BITS project: Testing Vegetables for Bacterial Contamination

Introduction

Fruits and vegetables are vital to a healthy diet but can be contaminated by bacteria, posing significant health risks. In recent years *E. coli O157:H7* outbreaks in the U.S. have affected imported lettuce, impacting partners like Barbados. This Caribbean nation relies heavily on imported leafy greens, making it vulnerable to foreign food handling practices. Local production in Barbados also faces contamination issues with bacteria like *E. coli O157:H7* and *Salmonella* due to poor food handling. This project evaluates bacterial contamination in 28 samples from Barbados' supermarkets. We led a multidisciplinary approach in order to assess the risks in Barbados, aiming to provide recommendations for the Ministry of Agriculture.

Method

We sampled leafy greens weekly from various supermarkets, preparing samples for microbial analysis, and documenting results. Fresh products from both imported and local sources were selected to ensure reliability in our conclusion. We thus proceeded to a precise laboratory protocol to test vegetables adequately. These practices include sampling of our products under sterile conditions, preparation of pre-enrichment medium (Buffer Peptone Water), PCR test and streaking test. This series of techniques allows for DNA amplification and bacteria isolation and identification. Data was then recorded on the database software that we use to analyze and compare across produce, sources and brands.

Key results

Concerning the variety of green products we tested (lettuce, cabbage, kale, cucumber), our investigation didn't show any sign of *E. Coli O157:H7* contamination in the investigated samples when PCR was done. This was concluded based on the results obtained with the positive and spiked controls. Bacterial growth was observed when streaking was done, but we concluded it was not *E. coli O157:H7*. While this is certainly positive news, we yet emphasize the need for continuous testing and monitoring as the strains of bacteria found were not identified and could pose a threat to human health. Therefore, the tested products would need extensive investigation such as PCR for other bacterial DNA.

Conclusion

This project allowed us to assess bacterial contamination in various leafy greens sourced from Barbados' supermarkets. We argue that rigorous testing and ongoing monitoring are essential to ensure food safety and protect consumer health, particularly in Barbados, where tourism is a key economic driver. To strengthen Barbados's resilience to these challenges, we recommend promoting local agriculture and sustainable practices. Additionally, raising awareness among both consumers and producers is crucial to drive change.

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