

Heavy metal contamination during processing of canned fish: a review on food health and food safety

Md. Masud Rana^{a,b}, Roslianah Asdari^a, Ahmed Jalal Khan Chowdhury^{c,*},
Mohammad Bodrul Munir^{c,*}

^aFaculty of Resource Science and Technology, Universiti Malaysia Sarawak, Malaysia,
email: ranadof.bd@gmail.com (Md. Masud Rana)

^bFaculty of Fisheries, Aquaculture and Marine Science, Sher-e-Bangla Agricultural University, Bangladesh

^cFaculty of Agriculture, Universiti Islam Sultan Sharif Ali, Sinaut Campus, Brunei Darussalam,
emails: hsjewel730@yahoo.com (M.B. Munir), ahmed.chowdhury@unissa.edu.bn (A.J.K. Chowdhury)

Received 24 August 2023; Accepted 30 October 2023

ABSTRACT

Fish in cans is more popular than ever because of its convenience, improved quality, less risk of contamination, and long shelf life. To preserve seafood products, the canning process uses a hermetic closure and thermal techniques. Tuna, salmon, mackerel, and herring are a few marine fish species that are widely used in canned goods. The canning procedure has significant shortcomings. Problems with canning include the transfer of hazardous metals from the cans into the food, incorrect canning, which can cause botulism, and chemical contamination. The biggest and most pervasive issue is the presence of heavy metals like Pb, Hg, Cd, Cu, and Zn in canned fish. These metals are exceedingly poisonous, persistent, and difficult to biodegrade even at low concentrations. Heavy metals significantly affect marine bioaccumulation, toxicity, and water contamination. Heavy metals build up in marine fish along the food chain as a result of growing industrial and agricultural environmental harm, and they are eventually absorbed by humans through canned foods. While Pb and Cd toxicity can result in renal, cardiovascular, and reproductive issues, heavy metal (Hg) toxicity can lead to eye impairment, vertigo, and a weakened immune system. So that consumers may learn more and make wise decisions about consuming canned fish, the main method by which heavy metal contamination in canned fish spreads could be identified in this review paper.

Keywords: Heavy metal, Canning, Fish, Food health, Food safety

1. Introduction

Fish is nutritious for humans because it serves as a dietary protein with low saturated fat. Due to being a major source of several nutritional elements including omega-3 and polyunsaturated fatty acids, vitamins and essential minerals, fish is now widely consumed around the world [1]. Because of its perishable quality, fish products with maximum durability is given utmost consideration during

processing and preservation. One of the modern techniques of processing is 'Canning' which involves a hermetically sealing method with thermal processes that aims to preserve fishery products [2]. Furthermore, the shift in consumer behavior and adoption of healthier dietary habits following the pandemic has led to a rise in the worldwide popularity of canned fish products [3].

Typically, the cans are crafted from tin or steel and are externally coated with white tin. Within this process, the

* Corresponding authors.