



# One Health, One Aquaculture – Aquaculture under One Health Umbrella



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## Abstract

The One Health concept applied to aquaculture include many aspects involving animal, human and environmental health, political, economic and social developments. Here we highlight the aspects associated with occupational health in aquaculture within the concept of One Health. From a public health perspective, the aquaculture industry could uses the One Health approach to prevent and control occupational diseases in aquaculture workers. We propose to bring the One health concept for aquaculture in order of prevent and control health and safety hazards for workers in aquaculture.

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## Introduction

The world aquaculture production has increased at an average annual rate of 6.2% in the 2000-2012 period, this means of 32.4 million to 66.6 million tons<sup>[1]</sup>. Aquaculture is one of the fastest growing food-producing sectors, supplying approximately 40% of the world's fish food<sup>[2]</sup>. The development of aquaculture has led to an increase in the number of workers in the sector. Food and Agriculture Organization (FAO) data indicates that, in general, fisheries and aquaculture ensure the livelihood of 10% to 12% of the world's population<sup>[1]</sup>, and employs an estimated 24 million people<sup>[3]</sup>. In this context, concern for safe practices must be present to ensure the health of the fish and the health and safety of the workers.

In this sense, health has been discussed in a broader concept, encompassing animal, human and environmental health. The One Health approach has been recognized as a major element of disease control and prevention strategies by international agencies, including the Food and Agriculture Organization of the United Nations (FAO), the World Organization for Animal Health (OIE), and the World Health Organization (WHO)<sup>[4]</sup>. One Health is gaining recognition nationally and internationally as a practical and innovative approach to global health challenges that recognizes the interconnections among humans, animals and their shared environment as well as the economic, cultural and physical factors that influence health<sup>[5]</sup>. As a transdisciplinary and multidisciplinary approach, the One Health promotes cooperation between health, environmental and social scientists and other professionals<sup>[6]</sup>.

From a Global perspective, the One Health must be expanding to aquaculture production, using methods that minimize risks to public and animal health, and ecology<sup>[7]</sup>. Healthy animal production systems converge with efforts to reduce the risk for disease outbreaks by implementing agricultural and development policies that improves food security<sup>[8]</sup> as well as human health. The hazards related to animal

disease, contamination, recontamination or survival of biological hazards during processing can be controlled by applying Good Manufacturing Practice (GMP), Good Hygiene Practice (GHP) and Hazard Analysis and Critical Control Point (HACCP)-programme<sup>[9]</sup>. The One Health applying to aquaculture could stimulate discuss and establish safe practices in order to prevent accidents among aquaculture workers. Occupational health in aquaculture involves the health of the workers, the animals, and the shared work environment. These interrelationships require a comprehensive approach that seeks to simultaneously maximize human, animal, and environmental health, based on 'One Health' approach<sup>[10]</sup>.

Disease and health management included compliance with international codes, aquatic animal health strategies, new diagnostic and technologic techniques, biosecurity measures including risk analysis, epidemiology, reporting and planning for emergency response to diseases, targeted research; institutional strengthening and manpower develop



ment<sup>[11]</sup>, Hazard Analysis and Critical Control Points (HACCP) and occupational health. Improving biosecurity and occupational safe practices is widely recognized<sup>[12]</sup>. Aquaculture occupational hazards to health can be categorized into those concerning physical, chemical, biological, toxic exposures<sup>[2]</sup> as well as ergonomic and mechanical hazards. The occupational health risks of aquaculture workers are poorly documented compared to those experienced by fisherman or by seafood processing workers<sup>[13]</sup>. However, comparing fatality statistics in the fishing industry with those for other occupational categories reveals that fatality rate for fishermen was 40 times higher than the national average in some development countries<sup>[14]</sup>. Causes of deaths include electrocution, drowning, poisoning and fatal head injury<sup>[15]</sup>. Nonfatal injuries include stings, bites, cuts, infections<sup>[16,17]</sup>, slips, falls, strains and sprains; chemicals and fires<sup>[17]</sup>. Other hazards are related to the worker's psycho-physiological conditions, like ergonomic risks or accidents<sup>[18]</sup>.

More attention needs to be paid to aquaculture industry in order to improve the workplace. Comprehensive occupational health and workplace safety programs need to be better organized and extend around the world<sup>[2]</sup>. In this context, it is important to establish universal guidelines and specific legislation for aquaculture workers. Regulatory standards should include personal protective measures, health surveillance, sound management practices<sup>[2]</sup> in order to minimize the injuries from aquaculture work. It is time to aquaculture industry talk about the occupational hazards in the workers and provide safety workplace. Likewise, all regulatory agencies should promote prevention behaviors and an official platform to register the accidents, in order to address the industry for occupational safety and health problems for its workers<sup>[19]</sup>. In a One Health idea, its value join efforts to monitoring and control the health and safety of aquaculture and fishing workers.

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