

## **ABSTRACT**

Fish processing plants still face microbial food safety-related product rejections and the associated economic losses, although they implement legislation, with well-established quality assurance guidelines and standards. We assessed the microbial performance of core control and assurance activities of fish exporting processors to offer suggestions for improvement using a case study. A microbiological assessment scheme was used to systematically analyze microbial counts in six selected critical sampling locations (CSLs). Nine small-, medium- and large-sized companies implementing current food safety management systems (FSMS) were studied. Samples were collected three times on each occasion (n = 324). Microbial indicators representing food safety, plant and personnel hygiene, and overall microbiological performance were analyzed. Microbiological distribution and safety profile levels for the CSLs were calculated. Performance of core control and assurance activities of the FSMS was also diagnosed using an FSMS diagnostic instrument. Final fish products from 67% of the companies were within the legally accepted microbiological limits. Salmonella was absent in all CSLs. Hands or gloves of workers from the majority of companies were highly contaminated with *Staphylococcus aureus* at levels above the recommended limits. Large-sized companies performed better in Enterobacteriaceae, *Escherichia coli*, and *S. aureus* than medium- and small-sized ones in a majority of the CSLs, including receipt of raw fish material, heading and gutting, and the condition of the fish processing tables and facilities before cleaning and sanitation. Fish products of 33% (3 of 9) of the companies and handling surfaces of 22% (2 of 9) of the companies showed high variability in Enterobacteriaceae counts. High variability in total viable counts and Enterobacteriaceae was noted on fish products and handling surfaces. Specific recommendations were made in core control and assurance activities associated with sampling locations showing poor performance.