

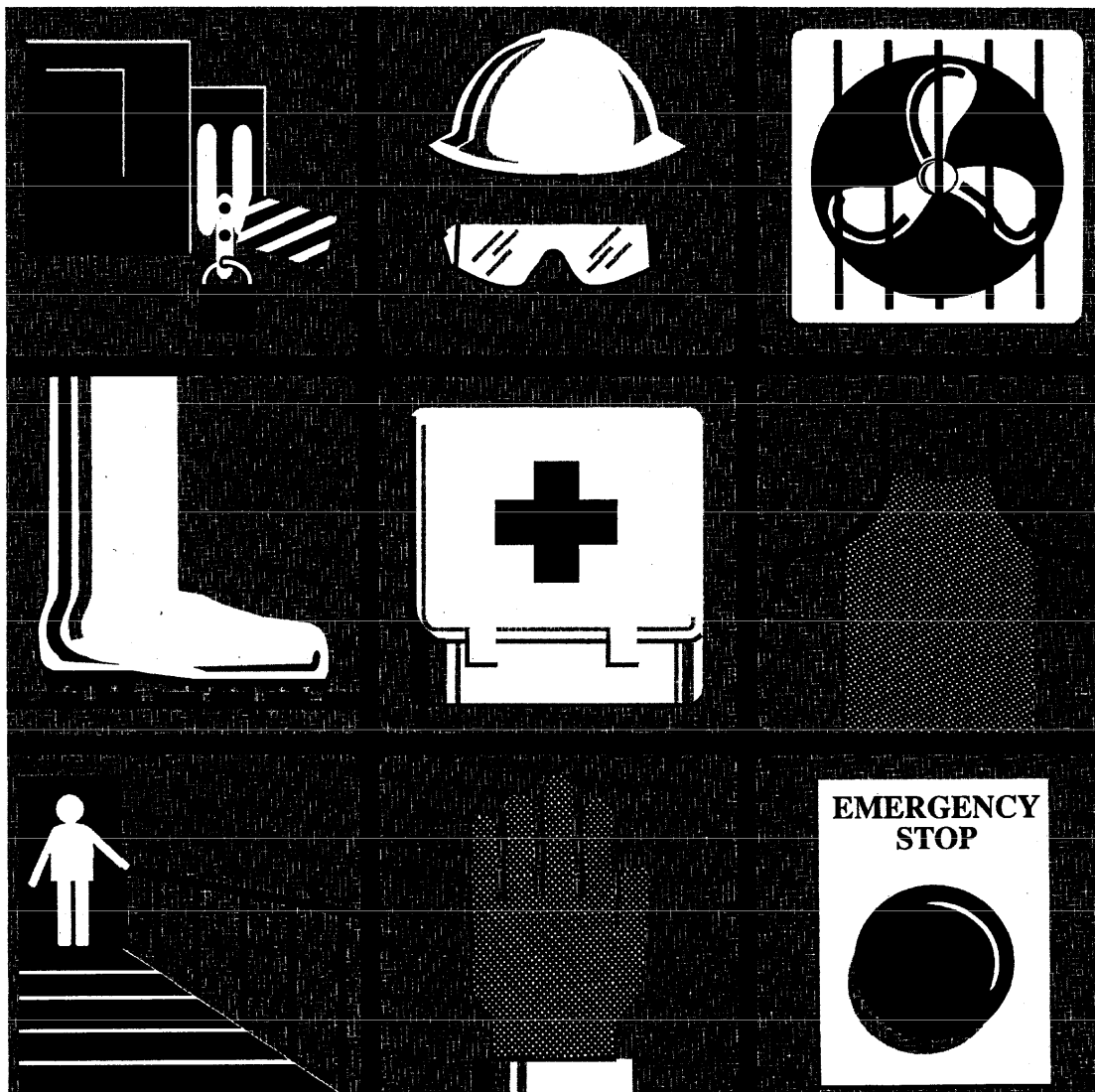
# Safety and Health Guide for the Meatpacking Industry

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U.S. Department of Labor  
Occupational Safety and Health Administration  
1988

OSHA 3108



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# Safety and Health Guide for the Meatpacking Industry

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U.S. Department of Labor  
Ann McLaughlin, Secretary

Occupational Safety and Health Administration  
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1988

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## Introduction

The meatpacking industry (Standard Industrial Classification 2011), which employs over 100,000 workers, is considered to be one of the most hazardous industries in the United States. According to the Bureau of Labor Statistics (BLS),<sup>1</sup> this industry has had the highest injury rate of any industry in the country for five consecutive years (1980-1985), with a rate three times that of other manufacturing industries.

BLS studies have also shown that for 1985, 319 workers were injured during the first month of employment in the industry. Of those workers, 29 percent were cut by knives or machinery and 30 percent received sprains and strains. In addition, more than 30 percent of all injuries occurred to workers 25 years of age or younger. Younger new workers are at the highest occupational risk and suffer a significant proportion of all injuries.

Workers can be seriously injured by moving animals prior to stunning, and by stunning guns that may prematurely or inadvertently discharge while they try to still the animal. During the hoisting operation, it is possible for a 2,000-pound carcass to fall on workers and injure them if faulty chains break or slip off the carcass' hind leg. Workers can suffer from crippling arm, hand, and wrist injuries. For example, carpal tunnel syndrome, caused by repetitive motion, can literally wear out the nerves running through one section of the wrist. Workers can be cut by their own knives and by other workers' knives during the butchering process. Back injuries can result from loading and unloading meat from trucks and from moving meat, meat racks, or meat trees along overhead rails. Workers can be severely burned by cleaning solvents and burned by heat sealant machines when they wrap meat. It is not uncommon for workers to sever fingers or hands on machines that are improperly locked-out or inadequately guarded. For example, in 1985, BLS studies also reported 1,748 cases of injuries to the fingers, including 76 amputations. Many workers can also injure themselves by falling on treacherously slippery floors and can be exposed to extremes of heat and cold.

This publication is designed to increase employer and employee awareness of these and other workplace hazards and to highlight the ways in which employers and employees can work together to eliminate them. Employers are encouraged to review and strengthen overall safety and health precautions to guard against workplace accidents, injuries, and illnesses.

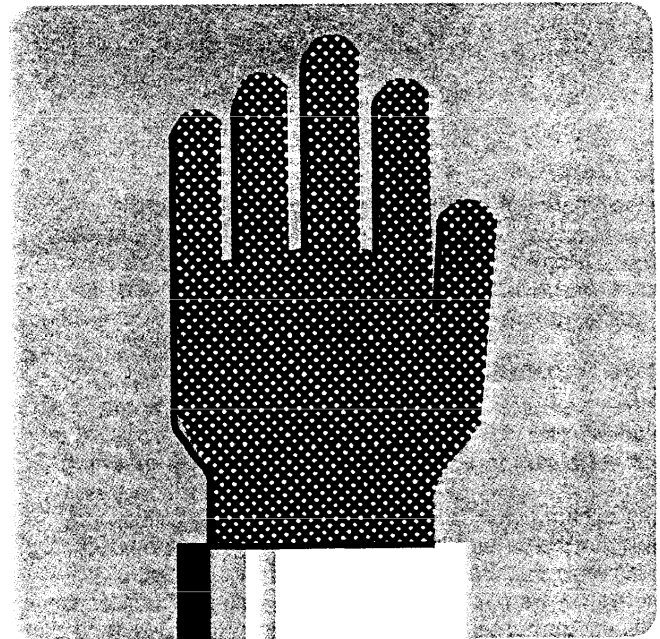
## Potential Hazards

Machinery such as head splitters, bone splitters, snout pullers and jaw pullers, as well as band saws and cleavers, pose potential hazards to workers during the various stages of processing animal carcasses. A wide variety of other occupational safety and health hazards exists in the industry (see Appendix). These hazards are identified and discussed in the following paragraphs.

### Knife Cuts

Knives are the major causes of cuts and abrasions to the hands and the torso. Although modern technology has eliminated a number of handknife operations, the handknife remains the most commonly used tool and causes the most frequent and severe accidents. For example, one worker used a knife to pick up a ham prior to boning; the knife slipped out of the ham striking him in the eye and blinding him. Another worker was permanently disfigured when his knife slipped out of a piece of meat and struck his nose, upper lip, and chin.<sup>2</sup>

Workers have also been cut by other workers as they remove their knives from a slab of meat. These "neighbor cuts" are usually the direct result of overcrowded working conditions.

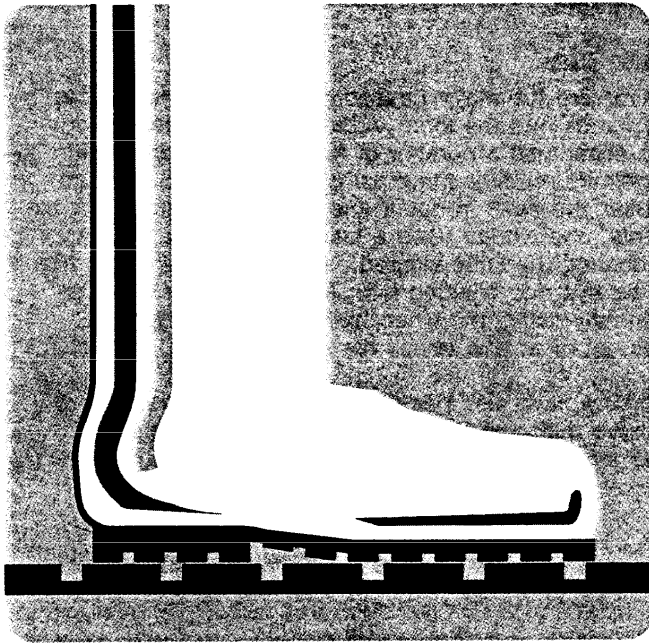


<sup>1</sup>U.S. Department of Labor, Bureau of Labor Statistics, "Supplementary Data System" (Washington, D.C., 1985), unpublished data.

<sup>2</sup>National Safety Council, *Meat Industry Safety Guidelines* (Chicago, 1978), p. 33.

## Falls

Falls also represent one of the greatest sources of serious injuries. Because of the nature of the work, floor surfaces throughout the plants tend to be wet and slippery. Animal fat, when allowed to accumulate on floors to dangerous levels, and blood, leaking pipes, and poor drainage are the major contributors to treacherously slippery floors.



## Back Injuries

These injuries tend to be more common among workers in the shipping department. These employees, called "luggers," are required to lug or carry on their shoulders carcasses (weighing up to 300 pounds) to trucks or railcars for shipment.

## Toxic Substances

Workers are often exposed to ammonia. Ammonia is a colorless gas with a characteristic pungent odor and is used as a refrigerant, and occasionally, as a cleaning compound. Leaks can occur in the refrigeration pipes carrying ammonia to coolers. Contact with anhydrous liquid ammonia or with aqueous solution is intensely irritating to the mucous membranes, eyes, and skin. There may be corrosive burns to the skin or blister formation. Ammonia gas is also irritating to the eyes and to moist skin. Mild to moderate exposure to the gas can produce headaches, salivation, burning of the throat, perspiration, nausea, and vomiting. Irritation

from ammonia gas to the eyes and nose may be sufficiently intense to compel workers to leave the area. If escape is not possible, there may be severe irritation of the respiratory tract with the production of cough, pulmonary edema, or respiratory arrest. Bronchitis or pneumonia may follow a severe exposure.

On some occasions, employees have been exposed to unsafe levels of carbon dioxide from the dry ice used in the packaging process. When meat is ready to be frozen for packaging, it is put into vats where dry ice is stored. During this process, carbon dioxide gas may escape from these vats and spread throughout the room. Breathing high levels of this gas causes headaches, dizziness, nausea, vomiting, and even death.

Workers are also exposed to carbon monoxide. Carbon monoxide is a colorless, odorless gas that is undetectable by the unaided senses and is often mixed with other gases. Workers are exposed to this gas when smokehouses are improperly ventilated. Overexposed workers may experience headaches, dizziness, drowsiness, nausea, vomiting, and death. Carbon monoxide also aggravates other conditions, particularly heart disease and respiratory problems.

Workers are also exposed to the thermal degradation products of polyvinyl chloride (PVC) food-wrap film. PVC film used for wrapping meat is cut on a hot wire, wrapped around the package of meat, and sealed by the use of a heated pad. When the PVC film is heated, thermal degradation products irritate workers' eyes, nose, and throat or cause more serious problems such as wheezing, chest pains, coughing, difficulty in breathing, nausea, muscle pains, chills, and fever.

## Cumulative Trauma Disorders

Cumulative trauma disorders are widespread among workers in the meatpacking industry. Cumulative trauma disorders such as tendonitis (inflammation of a tendon), tenosynovitis (inflammation of a tendon sheath), and carpal tunnel syndrome are very serious diseases that often afflict workers whose jobs require repetitive hand movement and exertion.

Carpal tunnel syndrome is the disorder most commonly reported for this industry and is caused by repeated bending of the wrist combined with gripping, squeezing, and twisting motions. A swelling in the wrist joint causes pressure on a nerve in the wrist. Early symptoms of the disease are tingling sensations in the thumbs and in the index and middle fingers. Experience has shown that if workers ignore these symptoms, sometimes misdiagnosed as arthritis, they could experience permanent weakness and numbness in the hand coupled with severe pain in the hands, elbows, and shoulders.

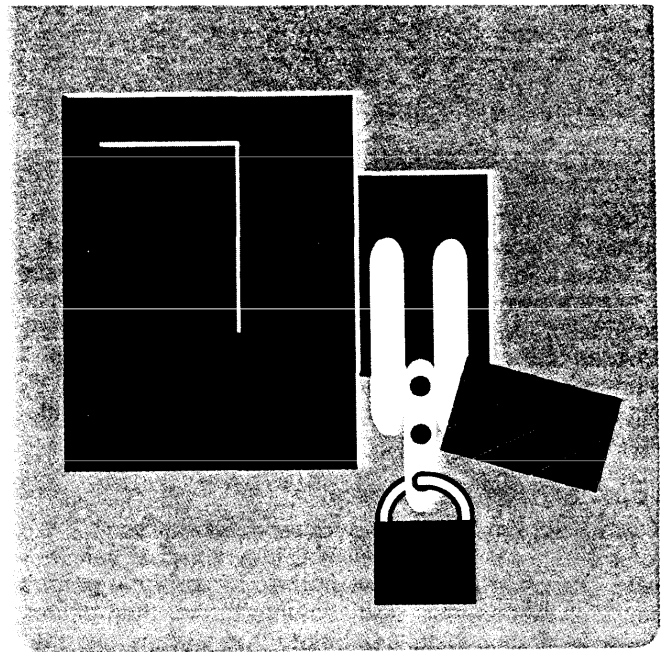
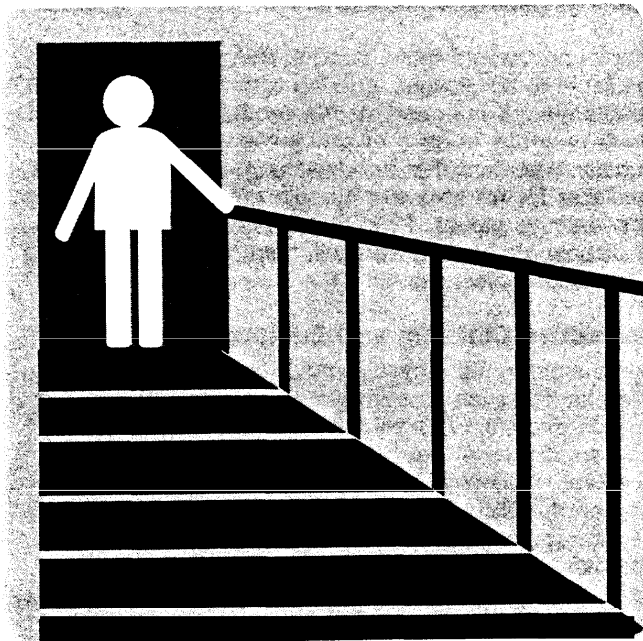
## Infectious Diseases

Workers are also susceptible to infectious diseases such as brucellosis, erysipeloid, leptospirosis, dermatophytoses and warts. Brucellosis is caused by a bacterium and is transmitted by the handling of cattle or swine. Persons who suffer from this bacterium experience constant or recurring fever, headaches, weakness, joint pain, night sweats, and loss of appetite.

Erysipeloia and leptospirosis are also caused by bacteria. Erysipeloid is transmitted by infection of skin puncture wounds, scratches and abrasions; it causes redness and irritation around the site of infection and can spread to the blood stream and lymph nodes. Leptospirosis is transmitted through direct contact with infected animals or through water, moist soil, or vegetation contaminated by the urine of infected animals. Muscular aches, eye infections, fever, vomiting, chills, and headaches occur, and kidney and liver damage may develop.

Dermatophytosis, or! the other hand, is a fungal disease and is transmitted by contact with the hair and skin of infected persons and animals. Dermatophytosis, also known as ringworm, causes the hair to fall out and small yellowish cuplike crusts to develop on the scalp.

"Verruca vulgaris," a wart caused by a virus, can be spread by infectious workers who have contaminated towels, meat, fish knives, work tables or other objects.



## Protective Measures

The unique safety and health hazards found in this industry can be minimized or eliminated with the proper use of control methods. A preferred way of controlling potential hazards is through the use of engineering controls. Engineering controls are methods that prevent harmful worker exposure through proper design of equipment and processes. Various controls are briefly described in the following paragraphs.

### Guardrails

The use of guardrails can protect workers from accidental falls. Open surface dip tanks, used for sterilizing shackling equipment, and elevated work platforms must have guardrails. Railings should also be checked to see that they are securely attached to walls.

### Floors

Employers should install a non-skid flooring material or rubberized cushioned floor mats at all work stations for workers to stand on, especially in areas where hand knives and power tools are used.

### Wiring

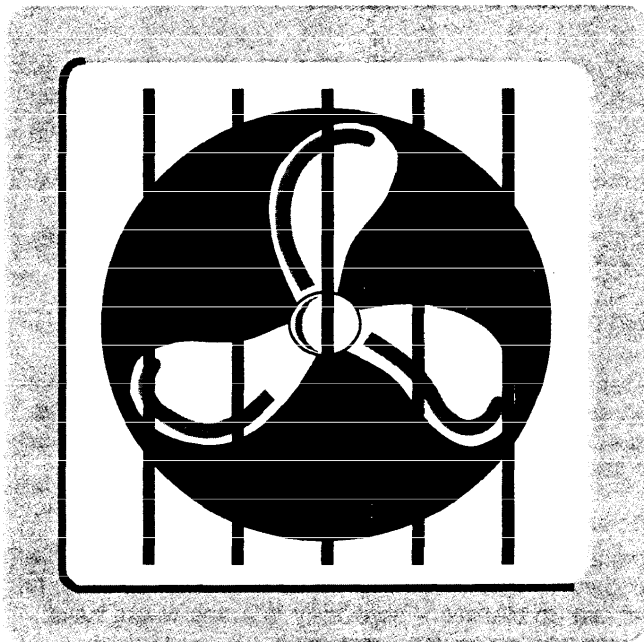
All electrical wiring should be checked periodically for cracking, fraying, or other defects, and all electrical equipment should be grounded.

## Equipment and Machine Guarding

Equipment used to hold and move meat and items such as shackles, conveyors, and hooks should be checked frequently and repaired. Equipment that poses a hazardous energy source should, when not in use, be subject to lock-out and tag-out procedures. This assures that workers inspecting or maintaining equipment are not injured by inadvertent start-up of the equipment. All equipment that poses a hazard should be guarded.

## Local Exhaust Ventilation

A preferred control method for removing air contaminants from the workplace is local exhaust ventilation. This control is located at the source of the generation of contaminants, and captures, rather than dilutes, the hazardous substances before they escape into the workplace environment.



## General Ventilation

General, or dilution, ventilation systems are also recommended because they add or remove air from the workplace to keep the concentration of air contaminants below hazardous levels. General ventilation consists of air flow through open windows or doors, fans, and roof ventilators. General ventilation control only dilutes air contaminants, unlike local exhaust ventilation which removes air contaminants. When using general ventilation systems, care should be taken not to recirculate the air contaminants throughout the workplace.

## Administrative Controls

An employer also might decide to use administrative controls to minimize the risk of carpal tunnel syndrome, back and shoulder injuries, and exposure to toxic substances. One type of administrative control would be to reduce employee work periods in which excessive repetitive wrist bending is necessary or when the worker is exposed to hazardous substances.

## Work Practices

Safe work practices are essential in helping to maintain a safe and healthful work environment. Workers must therefore be encouraged and be given sufficient time and equipment to keep surfaces clean and orderly.

To do this, spills must be cleaned up immediately. Water, blood, or grease on floors will cause falls. Also, wet working conditions pose a serious threat of electrocution. Periods during the day should also be set aside for general housekeeping, and constant surveillance should be kept to spot slippery areas. Non-skid floor mats can also be used successfully in potentially dangerous areas. Knives left carelessly in sinks or on counters can cause serious accidents. Knives should be kept sharpened at all times. Dull knives can cause serious safety hazards and worker fatigue. Equipment such as the band saw and the bacon press must be cleaned with the power off and locked-out, and tagged-out. Workers should use only tools and equipment with which they are familiar. Moreover, employers should check refrigeration systems regularly for leaks and should make sure that hazardous substances, such as ammonia, are identified by appropriate hazard warnings (labels, signs, etc.).

Employers should make handwashing facilities readily available to employees working with or near toxic substances. It is important that workers be able to wash promptly in case of accidental splashes. It is equally important that handwashing facilities be made available for workers who handle meat without the use of protective gloves. Prompt handwashing and the use of disposable hand towels will help prevent the spread of infectious diseases.

## Protective Clothing and Equipment

Since slippery floors are a major cause of falls, protective clothing such as safety shoes or boots with ice guards and slip-resistant soles must be worn by workers. To help reduce the spread of infectious diseases, protective gloves should be worn when workers handle meat. Workers who use cleaning compounds must also wear protective gloves to prevent chemical burns. In addition, workers who use knives must be provided with metal mesh gloves and aprons, and wrist and forearm guards to protect them from knife cuts.

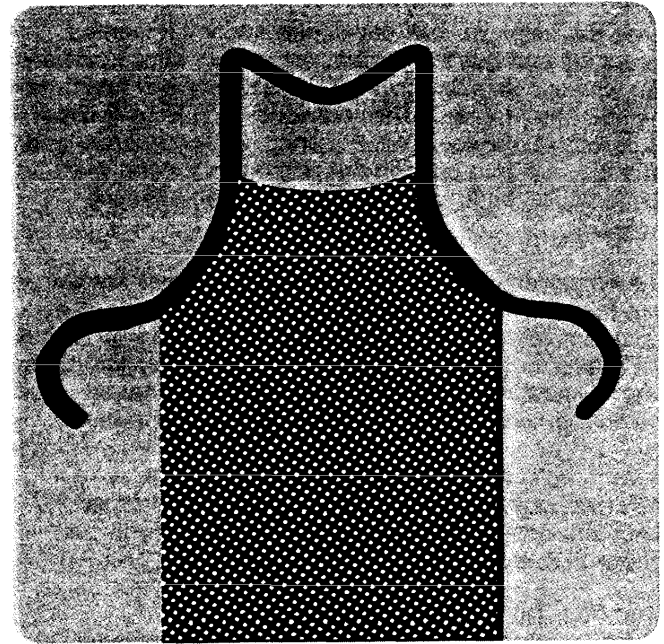
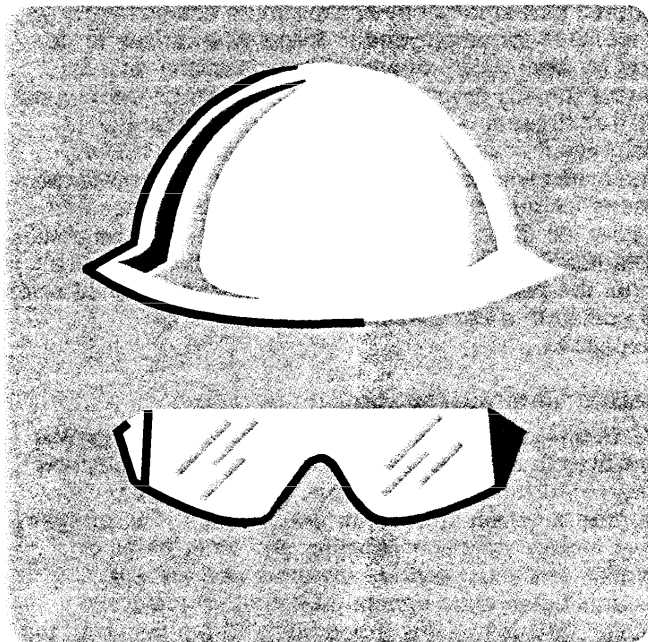


Workers performing hoisting and shackling operations should be protected with safety helmets that meet the specifications of American National Standard Requirements for Protective Head Wear for Industrial Workers Z89.1-1969, as well as a barricade or shield assembly. These safeguards can prevent injury from falling or moving animals and/or materials. In addition, removing the worker from the immediate area during hoisting operations is recommended.

The employer must furnish employees with proper personal protective equipment required for his or her specific work operation and exposure. For example, in the event of exposure to toxic chemicals, a worker must be provided with a suitable respirator to prevent inhalation of harmful substances.

In addition, adjustable work stands should be made available to accommodate for worker height to minimize the possibility of back strain.

Machines and equipment found in meatpacking plants produce a high level of noise; in such circumstances, workers must be provided with ear plugs. The employer may be required to provide workers with face shields or goggles when workers mix or handle cleaners. The use of this equipment will prevent chemical burns to the face and eyes. Goggles may also be required during the boning, trimming, and cutting operations to prevent foreign objects from entering the workers' eyes.



## Related Issues

### Training and Education

BLS studies show that many workers are injured because they often do not receive the safety training they need, even on jobs involving dangerous equipment where training is clearly essential. These studies also show that younger, and especially new, employees are most at risk because they are not taught the necessary safety measures before they begin work.\* More experienced workers, on the other hand, are injured because the task becomes routine, and they are not as cautious as they might be otherwise.

It is essential, therefore, that employers develop, implement, and maintain at the workplace a written comprehensive training program for all employees. A comprehensive, well-organized training program helps the employer to educate workers in safe work practices and techniques, and helps demonstrate the employer's concern for, and commitment to, safe work practices.

The training program should inform workers about safety and health hazards and their prevention, the proper use and maintenance of equipment, any appropriate work practices, a medical surveillance program, and emergency situations.

\*Note: The Secretary of Labor's Hazardous Occupations Order Number 10 sets a minimum age of 18 years for employment in many meat processing occupations. See 29 CFR, Part 570.61, December 29, 1971.

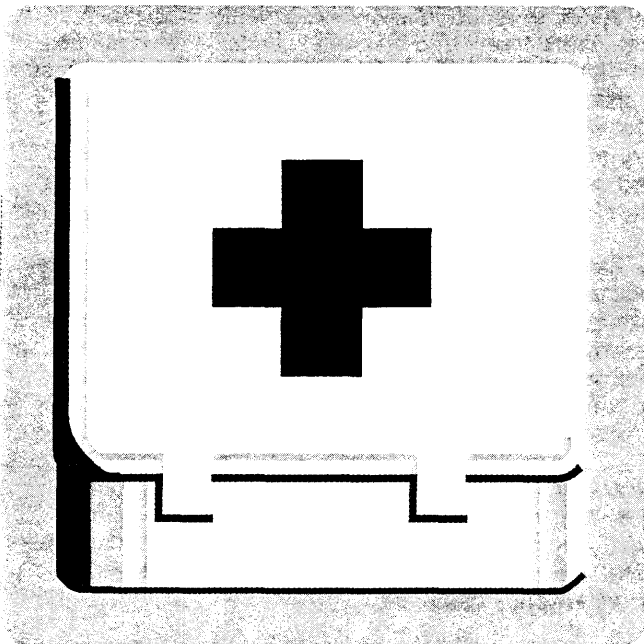
Once the employer has developed and implemented the safety and health program, he should choose a person who is committed to workplace safety and health to manage the program. This individual should have time to devote to developing and managing the program and must be willing to take on the responsibility and the accountability that goes with operating an effective program.

The employer should also make all employees familiar with their surroundings and work environment. Furthermore, employers should train workers annually in their work tasks or in new job assignments that expose them to new hazards. New employees should be trained at the time of initial assignment, and annually thereafter.

More training is needed when new equipment, materials, or processes are introduced, when procedures are updated or revised, or when employee performance is inadequate.

### **First-Aid Training**

At least one person on each shift should be trained and certified in first aid. First-aid training should include, as a minimum, completion of an approved first-aid training course. Moreover, proper first-aid supplies must be readily available for emergency use. Pre-arranged ambulance services should also be available for any emergency.



### **Emergency Response**

Proper planning for emergencies is necessary to minimize employee injury. It is important, therefore, that employers in the meat industry develop and implement a written emergency action plan. The plan should include elements such as (1) emergency escape procedures and emergency escape route assignments, (2) procedures for employees to follow who remain to perform (or shut down) critical plant operations prior to evacuation, (3) procedures to account for all employees after emergency evacuation has been completed, (4) assignment of rescue and medical duties to those employees who are to perform them and the preferred means for reporting emergencies, and (5) names and regular job titles of persons or departments to be contacted for further information or explanation of duties under the plan. Emergency phone numbers should also be posted in a conspicuous place near or on telephones.

### **Hazard Communication**

OSHA's Hazard Communication Standard requires the employer to establish a written hazard communication program to transmit information on the chemical hazards to which employees are exposed. The program must include container labeling and other forms of warning and must provide exposed workers with material safety data sheets (MSDS's). The MSDS details the substance's properties and the nature of the hazard. The standard further requires chemical hazard training for exposed workers.

In addition, workers who handle only sealed containers of chemicals are required to keep labels affixed to incoming containers, are to be provided access to MSDS's while the material is in the workplace, and are to be trained on how to protect themselves against potential hazards.

### **Access to Exposure and Medical Records**

In 1988, OSHA issued a standard that requires employers to provide employees with information to assist in the management of their own safety and health. The standard, "Access to Employee Exposure and Medical Records" (29 CFR 1910.20), permits direct access by employees or their designated representatives and by OSHA to employer-maintained exposure and medical records. This access is designed to yield both direct and indirect improvements in the detection, treatment, and prevention of occupational disease. Access to these records should also result in a decreased incidence of occupational exposure and should aid in designing and implementing new control measures.

### **Recordkeeping**

The Occupational Safety and Health Administration requires employers with 11 or more employees to prepare and maintain pertinent injury and illness records of accidents affecting their employees. Moreover, all employers are required to report to the nearest OSHA office, within 48 hours, all accidents resulting in a work-related death or in five or more hospitalizations. The report may be either oral or written.

The employer is also required to maintain occupational injury and illness records at each workplace. Records must be retained for five calendar years following the end of the year to which they relate and may be inspected and copied at any reasonable time by authorized Federal or State government representatives.

These records are important to the employer in analyzing the effectiveness of safety and health programs. They are also important to OSHA inspectors in deciding whether to conduct a complete workplace inspection and, if so, where to concentrate their attention.

### **Employer and Employee Responsibilities**

An employer's commitment to a safe and healthful environment is essential in the reduction of workplace injury and illness. This commitment can be demonstrated through personal concern for employee safety and health, by the priority placed on safety and health issues, and by setting good examples for workplace safety and health. Employers should also take any necessary corrective action after an inspection or accident. They should assure that appropriate channels of communication exist between workers and supervisors to allow information and feedback on safety and health concerns and performance. In addition, regular self-inspections of the workplace will further help prevent hazards by assuring that established safe work practices are being followed and that unsafe conditions or procedures are identified and corrected properly. These inspections are in addition to the everyday safety and health checks that are part of the routine duties of supervisors.

Since workers are also accountable for their safety and health, it is extremely important that they too have a strong commitment to workplace safety and health. Workers should immediately inform their supervisor or their employer of any hazards that exist in the workplace and of the conditions, equipment and procedures that would be potentially hazardous. Workers should also understand what the safety and health program is all about, why it is important to them, and how it affects their work.

Finally, employers who want help in recognizing and correcting safety and health hazards and in improving their safety and health programs can receive assistance from a free consultation service largely funded by the Occupational Safety and Health Administration. The service is delivered by State governments using well-trained professional staff. The service offers advice and help in correcting problems and in maintaining continued effective protection. In addition to helping employers identify and correct specific hazards, consultants provide guidance in establishing or improving an effective safety and health program and offer training and education for the company, the supervisors, and the employees. Such consultation is a cooperative approach to solving safety and health problems in the workplace. As a voluntary activity, it is neither automatic nor expected. It must be requested. For additional information, contact one of the consultation programs or the nearest OSHA Regional Office listed in this publication.

## Appendix Operational Hazards in the Meatpacking Industry

Operation Performed	Equipment/Substances	Accidents/Injuries
Stunning	Knocking gun	Severe shock, body punctures
Skinning/Removing front legs	Pincher device	Amputations, eye injuries, cuts, falls
Splitting animal	Spiitter saws	Eye injury, carpal tunnel syndrome, amputations, cuts, falls
Removing brain	Head splitter	Cuts, amputations, eye injury, falls
Transporting products	Screw conveyers, screw auger	Fractures, cuts, amputations, falls
Cutting/trimming/boning	Hand knives, saws—circular saw, band saw	Cuts, eye injuries, carpal tunnel syndrome, falls
Removing jaw bone/snout	Jaw bone, snout puller	Amputations, falls
Preparing Bacon for slicing	Bacon/belly press	Amputations, falls
Tenderizing	Electrical meat tenderizers	Severe shock, amputations, cuts, eye injuries
Cleaning equipment	Lock-out, tag-out	Amputations, cuts
Hoisting/shackling	Chain/dolly assembly	Falls, falling carcasses
Wrapping meat	Sealant machine/polyvinyl chloride, heat	Exposure to toxic substances; severe burns to hands/arms; falls
Lugging meat	Carcasses	Severe back/shoulder injuries, falls
Refrigeration/curing cleaning, wrapping	Ammonia, carbon dioxide, carbon monoxide, polyvinyl chloride	Upper respiratory irritation and damage

Source: Compiled by the U.S. Department of Labor, Occupational Safety and Health Administration, based on information from "The Unique Hazards of Packing," by Jeff Spahn, Area Director, U.S. Department of Labor, Occupational Safety and Health Administration, Wichita, Kansas, 1976 (Unpublished information).

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## OSHA Consultation Project Directory

State	Telephone
Alabama	(205) 348-3033
Alaska	(907) 264-2599
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Arkansas	(501) 682-4522
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West Virginia	(304) 348-7890
Wisconsin	(608) 266-8579 (H) (414) 521-5063 (S)
Wyoming	(307) 777-7786

## Related Publications

### BLS Publication OMB No. 1220-0029—Recordkeeping Guidelines for Occupational Injuries and Illnesses

<b>OSHA 2056</b>	<b>All About OSHA</b>
<b>OSHA 2224</b>	<b>Carbon Monoxide</b>
<b>OSHA 3084</b>	<b>Chemical Hazard Communication</b>
<b>OSHA 3047</b>	<b>Consultation Services for the Employer</b>
<b>OSHA 3057</b>	<b>Controlling Electrical Hazards</b>
<b>OSHA 3080</b>	<b>Hand and Power Tools</b>
<b>OSHA 3088</b>	<b>How to Prepare for Workplace Emergencies</b>
<b>OSHA 2236</b>	<b>Materials Handling and Storage</b>
<b>OSHA 3077</b>	<b>Personal Protective Equipment</b>
<b>OSHA 3079</b>	<b>Respiratory Protection</b>

**H = Health**  
**S = Safety**

**U.S. Department of Labor  
Occupational Safety and Health Administration  
Regional Offices**

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**Region I**  
**(CT,\* MA, ME, NH, RI, VT\*)**  
133 Portland Street  
1st Floor  
Boston, MA 02114  
Telephone: (617)565-7164

**Region II**  
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New York, NY 10014  
Telephone: (212) 337-2378

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**(AL, FL, GA, KY,\* MS, NC,  
SC,\* TN\*)**  
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\*These states and territories operate their own OSHA-approved job safety and health programs (the Connecticut and New York plans cover public employees only and OSHA currently is exercising concurrent private-sector Federal enforcement authority in California).



