

Identification of critical control points using water quality as an indicator of hygiene in artisanal fisheries on Lake Malawi

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Abstract

Fish are a highly perishable commodity, and unhygienic fresh fish supply chains have been documented over the past two decades in sub-Saharan Africa. Fishers spend long hours on boats with no provision of sanitary facilities, and even after landing, they are often in environments without sanitary facilities. The purpose of this case study was to explore the impact of water, sanitation and hygiene practices in an artisanal fishery on food safety by analysing water samples that are in close contact with fresh fish at various checkpoints from capture to sale at the local market along the shores of Lake Malawi (Malawi). The four checkpoints included fishing boats at the fishing ground before fishing commenced (n=85), in the same boats at the landing site before offloading fresh fish (n=85), with fresh fish

transporters at the landing site (n=71) and among vendors at the market (n=63). *Escherichia coli* was found in a high percentage of samples at each of the four checkpoints during the dry, wet and cold seasons. The highest risk for contamination (as represented by *E. coli* concentrations) was the transition from transport to vendor, regardless of the season during which the samples were taken. The product value chain demands food safety. This research has potential applications in informing future interventions to develop behavioural change strategies regarding handwashing and toileting practices and norms unique for highly mobile fishing communities through the integration of hardware and software solutions and using better-quality water to store fish on the boat, in transport and at the market.

Keywords: *Escherichia coli*, fisheries, Malawi, sanitation, water quality