

## Safety and Health Practices in the Food Industry and Ergonomic Interventions

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### Introduction

Occupational safety and health (OSH) problems of the food industry have not been generally perceived as a serious issue in the same way as other industries such as healthcare, transportation, mining, and construction sectors. Statistics from various countries show that OSH issues from the food sector have one of the worst records in the manufacturing industries [1,2]. There are also evidences that some OSH aspects in the food industry are getting worse. Despite global economic declines in the recent years, the food and drink businesses have continued to expand in response to the growing worldwide demands for processed foods and drinks [1,2]. In this context of expansion and intensified competition, the food industry has experienced rationalization, restructuring, and a high level of mechanization, in both the industrialized and developing countries [1,2]. As a result, the overall worldwide employment levels in the sector have continued to expand, particularly in the highly capital-intensive drink industry has suffered. Moreover, mechanization has often had the effect of increasing the work volumes and the resulting stress levels of workers, as well as increasing the number of monotonous and repetitive tasks, with a consequent rise in the incidence of musculoskeletal disorders (MSDs). Increased automation has also been accompanied by higher noise levels, which has led to more workers suffering from hearing impediments [3]. Other common OSH problems in the food industry arise out of handling sharp cutting tools, exposing dusts in the air, contacting with infected animals, and increasing use of hazardous chemicals [3].

Governments, employers, and employees in the food industry are naturally attempting to respond to the above problems as best they can [4]. In many countries, safety and health codes have been adopted for the food industry, as a complement to the more general safety and health legislation [4]. Particular efforts have been made in a number of countries for the essential area of collection and dissemination of information and research, including establishment of data banks on the use of hazardous substances [4]. As a result, workers and employees in the food industry are undoubtedly in a good position to identify OSH problems, as well as to suggest solutions. Hence, it is vital for the employers and employees in the food industry to be able to contribute and maintain their knowledge and competence to improve workplace safety and health issues.

### OSH Issues in the Food Industry

#### Risk characteristics

The food industry covers a highly diversified range of activities. Although some concerns and risks are common to the whole sector,

others are more specific to certain branches of the industry. One of the general factors shared by all branches of the food industry is that they are required to follow strict health and hygiene standards, since their products can affect the health of consumers [4]. For example, at the initial stage of food processing, raw materials must be thoroughly washed, whilst workers have to observe personal hygiene rules such as hand washing, protective clothing, and personal cleanliness. As a result of these rules, workers keep their hands constantly in water, which may gradually affect the nerves of their hands and arms. The constant use of water in the workplace also means that the floors and floor coverings are likely to be wet, with a consequent increase in the risk of slip and fall incidence.

Another common vocational feature of the food industry is that workers are engaged in the processing and transformation of raw materials, such as meat, poultry and seafood which goes rotten easily unless processed quickly at a low temperature [4]. In these circumstances, workers often have to perform their tasks in a refrigerated room for long hours. The fact that the same task is performed repeatedly at such low temperatures also increases the risk of strains, particularly of the elbow and wrist. These workers are liable to suffer from respiratory disorders, frostbite and rheumatic disorders [4].

Workers in the food industry often use sharp and dangerous hand tools to process various raw materials [4]. In the meat processing branch, particularly sharp and heavy butcher's knives are used to cut and trim meat, which can be greasy and unstable on the cutting board. The floor surfaces of meat processing plants can also be dangerously slippery as a result of dropped animal fats. Some works in the food industry can be highly seasonal when the raw materials are of seasonal nature [4]. Because raw materials such as fruits and vegetables are highly perishable, they have to be processed within a short time period. As a result, workers can be exposed to consequent overexertion which can lead to high stress and MSDs.

Workers in certain branches run a high risk of inhaling a heavy concentration of dust particles, which are likely to result in respiratory disorders and allergies [4]. Processes such as grinding and mixing of grain, beans, nuts and herbs emit considerable levels of dusts into the air. Employees working in such environment for long hours are liable to inhale dust particles to such an extent that allergic symptoms begin to appear [4].

Workers can also be exposed to a high risk of injury from glass bottles, which can fall and break whilst being washed or burst whilst being filled [4]. Glass bottles are also a source of high noise levels which can be hazardous to workers' hearing. Glass bottles are now gradually being replaced by aluminium cans and plastic bottles, which

are lighter and easier to handle and present no danger of injury to workers. However, the manufacturing of plastic bottles is a process which produces high noise levels and in which particularly hazardous chemical substances are used.

### Ergonomic interventions

As demonstrated in the above, food industry workers may experience fatigue and discomfort when performing highly repetitive tasks, working in recurring and sustained or awkward postures, performing heavy physical works, and using forceful exertions. Prolonged workings under such conditions may result in chronic injuries to muscles, tendons, ligaments, nerves, and blood vessels. Injuries of this type are known as work-related musculoskeletal disorders (WMSDs) [5,6]. WMSDs can increase the costs that may include medical services, workers' compensation premiums, employee turnover, absenteeism, and retraining [5]. Productivity, product quality, and employee morale may also suffer [5]. One way to reduce WMSDs and to minimize the other OSH problems in the food industry and food-related workplace is to apply ergonomic interventions. Ergonomics is the study of how to improve the fit between the tasks of jobs and employees who perform the works [7,8].

Employees in the food industry also suffer frequent sprains and strains in various parts of their bodies [9]. For example, cumulative trauma disorders (CTDs), which are also referred to as repetitive strain disorders (RSDs), account for a large percentage of workers' compensation costs, particularly in the US meat-packing industry [8]. Overexertion from lifting, pulling, and pushing heavy objects is the normal cause of these injuries. They can be reduced considerably by automation of strenuous tasks. If automation is not feasible, ergonomic interventions such as a safe posture for lifting, pulling, and pushing heavy objects should be established with weight restrictions for such tasks.

In addition to the issue of overexertion in the handling of heavy objects, employees in the food industry are also often uncovered to perform tasks in awkward and stressful postures, which may result in sprains and strains, particularly to the wrists and the elbows. Working in such uncomfortable positions leads to greater fatigue, which increases the risk of accidents. The tools and machineries which employees use may also be too heavy for the tasks performed.

Therefore, ergonomic approaches have come to play an important role in the food industry and consist of optimum designing equipments and work stations for the workers to carry out their tasks efficiently with as little fatigue and discomfort as possible. When ergonomically sound tool is planned, the workers' body structure (anthropometry) should be fully reflected. A sufficient leg room is also needed to be able to adopt the most comfortable postures, both for workers who are standing and those who are sitting. In general, there is little room for doubt that better designed tools, equipment, and workstations result in greater efficiency and a safer working environment for the food industry [4].

### Conclusion

Food preparations, processing, and dining services are a potentially dangerous job which occasionally leads to serious injuries [10].

Because of this outcome, a high percentage of occupational injuries are reported in the food industry. Hence, work-related risks in the food industry require careful attention to OSH principles and a key to avoiding these accidents is to be aware of the things that can hurt employees. This article briefly discussed OSH practices in the food industry from a view of ergonomic intervention. By understanding safety issues and recognizing associated OSH problems in the food industry, the following safety practices are suggested for the food industry:

- Machineries should be activated to heavy and repeating tasks to eliminate musculoskeletal hazards that risk the health of operators.
- Risks should be controlled at the root level to avoid infecting employees.
- Medical check-ups so as to determine workers' state of health should be regularly conducted.
- Employers and employees must be inducted on the OSH issues that apply to their workplace(s) and to the company as a whole.
- Accident statistics of a vacant workplace should be disclosed to a new worker so that employees become more careful when working and thereby reducing accidents.
- Upgrade the factory and workplace by installing new machines that are free from occupational hazards.
- Employers should provide adequate protective clothing only as the last line of protection.
- An accident register of all accidents and near misses should be kept at the workplace.

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