

**Analysis of Fish Lipids and Heavy Metal Contents in Selected Fish Species from  
Lake Naivasha and the Kenyan Coast and Fish Eating Habits of the Inhabitants**

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## ABSTRACT

The consumption of aquatic products especially fish is very beneficial to the human body since they provide essential nutrients that are unavailable in plant natural products and terrestrial animals. The purpose of this research work was to determine and document the level of lipid contents and classes in the fish species commonly found in Lake Naivasha and the Kenyan coast, determine heavy metal concentration in fish muscle and water and to establish the fish eating habits of Juja, Naivasha and Mombasa communities.

GC-MS analysis was performed to determine qualitatively the fatty acid composition in fish oils. Heavy metal (Cu, Cd, Pb, Ni and Zn) concentrations in the fish muscle tissue were determined using Flame Atomic Absorption Spectrometer equipment. Fish eating habits of Juja, Naivasha and Mombasa inhabitants was established by conducting interviews using the questionnaire method.

Triacylglyceride was the highest proportion of the neutral lipids in all the tissues examined. Polar lipids including the phosphatidylcholine and phosphatidylethanolamine was the major lipid class in the muscle, pyloric caecum, liver and orbital tissues of the specimen studied.

The study revealed that selected L. Naivasha fish has more omega-6 series of the polyunsaturated fatty acids while the Kenyan coast fish has more omega-3 series. The prominent omega-3 being C22:6 while the C18:2 are for the omega-6 series.

Lead and nickel metal concentration were significantly higher than other heavy metals, however there was no significant differences between them. Cadmium seemed to be in low concentration in every fish species examined, while zinc levels throughout the study were in high amounts compared to other heavy metals studied. Nickel was significantly lower than zinc levels but

significantly higher than other metals such as cadmium, lead and copper. In addition, the study was extended to determine these elements in the waters of L. Naivasha and the Kenyan coast. Heavy metals under study in the edible tissue of the fish specimen were in the safety permissible levels for human use.

Respondents are becoming aware of the importance marine products have to growth and development of human body and are willing to consume more fish if made readily available and at subsidized prices.