

Bacterial contamination of Kale(*Brassica oleracea acephala* along the supply chain in Nairobi and its environments

E. K, Kutto; M.W, Ngigi; N, Karanja; E, Kange'the; L. C, Bebora; C. J, Lagerkvist; P. G, Mbuthia; L. W, Njagi; J. J, Okello

Date: 2011

Abstract

To assess the microbiological safety of kale (*Brassica oleracea Acephala*) produced from farms and those sold at the markets with special focus on coliforms, *E.coli* and *Salmonella*. Design: A cross sectional study. Setting: Peri-Urban farms (in Athi River, Ngong and Wangige), wet markets (in Kawangware, Kangemi and Githurai), supermarkets and high-end specialty store both within Nairobi city. Results: Mean coliform count on vegetables from farms were $2.6 \times 10^5 \pm 5.0 \times 10^5$ cfu/g while those from the wet markets were $4.6 \times 10^6 \pm 9.1 \times 10^6$ cfu/g, supermarkets, $2.6 \times 10^6 \pm 2.7 \times 10^6$ and high-end specialty store $4.7 \times 10^5 \pm 8.9 \times 10^5$. Coliform numbers obtained on kales from the wet markets and supermarkets were significantly higher ($p < 0.05$) compared to those from farms, while kale samples purchased from high- end specialty store had similar levels of coliform loads as those from the farms. *E. coli* prevalence in the wet markets, supermarkets and high-end specialty store were: 40, 20 and 20%, respectively. *Salmonella* was detected on 4.5 and 6.3% of samples collected from the farms in Wangige and wet market in Kawangware, respectively. Fecal coliforms in water used on farms (for irrigation) and in the markets (for washing the vegetables) exceeded levels recommended by World Health Organization (WHO) of 103 organisms per 100 milliliter while *Salmonella* was detected in 12.5% of washing water samples collected from Kangemi market. Conclusion: Poor cultivation practices and poor handling of vegetables along the supply chain could increase the risk of pathogen contamination thus putting the health of the public at risk, therefore good agricultural and handling practices should be observed.