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Prevalence of some food poisoning bacteria in some ready to eat sandwiches

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By

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7- Summary

The current study aimed to study the extent of contamination of some ready-to-eat meat products sandwiches represented by (beef kofta, beef liver, chicken nuggets, and fish fillet - 30 samples of each type) that were collected from various restaurants and street vendors in Benha City, Qalubiya Governorate, Egypt, to examine the bacteriological inventory of these products, its safety, and impact on the health of the consumer.

The main objective of the study was to demonstrate the bacteriological quality and safety of the examined products for consumption. The average counts of APC, coliform, and staphylococci were 9.6×10^6 , 1.9×10^2 , and 10.3×10^4 CFU/g in kofta sandwich samples; 1.2×10^6 , 1.1×10^2 , 8.6×10^4 CFU/g in liver sandwich samples; 3.6×10^6 , 1.3×10^2 , and 9.6×10^4 CFU/g in fish fillet sandwich samples; 5.8×10^6 , 1.6×10^2 , and 9.9×10^4 CFU/g in chicken nugget samples, respectively. In addition, the prevalence of coliform and staphylococci in the examined samples were totally 37.5 and 46.6%, respectively; where kofta sandwich samples were the most contaminated samples with the incidence of 50 and 53.3%, respectively.

The bacteriological identification of the isolates showed the presence of *Escherichia coli*, *Salmonella* and *S. aureus* with the prevalence of 5.8, 2.5 and 34.2% in the examined samples, respectively.

E. coli was found at 10, 3.33, 3.33 and 6.66% in the examined samples of kofta, liver, fish fillet, and chicken nuggets sandwiches, respectively. The serological classification of the isolates showed the presence of the strains *E. coli* O₁₂₈:H₂, O₂₆:H₁₁, O₁₁₉:H₆, O₉₁:H₂₁, O₇₈, and O₁:H₇.

Salmonella was detected in 6.66% and 3.33% of the examined samples of kofta and liver sandwiches, respectively, while fish fillet and chicken nuggets samples were free from salmonella contamination. The serological classification of the isolates showed presence of *S. Typhimurium*, *S. Infantis* and *S. Enteritidis*.

Whereas, *S. aureus* was found at 40, 26.6, 33.3 and 36.6% in the examined samples of kofta, liver, fish fillet and chicken nuggets, respectively, to come first in terms of the percentage of presence in the examined product sandwich samples; and since the *S. aureus* was the most prevalent in the examined samples, the study followed the properties of the *S. aureus* isolates deeper in terms of the genetic detection of the presence of *S. aureus* genes responsible for the secretion of enterotoxin (SEs).

Genetic examination of ten isolates was carried out using the multiplex PCR, which showed presence of 2 isolates carrying *sea* gene, and one strain showed carrying *sec* gene as well; while one isolate was found bearing both genes of *S. aureus* enterotoxin type C and D. Enterotoxin genes carrying *S. aureus* was detected in 30% of the examined isolates.

From the obtained results, the study indicates the extent of contamination of some RTE meat products sandwiches with foodborne bacteria in general and *S. aureus* especially. In particular, detection of *S. aureus* producing SEs poses serious public health problem to the consumers.

Finally, the present study proved that meat products are considered of public health hazard due to presence of Staphylococci mainly enterotoxigenic *S. aureus*; this may be referred to mishandling and the negligence of hygienic aspects either at production levels where most workers did not have medical certificates or selling of meat with expired dates. Moreover, the hygienic measures are suggested for obtaining meat and meat products with controlled bacterial pathogens to be fit for human consumption.