

## Evaluation of Microbiological Quality and Safety of Two Types of Salads Prepared at Libyan Airline Catering Center in Tripoli

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**Abstract :** This study was designed to evaluate the microbiological quality and safety of two types of salads prepared at a catering center affiliated with Libyan Airlines in Tripoli, Libya. Two hundred and twenty-one (221) samples (132 economy-class and 89 first-class) were used in this project which lasted for ten months. Biweekly, microbiological tests were performed which included total plate count (TPC) and total coliforms (TCF), in addition to enumeration and/or detection of some pathogenic bacteria mainly *Escherichia coli*, *Staphylococcus aureus*, *Bacillus cereus*, *Salmonella sp*, *Listeria sp* and *Vibrio parahaemolyticus* parahaemolyticus, By using conventional as well as compact dry methods. Results indicated that TPC of type 1 salad ranged between ( $<10 - 62 \times 10^3$  cfu/gm) and ( $<10$  to  $36 \times 10^3$  cfu/g), while TCF were ( $<10 - 41 \times 10^3$  cfu/gm) and ( $<10$  to  $66 \times 10^2$  cfu/g) using both methods of detection respectively. On the other hand, TPC of type 2 salad were: ( $1 \times 10 - 52 \times 10^3$ ) and ( $<10 - 55 \times 10^3$  cfu/gm) and in the range of ( $1 \times 10$  to  $45 \times 10^3$  cfu/g), and the (TCF) counts were between ( $<10$  to  $55 \times 10^3$  cfu/g) and ( $<10$  to  $34 \times 10^3$  cfu/g) using the 1st and the 2nd methods of detection respectively. Also, the pathogens mentioned above were detected in both types of salads, but their levels varied according to the type of salad and the method of detection. The level of *Staphylococcus aureus*, for instance, was 17.4% using conventional method versus 14.4% using the compact dry method. Similarly, *E. coli* was 7.6% and 9.8%, while *Salmonella sp.* recorded the least percentage i.e. 3% and 3.8% with the two mentioned methods respectively. First class salads were also found to contain the same pathogens, but the level of *E. coli* was relatively higher in this case (14.6% and 16.9%) using conventional and compact dry methods respectively. The second rank came *Staphylococcus aureus* (13.5%) and (11.2%), followed by *Salmonella* (6.74%) and 6.70%). The least percentage was for *Vibrio parahaemolyticus* (4.9%) which was detected in the first class salads only. The other two pathogens *Bacillus cereus* and *Listeria sp.* were not detected in either one of the salads. Finally, it is worth mentioning that there was a significant decline in TPC and TCF counts in addition to the disappearance of pathogenic bacteria after the 6-7th month of the study which coincided with the first trial of the HACCP system at the center. The ups and downs in the counts along the early stages of the study reveal that there is a need for some important correction measures including more emphasis on training of the personnel in applying the HACCP system effectively.

**Keywords :** air travel, vegetable salads, foodborne outbreaks, Libya

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