ERGONOMIC SOLUTIONS FOR RETAILERS

Prevention of Material Handling Injuries in the Grocery Sector

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

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TRAINING REQUIREMENTS

As with any mechanical device before using, employees need to be trained and in some cases certified to use devices that are self-propelled. OSHA and NIOSH supplies safety information in working with pallets, pallet jacks, conveyors, as well as other mechanical devices. See the following:

https://www.osha.gov/SLTC/etools/woodworking/commonhaz_forklifts.html

https://www.osha.gov/SLTC/poweredindustrialtrucks/standards.html

https://www.osha.gov/dte/library/pit/ppt/index.html

http://www.cdc.gov/niosh/docs/2001-109/

The main hazard associated with using or working around mechanical assists and pallets are injuries identified as "contact-based" which are common in warehouses and back storage areas where space is often limited. Further information on the hazards in the retail and wholesale sector are discussed in Anderson et al. [2010].

SUGGESTED CITATION

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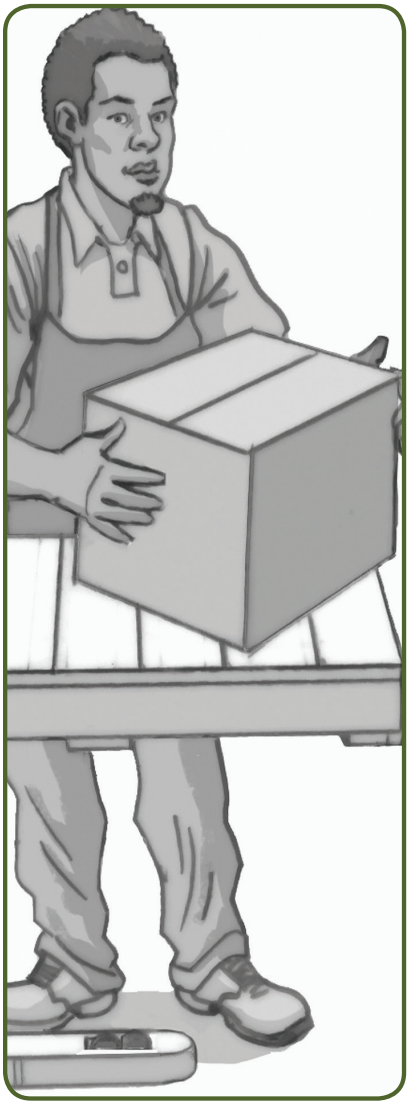

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- The Ergonomic Assist Systems and Equipment (EASE) Council and chair for the review of the ergonomic assist equipment and its usage.

Figure: *An employee loading a box on to an elevated pallet. This figure is a preview of an illustration shown in greater detail on Page 10, Figure 8.*

REDUCE INJURIES — USE ERGONOMIC SOLUTIONS

ERGONOMIC SOLUTIONS FOR GROCERY RETAILERS

Figure: *An employee operating a pneumatic lift and moving device. More details on Page 11, Figure 9.*

Purpose

This booklet was designed for retailers and safety experts to illustrate the use of mechanical assist devices for reducing manual materials handling (MMH) injuries in retail grocery work.

This booklet provides illustrations of employees in a retail grocery store using mechanical assist devices to perform material handling tasks. For each task, there are multiple devices that can be used.

The types and numbers of such devices that are used in a retail business depend on the nature of the business and the type of work employees perform. The technology presented will also support a retailer's growing internet sales that depends on moving large quantities of merchandise in a short time span and often with fewer employees.

Additional information on this topic can be found at the end of this document in two sections entitled: "Sources for Preventing Manual Material Handling Injuries" and "Sources for Information from Business/Labor Trade Associations".

The drawings are not intended to depict the mechanical details of each assist device, but rather are intended to provide an illustration that shows how and where an employee would use such a device.

REDUCE INJURIES — USE ERGONOMIC SOLUTIONS

MANUAL MATERIAL HANDLING JOBS IN THE RETAIL GROCERY INDUSTRY

The series of four illustrations below represent material handling job activities involved in the movement of materials from the delivery truck to the sales floor. The following pages will describe mechanical assist devices that can be used during each activity to reduce stressful postures and handling of heavy loads.

1

Unload truck and transport merchandise to the store using a conveyor

2

Transport and unload merchandise from the truck onto the sales floor

3

Transport and unload merchandise onto storage racks

4

Transport and unload merchandise from storage onto the sales floor

REDUCE INJURIES — USE ERGONOMIC SOLUTIONS

UNLOADING PALLETS FROM A TRAILER WITH A POWERED-PALLET MOVER

Figure 1 *shows an employee unloading a trailer stocked with pallets of merchandise using a powered-pallet mover with a riding platform.* Although, the device reduces the risk of material handling injuries, it does pose an added risk of a contact-with-object injury, such as bumping into the side of the trailer. Training is required to enable the operator with a loaded pallet to move safely across the loading dock's threshold into the facility's receiving area.

REDUCE BENDING AND REACHING MOTIONS

PLACE PRODUCTS ON CONVEYOR FOR TRANSPORT TO STORE

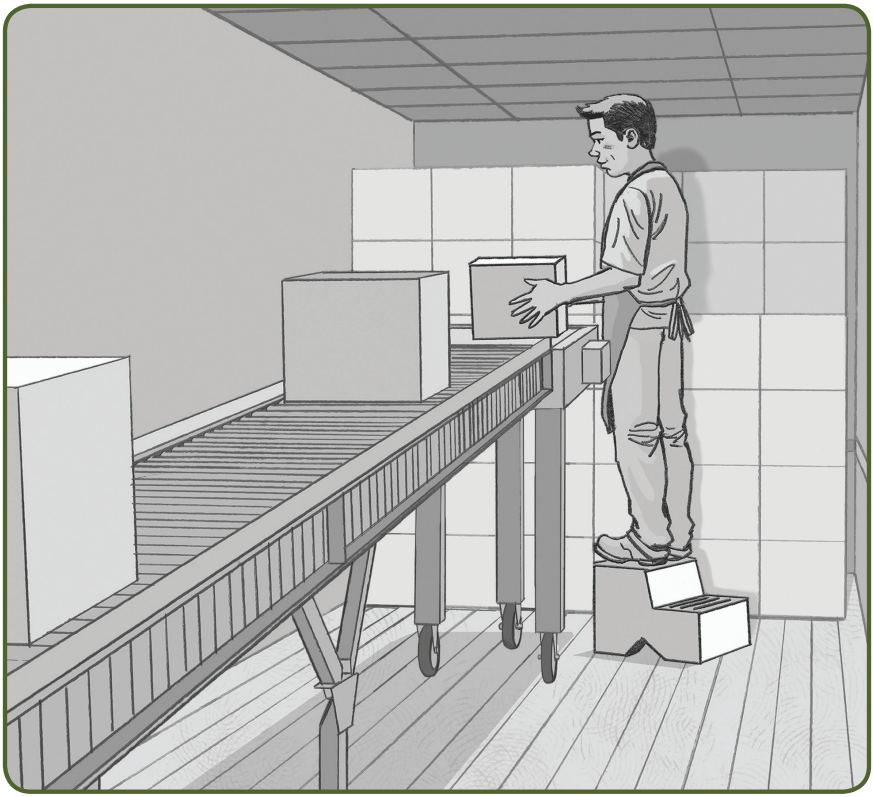

Figure 2 *shows an example of a height-adjustable conveyor.* With this type of conveyor, one person can do what two or more individuals normally do in unloading a trailer. Height adjustable conveyors can also reduce extreme bending and allow the boxes to be placed on the conveyors rather than dropped which could damage the container and/or contents. A sturdy step stool or platform is needed to reach the top levels of the interior of the trailer, which range from 7.5 feet (2.3 m) to 9.0 feet (2.7 m) high.

REDUCE BENDING AND REACHING MOTIONS

REMOVE BOXES FROM CONVEYOR TO HANDCART FOR SALES FLOOR

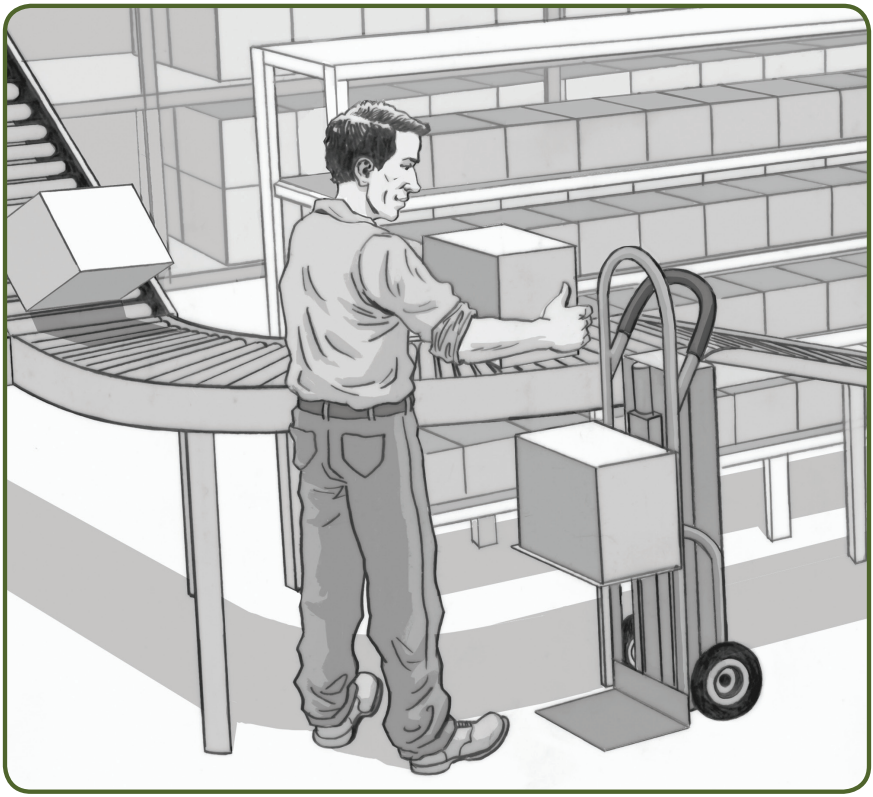

Figure 3 *shows an employee who is removing boxes from a conveyor to load on a two-wheeled, self-adjusting handcart.* Handcarts of this type are used frequently in moving beverages and containers of similar weights. In addition to saving time, adjustable handcarts reduce bending by keeping the load at or near waist level. Most adjustable handcarts operate with a spring or counterbalancing system.

REDUCE BENDING MOTIONS

REMOVE BOXES FROM CONVEYOR ONTO U-BOAT FOR SALES FLOOR

Figure 4 *shows an employee in two positions as she unloads boxes from a conveyor onto a U-Boat platform truck in which a spring-loaded platform has been added.* In the first position she is grasping the box. In the second position she turns her feet and body to face the platform truck. The U-Boat outfitted with spring loaded platform is designed to reduce bending by keeping the load at or near waist height either when loading or unloading containers. The narrow platform deck reduces excessive reaching.

REDUCE BENDING AND EXCESSIVE REACH

UNLOAD PALLET ONTO HANDCART FOR TRANSPORT TO SALES FLOOR

Figure 5 *shows an employee unloading boxes from a pallet onto a powered adjustable handcart.* The pallet is resting on a rotating and adjustable base that may be adjusted mechanically or pneumatically to set the height at waist level. The turntable minimizes reaching across or walking around the pallet.

REDUCE BENDING AND EXCESSIVE REACH

MOVING EXCESS MERCHANDISE FROM A FLAT CART TO STORAGE RACK

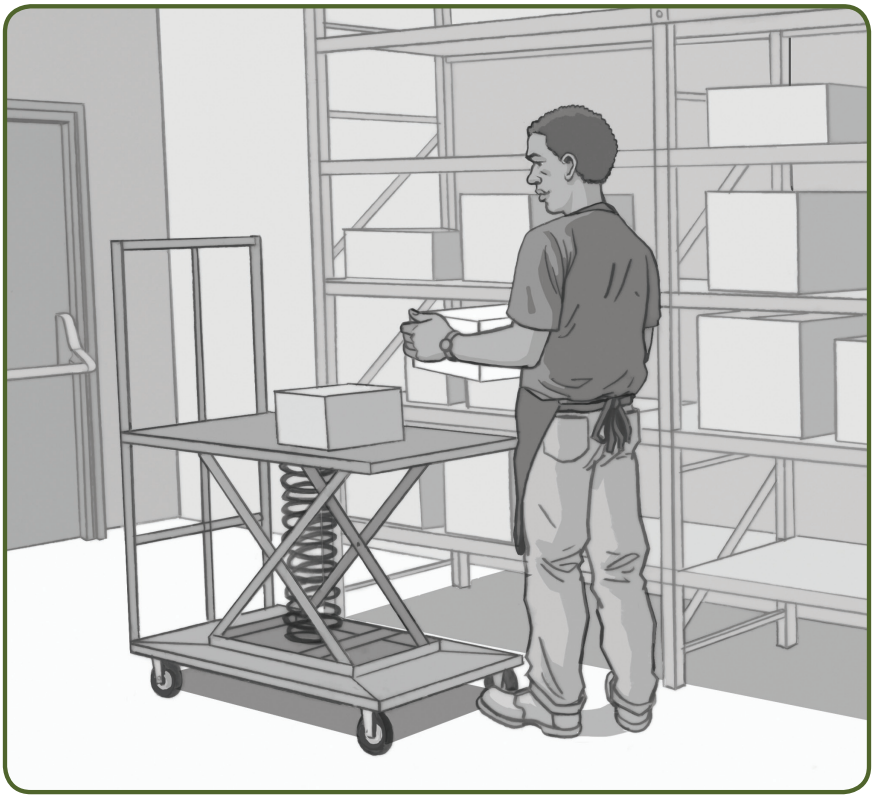

Figure 6 *shows an employee unloading onto the storage shelves from a flat cart, outfitted with a spring-loaded platform.* The intent of this device is to reduce excessive bending in loading and unloading materials located at or near the bottom of the flat cart. Best practices suggest stocking lighter weight goods on the lower level shelves. Knee pads are also an option if kneeling is required to stock lower shelves.

REDUCE BENDING AND LIFTING FORCES

USING A PALLET STACKER TO MOVE A LOADED PALLET TO STORAGE RACK

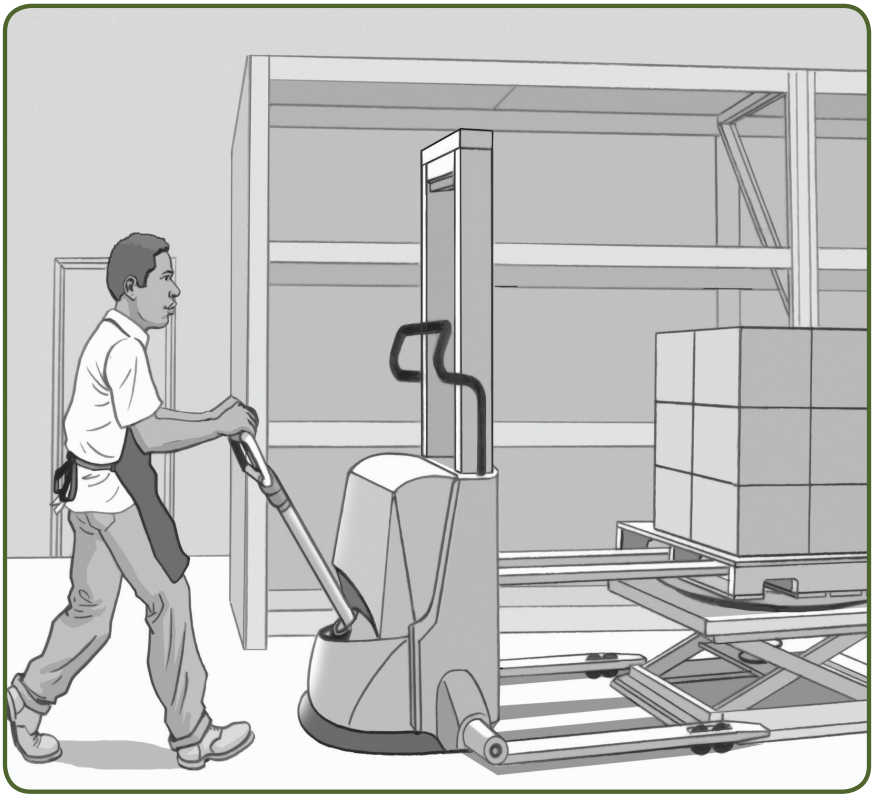

Figure 7 *shows an employee with a battery powered pallet stacker picking up a full pallet.* The full pallet is resting on a height-adjustable, pallet-loader table. The task here is either to move the full pallet to the sales floor or to move the pallet to a storage area away from a busy work area. The pallet stacker is designed to place a full pallet on a shelf for easy retrieval at a later time.

USING A PALLET STACKER TO MOVE EXCESS MERCHANDISE TO STORAGE RACK

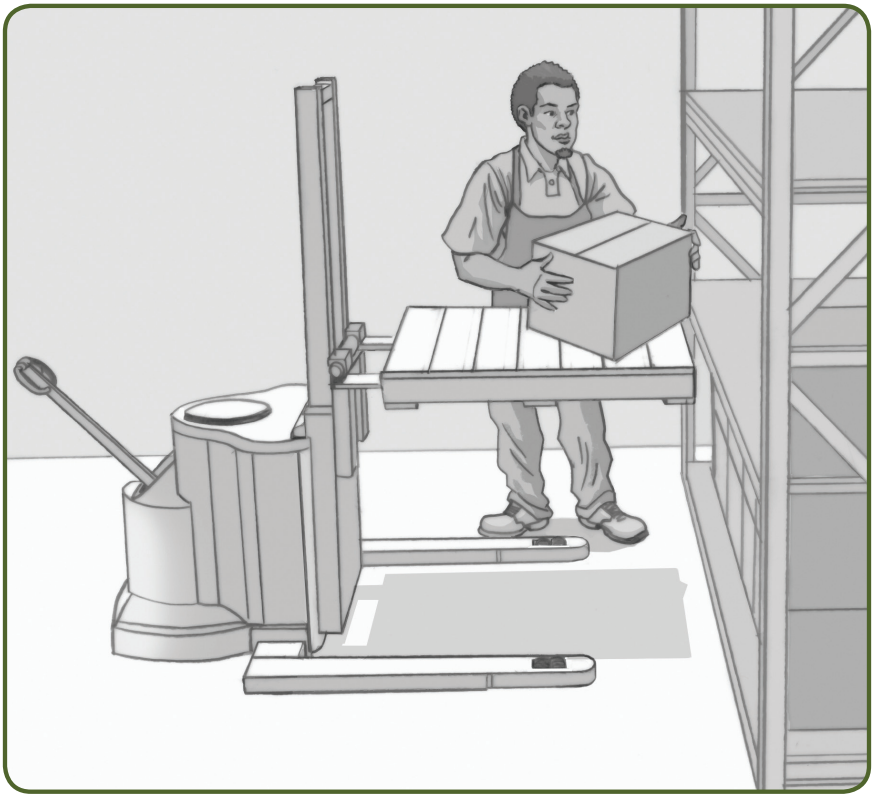

Figure 8 *also shows an employee using a pallet stacker to position the pallet next to, and even with, the shelf-edge allowing the box to be pushed onto the shelf without bending and lifting motions.* Best practices suggest stocking lighter weight goods on the lower level shelves. Knee pads are also an option if kneeling is required to stock lower shelves.

USING A VACUUM LIFT TO LOAD OR UNLOAD BAGS OF MATERIAL FROM A PALLET

Figure 9 *shows an employee operating an overhead vacuum or air hoist to move large bags of materials to flat carts or pallets (not shown).* A vacuum lift device can alleviate the repetitive stress of lifting and moving of unstable materials. A main advantage is the lifting task can be done in less time by nearly any employee regardless of size and strength, thus increasing productivity.

REDUCE LIFTING AND LOWERING FORCES

USING A PALLET JACK TO MOVE BOXES FROM BACK ROOM TO SALES FLOOR

Figure 10 *shows an employee pushing a manual pallet jack through the doors separating the stock area from the sales area.* Pallets jacks or trucks are designed to lift and move a pallet. Although the pallet is able to hold large amounts of stock, thus reducing the number of trips between the back room and sales floor, pallets can pose a trip hazard to those in the immediate area, as well as blocking customers' access to the products.

CONVERT CARRYING FORCES TO PUSHING

USING A STOCKING CART TO PLACE PRODUCTS ON SHELVES

Figure 11 *shows an employee with the aid of a stocking cart placing products on the store shelves using both hands, which increases his efficiency.* This device was also designed to reduce excessive bending, holding, and reaching when stocking shelves. The top shelf slides up and down to keep the shelf at a better position for stocking shelves, while minimizing excessive bending.

REDUCE BENDING AND AWKWARD POSTURES

USING A STOCKING CART TO PLACE PRODUCTS ON SHELVES

Figure 12 *shows an employee also using a stocking cart.* The man is stocking the top shelf and is able to keep the extra stock on the shelf of the stocking cart, which has been raised to its top position. Two hands are being used for stocking, as there is no need to hold the carton in one hand and stock with the other.

USING STOCKING CART WITH A TILTED CONTAINER TO STOCK SMALL PRODUCTS

Figure 13 *shows an employee stocking small goods from a tote (container) held in position by the stocking cart.* By tilting the tote, awkward postures involving the shoulders, arms, and wrist are reduced, which lessens muscle fatigue and improves productivity. This type of stocking cart is particularly useful in stores where small items are stocked and sold, such as in the health and beauty aids departments in grocery stores.

REDUCE BENDING AND HOLDING CONTAINER

SOURCES FOR PREVENTING MANUAL MATERIAL HANDLING INJURIES

Ergonomic Intervention for the Soft Drink Beverage Delivery Industry
http://www.cdc.gov/niosh/pdfs/96-109.pdf

NIOSH conducted a study to investigate, identify, and reduce risk factors that may cause musculoskeletal disorders and injuries in the soft drink beverage delivery industry. The engineering/ergonomic controls, in combinations with improved work practices, reduced worker fatigue, reduced multiple handling of beverage cases, and decreased awkward postures.

Ergonomic Guidelines for Manual Material Handling
http://www.cdc.gov/niosh/docs/2007-131/pdfs/2007-131.pdf

Manual material handling tasks may expose workers to physical risk factors. If these tasks are performed repeatedly or over long periods of time, they can lead to fatigue and injury. The main risk factors, or conditions, associated with the development of injuries in manual material handling tasks are described on pp. 9–14.

Elements Ergonomics Programs: A Primer based on Workplace Evaluations of Musculoskeletal Disorders
http://www.cdc.gov/niosh/docs/97-117/pdfs/97-117.pdf

This primer provides basic information that will be useful for employers, workers, and others in designing effective programs to prevent work-related musculoskeletal disorders. NIOSH introduced the seven step pathway for evaluating and addressing musculoskeletal concerns in an individual workplace. See section on warehousing material handling and supermarket checkout operations on pp. 7–8, 21.

National Occupational Research Agenda for Musculoskeletal Disorders
http://www.cdc.gov/niosh/docs/2001-117/pdfs/2001-117.pdf

Work-related musculoskeletal disorders (MSD), such as low back pain, tendinitis, hand-arm vibration syndrome and carpal tunnel syndrome, account for a major component of the cost ($13 to $54 billion annually) of work-related illness in the U.S. The "Intervention Research Agenda" is found on pp. 10–11, and 22–23.

Guidelines for Retail Grocery Stores: Ergonomics for the Prevention of Musculoskeletal Disorders
https://www.osha.gov/Publications/osha3192.pdf

This document provides practical recommendations to help grocery store employers and employees reduce the number and severity of injuries in their workplaces. The document focuses on effective approaches for assessing the need for ergonomic solutions. Ergonomic solutions that deal with stocking activities are found on p. 19.

Grocery Warehouse Ergonomics: OSHA ETool
https://www.osha.gov/SLTC/etools/grocerywarehousing/packaging.html#pallets

This eTool describes example ergonomic hazards and solutions in grocery warehousing with an emphasis on traditional order picking, which accounts for a large number of musculoskeletal disorders. However, many of the examples are also applicable to the other types of Order Picking. Information is provided on hazards associated with pallets and the importance of maintenance of devices.

SOURCES FOR INFORMATION FROM BUSINESS/LABOR TRADE ASSOCIATIONS

Ergonomic Assist Systems and Equipment (EASE)
http://www.mhi.org/ease

EASE is the resource for information, practices, equipment, and organizations that focus on ergonomics and improving the working interface between people and the materials to reduce injury and increase productivity. Ergonomic equipment promotes the safety and health aspects of work environments for people.

National Grocers Association*
http://www.nationalgrocers.org

This is the national trade association representing the retail and wholesale grocers that comprise the independent sector of the food distribution industry. NGA provides the latest education and research to help independent retailers increase profits and grow their operations. Serving their industry through sharing information, education, and research.

Retail Industry Leaders Association (RILA)
http://www.rila.org

RILA promotes consumer choice and economic freedom through public policy and industry operational excellence. RILA provides a forum where members can conduct discussions aimed at understanding common operational practices, areas of concern, and pragmatic solutions to problems.

The United Food & Commercial Workers (UFCW) International Union
http://www.ufcw.org/

UFCW is are made up of more than 1.3 million people working primarily in grocery and retail stores, and in the food processing and meat packing industries. UFCW members work to improve wages, benefits, and conditions on the job.

The Loss Prevention Foundation (LPF)
http://www.losspreventionfoundation.org

LPF is an international leader in educating and certifying retail loss prevention and asset protection professionals. LPF's mission is to advance the retail loss prevention and asset protection profession by providing relevant, convenient and challenging educational resources. The LPF is exclusively created to serve the education needs of the retail loss prevention and asset protection professions.

Food Marketing Institute (FMI)
http://www.fmi.org

FMI is an organization that conducts food safety, public affairs, education, research, and industry relations programs for food retailers and wholesalers. FMI's membership consists of approximately 1,500 companies in 50 countries, ranging from large multi-chain stores to independent supermarkets.

Material Handling Industry (MHI)
http://www.mhi.org

MHI is the nation's largest material handling, logistics and supply chain association. MHI offers education, networking and solution sourcing for members and their customers through programming and events. MHI is concerned with the movement, protection, storage and control of materials.

Warehousing Education and Research Council (WERC)
http://www.werc.org

WERC provides leadership in the warehousing/distribution field to advance the art and science of warehousing management. WERC supports the professional development of their members and the logistics community by providing quality learning experiences, and networking opportunities.

**This listing is for identifying trade associations with members that are concerned with improving material handling. It does not mean these associations recommend adopting these solutions as presented.*

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