

# BEYOND SAFETY GEAR:

## Nutrition protects workers

### EXECUTIVE SUMMARY

Chemical exposure is a growing occupational health concern as industrialization and technological change increase workers' contact with hazardous substances. While occupational safety and health frameworks focus on managing exposure, they do not fully address chemicals that accumulate in the body and weaken immune function. Chemical exposure and poor nutrition can reinforce each other, increasing vulnerability to illness.

Integrating workforce nutrition into chemical risk management strengthens resilience, supports immunity, and provides an additional layer of protection for workers.



### BACKGROUND

With technological advancement & industrialization, we are constantly exposed to hazardous substances including chemicals, pesticides, heavy metals, fumes, dusts, pollutants affecting our health and safety. Workers in almost all modern work environments: agriculture (pesticides, fertilizers), industry (metals, elements, industrial chemicals) or in services (cleaning agents, dyes and solvents), daily face chemical risks. Workers' health and safety are thus compromised.

The International Labour Organization (ILO) estimated that **1 billion workers worldwide** are exposed to hazardous substances (2021)



The scope for the comprehensive management of chemical hazards has, hitherto, been limited to the occupational safety and health (OSH) framework of the hierarchy of control.<sup>2</sup> In this framework, workers should be safeguarded from exposure through a

combination of strategies from elimination, substitution, engineering and administrative control measures and finally, personal protective equipment (PPE). However, these measures reduce exposure, but they do not fully protect the body from chemicals.

Some chemical exposures are associated with increased capacity to penetrate and accumulate in body tissues and organs, interfering with, and destabilizing the immune system. These substances could be heavy metals, persistent organic pollutants (such as certain pesticides), endocrine disrupting chemicals, industrial solvents, volatile organic compounds, or pesticides and herbicides. This places extreme pressure on the person's inner defences, compromises immunity, causes fatigue, depletes nutrient stores, and also leads to poor nutrient absorption.<sup>3,4,5</sup> Additionally, prolonged exposure to chemical hazards can trigger chronic inflammation and metabolic dysfunction, which are key pathways of non-communicable diseases such as diabetes, cancer, cardiovascular, and respiratory diseases.<sup>6</sup> Good nutrition has an important role to play.

#### Hidden health effects of chemical hazards:



Weakened immune system

Constant tiredness



Depleted nutrient stores

Higher risk of long-term diseases



1 ILO 2021. Exposure to hazardous chemicals at work and resulting health impacts: a global review.

2 OSHA, 2023. Identifying Hazard Control Options: The Hierarchy of Controls.

3 Hoffman & Hennig, 2017. Protective influence of healthful nutrition on mechanisms of environmental pollutant toxicity and disease risks.

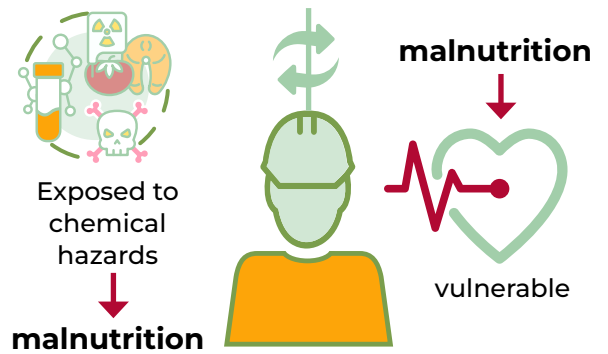
4 Hennig et al., 2018. The role of nutrition in influencing mechanisms involved in environmentally mediated diseases.

5 Lee & Jacobs, 2019. New approaches to cope with possible harms of low-dose environmental chemicals.

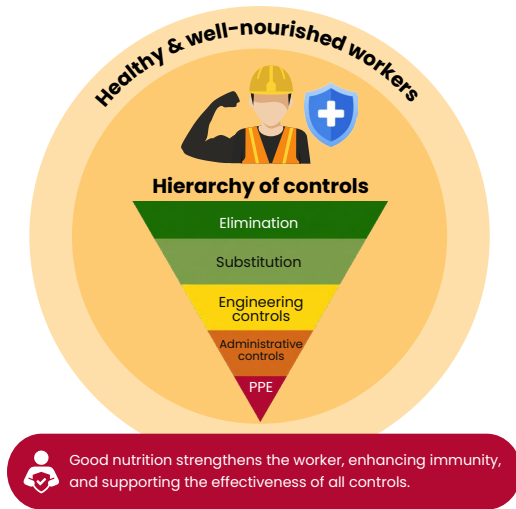
6 Hennig et al., 2012. Nutrition can modulate the toxicity of environmental pollutants: implications in risk assessment and human health.

# HOW WORKFORCE NUTRITION CAN SERVE AS A PROTECTIVE LAYER

When workers are exposed to chemical hazards, their bodies may be less able to absorb and effectively utilise nutrients from the foods they consume, thereby increasing the risk of malnutrition.<sup>7</sup> Similarly, workers who consume poor diets or are malnourished are more vulnerable to the harmful effects of these exposures.<sup>8</sup> Eating a safe and healthy diet supports the body's natural defense systems and can reduce the absorption and impact of harmful substances.



Point of recommendation



Therefore, integrating nutrition into the hierarchy of control offers an additional layer of protection for the workers. By strengthening worker resilience and boosting immune function, good nutrition can help reduce the lingering effects of chemical exposure. This is a simple yet effective way to further safeguard workers health and well-being.

Chemical exposure is pervasive now, so diets must be **nutrient-dense, diverse, and protective** against chronic toxic burden

## INVEST

Workers must be provided with safe and healthy meals at the workplace. Ensuring diets that are balanced, with adequate protein, fibre, vitamins and antioxidants can reduce the effects of various chemicals.

## BUILD

Safe and healthy meals should be accompanied by well-designed nutrition education sessions. Workers who know the importance of healthy diets and the basics of hazard-diet interactions can better support themselves to deal with persistent chemical exposure and maintain robust immune systems.

## MONITOR

Regular monitoring of chemical exposure and integrating nutrition indicators into the health checks are critical. This can provide insights for nutritional interventions that boost immunity levels, maintain nutritional status and prepare a safe and healthy work environment for all.

*We live in a chemical world.* To attenuate the negative effects of these chemical hazards, workplace nutritional interventions can play an important role supporting workers to thrive in a safe and healthy work environment.

7. Zhai et al., 2015. Dietary Strategies for the Treatment of Cadmium and Lead Toxicity.  
8. Pope & Liu. 2020. An introduction to interdisciplinary toxicology: From molecules to man.

**More information:** Please visit [www.workforcenutrition.org](http://www.workforcenutrition.org)  
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## Healthier Diets. For all.

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