

Restaurant Hazards

Practice-based approaches to disabling occupational injuries

By Alfred J. Filiaggi and Theodore K. Courtney

THE RESTAURANT INDUSTRY is one of the nation's largest employment sectors. While the industry has a below-average nonfatal injury incidence rate, restaurant workers comprise one of the largest groups of workers injured in the U.S. each year. This article provides an overview of the industry and the typical disabling injuries encountered (falls on same level, cuts, overexertion and burns). Several practical, experienced-based approaches for addressing related hazards are provided, and specific issues that can advance the safety process in restaurants are highlighted. Strengthening the safety research base on restaurants is also recommended to improve the effectiveness of the SH&E profession's response to this industry's hazards.

Industry Overview

According to the National Restaurant Assn., the U.S. has more than 850,000 restaurant industry establishments. On a typical day, four out of 10 U.S. adults are restaurant patrons. In 1999, the restaurant industry accounted for 46 cents of every American food dollar—up from 25 cents in 1955. Despite the recent

downturn in the U.S. economy, the restaurant industry expected to reach its eleventh consecutive year of growth in 2002, with an anticipated sales volume of \$407 billion [National Restaurant Assn.(a) 1].

Estimates of restaurant industry employment vary from 8 million workers using more restrictive Bureau of Labor Statistics (BLS) data on SIC 58 (Eating and Drinking Places), to 11.6 million workers using a more-expansive restaurant industry definition preferred by the industry itself [U.S. DOL(a) 7; National Restaurant Assn.(b) 2]. These figures place the restaurant industry as either the largest or the second-largest private-industry employer in the U.S. In fact, the National Restaurant Assn. reports that as many as one out of three American adults has worked in the restaurant industry at some point.

Injuries & Illnesses in Restaurants

The data in this section were obtained from print and web-based publications supplemented by specific requests for data from BLS (Courtney and Webster 24). In 1999, the total injury and illness case rate for restaurants (SIC 58) was slightly below the national average for private industry (5.6 versus 6.3 cases per 100 full-time workers). Even with a below-average case rate, restaurants ranked third in the total number of injury and illness cases in 1999 (n = 304,200) due to the industry's scale of employment. As Table 1 shows, restaurant injury and illness cases comprised 5.3 percent of all cases and ranked behind Health Services (10.5 percent) and Special Trade Contractors (5.8 percent) and ahead of Transportation Equipment (4.7 percent) [U.S. DOL(a) 9]. Table 2 shows that at the more-detailed three-digit SIC level, restaurants actually had the highest number of injury cases in private industry [U.S. DOL(a) 12].

In 1999, some 76,919 restaurant injury and illness cases involved one or more days away from work (DAFW), accounting for 4.5 percent of the national DAFW cases for private industry [U.S. DOL(b) R1]. Figure 1 shows the most frequent

Alfred J. Filiaggi, CSP, is a research scientist at the Liberty Mutual Research Institute for Safety in Hopkinton, MA. Prior to transferring to the Research Institute from Liberty Mutual's Loss Prevention Dept., he served as a safety manager for three East Coast divisions of a large restaurant chain, providing safety program administration for more than 250 restaurant operations. During his career, Filiaggi has also worked as an OSH consultant with large manufacturing, transportation and service companies. He earned a B.S. in Commerce and Engineering Sciences from Drexel University and is a member of ASSE's Greater Boston Chapter.

Theodore K. Courtney, M.S., CSP, is associate director at the Liberty Mutual Research Institute for Safety in Hopkinton, MA, and an instructor on injury, safety and ergonomics at the Harvard School of Public Health, Boston. He was a recipient of the 2003 William Floyd Medal from the Ergonomics Society for his work in injury prevention. Courtney holds a B.S. in Human Factors from Georgia Tech and an M.S. in Industrial and Operations Engineering from the University of Michigan.

A codeveloper of the BCSP specialty examination on ergonomics, he is a member of the ASSE Foundation Research Committee, the Society's Greater Boston Chapter and the editorial board of the American Industrial Hygiene Assn. Journal.

types of injuries and illnesses experienced in restaurants. Sprains, strains, tears accounted for one-in-three lost-time cases (with back sprains, strains, tears accounting for 46 percent of this category). Cuts, punctures (most frequently to the hands and fingers), bruises (typically to the shoulder, foot and wrist) and heat burns (typically on the foot, arm and face), followed as the most common injuries reported in restaurants.

Figure 2 provides a breakdown of events and exposures leading to injuries or illnesses with DAFW [U.S. DOL(c) R4]. One of every three disabling restaurant injuries in 1999 were the result of slipping, tripping and/or falling (STF), with the largest percentage of injuries (26 percent) attributed to falls on same level. Other high-frequency injury event types included being struck by object (especially swinging or falling objects), overexertion (79 percent from lifting), and exposure to harmful substance or environment (86 percent from contact with hot objects or substances).

Addressing Common Hazards

The data show that the most commonly encountered disabling injuries in restaurants relate to STF, handling sharp implements, overexertion, and contact with hot surfaces or objects. While these hazardous event categories are familiar to many SH&E professionals, restaurant operations present some unique challenges. Each hazard type is addressed in the following discussion, as are several practice-based control measures.

Falls on Same Level

Slips and falls can occur on wet or contaminated surfaces and where transitions in floor types occur (e.g., from the dining area to the kitchen). In restaurants, common sources of slippery floors include

dishwashing overspray or run-off, leaking equipment or pipes, food debris, and spillage from transport of open containers (such as those holding fryer grease and food waste). To reduce these types of hazards, management can:

- Ensure that restaurants strictly adhere to the procedures defined by the floor cleaning product manufacturer. A typical protocol may include: 1) Use the proper amount of cleaning product with hot, softened tap water. 2) Apply cleaning product evenly on floor surface with a clean mop. 3) Temporarily block floor drains to permit the chemical sufficient time to penetrate built-up contaminants. 4) Allow sufficient time for the cleaning product to loosen contaminants on

Table 1

Industry Groups with Largest Number of Nonfatal Occupational Injuries & Illnesses*

SIC Code	Industry Group	Employment (thousands)	Injuries & Illnesses Total Cases (thousands)	Total Incidence Rate [†]
—	Private industry	107,611.8	5,707.2	6.3
80	Health services	9,946.9	596.5	7.5
17	Special trade contractors	4,024.1	329.2	8.9
58	Eating and drinking places	7,954.4	304.2	5.6
37	Transportation equipment	1,891.8	265.6	13.7
50	Wholesale trade—durable goods	4,102.2	222.0	5.6
20	Food and kindred products	1,686.2	216.6	12.7
54	Food stores	3,490.5	201.1	7.9
34	Fabricated metal products	1,521.9	195.6	12.6
51	Wholesale trade—nondurable goods	2,800.8	194.2	7.3
35	Industrial machinery and equipment	2,132.8	183.1	8.5

*BLS annual survey, 1999 (two-digit SIC grouping).

[†]Incidence rates represent the number of injuries and illnesses per 100 full-time workers.

Table 2

Private-Sector Industries with 100,000 or More Nonfatal Occupational Injuries*

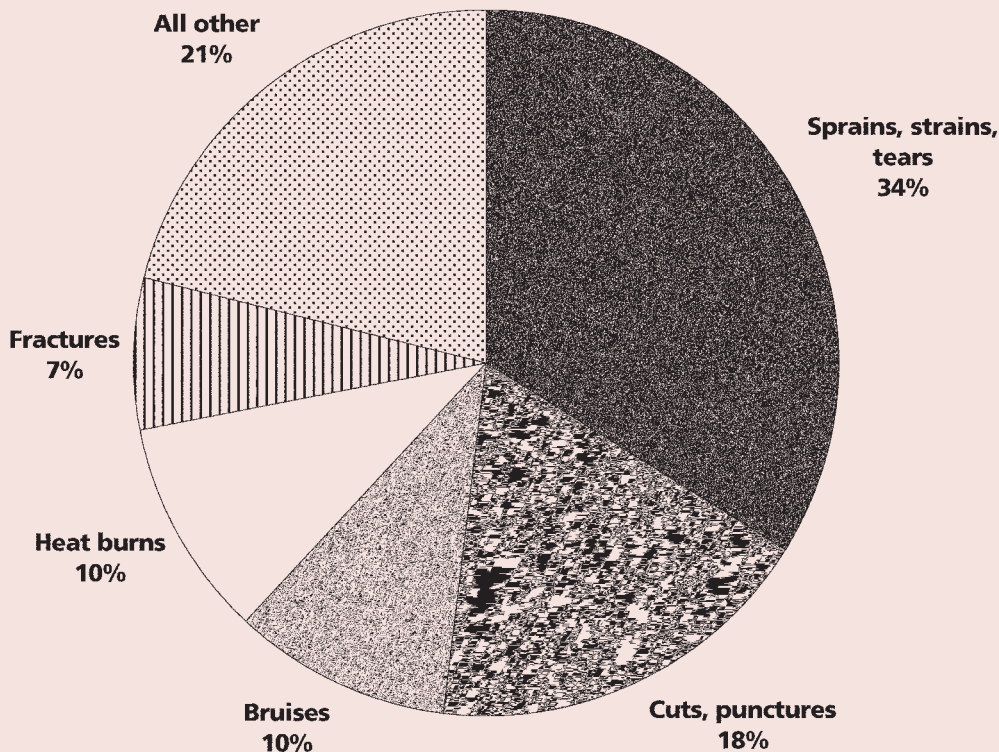
SIC Code	Industry Group	Injuries & Illnesses Total Cases (thousands)	Total Incidence Rate [†]
581	Eating and drinking places	299.8	5.5
806	Hospitals	271.7	8.5
805	Nursing and personal care facilities	188.6	13.2
541	Grocery stores	182.3	8.1
531	Department stores	159.7	8.7

*BLS annual survey, 1999 (three-digit SIC grouping)

[†]Incidence rates represent the number of injuries and illnesses per 100 full-time workers.

Figure 1

Nonfatal Occupational Injuries & Illnesses with DAFW in Restaurants* by Nature of Injury or Illness



Source: BLS annual survey, 1999
*SIC 58, Eating and Drinking Places

the floor—usually five to 10 minutes. 5) Deck brush the floor surface. 6) Open floor drains, squeegee and rinse floor with hot, softened tap water.

- Train managers to teach and enforce a “clean as you go” policy (e.g., clean the work area throughout the day).

- Systematically identify and eliminate all sources of water on the floor (e.g., sink overflow or spray, leaking pipes or containers, and breaks in counter surface solder welds).

- Evaluate the potential utility of slip-resistant footwear or floor treatments.

Overexertion

Typical materials handling exposures that can lead to overexertion include overloaded serving trays and bus tubs, as well as improper handling of kegs and other bulk product. Restaurants that offer full service (wait staff) should attempt to reduce weights carried by servers. In addition, both full-service and quick-service (i.e., fast food) establishments can reduce manual materials handling exposures when storing and transporting product throughout the restaurant. To achieve this, restaurants can:

- Use additional wait staff to serve parties of three or more in order to reduce the number of plates/amount of food carried at one time.

- Implement a policy whereby wait staff assist one another in food delivery and bussing of tables. This “full hands in, full hands out” (of the kitchen) approach helps to reduce the weights carried.

- Control tray weights and keep plates flat on the tray surface. As a rule of thumb, keep plates inside the outer rim of the tray.

- Store heavy items (e.g., bulk product such as potatoes and breading) between shoulder and knuckle height and use mechanical devices to transfer product.

Cuts

Cuts, punctures and lacerations from handling knives or cutting equipment, and broken glassware or plates are commonplace in restaurants. As Figure 1 shows, cuts, punctures accounted for 18 percent of the DAFW injuries in 1999. To reduce these injuries, restaurant management should:

- Sharpen knives regularly to reduce the potential for cuts from knife slippage. Research has demonstrated that dull knives increase the force required to accomplish a cutting task by as much as 30 percent (Szabo, et al 428).

- Provide and enforce the use of USDA-accepted cut-resistant gloves when using knives or cutting equipment. Be sure to have enough gloves on hand and in multiple sizes.

- Use nonslip pads under cutting boards.

- Provide USDA-accepted cut-resistant gloves to dishwashers and other employees who may routinely come into contact with sharp or broken materials.

- Use designated containers for broken glass and plates.

Burns

Restaurant workers encounter many hot surfaces and objects, including stoves, grills, fry vats and hot cookware, as well as hot food and beverage products. A Centers for Disease Control and Prevention (CDC) study of occupational burns among restaurant workers in Colorado and Minnesota found that 13 percent of all occupational burns requiring inpatient hospital care occurred in restaurants. Of these burns, 88 percent were associated with the use of deep fryers [CDC(a) 713]. To reduce worker exposure to burns:

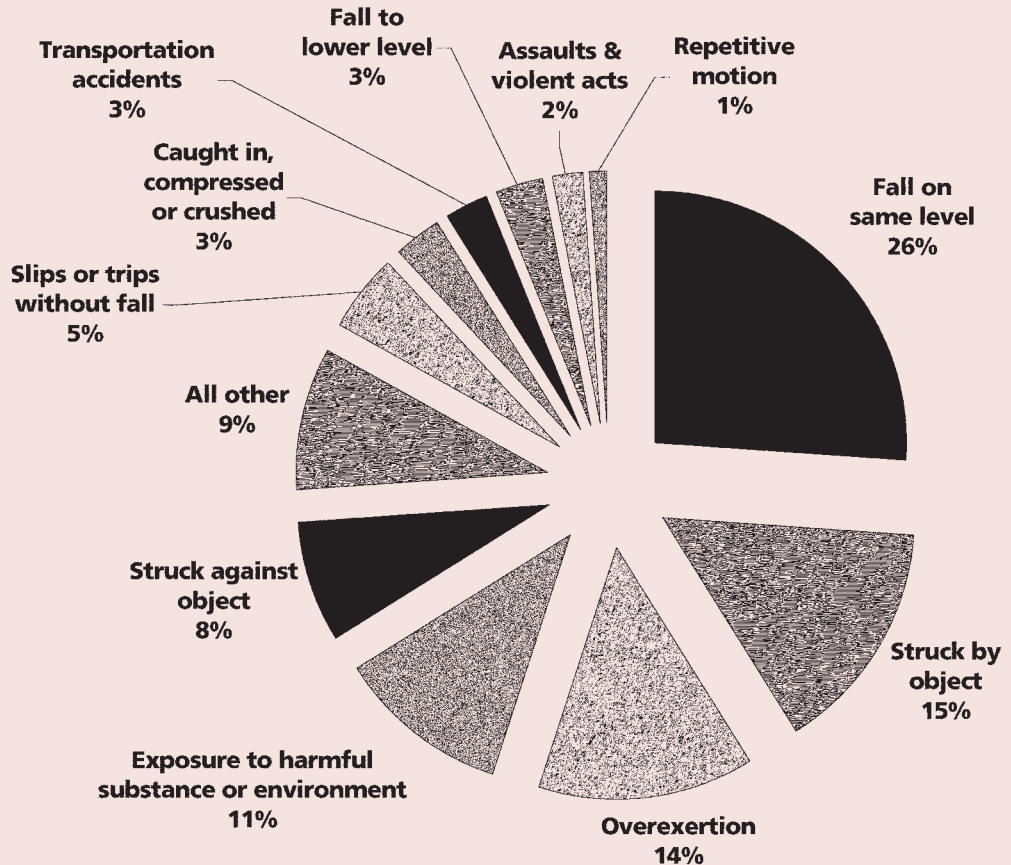
- Change or filter fryer oil in the morning before equipment is turned on.

- Use a closed grease transport system (i.e., no open pots or buckets) when removing and disposing of fryer grease.

- Prohibit workers from standing on cooking equipment when cleaning ventilation hoods. Operations should ensure an appropriately sized ladder to limit reaching.

Figure 2

Nonfatal Occupational Injuries & Illnesses with DAFW in Restaurants* by Events or Exposures Leading to Injury or Illness



Source: BLS annual survey, 1999
*SIC 58, Eating and Drinking Places

- Avoid or eliminate storage of objects above cooking equipment.

- Provide heat-resistant gloves to workers who reach into ovens or grab hot handles on pots and pans.

Incorporating Occupational Safety in Restaurants

While these approaches to specific hazards can help reduce worker exposure, SH&E professionals realize that such specific interventions must be integrated as part of an overall safety process. However, in the restaurant industry, the term “safety” is often more readily associated with food safety or public safety than with occupational safety. In addition, the fast-paced nature of operations and significant turnover of personnel can make it a challenge to get operators to focus on occupational safety issues. From the moment the opening manager arrives until the restaurant closes, the operational focus is on meal preparation, restaurant maintenance and customer service. On a typical day, the management team oversees worker scheduling, food truck deliveries, meal preparation, inventory, house-keeping, cash flow, employee hiring and training, and food quality checks. Often the manager or supervisor is working alongside employees, especially during the busiest meal periods.

Similar to approaches used elsewhere in private industry, the restaurant safety program should consist of a set of strategies, procedures and standards that collectively help to control hazards and prevent injuries. Typical elements such as top management support, safety training and incident investigation must be in place. Components that drive a restaurant safety program and typically impact its success include: 1) local restaurant management buy-in; 2) safety modeling; 3) integrated safety training; 4) accountability; and 5) worker involvement.

Local Restaurant Management Buy-In

In addition to safety support from the highest levels of corporate management, support from the local restaurant manager is critical. Unlike some industrial environments where senior managers and employees are under one roof, restaurants can be scattered across a region, the country or globe. In a sense, a restaurant’s general manager is similar to the president and CEO of a small business. Buy-in

requires that this manager fully understand the role of safety in operating a successful restaurant. For example, being short-staffed as the result of a disabling injury can have a negative effect on customer service. Other servers may be overworked and less-attentive to customer needs; food quality may suffer; and managers typically deviate from normal supervisory duties to respond to an incident. Additional workload from being short-staffed may also increase the potential for further injuries due to rushing or unfamiliarity with job tasks.

Management buy-in is enhanced by understanding the impact of occupational safety on restaurant performance and profitability. One way to achieve this is to establish the insurance costs of worker injuries as a “line item” in the restaurant’s profit and loss (P&L) statement. The direct workers’ compensation (WC) cost on the P&L can be an eye-opener for local management. An education on the indirect costs (e.g., incident investigation, worker replacement, overtime, effects on customer service) reinforces the priority safety should receive. Beyond indirect costs, other less-tangible but potentially influential effects such as employee job satisfaction and morale may significantly impact employee retention and customer perceptions.

Training managers in basic claims and disability

Safe behaviors and work habits developed early in a person's work experience could carry over to future jobs.

management reduces uncertainty and develops the manager's successful ownership in this key area (McLellan, et al 33). Regular communications with the injured worker and claims professional, directing care through provider networks where possible, and modified or light-duty options are among the approaches that can both respond to the needs of injured workers and manage costs. Furthermore, providing a new restaurant manager with safety training at orientation develops fundamental safety knowledge and improves the likelihood of management buy-in to safety.

Safety Modeling

Safety modeling is simply a demonstration and reinforcement of best practices and safe behaviors. This approach is especially important in the restaurant industry, which employs 25 percent or more of the adolescent workforce (Personick 23; Hendricks and Layne 1146). Before 1945, it was unusual for children to work while attending school; by the 1980s, about one-third of all students held jobs during the academic year. The workplace has become an important factor in adolescent development (NIOSH 1). According to CDC, 39 percent of children under age 18 who sustained a DAFW injury in 1993 were employed in restaurants. The study also noted that adolescent workers employed as food preparation and service workers (i.e., servers, cooks, food counter workers) were the most commonly injured occupational group—accounting for 37 percent of all adolescent DAFW injuries at work [CDC(b) 465].

Individuals entering the workforce for the first time, or those with limited work experience, benefit from having a role model for safety. Guarding against common workplace hazards is new for these individuals. Management can play an important role by introducing them to best practices and instilling good safety behaviors. Safe behaviors and work habits developed early in a person's work experience could carry over to future jobs. Additionally, the nonverbal aspects of safety modeling provide an important form of communication for situations in which language barriers exist or where workers may have hearing or other impairments.

The SH&E professional can verify the use of safety modeling through observation of safe behaviors and practices during peak periods of operation. For example, the manager picks food or trash off the floor, directs employees to cleanup spills or leads a safety discussion, and is fully aware of his/her surroundings and enforces safety policies. Follow-up meetings between the SH&E professional and the restaurant manager when service slows are important, as they offer immediate feedback before staff or conditions change.

Integrated Safety Training

Training employees is time-consuming and represents a considerable investment. Approaching safety training separately from operational training may, at times, result in incomplete or nonexistent safety training. Such an approach may also suggest to

workers that safety is secondary rather than an integral part of job performance.

Integrating safety training into operational training provides a two-fold solution: 1) it ensures that the worker has safety training specific to his/her job duties; and 2) it underscores management's commitment to safety. For example, when a line cook is shown how to operate a fry station, training should include instruction and a demonstration of working safely with and around hot grease. In multilingual situations, appropriate provisions should be made for translation.

The challenge for the SH&E professional in a restaurant environment is keeping safety at the forefront. Introducing the safety program during new restaurant openings offers a way to integrate safety with the operational start-up of a restaurant. Safety committee member involvement with new-hire orientation, highlighting safety in pre-meal meetings and publicly recognizing safety achievements are ways to better integrate operations and safety.

Accountability

As in other settings, individual accountability for safety performance is a key aspect of any effective safety process. Performance review metrics and disciplinary systems that incorporate safety provide effective applications of this principle for both employees and managers. By integrating safety into the training process, safety is more clearly recognized as a part of every employee's job responsibilities. As performance metrics are developed for a particular job, important safety-related objectives (e.g., observing safety rules, proper PPE use and care, housekeeping expectations) can be included.

For managers, a chargeback system connects insurance costs (base charge and performance charge) to the restaurant's financial performance. For example, WC charges or a performance charge (i.e., indemnity and medical) incurred in a given month can be included as a debit to the restaurant balance sheet for that same month. Thus, the financial aspects of safety directly impact the restaurant manager, whose bonus plan may well be tied to restaurant profitability. In addition, a line item performance metric of WC on the P&L statement provides a tool for holding a manager accountable for a given restaurant's safety performance.

Worker Involvement

Finally, as with any safety program, worker involvement through a representative safety committee provides an important link between employees and management. Research has shown that employee participation and appropriate hazard investigation and correction are associated with lower lost-time rates and/or lower WC costs (Hunt and Habeck 1; Shannon, et al 258). For a restaurant, "representative" means at least one management representative and employees from various departments such as service (e.g., wait staff, bartender), kitchen (e.g., line cook, prep cook) and utility (e.g., dishwasher, sanitation). Periodic rotation of membership

maximizes employee participation. Arguably, the two most vital roles this committee performs are incident review and hazard assessment. Review of incident investigation reports is vital to ensure that corrective action was taken. In addition, review of incident statistics helps to identify areas or operations with high incident frequency.

Hazard assessment involves a walkthrough of the restaurant. To get the most out of this assessment, one might ask: How should the walkthrough be conducted (i.e., is a systematic approach in place)? What is the committee looking for and are the members adequately trained? Are systems in place for review, recommendation and follow-up? Conducting assessments by area (e.g., outside the building, restrooms, dining areas, kitchen and prep areas) is a natural and familiar model for managers and employees. Within each area, particular hazard types should be examined (e.g., slips and falls, manual materials handling, burns, cuts). Beyond physical hazards, the committee should look for behavioral and procedural hazards, as well as those identified through incident review. To get a true picture of both the physical and behavioral conditions in the restaurant, hazard assessment should be performed during active service periods.

Ideally, committee members should evaluate those areas where they do not typically work. This can produce a more-objective assessment and reduce the chance that an employee has become accustomed to a hazard while frequently working around it. Standard restaurant checklists are available through safety resource companies and insurance carriers. A basic restaurant checklist is a good starting point; however, modifications may be needed in order to address site-specific loss sources.

Considerations for Research

The safety research base on the industry is somewhat limited. Among the important issues that could improve the profession's response to restaurant hazards are:

- more detailed knowledge of particular types of injuries and the specific events that contribute to them;
- differences between physical measures of floor surfaces and employee perceptions of slipperiness;
- the role of intermittent factors (distractions, fatigue, PPE nonuse) in cuts, burns and other traumatic injuries;
- types and biomechanical characteristics of loads workers typically handle;
- interactions between materials handling and slips and falls.

Conclusion

Restaurants are and will likely continue to be one of the nation's largest employers. While the industry has a below-average incidence rate, substantial numbers of restaurant workers are injured each year. The typical disabling injury hazards can be addressed using various practical approaches. To be effective, however, such approaches must be integrated with

an appropriate safety process that considers the unique challenges of the restaurant environment. The approaches suggested here are based on professional safety experience with effective injury prevention strategies in restaurants. Enhancing the safety research base on the industry could improve the effectiveness of the SH&E profession's response to the hazards typically encountered. ■

References

Centers for Disease Control and Prevention (CDC)(a). "Occupational Burns Among Restaurant Workers: Colorado and Minnesota." *Morbidity and Mortality Weekly Report (MMWR)*. 42(1993): 713-716.

CDC(b). "Work-Related Injuries and Illnesses Associated with Child Labor—United States, 1993." *MMWR*. 45(1996): 464-468.

Courtney, T.K. and B.S. Webster. "Getting Answers: What Can BLS Data Reveal About Disabling Injuries?" *Professional Safety*. Sept. 2002: 24-30.

Hendricks, K.J. and L.A. Layne. "Adolescent Occupational Injuries in Fast Food Restaurants: An Examination of the Problem from a National Perspective." *Journal of Occupational Environmental Medicine*. 41(1999): 1146-1153.

Hunt, H.A. and R.V. Habeck. "The Michigan Disability Prevention Study: Research Highlights." Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 1993.

McLellan, R.K., et al. "Disability Management Training for Supervisors: A Pilot Intervention Program." *Journal of Occupational Rehabilitation*. 11(2001): 33-41.

NIOSH. "Background." Chapter 2. *Child Labor Research Needs: Recommendations from the NIOSH Child Labor Working Team*. Washington, DC: U.S. Dept. of Health and Human Services, NIOSH, 1997.

National Restaurant Assn.(a). "2002 Restaurant Industry Forecast." Sept. 6, 2002. <http://www.restaurant.org/research/forecast_overview.cfm>.

National Restaurant Assn.(b). "Frequently Asked Questions." Sept. 1, 2002. <<http://www.restaurant.org/faq.cfm>>.

Personick, M.E. "Profiles in Safety and Health: Eating and Drinking Places." *Monthly Labor Review*. 114(1991): 19-26.

Shannon, H.S., et al. "Workplace Organizational Correlates of Lost-Time Accident Rates in Manufacturing." *American Journal of Industrial Medicine*. 29(1996): 258-268.

Szabo, R.L., et al. "The Influence of Knife Dullness on Poultry Processing Operator Exertions and the Effectiveness of Periodic Knife Steeling." *AIHA Journal*. 62(2001): 428-433.

U.S. Dept. of Labor (U.S. DOL), BLS(a). "Workplace Injuries and Illnesses in 1999." Bulletin USDL 00-357. Washington, DC: U.S. DOL, BLS, 2000.

U.S. DOL, BLS(b). "Table R1: Number of Nonfatal Occupational Injuries and Illnesses Involving Days Away from Work by Industry and Selected Natures of Injury or Illness, 1999." *Lost-Worktime Injuries: Characteristics and Resulting Time Away from Work*. 1999 USDL 01-71. Washington, DC: U.S. DOL, BLS, 2001. Aug. 5, 2002. <<http://www.bls.gov/iif/oshwc/osh/case/ostb0913.pdf>>.

U.S. DOL, BLS(c). "Table R4: Number of Nonfatal Occupational Injuries and Illnesses Involving Days Away from Work by Industry and Selected Events or Exposures Leading to Injury or Illness, 1999." *Lost-Worktime Injuries: Characteristics and Resulting Time Away from Work*. 1999 USDL 01-71. Washington, DC: U.S. DOL, BLS 2001. Aug. 5, 2002. <<http://www.bls.gov/iif/oshwc/osh/case/ostb0916.pdf>>.

The authors thank Drs. Wen Chang, Gordon Smith, Gary Sorock and Glenn Pransky for their helpful comments on earlier drafts of this article, and the BLS Office of Compensation and Working Conditions for its assistance with data acquisition.

The challenge for the SH&E professional in a restaurant environment is keeping safety at the forefront.

Your Feedback

Did you find this article interesting and useful? Circle the corresponding number on the reader service card.

RSC#	Feedback
30	Yes
31	Somewhat
32	No