

## Method development for determination of Arsenic, Cadmium and Mercury in marine origin dietary supplements by atomic absorption spectrometry (AAS)

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**Background and Aims:** Dietary supplements with marine origin fatty acids are known to have numerous benefits from childhood and pregnancy to old age. Omega 3 polyunsaturated fatty acids, such as Eicosapentaenoic acid (EPA) and Docosahexaenoic acid (DHA) was demonstrated that have a pivotal role in fetal/infant brain and retina development. Insulin sensitivity improvement and reducing inflammation. Also it has been claimed that consumption of omega3 prevent human from heart disease, hypertension, rheumatoid arthritis and many types of cancers such as breast, colon and prostate. In aquatic ecosystems, heavy metals were accumulated in fish tissues and also were presented in fish products, such as omega3 capsules. Increasing level of some heavy metals for example, Arsenic (As), Cadmium (Cd) and mercury (Hg) in human body may cause many problems. This study carried out to investigate contamination of mentioned in these kind of supplements and find out, whether they are safe.

**Methods:** Samples were digested for Cd and As, then As was determined by hydride generation (HG-AAS) and Cd was determined by graphite furnace atomic absorption spectrometry (GF-AAS), Hg was analyzed directly by thermal decomposition amalgamation atomic absorption spectrometry (TDA-AAS).

**Results:** Analytical results for As and Cd were validated by spiking the samples with various concentrations of these metals for recovery. Recoveries were 96.4, 104.4 for As and Cd respectively. Related factors such as volume, temperature, time and amount of sample were optimized. Calibration curves in the range of 2.5-20ng/ml, 2-8ng/ml and 0.5-20ng/ml were prepared for As, Cd and Hg respectively. LOD was 1ng/ml for As and 0.5ng/ml for Cd and 0.25ng forHg.

**Conclusions:** The results of this study revealed that consuming omega3 dietary supplements based on daily serving may not have harmful effects. However more investigation is required for completion of this research.

**Keywords:** Dietary supplements; Mercury; Cadmium; Arsenic; Atomic absorption; Omega 3