Food Manufacturing

(NAICS 311)

SIGNIFICANT POINTS

- The industry has a high incidence of injury and illness; meat packing plants have the highest incidence among all food manufacturing industries.
- Production workers account for more than half of all jobs.
- Most jobs require little formal education or training; many can be learned in a few days.

Nature of the Industry

Workers in the food manufacturing industry link farmers and other agricultural producers with consumers. They do this by processing raw fruits, vegetables, grains, meats, and dairy products into finished goods ready for the grocer or wholesaler to sell to households, restaurants, or institutional food services.

Food manufacturing workers perform tasks as varied as the many foods we eat. For example, they slaughter, dress, and cut meat or poultry; process milk, cheese, and other dairy products; can and preserve fruits, vegetables, and frozen specialties; manufacture flour, cereal, pet foods, and other grain mill products; make bread, cookies, and other bakery products; manufacture sugar and candy and other confectionery products; process shortening, margarine, and other fats and oils; and prepare packaged seafood, coffee, potato and corn chips, and peanut butter. Although this list is long, it is not exhaustive—food manufacturing workers also play a part in delivering numerous other food products to our tables.

Table 1 shows that about 34 percent of all food manufacturing workers are employed in plants that slaughter and process animals, and another 19 percent work in establishments that make bakery goods. Seafood product preparation and packaging, the smallest sector of the food manufacturing industry, accounts for only about 3 percent of all jobs.

Table 1. Employment in food manufacturing by industry segment, 2002 and projected change, 2002-12
(Employment in thousands)

Industry segment	2002 Employment	2002-12 Percent change
Total employment	1,525.2	4.7
Animal slaughtering and processing	520.3	15.4
Bakeries and tortilla manufacturing	294.6	3.0
Fruit and vegetable preserving and specialty food manufacturing	181.6	-1.1
Other food manufacturing	151.6	2.4
Dairy product manufacturing	136.9	-9.3
Sugar and confectionery product manufacturing	83.1	-3.3
Grain and oilseed milling	61.9	-1.0
Animal food manufacturing	51.5	1.0
Seafood product preparation and packaging	43.7	-8.0

Working Conditions

Many production jobs in food manufacturing involve repetitive, physically demanding work. Food manufacturing workers are highly susceptible to repetitive strain injuries to hands, wrists, and elbows. This type of injury is especially common in meat-processing and poultry-processing plants. Production workers often stand for long periods and may be required to lift heavy objects or use cutting, slicing, grinding, and other potentially dangerous tools and machines.

In 2002, there were 9.3 cases of work-related injury or illness per 100 full-time food manufacturing workers, much higher than the rate of 5.3 cases for the private sector as a whole. Injury rates vary significantly among specific food manufacturing industries, ranging from a low of 3.8 per 100 workers in flavoring extracts and syrups plants to 14.9 per 100 in meat packing plants, the highest rate in food manufacturing.

In an effort to reduce occupational hazards, many plants have redesigned equipment, increased the use of job rotation, allowed longer or more frequent breaks, and developed training programs in safe work practices. Although injury rates remain high, training and other changes have reduced those rates. Some workers wear protective hats, gloves, aprons, and shoes. In many industries, uniforms and protective clothing are changed daily for sanitary reasons.

Because of the considerable mechanization in the industry, most food manufacturing plants are noisy, with limited opportunities for interaction among workers. In some highly automated plants, "hands-on" manual work has been replaced by computers and factory automation, resulting in less waste and higher productivity. While much of the basic production—such as trimming, chopping, and sorting—will remain labor intensive for many years to come, automation is increasingly being applied to various functions, including inventory control, product movement, packing, and inspection.

Working conditions also depend on the type of food being processed. For example, some bakery employees work at night or on weekends and spend much of their shift near ovens that can be uncomfortably hot. In contrast, workers in dairies and meat-processing plants work typical daylight hours and may experience cold and damp conditions. Some plants, such as those producing processed fruits and vegetables, operate on a seasonal basis, so workers are not guaranteed steady, year-round employment and occasionally travel from region to region seeking work. These plants are increasingly rare, however, as the industry continues to diversify and manufacturing plants produce alternate foods during otherwise inactive periods.

Employment

In 2002, the food manufacturing industry provided about 1.5 million jobs. Almost all employees are wage and salary workers, but a few food manufacturing workers are self-employed. In 2002 about 29,000 establishments manufactured food, over 80 percent employing fewer than 50 workers (see chart). Nevertheless, establishments employing 250 or more workers accounted for 55 percent of all jobs.

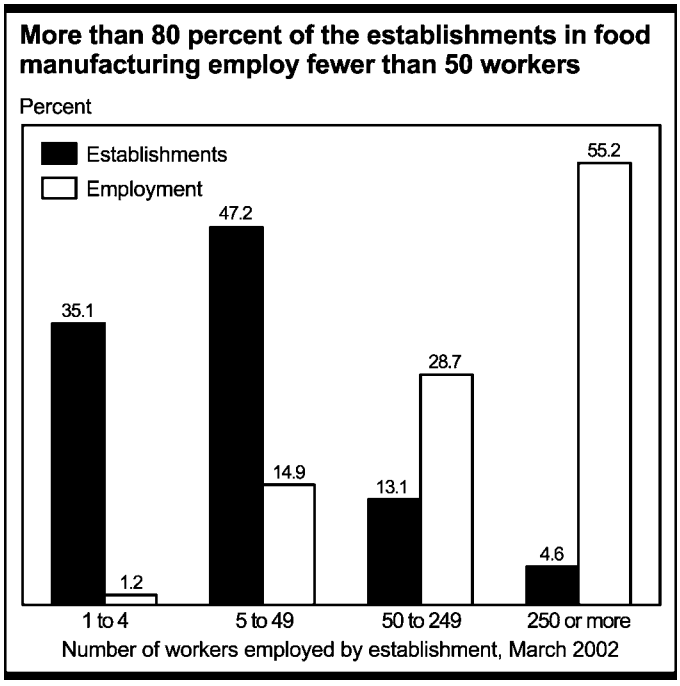
The employment distribution in this industry is widely varied. Animal slaughtering and processing employs the largest proportion of workers. Economic changes in livestock farming and slaughtering plants have changed the industry. Increasingly, fewer farms are producing the vast majority of livestock in the United States. Today, there is a smaller number of much larger meat-processing plants, owned by fewer companies—a development that has tended to concentrated employment in a few locations.

Food manufacturing workers are found in all States, although some sectors of the industry are concentrated in certain parts of the country. For example, California, Illinois, Iowa, Pennsylvania, and Texas employ more than a quarter of workers in animal slaughtering and processing. Wisconsin employed one-third of all cheese manufacturing workers. California accounts for one-fifth of fruit and vegetable preserving and specialty food manufacturing workers.

Occupations in the Industry

The food manufacturing industry employs many different types of workers. More than half are production workers, including skilled precision workers and less-skilled machine operators and laborers (table 2). Production jobs require manual dexterity, good hand-eye coordination, and in some sectors of the industry, strength.

Red meat production is the most labor-intensive food-processing operation. Animals are not uniform in size, and *slaughterers and meatpackers* must slaughter, skin, eviscerate, and cut each carcass into large pieces. They usually do this work by hand, using large, heavy power saws. They also clean and salt hides and make sausage. *Meat, poultry, and fish cutters and trimmers* use handtools to break down the large primary cuts into smaller sizes for shipment to wholesalers and retailers. They use knives and other handtools to eviscerate, split, and bone chickens and turkeys.



Bakers mix and bake ingredients according to recipes to produce breads, cakes, pastries, and other goods. Bakers produce goods in large quantities, using mixing machines, ovens, and other equipment.

Many food manufacturing workers use their hands or small handtools to do their jobs. *Cannery workers* perform a variety of routine tasks—such as sorting, grading, washing, trimming, peeling, or slicing—in the canning, freezing, or packing of food products. *Hand food decorators* apply artistic touches to prepared foods. *Candy molders* and *marzipan shapers* form sweets into fancy shapes by hand.

With increasing levels of automation in the food manufacturing industry, a growing number of workers operate machines. For example, *food batchmakers* operate equipment that mixes, blends, or cooks ingredients used in manufacturing various foods, such as cheese, candy, honey, and tomato sauce. *Dairy-processing equipment operators* process milk, cream, cheese, and other dairy products. *Cutting* and *slicing machine operators* slice bacon, bread, cheese, and other foods. *Mixing* and *blending machine operators* produce dough batters, fruit juices, or spices. *Crushing* and *grinding machine operator*s turn raw grains into cereals, flour, and other milled-grain products, and they produce oils from nuts or seeds. *Extruding* and *forming machine operators* produce molded food and candy, and *casing finishers* and *stuffers* make sausage links and similar products. *Bottle packers* and *bottle fillers* operate machines that fill bottles and jars with preserves, pickles, and other foodstuffs.

Food cooking machine operators and tenders steam, deep fry, boil, or pressure cook meats, grains, sugar, cheese, or vegetables. *Food and tobacco roasting, baking, and drying machine operators and tenders* operate equipment that roasts grains, nuts, or coffee beans, and tend ovens, kilns, dryers, and other equipment that removes moisture from macaroni, coffee beans, cocoa, and grain. *Baking equipment operators* tend ovens that bake bread, pastries, and other products. Some foods—ice cream, frozen specialties, and meat, for example—are placed in freezers or refrigerators by *cooling* and *freezing equipment operators*. Other workers tend machines and equipment that clean and wash food or food-processing equipment. Some machine operators also clean and maintain machines and perform other duties such as checking the weight of foods.

Many other workers are needed to keep food manufacturing plants and equipment in good working order. *Industrial machinery mechanics* repair and maintain production machines and equipment. *Maintenance repairers* perform routine machinery maintenance, such as changing and lubricating parts. Specialized mechanics include *heating, air-conditioning*, and *refrigeration mechanics and installers, farm equipment mechanics*, and *diesel engine specialists*.

Still other workers directly oversee the quality of the work and of final products. *Supervisors* direct the activities of produc-

tion workers. *Graders* and *sorters* of agricultural products, *production inspectors*, and *quality control technicians* evaluate foodstuffs before, during, or after processing.

Food may spoil if not properly packaged and promptly delivered, so packaging and transportation employees play a vital role in the industry. Among these are *freight, stock*, and *material movers*, who manually move materials; *hand packers* and *packagers*, who pack bottles and other items as they come off the production line; and *machine feeders and offbearers*, who feed materials into machines and remove goods from the end of the production line. *Industrial truck* and *tractor operators* drive gasoline or electric-powered vehicles equipped with forklifts, elevated platforms, or trailer hitches to move goods around a storage facility. *Truck drivers* transport and deliver livestock, materials, or merchandise, and may load and unload trucks. *Driver/sales workers* drive company vehicles over established routes to deliver and sell goods, such as bakery items, beverages, and vending machine products.

The food manufacturing industry also employs a variety of managerial and professional workers. Managers include *top executives*, who make policy decisions; *industrial production managers*, who organize, direct, and control the operation of the manufacturing plant; and *advertising, marketing, promotions, public relations*, and *sales managers*, who direct advertising, sales promotion, and community relations programs.

Engineers, scientists, and technicians are becoming increasingly important as the food manufacturing industry implements new automation. These workers include *industrial engineers*, who plan equipment layout and workflow in manufacturing plants, emphasizing efficiency and safety. Also, *mechanical engineers* plan, design, and oversee the installation of tools, equipment, and machines. *Chemists* perform tests to develop new products and maintain quality of existing products. *Computer programmers* and *systems analysts* develop computer systems and programs to support management and scientific research. *Food scientists and technologists* work in research laboratories or on production lines to develop new products, test current ones, and control food quality.

Finally, many sales workers, including sales *representatives, wholesale and manufacturing*, are needed to sell the manufactured goods to wholesale and retail establishments. *Bookkeeping, accounting, and auditing clerks* and *procurement clerks* keep track of the food products going into and out of the plant. *Janitors* and *cleaners* keep buildings clean and orderly.

Training and Advancement

Most workers in production-line food manufacturing jobs require little formal education or training. Graduation from high school is preferred but not always required. In general, inexperienced workers start as helpers to experienced workers and learn skills on the job. Many of these entry-level jobs can be learned in a few days. Typical jobs include operating a bread-slicing machine, washing fruits and vegetables before processing begins, hauling carcasses, or packing bottles as they come off the production line. Even though it may not take long to learn to operate a piece of equipment, employees may need several years of experience to enable them to keep the equipment running smoothly, efficiently, and safely.

Table 2. Employment of wage and salary workers in food manufacturing by occupation, 2002 and projected change, 2002-12
(Employment in thousands)

Occupation	Employment, 2002 Number	Employment, 2002 Percent	Percent change, 2002-12
All occupations	1,525	100.0	4.7
Management, business, and financial occupations	73	4.8	6.2
Top executives	20	1.3	3.8
Operations specialties managers	24	1.6	5.8
Professional and related occupations	26	1.7	6.8
Service occupations	71	4.6	4.9
Fast food and counter workers	19	1.3	6.3
Janitors and cleaners, except maids and housekeeping cleaners	26	1.7	3.6
Sales and related occupations	61	4.0	1.7
Cashiers	17	1.1	-1.6
Retail salespersons	15	1.0	-3.1
Sales representatives, wholesale and manufacturing	18	1.2	6.3
Office and administrative support occupations	105	6.9	-7.3
Financial clerks	20	1.3	-9.8
Shipping, receiving, and traffic clerks	19	1.2	-5.7
Farming, fishing, and forestry occupations	23	1.5	7.7
Agricultural workers	20	1.3	7.8
Installation, maintenance, and repair occupations	84	5.5	8.0
Industrial machinery mechanics	21	1.3	12.3
Maintenance and repair workers, general	36	2.4	7.5
Production occupations	790	51.8	8.2
First-line supervisors/managers of production and operating workers	49	3.2	8.1
Assemblers and fabricators	22	1.4	-3.5
Bakers	51	3.3	6.8
Meat, poultry, and fish cutters and trimmers	121	7.9	16.3
Slaughterers and meat packers	123	8.1	18.2
Food batchmakers	57	3.8	5.0
Food cooking machine operators and tenders	26	1.7	5.9
Crushing, grinding, polishing, mixing, and blending workers	26	1.7	-5.4
Mixing and blending machine setters, operators, and tenders	20	1.3	-5.7
Inspectors, testers, sorters, samplers, and weighers	25	1.6	5.3
Packaging and filling machine operators and tenders	105	6.9	6.0
Transportation and material moving occupations	288	18.9	-1.9
Driver/sales workers	15	1.0	-6.5
Truck drivers, heavy and tractor-trailer	28	1.8	11.1
Truck drivers, light or delivery services	16	1.0	3.7
Industrial truck and tractor operators	37	2.4	0.4
Cleaners of vehicles and equipment	17	1.1	0.2
Laborers and freight, stock, and material movers, hand	56	3.7	-12.4
Packers and packagers, hand	83	5.5	-0.5

NOTE: May not add to totals due to omission of occupations with small employment.

Some food manufacturing workers need specialized training and education. Inspectors and quality control workers, for example, often are trained in food safety and may need a certificate to be employed in a food manufacturing plant. Formal educational requirements for managers in food manufacturing plants range from 2-year degrees to master's degrees. Those who hold research positions, such as food scientists, usually need a master's or doctoral degree.

In addition to specialized training, a growing number of workers receive broader training to perform a number of jobs. The need for flexibility in more automated workplaces has meant that many food manufacturing workers are learning new tasks and being trained to effectively work in teams. Some specialized training exists for bakers and some other positions.

Advancement may come in the form of higher earnings or more responsibility. Helpers usually progress to jobs as machine operators, but the speed of this progression can vary considerably. Some workers who perform exceptionally well on the production line, or those with special training and experience, may advance to supervisory positions. Plant size and the existence of formal promotion tracks may influence advancement opportunities.

Requirements for other jobs are similar to requirements for the same types of jobs in other industries. Employers usually hire high school graduates for secretarial and other clerical work. Graduates of 2-year associate degree or other postsecondary programs often are sought for science technician and related positions. College graduates or highly experienced workers are preferred for middle-management or professional jobs in personnel, accounting, marketing, or sales.

Earnings

Table 3 shows that production workers in food manufacturing averaged $12.54 an hour, compared with $14.95 per hour for all workers in private industry in 2002. Weekly earnings among food manufacturing workers were lower than average, $497 compared with $506 for all workers in private industry in 2002. Food manufacturing workers averaged about 39.6 hours a week, compared with only 33.9 for all workers in the private sector. Weekly earnings ranged from $334 in seafood product preparation and packaging plants to $802 in grain and oilseed milling plants. Hours worked play a large part in determining earnings. For example, grain- and oilseed-milling workers, who averaged 44.2 hours a week, had higher hourly and weekly earnings than did workers in bakeries and tortilla manufacturing companies, who averaged 36.8 hours a week. Earnings in selected occupations in food manufacturing appear in table 4.

In 2002, about 18 percent of workers in the food manufacturing industry belonged to a union or were covered by a union contract, compared with about 15 percent of all workers in the private sector. Prominent unions in the industry include the United Food and Commercial Workers; the International Brotherhood of Teamsters; and the Bakery, Confectionery, Tobacco Workers and Grain Millers International Union.

Outlook

Overall wage and salary employment in food manufacturing is expected to increase by 5 percent over the 2002-12 period, compared with 16 percent employment growth projected for the entire economy. Despite the rising demand for manufactured food products by a growing population, automation and increasing productivity are limiting employment growth. Nevertheless, numerous job openings will arise in many segments of food manufacturing, as experienced workers transfer to other industries or retire or leave the labor force for other reasons.

Table 3. Average earnings of production or nonsupervisory workers in food manufacturing by industry segment, 2002

Industry segment	Weekly	Hourly
Total, private industry	$506	$14.95
Food manufacturing	497	12.54
Grain and oilseed milling	802	18.14
Beverages	684	17.38
Dairy products	639	15.83
Sugar and confectionery products	597	15.08
Fruit and vegetable preserving and specialty	514	12.83
Other food products	503	12.77
Bakeries and tortilla manufacturing	453	12.30
Animal slaughtering and processing	442	10.91
Seafood product preparation and packaging	334	9.70

Table 4. Median hourly earnings of the largest occupations in food manufacturing, 2002

Occupation	Food manufacturing	All industries
First-line supervisors/managers of production and operating workers	$18.78	$20.64
Industrial truck and tractor operators	12.67	12.54
Packaging and filling machine operators and tenders	11.07	10.20
Food batchmakers	10.99	10.54
Bakers	10.54	9.89
Laborers and freight, stock, and material movers, hand	10.11	9.48
Helpers—production workers	10.11	9.25
Slaughterers and meat packers	9.80	9.79
Packers and packagers, hand	9.15	8.03
Meat, poultry, and fish cutters and trimmers	8.47	8.57

Job growth will vary by occupation but will be concentrated among food manufacturing workers—the largest group of workers in the industry. Because many of the sorting, cutting, and chopping tasks performed by these workers have proven difficult to automate, employment among handworkers will rise along with the growing demand for food products. Handworking occupations include slaughterers and meat packers and meat, poultry, and fish cutters and trimmers, whose employment will rise as the consumption of meat, poultry, and fish climbs and more processing takes place at the manufacturing level. Other production workers also will benefit from the shift in food processing from retail establishments to manufacturing plants.

Although automation has had little effect on most handworkers, it is having a broader impact on numerous other occupations in the industry. Fierce competition has led food manufacturing plants to invest in technologically advanced machinery to be more productive. The new machines have been

applied to tasks as varied as packaging, inspection, and inventory control. As a result, employment will not increase as rapidly among some machine operators, such as packaging machine operators, as for industrial machinery mechanics who repair and maintain the new machinery. Computers also are being widely implemented throughout the industry, reducing employment growth of some mid-level managers and resulting in decreased employment for administrative support workers, but increasing the demand for workers with excellent technical skills. Taken as a whole, automation will continue to have a significant impact on workers in the industry as competition becomes even more intense in coming years.

Food manufacturing firms will be able to use this new automation to better meet the changing demands of a growing and increasingly diverse population. As convenience becomes more important, consumers increasingly demand highly processed foods such as peeled and cut carrots, microwaveable soups, or "ready-to-heat" dinners. Such a shift in consumption will contribute to the demand for food manufacturing workers and will lead to the development of thousands of new processed foods. Domestic producers also will attempt to market these goods abroad as the volume of international trade continues to grow. The increasing size and diversity of the American population has driven demand for a greater variety of foods, including more ethnic foods. The combination of expanding export markets and shifting and increasing domestic consumption will help employment among food manufacturing workers to rise slightly over the next decade and will lead to significant changes throughout the food manufacturing industry.

Sources of Additional Information

For information on job opportunities in food manufacturing, contact individual manufacturers, locals of the unions listed in the section on earnings, and State employment service offices.

Detailed information on many occupations in food manufacturing, including the following, appears in the 2004-05 *Occupational Outlook Handbook*.

- Food-processing occupations
- Industrial production managers
- Industrial machinery installation, repair, and maintenance workers, except millwrights
- Inspectors, testers, sorters, samplers, and weighers
- Material moving occupations
- Truckdrivers and driver/sales workers