

An accessible approach to reduce *Listeria monocytogenes* from lettuce

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Introduction

Raw vegetables are a vehicle of transmission of foodborne pathogens and play an important role in listeriosis epidemiology.

Proper food handling at home can maintain the hazard at a safe level and even reduce it. Thus, it is important to develop strategies to control *Listeria monocytogenes* in the home environment.

Interventions directed at home and retail environments may be an important way to reduce sporadic disease, which represents the greatest burden of *L. monocytogenes* infection.

Objectives

Screening of the antimicrobial activity of commercially available vinegars (cider, balsamic, fruit, rice and white and red wine).

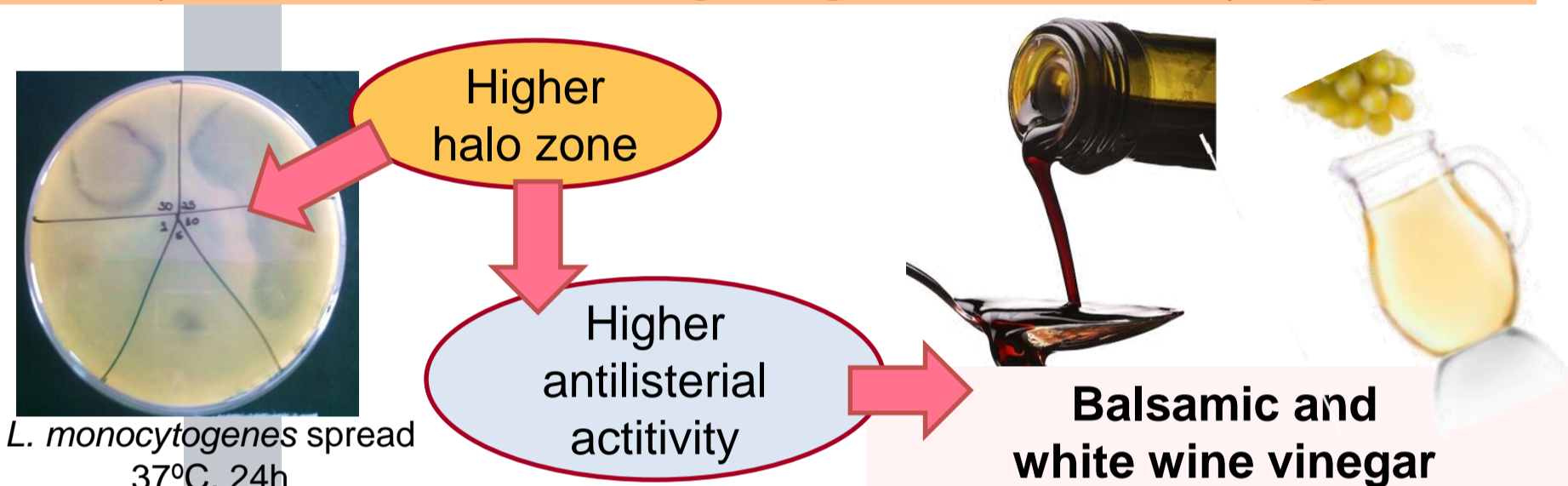
Assessment of the most effective conditions against *L. monocytogenes* onto lettuce artificially contaminated, by testing:

- the effect of simple water-washings
- the effect of acidity by using acetic acid solutions as control
- different vinegar/water proportions

Achievement of an effective decontamination washing method to be implemented at home and retail environments.

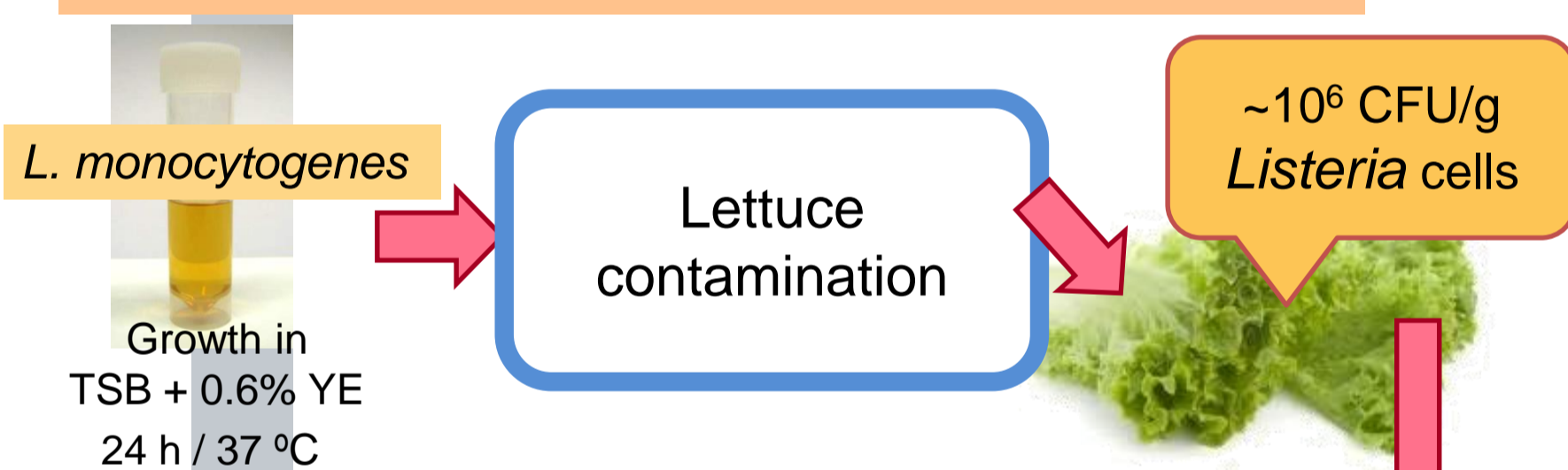
Methods

Activity of the various vinegar against *L. monocytogenes*

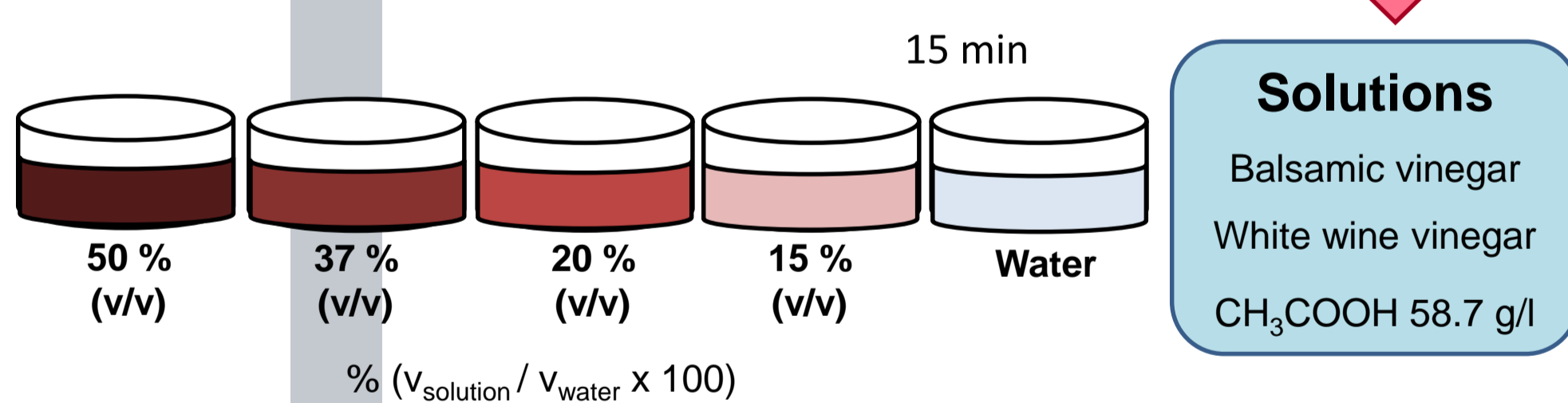


Antilisterial effect of selected solutions

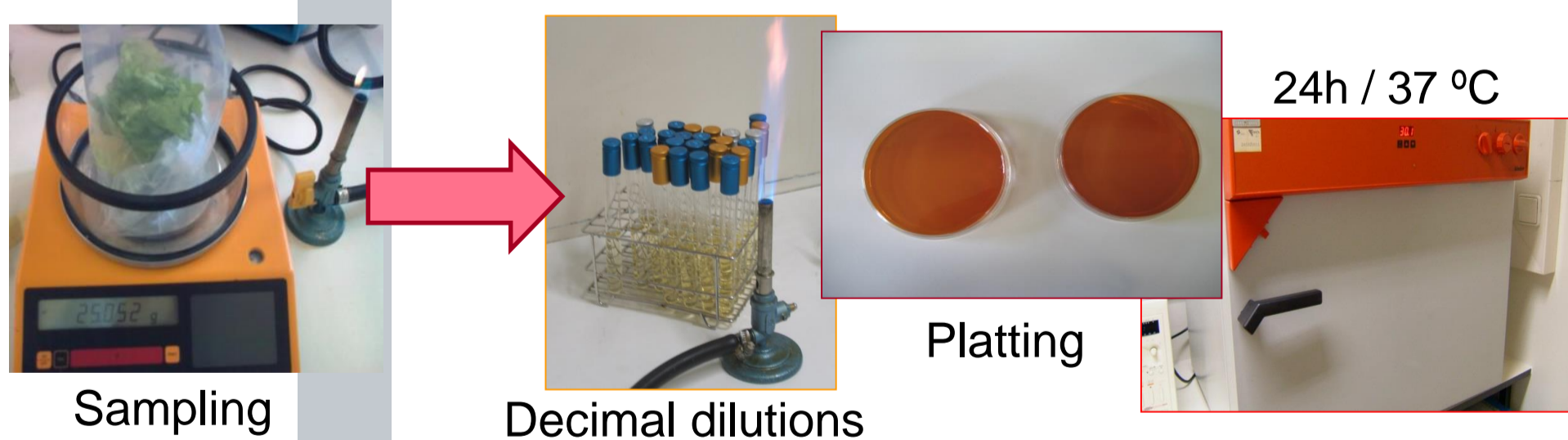
Contamination of lettuce



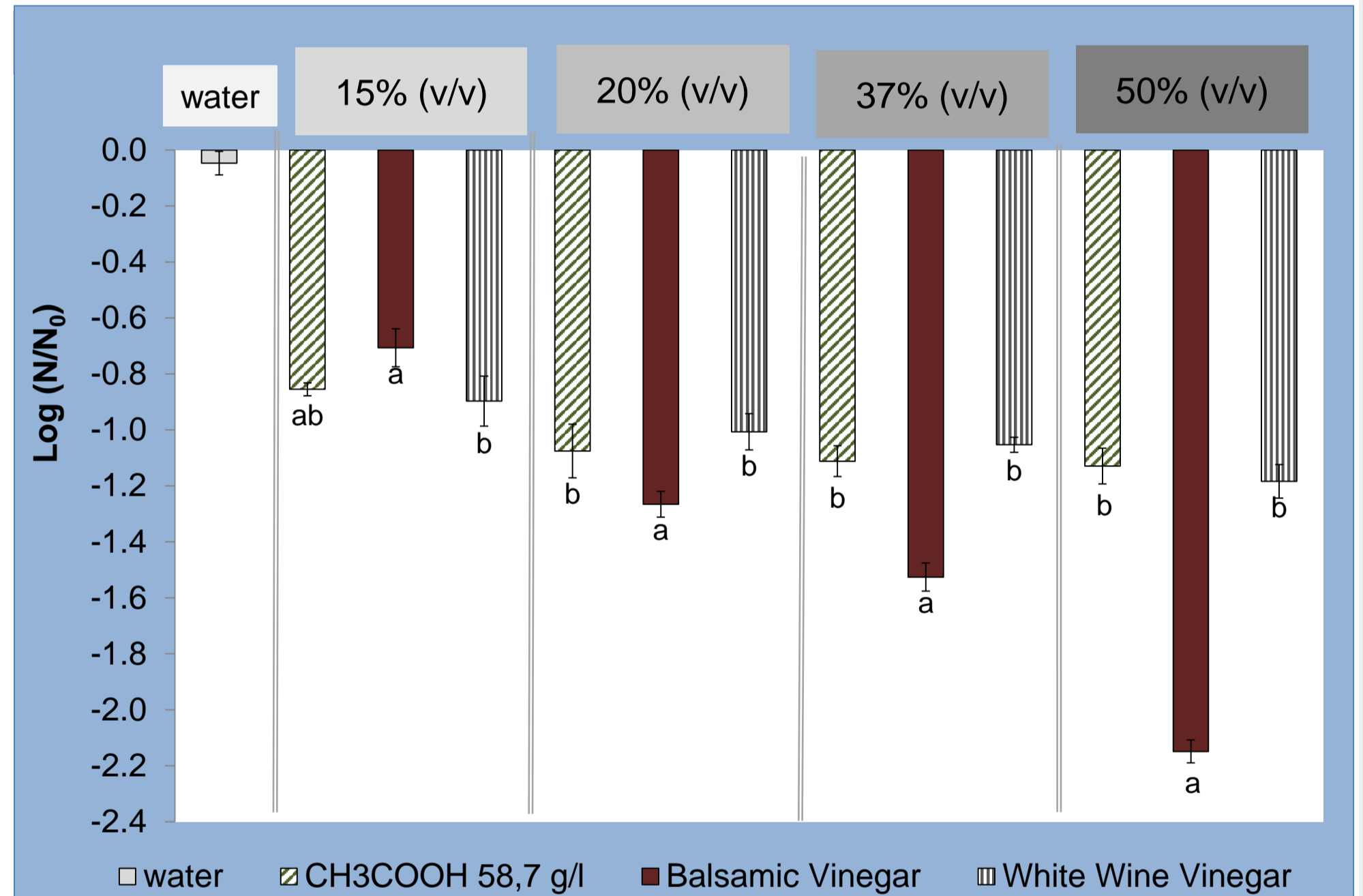
Washing of the lettuce in selected solutions



Sampling and *Listeria* Enumeration



Results

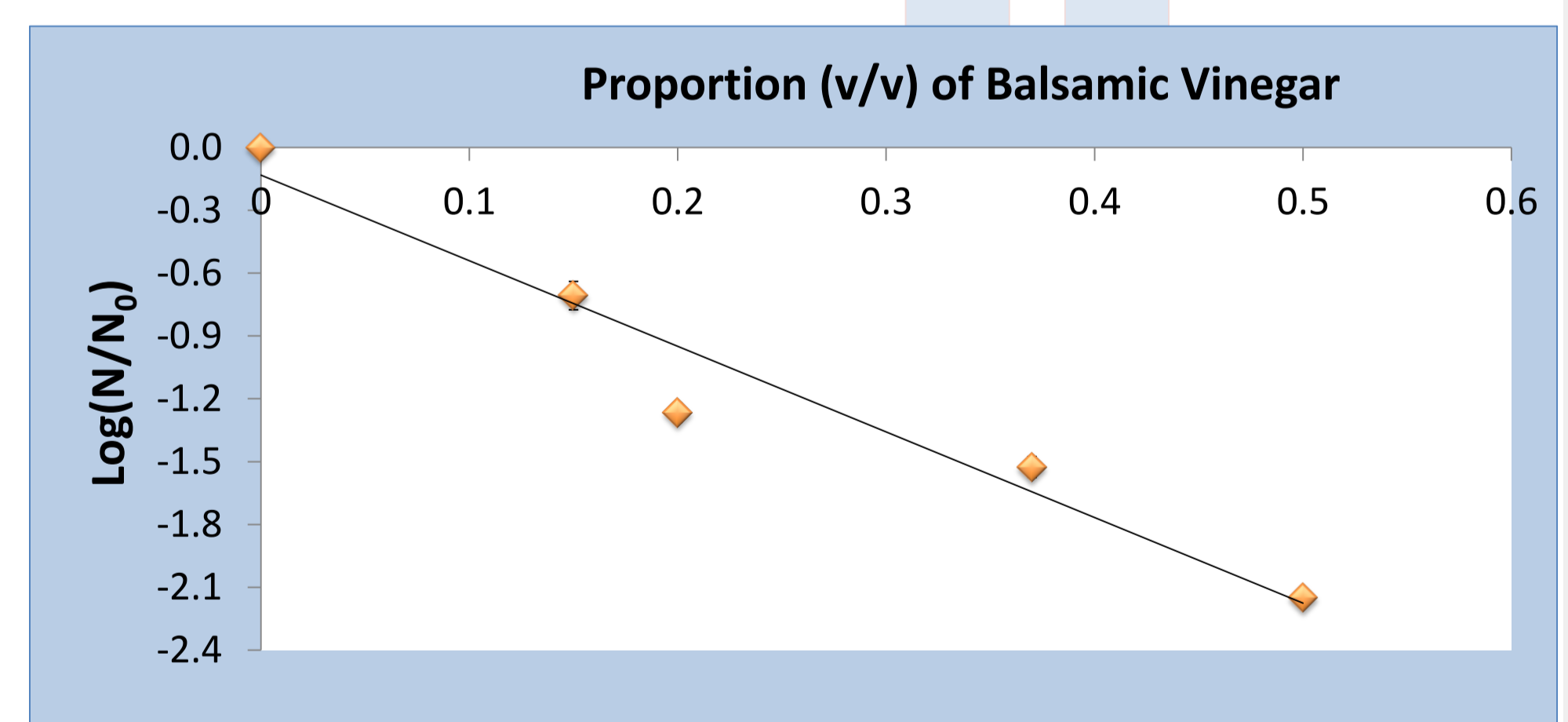


For a given proportion, values with different letters differ significantly ($p < 0.05$)

N – *Listeria monocytogenes* load

N_0 – Initial *Listeria monocytogenes* load

Listeria reduction versus balsamic vinegar proportion



$$\text{Log}(N/N_0) = -4.09 \text{ balsamic vinegar proportion (v/v)} - 0.13, \quad R^2 = 0.95$$

Conclusions

Balsamic vinegar washing is a promising method to reduce *L. monocytogenes* in contaminated lettuce.

A log reduction of 2.15 ± 0.04 *L. monocytogenes* cells can be achieved when using the highest proportion of balsamic vinegar (50 % v/v).

This procedure may inhibit other food pathogens present on produce surface or other foods, at home and retail environments.

Recipe: add a cup of balsamic vinegar (240 ml) to a cup of water (240 ml) and dip lettuce leaves (~240 g) for 15 min!

Acknowledgements

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