Effect of supercritical fluid extraction on the reduction of toxic elements in fish oil compared with other extraction methods

ABSTRACT

High-quality fish oil for human consumption requires low levels of toxic elements. The aim of this study was to compare different oil extraction methods to identify the most efficient method for extracting fish oil of high quality with the least contamination. The methods used in this study were Soxhlet extraction, enzymatic extraction, wet reduction, and supercritical fluid extraction. The results showed that toxic elements in fish oil could be reduced using supercritical CO2 at a modest temperature (60°C) and pressure (35 MPa) with little reduction in the oil yield. There were significant reductions in mercury (85 to 100%), cadmium (97 to 100%), and lead (100%) content of the fish oil extracted using the supercritical fluid extraction method. The fish oil extracted using conventional methods contained toxic elements at levels much higher than the accepted limits of 0.1 ε g/g.

Keyword: Fish oil; Toxic elements; Oil extraction methods