strengthening food safety controls for imported foods and requirements for food processing plants and introduction of new regulations for food safety in fresh produce. Many of the provisions of FSMA bring US food safety regulation in line with best practices, as recognized by the scientific community and other high-income countries.

The intent is to make US food safety regulation risk-based and preventive and to place responsibility for food safety in the private sector.

Food safety regulation of meat processing dates to 1906. This program underwent a major overhaul in 1996, with the Pathogen Reduction/Hazard Analysis and Critical Control Point (PR/HACCP) Rule, which mandated the use of the HACCP preventive system in meat and poultry plants and set standards to limit microbial pathogens. Recent changes have updated or refined this approach. One important change in 2014 updated the poultry inspection system to increase efficiency through focusing on the most important risks and introduced new standards to control important sources of foodborne illness from poultry.

Nutrition labeling regulations date to the Nutrition Labeling and Education Act of 1990, which brought about the now-familiar Nutrition Facts box on all packaged foods. The design and content of this Nutrition Facts label was modified in 2016 to bring it in line with new information and concerns about US diets (Table 6). The format is updated for easier comprehension, and serving sizes were updated to reflect actual consumption habits. Added sugars are disclosed to encourage consumers to limit their intake of this food ingredient.

Nutrition labeling was mandated for restaurant menus by the Affordable Care Act of 2010, and the regulations were finalized in 2016. This regulation mandates disclosure of calorie content for menu items in chain restaurants. As consumers obtain about a third of their calories away from home,⁴⁷ the intent was to provide information to guide choices in the same way that the Nutrition Facts label can guide choices for FAH.

Economic Contribution of the Food and Beverage Industry

Table 6

Selected recent regulations of importance to the food industry

Agency	Authorizing legislation	Status	Description/purpose
Food safety			
FDA	Food Safety Modernization Act (2011)	Seven different final regulations issued in 2015 and 2016 with implementation deadlines for business in 2017 to 2019	Modernize food safety regulation in line with best practices; address risks in fresh produce and from food imports
USDA/FSIS	Poultry Products Inspection Act (1957); Executive Order 13563 on Improving Regulation and Regulatory Review (2011)	New Poultry Inspection System Final Rule 2014; implementation immediate	Updates and streamlines inspection system; imposes new requirements to reduce <i>Salmonella</i> and <i>Campylobacter</i>
Food labeling			
FDA	Nutrition Labeling and Education Act (1990)	Changes to the Nutrition Facts Label rule final in 2016 with business implementation by 2018	Updates serving sizes; Added sugars content required; updates format
FDA	Affordable Care Act (2010)	Restaurant Calorie Labeling Rule final in 2016 with business implementation by 2017	Calorie information required on menus in chain restaurants
USDA/AMS	National Bioengineered Food Disclosure amendment to Agricultural Marketing Act (2016)	USDA has until 2018 to design implementation rules	Requires food companies to provide information on GM content of foods either through QR codes or phone number
Food assistance			
USDA/FNS	Child Nutrition Act (1966)	Revisions in WIC Food Packages Final Rule 2014	Increase fruits and vegetables, whole grains and low-fat dairy in WIC package
USDA/FNS	Healthy, Hunger Free Kids Act (2010) reauthorizing School Lunch and Breakfast Programs	New standards took effect 2012 – 2013 school year for lunch, 2013 – 2014 school year for breakfast, and 2014 – 2015 school year for competitive foods.	Increased the amount of fruits and vegetables served, emphasized whole grain-rich foods, required only low fat and nonfat milk, limited calories, and reduced saturated fat and sodium.
USDA/FSN	Farm Bill (2014)	Enhancing Retailer Requirements in SNAP Final Rule in 2016	Require retailers to stock more variety four categories: meat, poultry, or fish; bread or cereal; vegetables or fruits; and dairy.

Sources: FDA and USDA websites.

As of 2016, the National Bioengineered Food Disclosure amendment to the reauthorization of the Agricultural Marketing Act requires food companies to provide information on genetically modified (GM) content of foods but gives them some flexibility in how that is done. For example, the method of disclosure could be a QR code (readable by smartphones) or a toll-free phone number on the label, or GM content could be indicated directly on the label. As this law has just been enacted, the regulation has not been written, and these details will be specified in the future. USDA's Agricultural Marketing Service (AMS) will have responsibility for implementing this regulation. Although the National Academy of Sciences has found that food with genetically modified ingredients is safe,⁴⁸ consumer demand for this information sparked a national debate on how best to provide it in a consistent manner.

Updated nutrition standards for food assistance programs have been implemented for WIC, SNAP, and the National School Lunch and School Breakfast Programs during the past five years. The USDA requested a review of the WIC food package by the Health and Medicine Division (formerly the Institute of Medicine) of the National Academies. In response to guidance from a panel of nutrition and food market experts, the USDA revised the WIC food package to increase fruits, vegetables, whole grains, and low-fat dairy products. These changes became final in 2014.

School lunch and breakfast standards were also updated by the reauthorizing legislation in 2010, reflecting recommendations based on the latest nutrition science (Table 6). These standards were phased in from 2012 to 2015 and revised in response to feedback from school administrators and the food industry. In general, the new standards increase the amount of fruits and vegetables served, emphasize whole-grain foods, require that only low- or no-fat milk be served, limit total calories served, and reduce the amounts of saturated fat and sodium.

The Farm Bill of 2014 reauthorized the SNAP program. One provision called for strengthening the requirements for retailers to carry a wider variety of nutritious food products. Some SNAP retailers are convenience or small grocery stores with only limited selections of foods. The final rule issued in December 2016 would require retailers to stock more variety in four food categories (Table 6).

Voluntary market standards certified by the USDA

The USDA's AMS provides certification services for a wide range of product quality standards and grades—from the size of eggs to use of Good Agricultural Practices (GAPs) to adherence to organic production processes. Organic certification has growing visibility as that market expands, and the USDA sets the standards for producers and processors to sell, label, and represent their products as organic, based on provisions in the 1990 Farm Bill. The USDA also accredits agents who are responsible for certifying that farmers or processors meet organic standards. These products then carry the USDA organic label, to indicate their compliance with organic standards. USDA involvement in setting these standards and ensuring their certification helps to facilitate markets. Consumers can more easily find organic products and understand what certification means, and producers can meet standards and access this market niche. Both are assured that fraud in representation of organic certification is minimized.

AMS also certifies adherence to many different widely recognized process standards, such as those of International Organization for Standardization (ISO), or adherence to livestock production practices such as “grass fed.” As in the case of organic certification, these certification programs provide market facilitation and transparency in how standards are used and promoted.

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This selection of mandatory and voluntary market regulations shows the continued involvement of the US government in the food sector, reflecting a strong public interest in food system performance. The food industry's costs and market opportunities are shaped by these regulations.

Concluding Comments

Many studies have examined the farm sector or the entire food system. In this report, the focus on the food and beverage industry highlights

this industry's contributions within the food sector and the food value chain. It also allows comparisons with the manufacturing sector as a whole and an understanding of the industry as an important economic contributor to regional economies. This focus on the food and beverage industry provides new insights regarding the industry's multiple roles, including the industry's contributions in meeting emerging consumer demands and responding to evolving public policy. This report contributes to a more complete understanding of the food system through its focus on the food and beverage industry.

Endnotes

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