



Heavy Metals Accumulation in Different Cultivated Fish Tissues through Commercial Fish Feeds and Health Risk Estimation in Consumers in Bangladesh

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ABSTRACT

Cultivated fishes are major protein and microelement sources for all sorts of people in Bangladesh due to its availability and affordability. Since heavy metals are persistent in the aquatic environment, these metals can accumulate in the food chain. Cultivated fishes containing heavy metals can cause a carcinogenic and non-carcinogenic risk to human as it biologically accumulates heavy metals from commercial feeds. In this study, seven types of cultivated fishes and their respective commercial feeds were collected from different cultivation farms based on different physical characteristics and after taking dry weight, 1g of each sample was digested with an acid mixture. Data analysis was carried out using ICP-OES (Optima-7000DV) software. This study was designed to access the content of heavy metals in the flesh of fish species through feeds available in Bangladesh and potential health risk calculation for consumers due to intake daily. The concentration (mg/kg, dry weight) range of heavy metals like; Pb (4.56- 7.08), Cd (0.23- 1.28), Cr (4.00-7.08), Cu (11.23- 20.62), As (0.08- 0.34), Hg (0.05- 0.34) in selected commercial fish feeds and Pb (4.35-8.03), Cd (0.87- 1.35), Cr (4.71-8.98), Cu (14.00- 31.80), As (0.17- 0.28), Hg (0.08- 0.41) in collected fishes. Statistical analysis was interpreted to show data variability and coherence. The recorded concentration value for selected metals in fish tissues and feeds was also compared with the safe limit proposed by World Health Organization (WHO, 1995), Food and Agricultural Organization (FAO, 1983), European Union (EU, 2001). This study also estimated the carcinogenic and non- carcinogenic risk due to the daily consumption of these cultivated fishes for a certain age.

1. Introduction

Environment Pollution due to heavy metals along with food safety is a burning issue worldwide recently. Toxic metals may have adverse health impacts on all living organisms, especially to humans if the consumption level exceeded the allowable limit [1]. Moreover, heavy metal

contamination and toxicity are increasing at an alarming rate in the aquatic environment in recent days. Waterbody such as; rivers, ponds, streams can be contaminated by toxic metals as a result of an increase in atmospheric deposition and the rapid development of industrialization and agricultural activities [2]. Fish is a vital food source and

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