

## Industrial and Food Microbiology and Biotechnology

### P-210 - IMPACT OF STORAGE TEMPERATURE ABUSE ON THE MICROBIAL QUALITY AND SAFETY OF FRESH-CUT VEGETABLES AND FRUITS

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#### Background

Pre-packed fresh-cut fruits and vegetables satisfy the growing consumers demand for more convenient food. However, these products are highly perishable with short storage life under refrigeration temperatures below 5 °C. Several foodborne outbreaks linked to fruits and vegetables had been reported annually in the EU [1]. The impact of storage temperature abuse on the microbial quality and safety of fresh-cut fruits and vegetables was evaluated.

#### Method

Packages of pre-packed fresh-cut vegetables (shredded carrot and cress) and three pre-packed fresh-cut fruits (melon, melon-coconut, and pineapple-mango salads) from the same production lot were collected from retail. One package was immediately analysed, while three packages were stored until the last day of the expiration date at 4, 8 or 12 °C. For the shredded carrot and cress samples, three additional packages were open and closed by folding the package, to mimic what a consumer could do at home, and stored until the last day of the expiration date at 4, 8 or 12 °C. Microbial analysis were performed according to the procedures of International Organization for Standardization (ISO) [2] for enumeration of mesophilic aerobic counts (TVC), *Enterobacteriaceae*, *Escherichia coli*, coagulase-positive staphylococci, Lactic Acid Bacteria (LAB), and yeast and molds), and detection of *Salmonella* spp. and *Listeria monocytogenes*. pH values were measured for each sample.

#### Results & Conclusions

Samples analysed immediately after purchase presented TVC levels between 6.9 – 8.9 Log CFU/g, *Enterobacteriaceae* between 4.3 – 6.3 Log CFU/g, LAB between 3 – 9 Log CFU/g, yeasts between 3.5 – 5.3 Log CFU/g, molds between < 1.0 – 4.3 Log CFU/g. *Escherichia coli* and coagulase-positive staphylococci were absent (< 1.0x10<sup>1</sup>CFU/g) in all samples. Fresh-cut melon was positive for *Salmonella* spp., and the pineapple-mango salad was positive for *L. monocytogenes*. In general, stored packages at 4, 8 and 12 °C until de expiration date presented higher counts of *Enterobacteriaceae*. Cress sample (closed packaged) stored at 12 °C was positive for *L. monocytogenes* after 3 days of storage. Otherwise no differences were found among storage at different temperatures.

The presence of pathogens is worrisome and overall results indicate the need of implementing rules in the production and cold chains of these products to ensure food safety and quality.

#### References & Acknowledgments

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[1] Foodborne Pathog. Dis. 2015. 12(1): 32-38 DOI: 10.1089/fpd.2014.1821

[2] Available at <https://www.iso.org/standards.html>

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