Prevalence, Antibiotic Resistance, and Virulence Traits of *Escherichia coli* in Fermented Dairy Products During Ramadan in Dakahliya, Egypt: A Public Health Concern

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During Ramadan in Egypt, fermented dairy products like Yoghurt and Laban Rayeb are essential for Sehoor due to their nutritional benefits. They aid digestion, provide lasting energy, and help maintain hydration during fasting. Combined with traditional foods, they sustain well-being throughout the holy month of fasting. The elevated demand for fermented dairy products increases production to meet consumer needs. However, this increase in production may potentially compromise safety standards, leading to contaminated products. Inadequate handling and poor quality control can result in the introduction of pathogenic bacteria with antimicrobial resistance and virulence traits, posing a significant threat to global public health. Data on the prevalence of virulent *Escherichia coli* in fermented dairy products during the holy Ramadan in most popular supermarkets in the highly populated districts of ten Dakahliya governorate cities, Egypt, remain limited.



A complex heatmap with hierarchical clustering illustrates the phenotypic antimicrobial resistance patterns of *E.coli* isolates.

A complex heatmap with hierarchical clustering illustrates the existence pattern of resistance genes in *E.coli* isolates

This study aimed to identify and characterize *E. coli* isolates using biochemical, serological, antibiotic susceptibility, and multiplex PCR (M-PCR) analyses of virulence genes. A total of 26 (22.6%) *E. coli* isolates, representing twelve distinct serotypes, were recovered from 115 randomly collected fermented milk samples, including yoghurt (n=55) and Laban Rayeb (n=60), obtained from various districts of ten Dakahliya governorate cities, Egypt. The most prevalent serotypes were O26:H11, O127:H6, and O91:H21. The virulence genes *stx1* and *stx2* were detected in most isolates, while *eaeA* and *hy/A* were found exclusively in O26:H11 and

O111:H2. The highest level of antibiotic resistance observed against and were vancomycin clindamycin, followed by trimethoprim and oxacillin, whereas ciprofloxacin and ampicillin demonstrated the greatest effectiveness. The antibiotic resistance patterns and virulence genes detected in isolated E. *coli* serotypes highlight inadequate food safety measures and the potential risk of food poisoning for consumers in the surveyed areas. This underscores the urgent need for stricter food control measures. Authorities must enforce proper hygiene standards to ensure the safety of fermented dairy products.

