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"Competing pathways for equitable food systems transformation: Trade-offs and synergies"

Bacterial quality assessment of meat from selected butcheries in peri-urban areas of Nairobi, Kenya

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Abstract

Unhygienic meat handling practices predispose the meat to contamination by pathogenic and spoilage bacteria, leading to sickness, food loss, and economic costs. Despite the existence of food safety policies in Kenya, well-structured risk assessments are rarely done, and enforcement of regulations is weak. Evidence-based studies to address bacterial contamination of meat and unhygienic handling practices are needed. The objectives of the study were to assess the microbial quality/contamination of meat sold in selected butcheries in Peri-urban areas of Nairobi and the associated handling practices of butcher shop attendants. These data will be used to guide the design of a meat safety intervention.

A descriptive, cross-sectional study design was used, and 200 meat samples were collected by purchasing beef from 200 randomly selected butcheries. A checklist was used for the visual observation of meat-handling practices. Total coliform and Escherichia coli were enumerated using 3M Petri film EC count plates and *Salmonella* chromogenic agar was used to isolate Salmonella. Species identification was done using the Matrix-assisted laser desorption/ionisation-time of flight mass spectrometry (MALDI-TOF MS).

Sixty-one percent of samples had levels of total coliforms above the acceptable regulatory limit (EU standards). Additionally, 36 % of samples had levels of *E. coli* above the acceptable regulatory limit but no *Salmonella* was detected. Eighty-five percent of the butcher attendants neither washed their hands before nor after handling the meat and 91 % handled money while selling meat at the same time. The presence of microbial loads above the regulatory limit indicates poor meat handling practices which were also observed, increasing the risk of foodborne illness in consumers. There is a need for the education of stakeholders in the meat supply chain on the appropriate handling of meat and the importance of these practices to public health.

Keywords: Bacteria, contamination, meat, Nairobi

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