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Contamination with Heavy Metals of Frozen Fish Sold in Open Markets in Ondo City, Southwest Nigeria

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Abstract : Fish consumption has increased in recent years in both developing and advanced countries, owing to increased awareness of its nutritional and therapeutic benefits and its availability and affordability relative to other animal protein sources. Fish and fish products, however, are extremely prone to contamination by a wide range of hazardous organic and inorganic substances. This study assessed the levels of three heavy metals, copper (Cu), iron (Fe), and zinc (Zn), in frozen fish imported into Nigeria and sold in Ondo City for their safety for human consumption as recommended by WHO and FEPA. Three species of frozen fish (Scombrus scombrus, Merluccius merluccius, and Clupea harengus) were purchased, and the wet tissues (gills, muscles, and liver) were digested using a 3:1 mixture of nitric acid (HNO3) and hydrochloric acid (HCL). An atomic absorption spectrophotometer (AAS) was used to detect the amount of metal in the tissues. The levels of heavy metals in different fish species' organs varied. The fish had Zn > Fe > Cu heavy metal concentrations in that order. While the concentration of Cu and Fe in the tissues of all three fish species studied were within the WHO and FEPA prescribed limits for food fish, the concentration of Zn in the muscles of M. merluccius (0.262±0.052), C. harengus harengus (0.327±0.099), and S. scombrus (0.362±0.119) was above the prescribed limit (0.075 ppm) set by FEPA. An excessive amount of zinc in the body can cause nausea, headaches, decreased immunity, and appetite loss.

Keywords : heavy metal, atomic absorption spectrophotometer, fish, agencies
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