



**ASSESSMENT OF HEAVY METAL LEVELS IN FISHES AND FRESH WATER  
FROM LAKE VICTORIA BASIN, UGANDA.**

**BY**

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## DECLARATION

This research dissertation is declared an original copy by I the researcher, Draru Favour Vanessa for the award of Bachelor of Animal production and management, and never has it been submitted to any academic institution and university for the award of any academic qualification. Submitted with approval.

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## **DEDICATION**

I dedicate this dissertation to the almighty God for having helped me during the study,also my entire family mostly my guardian Asea Henry for his tireless effort to help me reach this level and the lecturers of Busitema University Arapai Campus finally my course mates for their contributions.

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## LIST OF ABBREVIATIONS

<b>AAS:</b>	Atomic Absorption Spectrophotometer
<b>ANOVA:</b>	Analysis of Variance
<b>AOAC:</b>	Association of Analytical Chemistry
<b>AU:</b>	African Union
<b>Cd:</b>	Cadmium
<b>Cu:</b>	Copper
<b>EDI:</b>	Estimated Daily Intake
<b>EPA:</b>	Environmental Protection Agency
<b>FAO:</b>	Food and Agricultural Organization
<b>NaFIRRI:</b>	National Fisheries Research Institute
<b>Pb:</b>	Lead
<b>SPSS:</b>	Statistical Package for Social Scientists
<b>UBOS:</b>	Uganda Bureau of Statistics
<b>UIA:</b>	Uganda Investment Authority
<b>UNBS:</b>	Uganda Bureau of Standards
<b>WHO:</b>	World Health Organization
<b>Zn:</b>	Zinc

## **LIST OF TABLES**

**Table 1;**maximum permissible limits of heavy metals

**Table 2** Analysis of heavy metal safety by comparisons to international reference organizations

## **LIST OF FIGURES**

**Figure 1.** Fish samples were collected from Kasenyi, Gaba and Masese fish landing sites along the shores of Lake Victoria. The landsites are densely populated and along major industrial and sewage drainage routes.



## ABSTRACT

**Background** Heavy metals -vital group of chemical contaminants and the major vehicle for entry in to the body systems is food ,one of which is consumable fish. Ther fore the main purpose of this study was to assess the amount of heavy metals (Lead, Cadmim, Zinc) and their safety in fish species and fresh water in Lake Victoria basin, Uganda.

**Methods:** This was purely a quantitative studycross-sectional study in which fish samples were collected from the selected fishing communities community. Four fish species (*Haplochromine cichlid, Lates niloticus, Oreochromis niloticus, clarius batruchus*) were collected nine from each fish landing site was bought from skilled fishermen with whom appointments were made the previous day. Analysis against lead (Pb), zinc (Zn) and cadmium (Cd) using an atomic absorption spectrometry. Safety was assessed by making comparisons against the World Health Organization (WHO), European Union (EU) and the United States Environmental Protection Agency (US EPA) acceptable limits in fish and water.

**Results ;** Enkejje fish had the highest Zn concentrations of 25.2ppm while the other fish species all had low Zn concentrations . No significant differences were found in Pb concentrations in all fish species, although Catfish had high relative values of Pb. Concentrations of Cd were also the same in all fish species although Enkejje had relatively higher Cd concentrations than all fish species. Zn was higher in waters in Gaba and Masese while Pb was only identified in water collected from Kasenyi fish landing site in Lake Victoria. Cd was not detected.

**Conclusion:** Fish in Lake Victoria basin ,Uganda are able to bioaccumulate heavy metals even above the set limits of WHO, EU and USEPA. The main public health risks identified in the study were the presence of high relative values Pb and Cd in Catfish ,Nile Tilapia and Nile perch. Zinc was found to be a good source in small fish which is enkejje.