

ABSTRACT

The public health concerns in Kenya together with a competitive global trade in red meat have been incentives in demand for disease-free animals and animal products. Most local slaughterhouses located in rural arid and semi-arid lands (ASALs) of Kenya lack enough infrastructure, technological and human capacity to support the dispatch of meat of known safety levels. In addition to this, the provisions of the Meat Control Act CAP 356 are poorly enforced. Consequently, the safety status of meat consumed by the domestic market is to a great extent unknown.

This study seeks to determine the level of enterohemorrhagic *Escherichia coli* (EHEC) O157:H7 contamination in beef carcasses prior to dispatch to the retail markets in Kajiado County. Slaughterhouse management and workers will be interviewed through structured questionnaires to establish their knowledge, attitudes and practices on the production of safe meat and their linkages with other beef value chain actors. In the months of April 2021 and August 2021 seasonal prevalence data on diarrheagenic *E. coli* EHEC O157:H7 shall be collected from bovine carcass samples, hides and intestinal content from the four slaughterhouses in Kajiado County. The microbiological culturing of *E. coli* EHEC O157:H7 will be investigated after which PCR analysis of its virulence genes will be performed. Antimicrobial resistance (AMR) profiles of the isolated strains will be performed by the Kirby-Bauer antibiotic sensitivity test. The testing for extended spectrum beta-lactamases will be done by double disc diffusion method then confirmed by VITEK®.

In an attempt to establish a risk-based decontamination method, carcass washing with portable water at temperatures of 65, 70, 75 and 80 °C for 20 seconds will be evaluated on the reduction of bacteria and determined by total aerobic plate count as well as water temperature effect on the appearance of the carcass. The study will ultimately carryout cooking tests to assess the effects of four cooking methods on microbial load, namely braising method for the production of stews (98 °C for 72 minutes), oven roasting method to simulate grilled meats (160 °C for 72 minutes), pressure cooking at 60 °C for 30 minutes 150 MPa and sous-vide, a low temperature- long time method as used at catering outfits (58 °C for 72 minutes).

The study will be able to make recommendations for a complementary training curriculum to be offered to the slaughterhouse's workers, enable slaughterhouse management and workers to better integrate and employ the the provisions of the Meat Control Act CAP 356 consistently. Similarly, the study expects to enable slaughterhouse management put in place seasonally-based controls to avert risks in addition to delivering a cooking method that will produce beef products of acceptable microbiological quality.

The study will have a research phase running for two years beginning April 2021.