

Reduction of *Listeria monocytogenes* on Stainless Steel Utilizing *Lactobacillus salivarius*

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Introduction

- Consumers expect the food they buy to be safe.
- To meet this expectation, the food industry has many regulations and preventative measures to prevent contamination.
- Food contamination can occur during transportation, handling, and processing.
- In processing plants, one of the most widely used food contact surfaces is stainless steel.
- Antibiotic sanitizers can be used to clean these surfaces but there are concerns about food pathogens becoming antibiotic resistant.
- As a result, scientists are exploring alternative options.
- The use of lactic acid bacteria (LAB) as a biosanitizer to replace antimicrobial sanitizers has become popular since LAB are generally recognized as safe by the US Food and Drug Administration.

Purpose

The purpose of this project was to analyze the ability of *Lactobacillus salivarius* (L28) to act as a pre-treatment and disrupt attachment of *Listeria monocytogenes* to stainless steel at 12°C and 25°C.

Methods

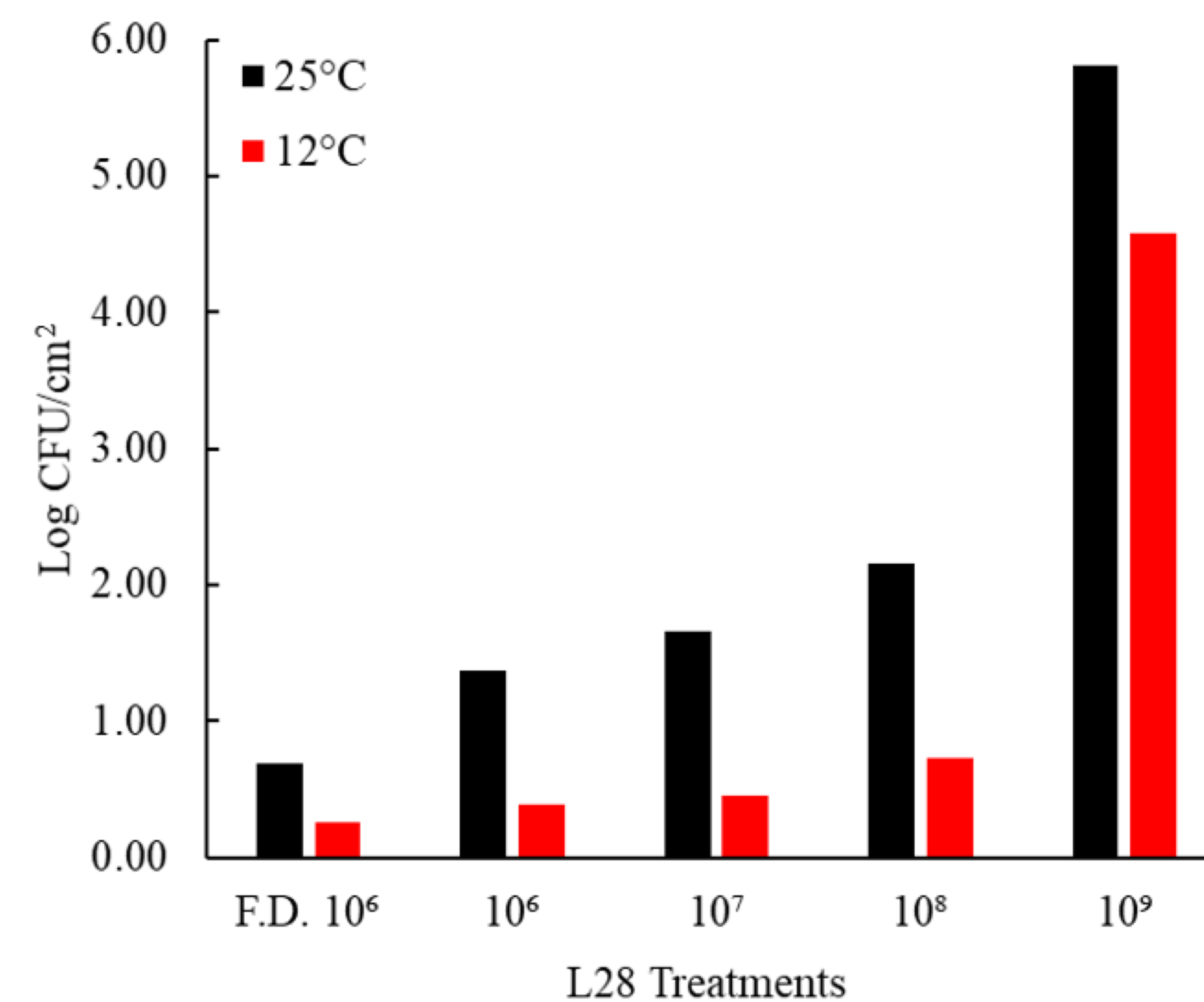
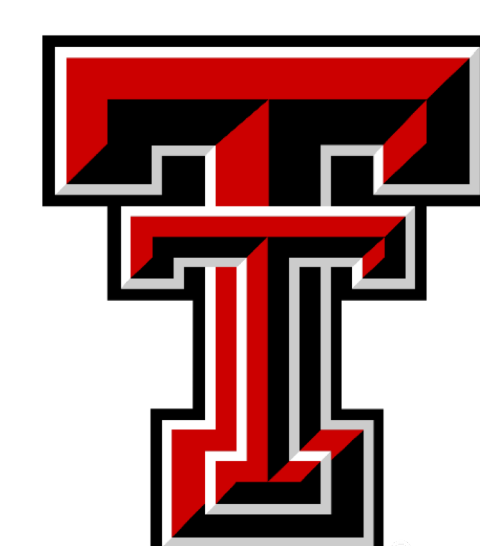
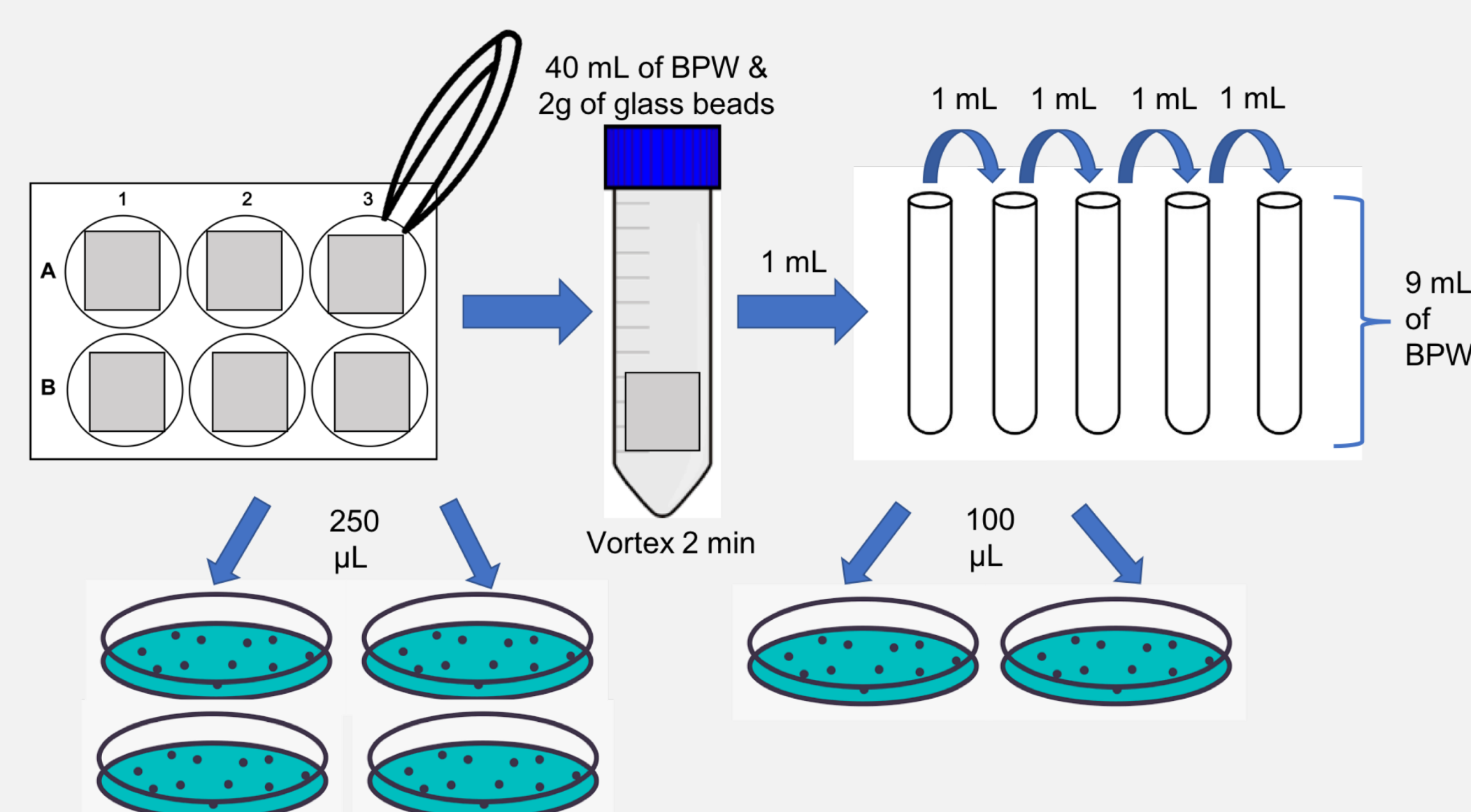


Figure 1: Reduction of *Listeria monocytogenes* attachment after L28 treatment application.

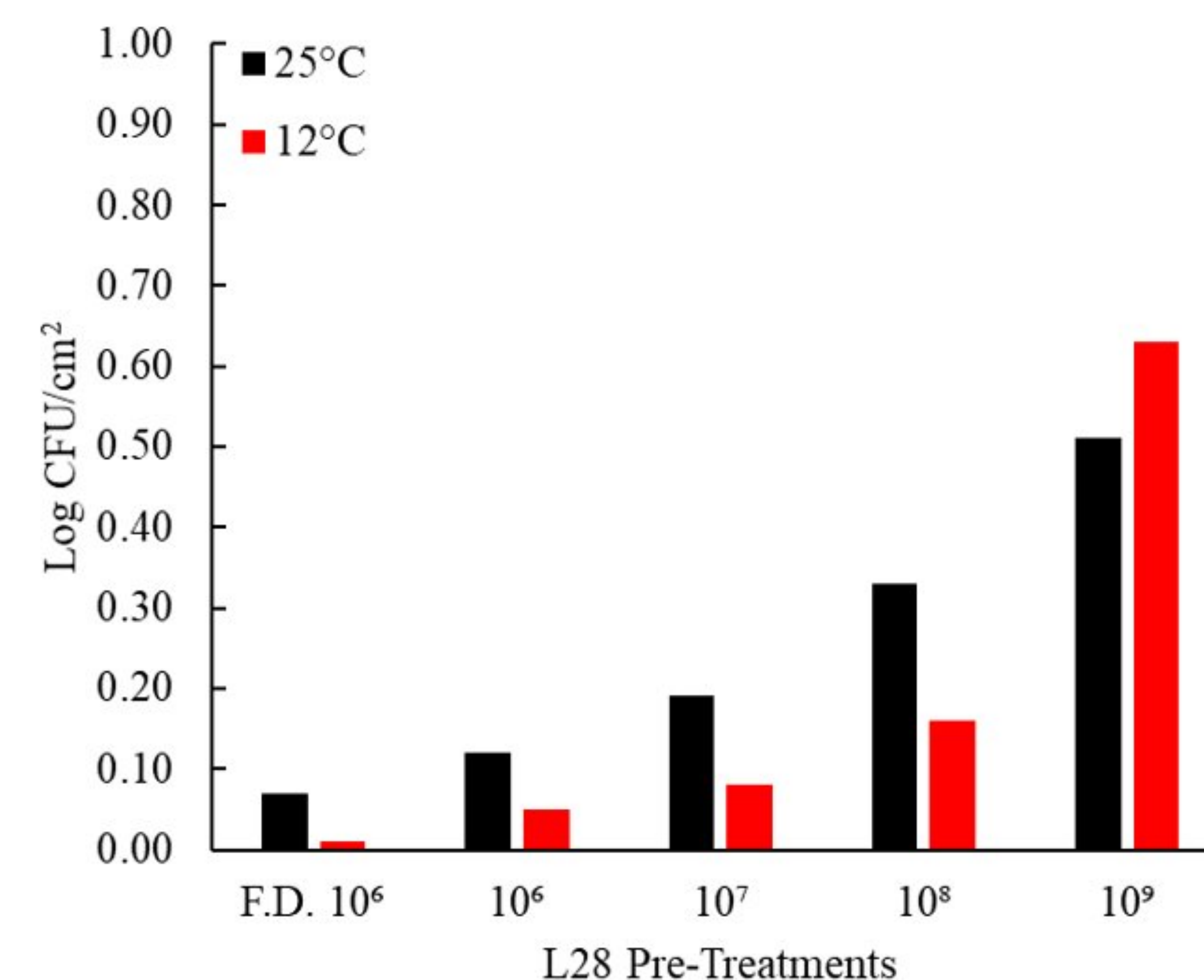


Figure 2: Reduction of *Listeria monocytogenes* attachment following one-hour L28 pre-treatment.

Results

- As L28 concentrations were increased, reduction of attached *Listeria monocytogenes* increased. Higher concentrations displayed the greatest reduction. A reduction means that the number of attached *L. monocytogenes* decreased.
- L28 was successful at inhibiting existing *L. monocytogenes* and semi-successful at preventing *L. monocytogenes* attachment
- This experiment was done with both freshly grown cultures of L28 and freeze dried cultures. We noticed that freeze dried cultures of L28 did not reduce attached *L. monocytogenes* counts to the same degree as the fresh cultures of L28 at the same concentrations.

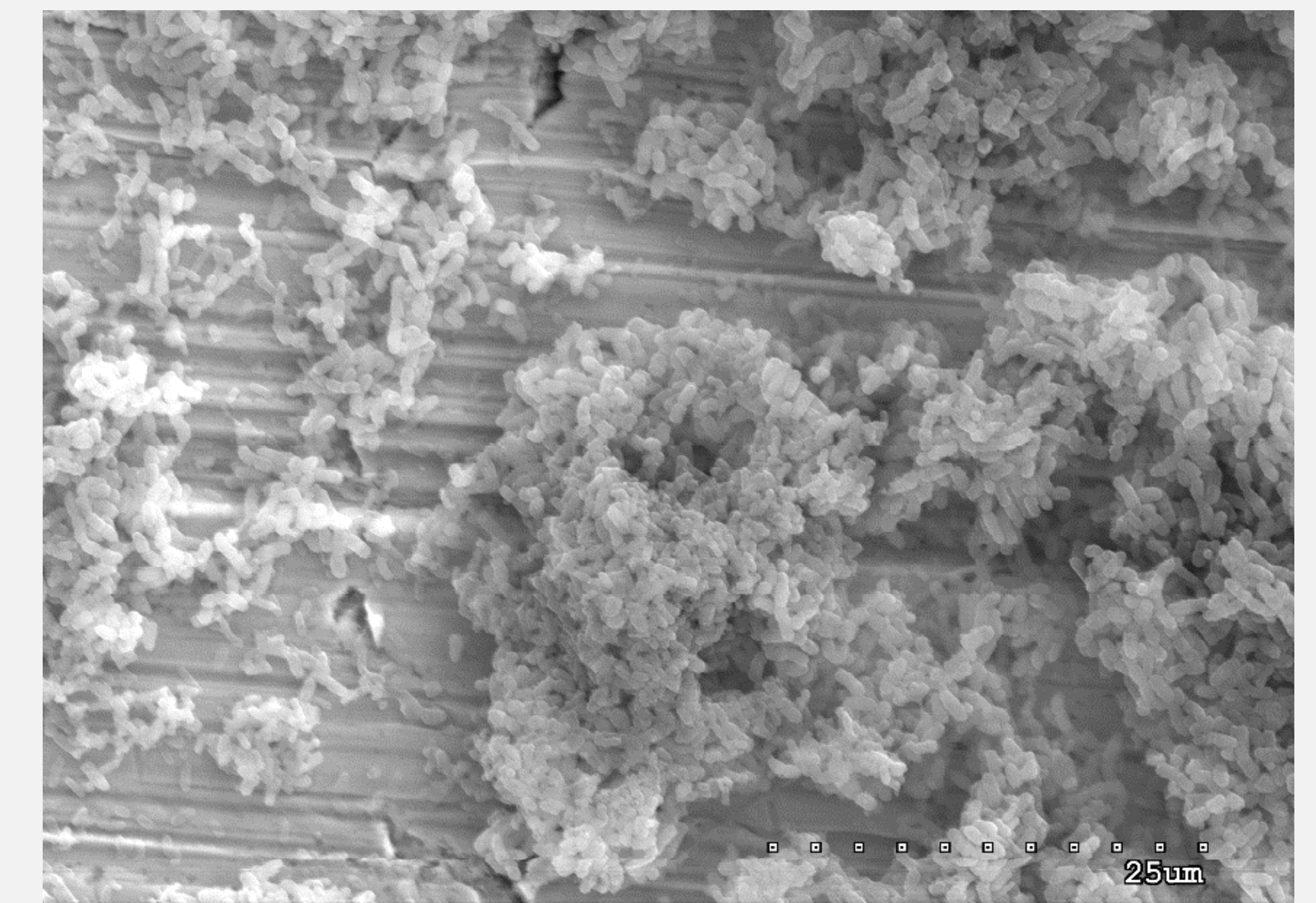


Figure 3: Stainless Steel coupon with *Lactobacillus salivarius* biomass formation (1)

Conclusions

With more research and fine tuning, we can hopefully phase out the use of antibiotic sanitizers and make biosanitizers more widely used in the future. L28 has potential to become a viable biosanitizer. This would have numerous advantages and could make an impact in the food industry and consumer health.

Acknowledgments

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References

1. TTU International Center for Food Industry Excellence (ICFIE) Lab collection

