

Concomitant Effects of Fish Processing Plant and Optimal Safety Measures Taken by Workers

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Abstract

The industry involved in fish processing contributes chiefly to the Food and Agriculture sector by producing a variety of different products from fresh or frozen fishes that are then exploited in food, fertilizer, and industrial feedstock. These fish processing plants also require handful influx of labour to increase their product quantity over a short period of time. Despite huge impact on the industry these plants have affected the workers by begetting fatal and non-fatal occupational health hazards mainly due to awkward posture, repetitive motions, carrying, bending etc affecting musculoskeletal system and other soft tissues of the body. This paper highlights work related risks, negligence and the possible considerations that can be made for their prevention.

Introduction

Fish processing work sites include factories that are located offshore (in large vessels) and on shore that engage in production and packaging activities. These factories are a component of the critical infrastructure within the Food and Agriculture Sector. Fish Processing Plant is a major exporter of Seafood and marine products that comprises primary processing and secondary processing. All these mechanisms protect the seafoods' shelf life by inhibiting the pathways that promote spoilage, deterioration and degradation. The workers involved in this health hazardous fish processing plant reported many fatal and non-fatal health consequences. The rise in occupational diseases, personal negligence, work related morbidity and gender related workloads also contributes to the occurrence of health risks among fish processing plant workers [1].

Concomitant Effects of Primary Fish Processing Plant

Primary fish processing plant comprises heading, degutting, eviscerating, filleting of fishes, processing oils, freezing of fresh fish for distribution to fresh fish retail and later to catering outlets [2]. The processes include sorting (segregation), peeling that is for removing shells, packaging for delivery, grading that includes segregation of fishes depending on size and ring cutting. These are then transferred to cold storage and dispatched to consignments. The fish processing industry is highly hazardous in terms of health risks due to electrical and mechanical malfunctions and accidents, infections due to parasites and bacteria's, unbearable noise levels due to heavy machineries, allergic reactions because of bioaerosols [3].

The workers involved in primary fish processing are exposed mainly to occupational hazards due to repetitive and forceful movements. They experience stiffness in the neck due to stooped posture and prolonged standing while doing sorting as this is an important step while doing primary processing. The work stressors such as excessive physical overload, poor workplace organisation, cold environment and constrained body postures give rise to many fatal and nonfatal diseases. The occupational diseases affecting massive amount of workers involved in primary fish processing plant are frostbite due to working in low temperature, cold-induced injuries, noise-induced hearing loss, Raynaud's phenomenon, sepsis skin infections and allergic reactions consisting urticaria (3-11%), protein contact dermatitis (3-11%), rhino conjunctivitis, asthma (2-8%), allergic alveolitis and nonspecific bronchial hyperresponsiveness. The workers are at high risk for

immunological reactions due to aerosolization of seafoods [4].

Musculoskeletal disorders (MSDs) are complaints frequently observed as a major health related trauma among workers in fish processing due to repetitive and monotonous work at a fast pace and heavy physical workload. Occurrence of MSD in neck and shoulder is 31-35% due to overexertion but carpal tunnel syndrome and epicondylitis are reported 15% because of forcefully gripping tools by hand and poor task clarity among workers. Women constitute most of the labour force in fish processing plant in Asian countries as in Pakistan and India, where all these high yield tasks are carried out manually giving rise to injuries of body regions like shoulder, upper extremity, upper and lower back, hands and fingers [5]. Work related morbidity like blanching of hands, laceration of skin due to sharp tools like knives, skin conditions as in eczematous dermatitis due to irritants and crayfish handler's disease by *Erysipelothrix rhusiopathiae* bacteria invading skin through abrasions, laceration and fissures and head related injuries by striking force and falling on head are reported.

Concomitant Effects of Secondary Fish Processing Plant

Secondary fish processing plant comprises tasks that include battering, breading, stuffing, and packaging. The main operation of this processing plant is the Buttered Sole Line consisting of spreading where the frozen sole is scattered on the conveyor following the automated processes like breading and battering then packaging the fillet into boxes. The other representative operation is Scallops Line which consists of stuffing by placing ingredients on a fillet then rolling into a ball shape, wrapping them into cellophane bags and packaging individually wrapped fillet into boxes [6].

The workers involved in these high yield tasks in secondary fish processing plant are at extreme health risks due to stooped posture, limiting flexibility due to prolonged standing, repetitiously utilising

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hands, frequent twisting of body, highly forceful and continuous functioning of upper limbs and weight bearing and efforts distributions at lower limbs. Due to the improper layouts of labour stations, conveyor driven pace of works, monotonous activities throughout the day and lack of relaxation hours in between work loads contributes to innumerable health hazards that are injuries to wrist, neck, shoulders, and arms. The discomfort in lower legs and lower back pain is also attributed to health problems among workers [7].

Safety Measures

Due to high prevalence of health hazards among workers in fish processing plants, preventive measures should be taken for protecting labourers from occupational injuries. It is recommended to adopt job rotations and implementation of 5-10 minutes breaks every hour to limit the exposure due to a cold environment or repeatedly performing tasks for a long period of time. Another approach is to create a proper joint management committee tasked with identifying problems and finding solutions in the workplace. As a preventive measure, it is suggested to use sanitary gloves as this can reduce contamination by *S. Aureus* organisms. Wearing adequate insulating clothes and protective equipment like boots is also recommended [8]. Applying emollients and moisturisers prophylactically to protect the skin barrier is also suggested to prevent the development of contact dermatitis. Anti-fatigue mats and a sit/stand stool should be required to reduce the stress on lower extremity due to prolonged standing and continuous bending. There should be enough foot clearance to allow workers to get as close to the conveyor [9].

Establishment of smart factories with proper data should be done to minimise work loads. By introducing and implementing all these preventive measures can function as a helping hand in reducing work related trauma and psychosocial factors in the occurrence of occupational health hazards among fish processing workers [10].

Conclusion

The working conditions of workers employed in the fish processing plants are awful especially in low-income countries and on top of that they are exploited as well. They are forced to work without any preventive measures in a very hazardous environment for a very minimum wage which ultimately results in taking a heavy toll on their physical health. It is important for national and state governments to make sure that these workers are provided with basic preventive kits

and have a safer environment which can easily prevent most of the diseases that they can suffer.

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Competing Interests

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