

Safety Evaluation of Potential Toxic Metals Exposure from Commonly Used Omega 3 Products for Infants in Jordan

By
Ghada Ismail Abd Allatef Al-Azzeh

Supervision
Dr. Ala Alhusban

Al-Zaytoonah University of Jordan, 2023

Abstract

The main objective of this study was to evaluate the amount and level of potential contamination by the metals including Al, Sb, As, Be, Bi, Cd, Cu, Cr, Co, Pb, Hg, Mo, Sn, Ni, Ag, V, and Zn in seven pharmaceutical natural omega-3 syrup and drop products used for infants and children in Jordan. These products are recommended recently by paediatricians to enhance children immunity and growth and are easily accessible by parents because they are classified as an over-the-counter medication. To evaluate the amounts of these metals in the omega-3 products, two sample digestion methods were evaluated including open wet digestion and microwave digestion. The tested samples after digestion were analysed using a validated inductively coupled plasma-optical emission spectroscopy (ICP-OES) with limit of detections (LODs) of (Al) 0.007 mg/L, (Zn) 0.00005 mg/L, (Cu) 0.008 mg/L, and (Cd) 0.0008 mg/L. Microwave digestion showed higher recovery values for metals after analysing CRM. Al, Zn, and Cu were found in 86%, 86%, and 100% of the analysed pharmaceutical natural omega 3 product samples, respectively. Cd was found in only 28% of the samples that were examined. The acquired data were then compared using World Health Organization (WHO) criteria for the allowed amounts of hazardous heavy metals. The majority of the completed pharmaceutical natural omega 3 products (AL, Cu Zn 4and Cd) revealed values that were within the permissible hazardous

metal limits. Additionally, it was revealed that the daily tolerated consumption limit established by the regulatory agencies was not exceeded by the levels of metals that were identified through pharmaceutical omega-3 products.

Keywords: Omega-3 product, infant and children, ICP- OES, Toxic metal, open wet digestion, microwave digestion, safety evaluation