FACULTY OF BIOSCIENCE ENGINEERING

DEPARTMENT OF FOOD TECHNOLOGY, SAFETY AND HEALTH
RESEARCH UNIT FOOD MICROBIOLOGY AND FOOD PRESERVATION

ROMAINE LETTUCE INDIGENOUS MICROBIOTA SHOW POTENTIAL FOR GROWTH SUPPRESSION OF *LISTERIA MONOCYTOGENES*

Thomas De Bock, Mathis Vermeersch, Liesbeth Jacxsens, Frank Devlieghere and Mieke Uyttendaele

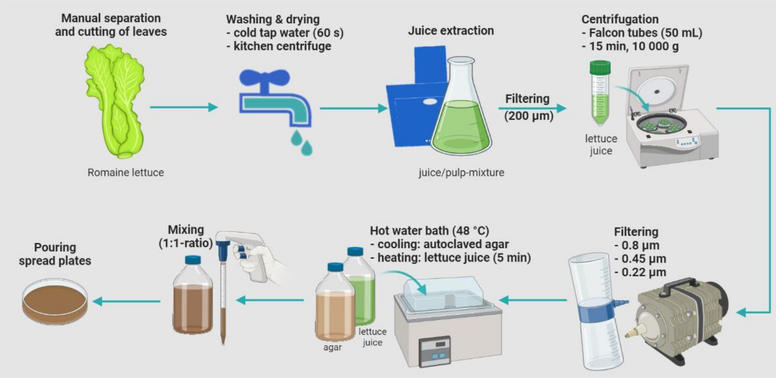
Objectives

There is increasing attention to ***L. monocytogenes* contamination** on **fresh-cut produce**. The prevalence of this pathogen on leafy greens is occasionally reported and usually present in low numbers (< 100 CFU/g) in particular when compared to the **abundance of diverse indigenous microbiota** present in high numbers (> 10^5 CFU/g). It is hypothesized that **competitive interbacterial interactions** on the (cut-)surfaces of vegetables may decrease the potential for persistence and proliferation of foodborne pathogens.

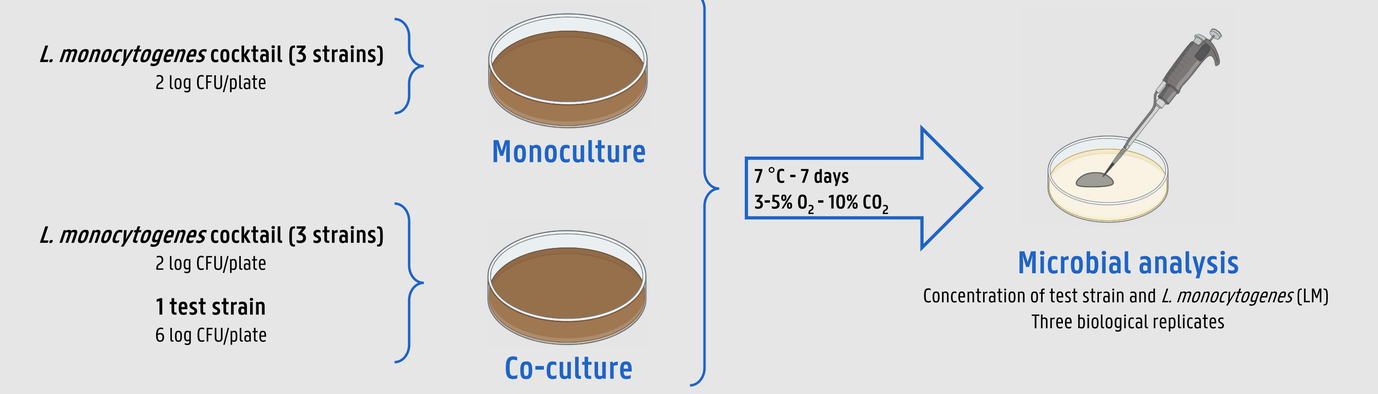
The objective of this study was to investigate the potential growth-suppressing effect of the indigenous microbiota of fresh-cut Romaine lettuce on *L. monocytogenes*.

Methods

1. Preparation of lettuce-juice agar (LJA)

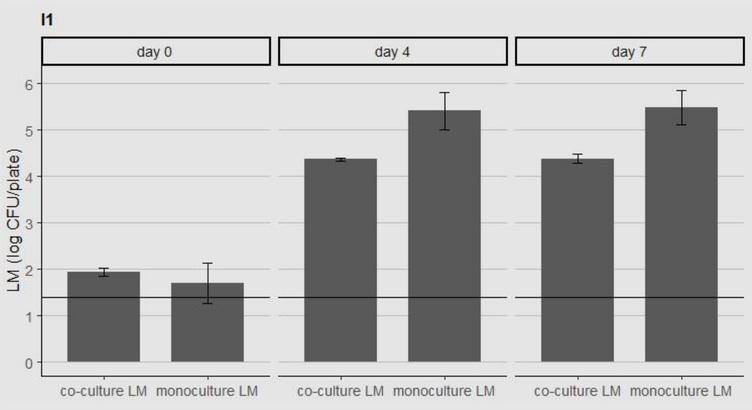


2. Co-inoculation experiment

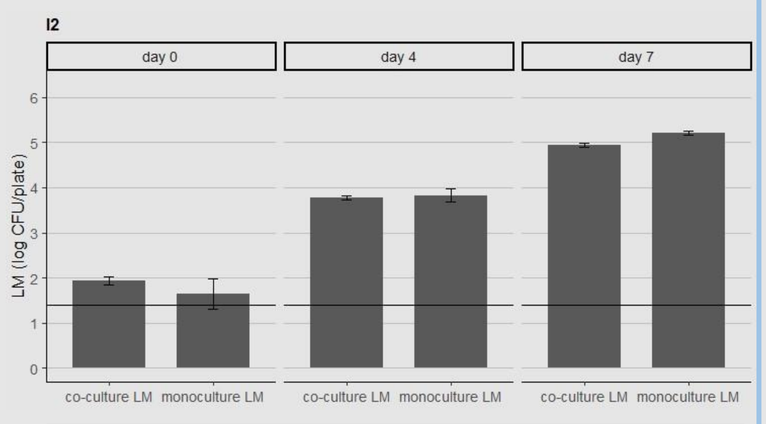


Results

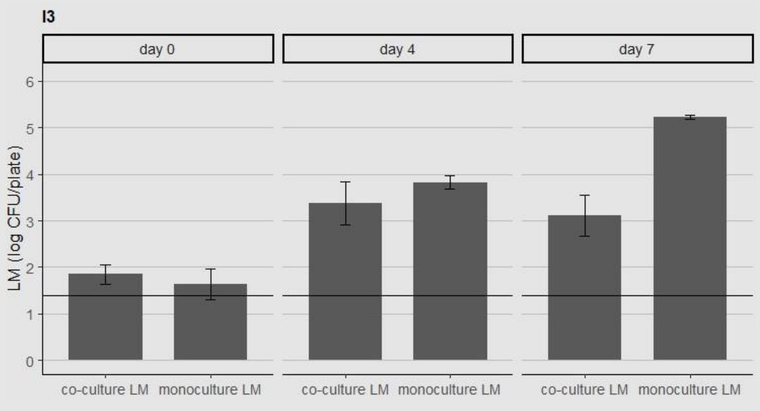
High-abundant Gram-negative bacterial isolates from (E)MAP stored lettuce at 7°C



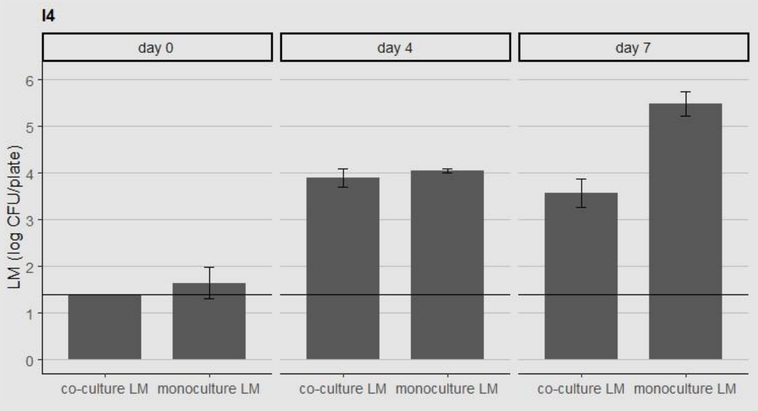
	Day 0	Day 4	Day 7
Co-culture strain I1 (log CFU/plate)	5.87 (0.06)	9.71 (0.12)	5.40



	Day 0	Day 4	Day 7
Co-culture strain I2 (log CFU/plate)	5.64 (0.06)	8.97 (0.11)	9.75 (0.07)

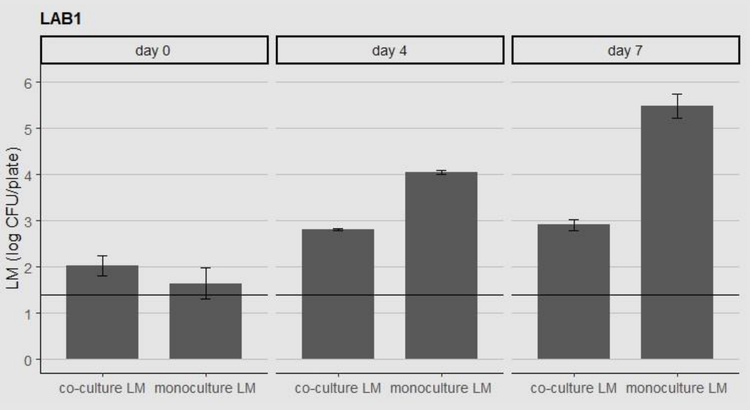


	Day 0	Day 4	Day 7
Co-culture strain I3 (log CFU/plate)	5.75 (0.19)	8.53 (0.52)	8.92 (0.45)

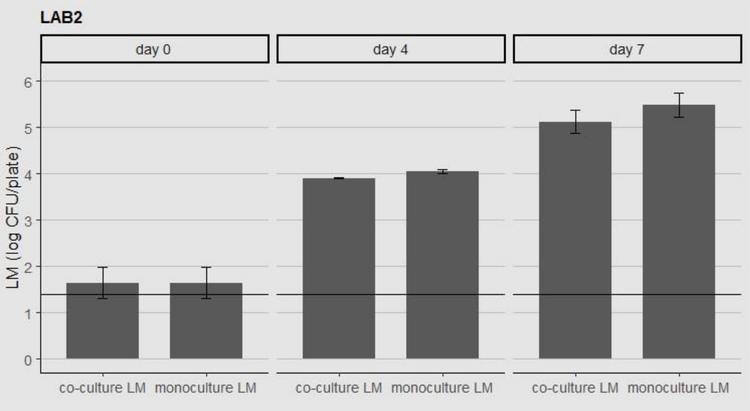


	Day 0	Day 4	Day 7
Co-culture strain I4 (log CFU/plate)	5.84 (0.02)	9.52 (0.07)	6.90 (0.28)

Lactic acid bacteria from FMFP culture collection



	Day 0	Day 4	Day 7
Co-culture strain LAB1 (log CFU/plate)	6.90 (0.09)	10.13 (0.01)	10.19 (0.05)

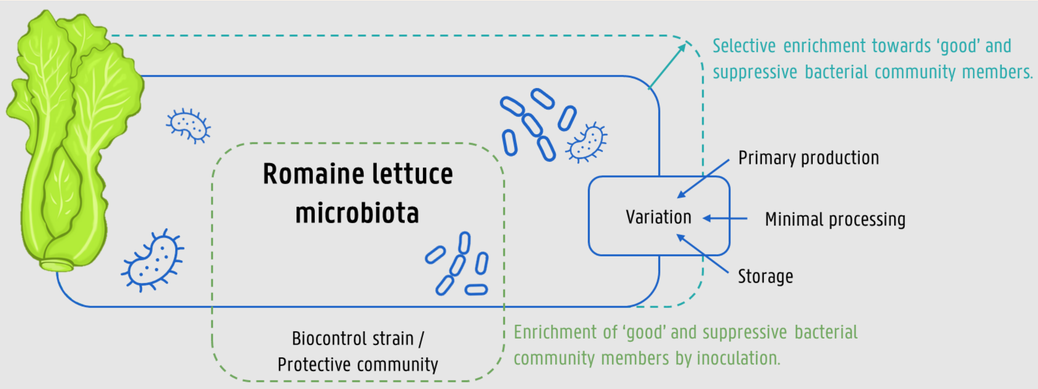


	Day 0	Day 4	Day 7
Co-culture strain LAB2 (log CFU/plate)	6.06 (0.04)	7.32 (0.04)	8.04 (0.08)

- One of the two bacterial collection strains (LAB), as well as three out of four of the bacterial isolates from lettuce were able to suppress *L. monocytogenes* growth on LJA.
- Growth of the test strains to high concentrations (up to 9-10 log CFU/plate) was necessary to exert these competitive effects (Jameson effect).

Conclusion

The growth-suppressing strains may have the potential to be used as a biocontrol strain or to be included in a protective community, functioning as a preventive food safety intervention for fresh-cut produce.



Contact

tacdbock.DeBock@ugent.be
www.foodscience.ugent.be

Universiteit Gent
@ugent
Ghent University

GHENT UNIVERSITY