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A Pilot Study on Evaluating the Microbial Quality of Produce Sold at the Wholesale Produce Market in Doha Qatar

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Environmental and sanitary conditions play a major role on the quality of fresh produce. The Wholesale Produce Market (WPM) in Doha is an open-air market located in close proximity to the livestock market and slaughterhouse. Currently, there is no data available on establishing the link between the microbial quality of produce sold at this market and environmental factors affecting the quality of produce. Therefore, this pilot study was carried out to evaluate the effect of environmental conditions (e.g.; seasonal temperature, humidity, hygiene conditions of the market) on the microbial quality of produce sold at the WPM. Triplicate samples of different produce samples (e.g.; tomato, lettuce, parsley, cucumber, and green onion) were collected monthly starting from July 2016 to June 2017. Selective media were used to determine the target microorganisms (e.g.; total aerobic bacteria-PCA, total E.coli - MCA, total Listeria - LSA, total coliform - EMB, total Staphylococcus - BPA, total Salmonella - XLT4, and total fungal growth - PDA). The colonies identified as presumptive target organisms were isolated and identified using molecular techniques. The results indicated that produce samples (especially parsley, green onion, and lettuce) tested in this study were highly contaminated with various microorganisms based on the PCA, MCA, and EMB counts. The microbial analysis of produce samples revealed that the most dominant strains in summer months (47°C daytime and 25°C nighttime) were Bacillus, Enterococcus, and Klebsiella. While, Pseudomonas and Enterobacter were the most abundant species during the winter months (24°C daytime, 12°C nighttime). In addition, Penicillium, Aspergillus, and Fusarium were the most commonly isolated fungal species during the months of November-January. It is clear that environmental conditions, such

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as temperature and humidity are the major factors affecting the growth of different microorganisms in fresh produce. Although no pathogenic target bacteria were detected in the produce samples at WPM, the relatively high PCA and EMB counts demonstrate the need to improve the sanitary conditions at this major produce market in Qatar.