Profiles in safety and health: retail grocery stores

This industry reported large numbers of work-related injuries and illnesses in store and warehouse operations; stock handlers and retail sales clerks sustained serious sprains, cuts, and other disabling disorders

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"Customers had a tendency to stop shopping when the baskets became too full or too heavy."

—Sylvan Goldman, on what prompted his design of the first shopping cart in the 1930's

Shopping carts, those common carriers traversing today's supermarket aisles, have provided clues to the changing character of grocery stores since the Great Depression. Back then, small one-person operations were the norm and customers shopped with small baskets or store operators filled their shopping lists. But by the early 1940's, larger food stores, commonly called supermarkets, were firmly established, featuring many self service departments, one-stop food shopping, selected nonfood items, and free parking.

By 1960, supermarkets accounted for a large majority of the Nation's food for home consumption, replacing the corner grocery as the primary outlet for family food shopping.[1]

This article examines the recent injury and illness experience of the nearly 3 million workers currently employed in grocery stores, an industry with diverse settings that include convenience food stores, food markets, supermarkets, and the supporting operations run by large food retailers, such as fleets of trucks and cavernous warehouses.[2] The grocery store study is part of a Bureau of Labor Statistics series focusing on "high-impact" industries, which are defined as industries with the largest *numbers* of occupational injuries and illnesses, although not necessarily the highest incidence *rates*.[3]

According to a 1990 BLS survey, the grocery stores industry ranked third in total recordable injuries and illnesses, with 250,000 cases. Only nine industries reported at least 100,000 cases that year, according to the survey. (See table 1.) These industries, however, accounted for nearly 30 percent of the 6.8 million cases reported nationwide in 1990. Clearly, steady improvement in national figures on injury and illness experience on the job requires safer working conditions and work practices in high-impact and high-rate industries.

However, a trend to safer grocery stores is not evident from BLS survey results. The industry's injury and illness rate of 12.3 per 100 full-time workers in 1990 was much greater than the 8.1 rate for all retail trade and the 8.8 rate for private industry.[4] Indeed, the rate for grocery stores had increased from 11.5 per 100 full-time workers in 1980. The increase reflected a larger rise in the industry's injury and illness cases (39 percent) than in its hours of exposure to such risks (30 percent).

Persistently high readings of lost worktime underscore the lack of improvement in the industry's safety record. Approximately 40 percent of the

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Table 1. **Industry groups with the largest number of occupational injuries and illnesses, BLS annual survey, 1990**

SIC code[1]	Industry group	Employment (thousands)	Injuries and illnesses	
			Total cases (thousands)	Total case rate[2]
—	Private industry[3]	92,182.0	6,753.0	8.8
581	Eating and drinking places	6,565.2	357.2	8.4
806	Hospitals	3,547.0	297.6	10.6
541	Grocery stores	2,886.7	250.2	12.3
421	Trucking and courier services, except air	1,516.4	205.6	14.2
371	Motor vehicles and equipment manufacturing	809.4	180.9	23.0
805	Nursing and personal care facilities	1,419.8	170.5	15.6
531	Department stores	2,126.8	166.8	11.2
201	Meat products manufacturing	425.7	131.2	31.1
701	Hotels and motels	1,595.4	128.4	10.6

[1] *Standard Industrial Classification Manual*, 1987 edition.
[2] Rates per 100 equivalent full-time workers. See footnote 4 to text for method of calculation.
[3] Excludes farms with fewer than 11 employees.
NOTE: The nine groups shown here are the only "three-digit" industrial classifications reporting at least 100,000 injury and illness cases in 1990.

1990 injury and illness cases recorded for grocery stores—slightly more than 100,000—were serious enough to require workers to take time off from their jobs, be restricted to light duties, or work a shortened schedule. (See appendix.) The rate of such lost workday incidents was 5.2 per 100 workers in 1990, about the same as the 5.1-percent rate that occurred in 1980. In fact, recuperation time from disabling incidents in which work time was lost increased by 4 workdays over the 10 years, averaging 20 lost workdays per lost workday case in 1990.

The industry at a glance

Grocery stores are the dominant retailers of food for home preparation and consumption. Sales totaled $285 billion, about 95 percent of total food store sales reported in 1987, the latest census year for retail trade.[5] In 1990, grocery stores employed 90 percent of the Nation's 3.2 million workers in the food store industry, with the balance working primarily in retail bakeries and, to a lesser extent, in specialty food stores (establishments that sell only one product—meats, vegetables, or dairy products—for example). From 1985 to 1990, employment in grocery stores increased by nearly half a million, to 2.9 million, while the work force in food specialty stores declined by approximately 30,000 to a level of about 300,000.[6]

The seeds for dramatic growth in grocery store sales and employment were sown in the 1930's with the opening by Michael Cullen of the first "warehouse grocery" in an abandoned garage in Jamaica, New York.[7] Cullen's large, no-frills store, aggressive advertising, individual concessions that sold specialty foods and nonfood items under one roof, and free parking live on in the layout and operation of modern-day supermarkets and super stores.

Today's supermarkets and warehouse groceries offer many more products and services to attract the one-stop shopper, including ready-made specialty foods and salad bars, freshly-baked breads and pastries, and nonfood items such as flowers and floral arrangements, pharmaceuticals, books and videos, photo processing, and postage stamps.

To further increase sales, grocery stores have expanded hours of operation to fit consumers' work schedules and modern lifestyles. Stores that are open Sunday, early in the morning, late in the evening, or for 24 hours a day are common. Longer hours of operation and diversification of product lines largely explain the robust employment growth of grocery stores. The grocery store industry, in fact, accounted for 1 in 20 of the Nation's 19 million jobs added during the 1980's.[8]

The grocery store industry continued to attract a substantial number of part-time workers during the 1980's. (However, separate BLS data on employment and hours for part-timers in grocery stores are not available.[9]) From 1980 to 1990, for example, the total number of persons working in grocery stores increased 34 percent, considerably more than the 27-percent rise in their total hours.[10] In addition, over the same period, average weekly hours for the industry's nonsupervisory workers fell, from 31.5 in 1980 to 29.8 in 1990, although the trend toward longer store hours persisted.[11] (Declines in the average workweek can reflect not only an increase in workers on part-time schedules but other factors, such as fewer proprietors and partners who may work full-time schedules and shortened work schedules for full- or part-time workers.[12])

In recent years, total sales in grocery stores did not rise appreciably with the addition of new products and services and longer store hours. As a result, productivity in grocery stores declined an average 3 percent a year between 1985 and 1990, as hours worked rose 3 percent annually while output remained unchanged.[13] Over the past two decades (1972 to 1990), the industry experienced a more modest 0.7-percent per year decline in productivity, as hours worked rose 2 percent while output increased slightly more than 1 percent per year.[14]

Despite some technological breakthroughs at the checkout counter,[15] to effectively staff grocery stores managers must shuffle employee work schedules to match the hours customers choose to

shop and to staff the departments and provide the services the customers prefer.

A clear majority of the nearly 3 million workers in the grocery stores industry was classified in marketing and sales occupations, primarily cashiers and stock clerks on the selling floor. Other major occupational groups notable in this industry (and accounting for 25 percent of the industry's work force) were clerical and other administrative support jobs, food preparation and other service occupations, and operator, fabricator, and laborer jobs. Job categories with at least 50,000 workers (besides several jobs in sales and marketing) included general managers and top executives; bookkeeping, accounting, and auditing clerks; bread and pastry bakers; food preparation workers; food counter, fountain, and related workers; butchers and meatcutters; and those manually moving freight, stock, and other materials.[16]

The grocery stores industry is projected to add about 600,000 workers between 1990 and 2005.[17] Not surprisingly, cashiers, sales floor stock clerks, and other sales occupations account for about two-thirds of that expected increase. Most other job categories noted above are each projected to add between 10,000 and 25,000 workers during the 15-year span. But a decline of nearly 10,000 butchers and meatcutters is projected for the industry, largely because stores are expected to continue reducing their meatcutting operations by ordering "boxed" beef and other meat products already cut and processed by manufacturers.[18]

Frequency and severity measures

As part of the Annual Survey of Occupational Injuries and Illnesses, BLS develops a variety of measures to gauge the frequency and severity of recordable workplace incidents. All such measures show that the injury and illness record of grocery stores did not improve during the 1980's. The broadest gauge—the injury and illness rate for total recordable cases—*rose* from an average of 11.3 per 100 full-time workers in the 1981–85 period to an average of 12.1 in the 1986–90 period.

A substantial proportion of the industry's injury and illness cases was serious enough to require workers to take time off from work or be restricted in work activity.

The Bureau's separate measures of those disabling cases point up the extent of the problem for grocery stores and permit the following national comparisons for the most recent survey years, 1986 to 1990:

- The *lost workday case rate* was higher for grocery stores (5.1 per 100 workers) than for all of private industry (3.9).
- The *rate of lost workdays* was 98 days per 100 grocery store workers, compared with 75 days per 100 private industry workers.
- At 19 *workdays per lost workday case*, the worktime lost before returning to regular work duties was the same, on average, for grocery stores as for all private industry. This represented 2 days more than the average in the 1981–85 period for both sectors.

Although virtually all grocery stores cases are classified as occupational injuries, there has been a notable rise recently in the industry's reported number of repetitive motion illnesses, such as carpal tunnel syndrome and other motion-related disorders, usually involving the hand, wrist, elbow, or shoulder.[19] The 1990 survey of grocery store workers reported 2,300 new illness cases as "disorders associated with repeated trauma"; 5 years earlier, the corresponding count was 300 such reported "disorders."

As a result of the growing recognition and reporting of such disorders, grocery stores ranked among the 10 industry groups with the largest numbers of repeated trauma disorders in 1990—the only nonmanufacturing industry on that list.

The extent of safety and health problems in grocery stores varies by size of the work force. Grocery store rates were considerably higher for the industry's medium and large employers than for its smaller stores. The 1990 injury and illness rate for total recordable cases, for example, was 13.4 for grocery operations employing at least 20 workers, triple the 4.4-rate for smaller firms. Furthermore, a large majority of these small store operations reported no recordable cases in 1990—a pattern consistent with the national experience for small establishments.

Separate State data also are useful in spotting variations in the injury and illness experience in an industry.[20] In the grocery stores industry, for example, the 1990 injury and illness rate for total recordable cases ranged from more than 15 per 100 workers in Maine to 8 or fewer per 100 workers in North Dakota, Vermont, and Wyoming. (See table 2 for a comparison among 11 States.) Overall rates, however, were not necessarily indicative of accident severity in grocery stores. The 22 days per lost workday case for recuperation time in Maine, for example, was less than the average 36 days required to return to regular work duties in Vermont.

Characteristics by case and worker

The BLS annual survey identifies industries with high case counts or high case rates, but does not provide information about the characteristics of the occupational injuries and illnesses. Such information is available, to some extent, from another

BLS program—the Supplementary Data System—based on State workers' compensation systems. Unlike the annual survey, the Supplementary Data System does not produce nationwide estimates and lacks a uniform treatment among States of what is a compensable workplace injury or illness.[21] Nonetheless, despite these and several analytical and statistical limits, the Supplementary Data System helps spot general patterns (or their absence) in the characteristics of work-related injuries and illnesses involving lost worktime.

To obtain the broadest geographic profile possible for this analysis, injury and illness cases from the 14 States participating in the 1988 Supplementary Data System were combined with comparable cases from 13 jurisdictions that participated in the 1987 Supplementary Data System but, due to a lack of resources, did not participate in the 1988 System. The aggregated grocery store total for the 27 jurisdictions amounted to about 51,300 injury and illness cases that involved lost worktime.[22] The following profiles identify the principal features of these grocery store cases and note some instances where they differ somewhat from the major characteristic categories of private industry cases as a group. (Such comparisons, however, are subject to the same types of limits previously attributed to the Supplementary Data System.)

Table 2. **Occupational injuries and illnesses, grocery stores and selected States, BLS annual survey, 1990**

Industry and state	Incidence rates[1]				Average lost workdays per lost workday case
	Total cases[2]	Nonfatal cases without lost workdays	Lost workday cases	Lost workdays	
Private Industry[3]	8.8	4.7	4.1	84.0	20
Grocery stores[4]	12.3	7.1	5.2	106.4	20
Arkansas	10.2	6.4	3.8	93.5	25
Florida	11.6	7.4	4.2	64.6	15
Louisiana	9.6	4.8	4.8	65.5	14
Maine	15.6	5.4	10.2	219.3	22
New Mexico	13.4	8.3	5.1	169.2	33
North Dakota	7.3	5.1	2.1	29.4	14
Oklahoma	9.6	5.5	4.1	88.5	22
Rhode Island	13.0	3.7	9.3	153.4	16
Texas	10.5	5.9	4.6	142.1	31
Vermont	8.0	3.8	4.3	155.8	36
Wyoming	7.3	4.4	2.9	49.9	17

[1] Incidence rates represent the number of injuries and illnesses per 100 equivalent full-time workers. See footnote 4 to text for method of calculation.
[2] Includes fatalities. Because of rounding, the difference between the total and the sum of the rates for lost workday cases and nonfatal cases without lost workdays may not reflect the fatality rate.
[3] Excludes farms with fewer than 11 employees.
[4] Includes data for States in addition to those shown separately.

The Supplementary Data System identifies four basic characteristics of injury and illness cases: (1) physical condition, or nature of injury or illness; (2) part of body affected by the condition; (3) source of injury or illness—the object, substance, exposure, or bodily motion that directly produced or inflicted the condition; and (4) the type of event or exposure associated with the injury or illness—that is, how the condition was inflicted or produced. These features help determine the "what and how" of disabling incidents in the workplace.

Sprain and strain occurred most frequently among the *nature of injury or illness* categories, accounting for nearly half of the 51,300 grocery store cases incorporated in the 1987–88 Supplementary Data System tabulation. Other leading categories were cut, laceration, and puncture, cited in slightly more than one-sixth of the industry's case total; contusion, crushing, and bruising, one-tenth of the total; and fractures, one-twentieth. Conditions of the nervous system (primarily those affecting the nerves and peripheral ganglia, such as the pinched nerve condition known as carpal tunnel syndrome) and other work-related illnesses (particularly mental disorders) also were cited in one-twentieth of the grocery store cases.

The back and, to a lesser extent, other portions of the trunk (the abdomen and shoulders, for example) together constituted the major *part of body affected* by injuries and illnesses, accounting for nearly two-fifths of the industry's case total. Next in frequency were the upper extremities, particularly the fingers, which represented three-tenths of the total, followed by the lower extremities, slightly more than one-sixth. Of the many combinations of nature and affected body part categories, "back sprain" (cited in one-fourth of the 51,300 cases), and "finger cut" (cited in slightly more than one-eighth of the cases) were the only combinations commonly cited.

The leading category under *source of injury and illness* was "boxes, barrels and containers." This classification, which includes crates and cartons, was cited in one-third of the industry's case total, double its one-sixth share of all private industry cases reported in the Supplementary Data System. Three other source categories—working surfaces (primarily floors), machines (particularly food slicers and trimmers), and vehicles (especially carts, handtrucks, and other nonpowered carriers)—each constituted roughly one-tenth of the grocery store total. Other less common but notable sources included inadvertent bodily motion (for example, slipping or tripping), knives and other nonpowered hand tools, and wood skids and pallets.

The leading *event or exposure* associated with

injuries or illnesses in grocery stores was overexertion, which represented nearly two-fifths of the industry's case total. Next in frequency was being struck by an object, cited in nearly one-fifth of the cases, followed by striking against objects and falling on the same level, each about one-tenth of the total. Given their work responsibilities, grocery store employees sustained a larger proportion (one-fourth) of their injuries and illness while lifting heavy and unwieldy objects than did private industry workers as a whole (slightly more than one-sixth).

Besides case characteristics, the Supplementary Data System also identifies *worker characteristics*, such as sex, age, length of service, and occupation—the "who" of work place injuries and illnesses. These characteristics have been the subject of previous BLS studies that examined the link between injury and work experience, the injury risks facing female workers, and how to identify comparatively hazardous occupations.[23]

Women figured prominently in the safety statistics of grocery stores, constituting about two-fifths of the industry's 51,300 injury and illness cases recorded in the 1987–88 Supplementary Data System tabulation. Partly reflecting their different staffing patterns, injured women were most commonly retail salesworkers, while injured men were most often stock handlers. The following tabulation shows the percentage of injuries and illnesses common to men and women employed in grocery stores, by occupation:

	Men	*Women*
All occupations (percent)	100	100
Retail salesworker	10–14	40–44
Food service worker	0–4	10–14
Butcher and meatcutter	10–14	0–4
Stock handler and bagger	30–34	20–24
Laborer, except construction	10–14	0–4
All other occupations	30–34	20–24

Safety risks appear to be comparatively higher for women in the grocery store industry, where they are primarily in sales occupations, than in private industry, where they are typically in clerical and other administrative support jobs.[24] Women account for nearly one-half of the work force in the grocery store industry and in all private industry, but their share of injury and illness cases in grocery stores (two-fifths) exceeds their share of the cases in private industry (one-fourth).

In grocery stores, retail salesworker and stock handler and bagger were, by far, the leading *occupations of the injured or ill worker*, each constituting about one-fourth of the industry's case total. The retail salesworker classification includes cashiers and checkout clerks, who may also stock store shelves and perform additional activities, and clerks stationed in various departments (the delicatessen and bakery counters, for example).

The stock handler and bagger category includes work activities on the selling floor, in the stockroom of stores, and in warehouses supporting the stores. Other job classifications, each accounting for between one-twentieth and one-tenth of the grocery store case total, included supervisory sales occupations, butcher and meatcutter, and laborer (except construction).

As a proxy for work activity, injury data by occupation can help zero in on specific work hazards in the grocery stores industry. Not surprisingly, retail salesworkers were injured under different circumstances from those related to injuries and illnesses to butchers and meatcutters, whose jobs involve the frequent use of knives, saws, and other cutting tools that increase their risk of serious cuts. The following tabulation illustrates this point by contrasting the relative shares (percentage ranges of total cases) of various categories that describe the event (manner), the resulting nature (physical condition) of injury and illness, and body part affected:

	Retail sales-worker	*Butcher and meatcutter*
Total (percent)	100	100
Event:		
Overexertion	35–39	25–29
Struck by, struck against	25–29	45–49
All other events	35–39	20–24
Nature:		
Sprain and strain	50–54	30–34
Cut, laceration, and puncture	15–19	45–49
Illnesses	5–9	0–4
All other natures	25–29	15–19
Body part affected:		
Back	25–29	20–24
Upper extremities	30–34	55–59
Fingers	10–14	40–44
Lower extremities	15–19	5–9
All other body parts	25–29	15–19

Illnesses were a relatively small share of total grocery store cases reported to the Supplementary Data System. However, an analysis of the illnesses can improve our understanding of the varying health risks and exposures facing the industry's workers. The following tabulation of leading illness categories for retail salesworkers and butchers shows that two groups of cumulative trauma disorders—inflammation or irritation of joints, tendons, and muscles and diseases of the nerves and peripheral ganglia—constitute a clear majority of such cases:

	Retail sales-worker	Butcher and meatcutter
All conditions	100	100
Inflammation or irritation of joints, tendons, and muscles	25–29	30–34
Diseases of the nerves and peripheral ganglia	35–39	30–34
Mental disorders	15–19	5–9
All other illnesses	20–24	25–29

The latter condition of the nervous system overwhelmingly involved the wrist, suggesting that many cases were diagnosed and reported on State worker's compensation reports as carpal tunnel syndrome. However, inflammation and related disorders comprise several conditions, including tendonitis, and bursitis, that commonly involve the wrist, fingers, elbow, and shoulders.

Warehouse workers survey

While the Supplementary Data System provides the basic characteristics of the injuries and illnesses of workers, BLS also conducts, at the request of the Occupational Safety and Health Administration, small-scale studies of specific work activities called Work Injury Reports, which focus on the circumstances surrounding a work injury or illness from the perspective of the injured worker. A 1984 study focused on injuries to warehouse workers, including order selectors and other stock handlers in grocery stores and warehouses operated by retail grocers.[25]

The study found that most injured workers were manually lifting, carrying, or handling materials at the time of their incident. Many said they would not have used lifting/handling equipment because the material had to be moved by hand at some stage, or not enough space was available for the equipment. Some who worked with lifting/handling equipment said they were injured when placing the goods on forklifts, powered pallets, or dollies. According to these injured warehouse workers, the major conditions and factors leading to the incidents were confined work spaces or that they worked in an awkward position, worked too fast, or lifted unusually heavy objects. A large majority believed that preventive methods or procedures, such as more help and additional time to do the job, would have helped to prevent the injury.[26]

The following examples of disabling incidents illustrate the types of safety problems encountered by the 30 injured warehouse workers in the grocery stores industry interviewed for the 1984 BLS study. Although the study shed some light on warehousing hazards, a separate, indepth study of grocery stores would be required to cover the circumstances surrounding injuries to warehouse workers in stockrooms of grocery stores and in the warehouse storage areas, loading docks, and trucks.[27]

- While riding a pallet jack down an aisle of a warehouse storage area, an employee hit a storage rack that had fallen on the floor and was thrown off the jack by the impact.
- While unloading a trailer, an employee pulled a chest muscle after manually lifting 15 sacks of beans, weighing 100 pounds each, onto a pallet.
- While cleaning a loading dock, an employee lost control of the water hose; the worker's ankle was sprayed with scalding hot water.

Improving the statistics

Although each of BLS three safety and health surveys—the Annual Survey of Occupational Injuries and Illnesses, the Supplementary Data System, and the Work Injury Reports—is useful, safety and health experts continue to recommend that they be integrated into one nationwide survey with injury and illness cases defined uniformly.[28] After several years of planning and testing various methods, the Bureau begain implementing a redesigned occupational safety and health statistical system in 1992. The new survey system expands the scope of the nationwide annual survey to include information on how the incident occurred, and pertinent worker characteristics, such as age and sex, for all injury and illness cases resulting in lost worktime.[29]

(A similar effort to design a census approach to identify and describe the circumstances surrounding all fatal occupational injuries is described on pages 3–8.)

The newly redesigned system will improve the information currently available for the grocery stores industry. It will describe the characteristics of nearly double the number of grocery store cases covered by the Supplementary Data System of 27 States used in this article. And its lost workday cases will be defined uniformly, supplanting the variety of State definitions found in the Supplementary Data System. Uniform case definitions will add more credibility to State-to-State and State-to-national comparisons of injury and illness experience.

The redesigned system also will collect information not available from workers' compensation reports on the amount of lost worktime by individual case. These data can be summarized as the *average* number of lost workdays per case that will help identify the groups of injured

workers and types of incidents associated with comparatively long recuperation periods, or as the *distribution* of cases by number of lost workdays that will help focus on lengthy recuperations that result in a loss of, say, 30 workdays or more.

Such profiles could identify, for example, the proportion of long-term injury and illness cases, by occupation and age of the injured worker.

IN SUMMARY, the new BLS Federal/State safety and health survey will permit a more complete and thorough analysis of industries with large numbers of disabling workplace injuries and illnesses, such as grocery stores. Through such improved knowledge, the most serious work hazards will be targeted and fully analyzed, providing industry with information to develop and evaluate solutions to prevent future safety and health hazards. □

Footnotes

[1] See Randolph McAusland, *Supermarkets: 50 Years of Progress* (Washington, Food Marketing Institute and Butterick Publishing, 1980), p. 59.

[2] The *Standard Industrial Classification Manual*, 1987 ed., prepared by the U.S. Office of Management and Budget, designates grocery stores as industry group 541.

The industry includes stores engaged primarily in the retail sale of canned foods and dry goods, such as tea, coffee, spices, sugar, and flour; fresh fruits and vegetables; and fresh and prepared meats, fish, and poultry. Stores chiefly retailing one class of products, such as bakery or dairy products for home consumption, are classified as food stores elsewhere in major group number 54.

[3] For a current listing of industries with high rates of workplace injuries and illnesses, see *Occupational Injuries and Illnesses in the United States by Industry, 1990*, Bulletin 2399 (Bureau of Labor Statistics, 1992), p. 2.

[4] *Incidence rates* represent the number of injuries or illnesses, or both, per 100 full-time workers, and were calculated as:

$$N/EH \times 200{,}000$$

where:

N = number of injuries and/or illnesses;

EH = total hours worked by all employees of the industry during the calendar year; and

200,000 = base for 100 full-time equivalent workers (employees working 40 hours per week, 50 weeks per year).

A variety of useful incidence rates may be computed by making N equal to the number of injuries only, or the number of lost workday cases, and so forth. In each instance, the result is an estimate of the number of cases or days per 100 full-time workers.

[5] *1987 Census of Retail Trade*, RC87-A-52 (Bureau of the Census, 1989), table 1, p. 11.

[6] Employment data are from the Current Employment Statistics program, in which BLS cooperates with State employment security agencies in a survey to collect data each month on employment, hours, and earnings from a sample of nonagricultural establishments (including government).

[7] McAusland, *Supermarkets: 50 Years*, p. 5.

[8] See Lois M. Plunkert, "The 1980's: a decade of job growth and industry shifts," *Monthly Labor Review*, September 1990, table 2, p. 8 and table 5, p. 12.

[9] Data available from the Bureau's Current Population Survey show that wage and salary workers on full-time schedules in grocery stores averaged 42.9 hours per week in 1991, about 10 hours more than the industry average. The substantial difference in hours supports the notion that the industry employs a large number of workers working less than full-time schedules.

[10] See *Productivity Measures for Selected Industries and Government Services*, Bulletin 2406 (Bureau of Labor Statistics, 1992), table 152. The 1980–90 increase is subject to revision because 1990 data in this bulletin are preliminary.

[11] Employment, hours, and earnings data by industry are available from the Bureau of Labor Statistics, Division of Monthly Industry Employment Statistics.

[12] For a discussion of the dramatic shift from proprietors to paid employees that took place during the 1960's and early 1970's in the retail food industry, see John L. Carey and Phyllis Flohr Otto, "Output per unit of labor input in the retail food industry," *Monthly Labor Review*, January 1977, pp. 43–44.

[13] *Productivity Measures for Selected Industries*, table 152. Because 1990 data are preliminary and subject to revision, changes in productivity and related measures through 1990 may also be revised at a later date.

[14] *Productivity Measures for Selected Industries*, table 152.

[15] For a discussion of scanning devices at point-of-sale terminals, see *Technology and Labor in Three Service Industries: Utilities, Retail Trade, and Lodging*, Bulletin 2367 (Bureau of Labor Statistics, 1990), pp. 16-17.

[16] Based on the 1990 National Industry-Occupation Matrix, available from the Bureau of Labor Statistics, Office of Employment Projections.

[17] BLS 1990 National Industry-Occupation Matrix.

[18] The number of butchers and meatcutters in all industries is projected to decline by 14,000 between 1990 and 2005. For several articles on the BLS employment projections to the year 2005, see *Outlook, 1990-2005*, Bulletin 2402 (Bureau of Labor Statistics, 1992).

[19] The category "disorders associated with repeated trauma" includes conditions due to repeated motion, vibration, or pressure. Carpal tunnel syndrome is one such condition in which the nerve passing through the wrist to the hand is pinched and compressed because of fast, repeated, forceful motions. Other repeated traumas include tendonitis, bursitis, Reynaud's phenomena, and noise-induced hearing loss, to name a few. For a collection of readings on these conditions, see *Carpal Tunnel Syndrome: Selected References* (National Institute for Occupational Safety and Health, 1989).

[20] For a variety of reasons, injury and illness estimates tend to be more volatile for States than for the Nation. The 1990 State data are more illustrative of geographic variability than long term relationships among States.

[21] The Supplementary Data System is not statistically representative of the Nation because the data cover only the jurisdictions participating in the system, for example, 14 States in 1988.

States differ, moreover, in the kinds of cases they require by law to be reported to workers' compensation agencies.

While some States require reports for all occupational injuries and illnesses, regardless of length of disability, others require reports only for cases of sufficient duration to qualify for indemnity compensation payments, while other States require reporting of cases involving a specific number of lost workdays, regardless of the indemnity "waiting period." The file of the Supplementary Data System is not a complete census of all "disabling" injuries and illnesses in the jurisdictions studied.

The Supplementary Data System, however, does standardize the classification of data using the 1972 *Standard Industrial Classification Manual*, the 1980 *Census of Population, Alphabetical Index of Industries and Occupations*, and the 1962 *American National Standards Method of Recording Basic Facts Relating to the Nature and Occurrence of Work Injuries*, published by the American National Standards Institute (ANSI) and often referred to as the Z16.2—1962 standards, or simply, Z16.2.

[22] The 14 States that participated in the 1988 Supplementary Data System and their numbers of injury and illness cases in grocery stores (in parenthesis) included Arkansas (475), California (17,218), Indiana (1,316), Iowa (585), Kentucky (1,061), Louisiana (1,347), Maine (804), Maryland (2,493), Michigan (1,727), Mississippi (523), Missouri (1,756), Oklahoma (547), Oregon (1,284), and Texas (6,556). The comparable information tabulated for the 13 jurisdictions that participated in 1987 but not 1988 included Alaska (390), Arizona (1,506), Colorado (1,744), Hawaii (664), Nebraska (385), New Mexico (496), Ohio (3,425), Tennessee (1,073), Virgin Islands (16), Virginia (994), Washington (1,578), Wisconsin (1,302), and Wyoming (72).

As used in this article, the aggregated tabulations for grocery stores contained about 37,700 cases reported by the 1988 participating States and 13,600 reported by the 1987 participants. The 1987–88 total of about 51,300 cases was roughly half of the national total of 97,300 lost workday cases in grocery stores; the latter figure was an average of the 1987 and 1988 national counts for the industry as reported in the Bureau's annual survey.

[23] For a discussion of the relationship of age, work experience, and work injuries, see Norman Root and Michael Hoefer, "The first work-injury data available from new BLS study," *Monthly Labor Review*, January 1979, pp. 76–80. See also Norman Root and Judy R. Daley, "Are women safer workers? a new look at the data," *Monthly Labor Review*, September 1980, pp. 3–10; and Norman Root and Deborah Sebastian, "BLS develops measure of job risk by occupation," *Monthly Labor Review*, October 1981, pp. 26–30.

[24] According to the Current Population Survey, conducted for the Bureau of Labor Statistics by the Census Bureau, nearly 30 percent of women employed in the private sector held clerical and other administrative support jobs and slightly more than 12 percent were in sales occupations. No direct occupational comparisons are available for female clerical workers in grocery stores. But we can infer from the number (225,000) of total clerical workers in grocery stores that women clerical workers could be no more than 16 percent of the 1.4 million women in that industry.

[25] *Injuries to Warehouse Workers*, Bulletin 2257 (Bureau of Labor Statistics, 1986). The classification "warehouse laborer" was shown to be a relatively high-risk occupation in Root and Sebastian, "BLS develops measure of job risk by occupation."

[26] *Injuries to Warehouse Workers*, tables 18 and 19.

[27] The National Institute of Occupational Safety and Health (NIOSH) is conducting a research study of manual lifting activities in grocery warehouses. For more details on this project, contact Sherry Baron, NIOSH, 4676 Columbia Parkway, Mail Stop R-10, Cincinnati, OH, 45226.

[28] See, for example, Earl S. Pollack and Deborah Gellerman Keimig, eds., *Counting Injuries and Illnesses in the Workplace: Proposals for a Better System* (Washington, National Academy Press, 1987).

[29] Operationally, worker and case characteristic data from a probability-based sample of establishments and their cases involving days away from work will be statistically representative of all such lost workday cases.

APPENDIX: Work injury definitions

Definitions of occupational injuries and illnesses and lost workdays in this article conform to the recording and reporting requirements of the Occupational Safety and Health Act of 1970 and Part 1904 of Title 29, Code of Federal Regulations. Supplemental information pertaining to these definitions is in the booklet, *Recordkeeping Guidelines for Occupational Injuries and Illnesses* (Bureau of Labor Statistics, 1986).

Recordable occupational injuries and illnesses are:

1. Occupational deaths, regardless of the time between injury and death, or the length of the illness; or
2. Nonfatal occupational illnesses; or
3. Nonfatal occupational injuries that involve one or more of the following: loss of consciousness, restriction of work or motion, transfer to another job, or medical treatment other than first aid.

Occupational injury is any injury, such as a cut, fracture, sprain, amputation, and so forth, that results from a work accident or from exposure involving a single incident in the work environment.

Occupational illness is any abnormal condition or disorder, other than one resulting from an occupational injury, caused by exposure to environmental factors associated with employment. It includes acute and chronic illnesses or disease that may be caused by inhalation, absorption, ingestion, or direct contact.

Lost workday cases involve days away from work, or days of restricted work activity, or both.

1. *Lost workday cases involving days away from work* are cases that result in days away from work, or a combination of days away from work and days of restricted work activity.
2. *Lost workday cases involving restricted activity* are those cases that result in restricted work activity only.

Lost workdays—away from work are the number of workdays (consecutive or not) on which the employee would have worked but could not because of occupational injury or illness.

Lost workdays—restricted work activity are the number of workdays (consecutive or not) on which, because of injury or illness:

1. The employee was assigned to another job on a temporary basis; or
2. The employee worked at a permanent job less than full time; or
3. The employee worked at a permanently assigned job but could not perform all duties normally connected with it.

The number of days away from work or days of restricted work activity does not include the day of injury or onset of illness or any days on which the employee would not have worked although able to work.