

Comparative Assessment of Biological and Chemical Hazards Associated with Fresh and Frozen Chicken Meat at the Retail Level

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Both frozen branded chicken and fresh chicken meat is popular among Sri Lankan consumers but the biological and chemical hazards associated with those products are not investigated adequately. This study aims to assess the occurrence of such hazards in fresh and branded chicken on the aspects of the presence of foodborne bacterial pathogens, their antimicrobial resistance (AMR) and the presence of antimicrobial residues. Sixty-seven meat samples: 46 on-request produced fresh chicken meat and 21 branded frozen chicken meat samples (7 different brands) were purchased from retail shops and supermarkets respectively in Kurunegala Municipality and Pradeshiya Sabha area. Samples were tested to determine the presence of common foodborne bacterial pathogens, AMR and residues adopting to standard methods. The isolation rates of *E. coli*, *Salmonella* spp., and *Campylobacter* spp. in fresh chicken meat compared to frozen chicken were as follows: *E. coli*: 63% (29/46) in fresh chicken vs. 85.71% (18/21) in frozen chicken. *Salmonella* spp.: 54.3% (25/46) in fresh chicken vs. 14.28% (3/21) in frozen chicken. *Campylobacter* spp.: 4.3% (2/46) in fresh chicken vs. 19% (4/21) in frozen chicken. Even though both sample types were positive for *Staphylococcus* spp., coagulase positive *Staphylococci* were detected only in branded frozen chicken samples with the rate of 33.3% (7/21). Majority of isolated *E. coli* and *Salmonella* spp. from both fresh and branded frozen chicken were multidrug resistant (MDR) with resistance to ≥ 3 classes of antimicrobials. Considering *E. coli*, in fresh vs frozen chicken MDR isolates were 93% (27/29) and 72.2% (13/18) respectively. Occurrence of MDR *Salmonella* is 52% (13/25) and 100% respectively. MDR was reported in only one pathogenic *Staphylococcus* spp, from frozen chicken. None of the meat samples were positive for antimicrobial residues. The study findings indicated inadequate microbiological quality in both fresh and frozen chicken. This underscores the urgent need for the implementation and ongoing monitoring of good hygienic practices throughout the food chain, supported by robust quality control systems.

Keywords: Food borne pathogens, MDR, Antimicrobial residues, Fresh chicken, Branded frozen chicken