Synergistic effect of UV light and sanitizers on the survival of *Listeria monocytogenes* biofilms

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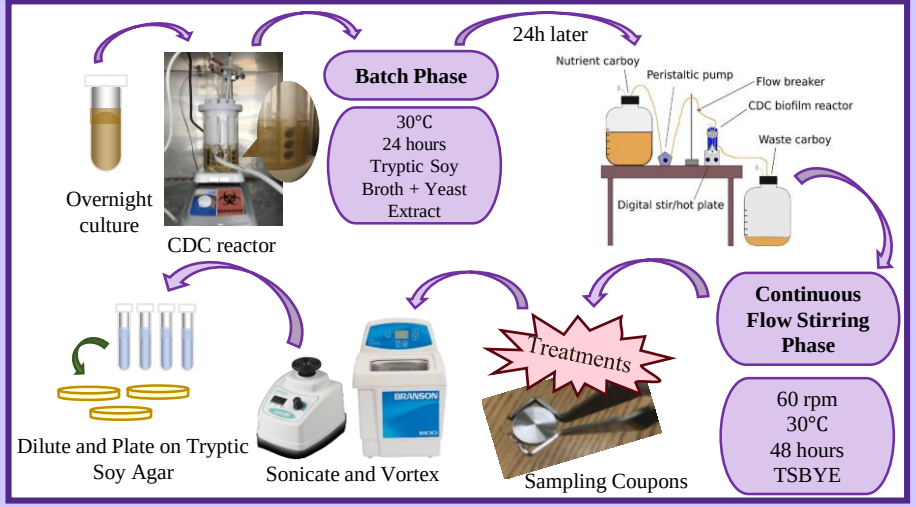
Introduction

- *Listeria monocytogenes* is a psychrotrophic, foodborne pathogen that concerns the food industry for its ability to form biofilms able to survive in harsh environments (Figure 1).
- Even when proper sanitization procedures are used in food production, *L. monocytogenes* can adapt and grow.
- The use of hurdle technology might represent a promising method to control biofilm growth and prevent contamination within food processing plants.

Objectives

The objective was to evaluate the effect of UV light alone or in combination with sanitizers (peracid acid, quaternary ammonium and lactic acid) on the survival of *L. monocytogenes* biofilms on stainless steel (SS) surfaces.

Materials and Methods



Results

- There was no difference between 15- and 30-minutes exposure to UV light (P>0.05) and a reduction of 2.0 and 1.8 log CFU/cm^2 was observed as compared to the control, respectively (Figure 2).
- LAC and QA combined with 30- minutes UV light presented 1 log CFU/cm2 greater reduction than sanitizers alone (P<0.05), hence suggesting a synergistic effect.
- PA alone or in combination showed the greatest reduction among treatments (P<0.05).

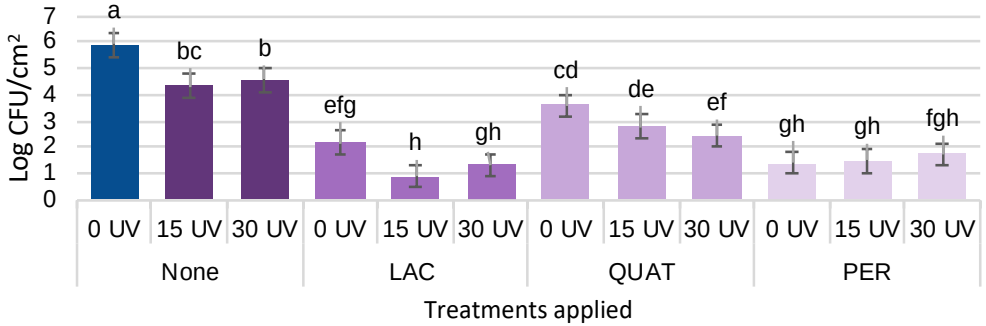


Figure 2. Data sharing the same letter are statistically the same. 0UV: No exposure to UV light. 15UV: 15min exposure to UV light. 30UV: 30min exposure to UV light. LAC: Lactic acid (4%). QUAT: Quaternary ammonium-based sanitizer (389ppm). PER: Peracid acid (190ppm).

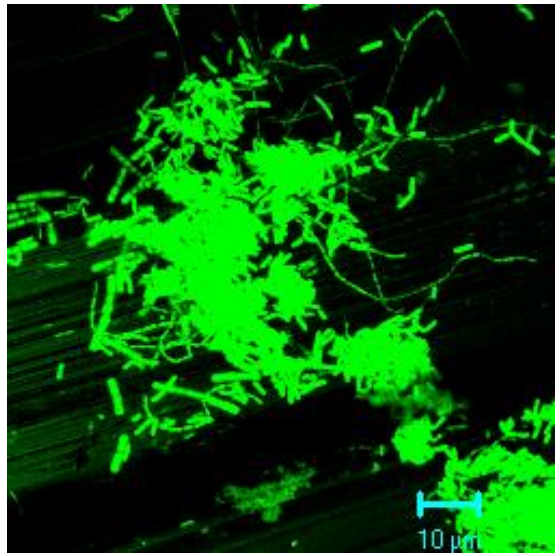


Figure 1. Biofilm formed after three days under a Laser Scanning Microscope

Conclusions

This study shows a possible synergistic effect between LAC or QA with UV light, suggesting the use of hurdle technology to control *L. monocytogenes* biofilms.

References

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