

Abstract

Wai Ching (Amy) Au-Yeung, 2002. *Methylmercury Bioaccumulation in Sport Fish and the Relation to Human Exposure.* A thesis presented to Ryerson University in partial fulfillment of the requirements for the degree of Master of Applied Science in the Program of Environmental Applied Science and Management

A long-lasting contaminant, methylmercury (MeHg), builds up in human bodies over a lifetime. Regularly eating contaminated fish may accumulate mercury to an amount that raises health concerns, especially for children and babies. Methylmercury is found throughout the parts of the fish that are eaten; cleaning or cooking methods cannot effectively reduce mercury exposure. The main focus of this thesis concerns the fish contamination in Lake Ontario and to conserve health from eating contaminated sport fish. Although mercury (Hg) is tightly regulated, mercury levels in fish still gradually increase throughout their life spans. Through the field data provided by the Ontario Ministry of Environment (MOE), greater amounts of methylmercury are found in older fish and predatory fish that eat other fish as part of their diet. A bioenergetics computer program, called Generic Bioaccumulation Model (BGM) (Luk, 1996), simulating the bioaccumulation of Hg in fish was applied to provide a good estimation of mercury levels for different species. It is an excellent tool in predicting the trends and magnitude of mercury levels among six sport fish in Lake Ontario. In addition, an estimation of human mercury consumption from fish was also developed. In most of the fish species, there is minimal risk to humans when eating fish less than two times a week. The species Walleye (*Stizostedion vitreum*) and its quality and quantity are of greatest concern, since it exhibits the highest mercury level among the six sport fish species.