

**PROCESSING ENVIRONMENT AND THE MICROBIAL QUALITY OF SMOKED FISH
IN THE ACCRA AND TEMA MUNICIPALITIES**

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2003

ABSTRACT

A major challenge facing smoked fish processors in Ghana on the international market is the inability of their products to meet international food quality and safety requirements. One factor which needs to be considered seriously when assessing the microbial quality of food is the environment within which processing occurs. In this study, the life cycle analysis of the microbial quality of smoked fish was made in relation to the processing environment, which included sanitary and hygiene facilities and the practices and the practices and knowledge base of processors.

A total of 46 fish samples were collected from four processors at three points along the processing line, which were: acquisition, processing site before smoking, and freshly smoked. Three of these processors were based at Tema New Town and one (who is also an exporter) was based at Achimota, Accra. A questionnaire was used to collect data on the knowledge base and sanitation practices of 21 processors. The sanitary and hygienic conditions at processing sites were assessed, guided by the Ghana Standard Code of Practice for the processing of smoked fish. Fish samples were analysed for microbial loads using the pour plate technique and enterobacteriaceae were identified using API 20E system.

The total viable counts of all fish samples were found to fall below the ICMSF guidelines for both fresh and smoked fish. The *E. coli* loads of fresh fish samples (10^1 - 10^4 cfu/g) were however high compared to ICMSF guidelines. The load of fresh samples from the exporter fell between the maximum recommended bacterial count for good quality products and that for marginally acceptable quality products.

The smoked fish industry was found to be dominated by women, mostly within their peak reproductive age. The illiteracy level was found to be quite high among the processors (61.9% had no formal education).

The processing environments within which the fish was processed were found to differ among the processors, particularly between the exporter and the processors at Tema New Town. The differences observed included sanitary and hygiene facilities present at processing sites. Differences were also

observed in the handling of the fish before and during smoking and personal hygiene of processors. One-way ANOVA for differences in *E. coli* and streptococci loads fresh fish and freshly smoked fish at processing sites revealed differences among processors.

In conclusion, differences observed in the microbial population of fish samples may be due to differences in the facilities available at the processing sites and the practises of processors. In addition, target market for the smoked fish affected some of the practises during the processing of the fish.

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