Coliform Contamination in Tilapia (*Oreochromis niloticus*) from three markets in Region Six, Guyana

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Wild caught freshwater fish are an important source of protein for many Guyanese. Fish on sale at local markets are not subjected to microbiological quality monitoring; thereby, presenting concerns about consumer safety as the fish move through the value chains. This study investigated coliform contamination in tilapia (*Oreochromis niloticus*) obtained from three markets in East Berbice-Corentyne (Region VI). Six tilapia samples were obtained from each market for a total sample of 18 fishes. Each sample was collected and stored in a sterile environment, and then transported to the University of Guyana, Berbice Campus for sample preparation. The method used to measure the level of contamination of total coliform, fecal coliform, and *Escherichia coli* was the enumeration method, which is based on lactose fermentation. Given the absence of local microbiological standards for fish sold at markets in Guyana, the results were compared with the International Commission on Microbiological Specification of Food (ICMSF) standard, which is used by the United States (US) agencies of the Food and Drug Administration (FDA) and Environmental Protection Agency (EPA). The results indicated that the coliform levels in the tilapia often exceeded the ICMSF standard of <1000 MPN/g for total coliform, ranging from <3.0 MPN/g to >1100 MPN/g. The ICMSF standard of <10 MPN/g for fecal coliform and *E. coli* was also often exceeded, reaching as high as 460 MPN/g. An ANOVA test showed no significant difference at the $p < 0.05$ level among samples and markets for total coliform, fecal, and *E. coli* levels. Compared against the US FDA, and EPA acceptable level (the ICMSF standard), the fish samples obtained from the three markets did not meet acceptable standards. These results indicate a potential public health risk to consumers. There is urgent need for the development of national microbiological standards, and further research should focus on the microflora of freshwater fishes offered for sale at markets across Guyana.

Keywords: Total coliform, fecal coliform, *E. coli*, *O. niloticus*, Guyana