

## Introduction

The time/temperature binomial plays a critical role in ensuring the safety of food. Inadequate refrigeration practices among European consumers were observed during SafeConsume's Workpackage 1, with 80% of the refrigerators operating above 4 °C. Ready-to-eat (RTE) meat products are among the major food vehicles linked to human listeriosis, a foodborne illness that causes gastroenteritis (non-invasive disease), bacteraemia, meningitis, miscarriage, or death. This work aimed to characterize the growth of the bacteria *Listeria monocytogenes*, the causative agent of listeriosis, in cooked ham slices subjected to temperature fluctuations simulating consumer handling of cold cuts immediately after shopping at retail.

## Results

### Listeria counts

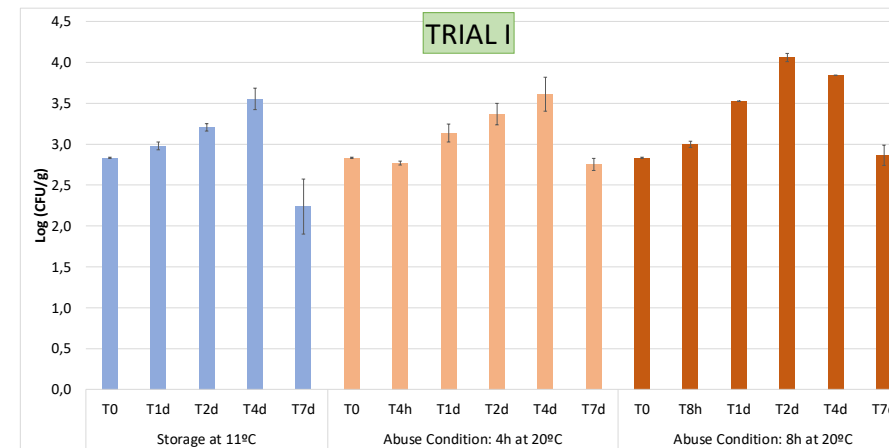


Figure 2. Levels of *L. monocytogenes* in spiked cooked ham slices exposed to different abused conditions at 20°C followed by storage at 11°C during 7 days.

- In Trial I: increase in *Listeria* numbers after 4 days of storage; however, after 7 days, counts reach values lower than those recorded at the beginning of the experiment;
- In Trial II: a higher abuse temperature was tested (25°) and for longer periods:
  - ✓ there was a proportional growth in relation to the temperature abuse to which they were subjected
  - ✓ no significant differences were observed among conditions
- High number of LAB and a decrease in pH was observed after 7 days of storage in Trial I.

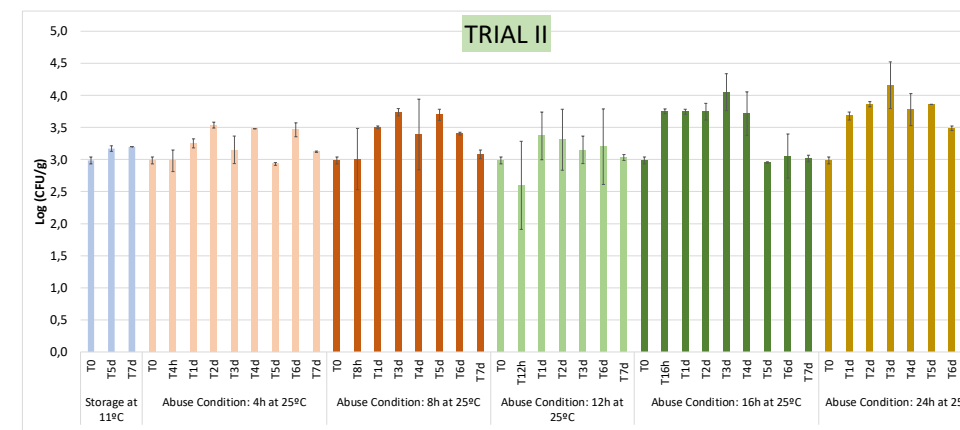


Figure 3. Levels of *L. monocytogenes* in spiked cooked ham slices exposed to different abused conditions at 25°C followed by storage at 11°C during 7 days.

## Conclusions

- Ham allows the growth of *L. monocytogenes*
- Refrigeration methods reduce the growth rate but do not inhibit the development of the bacteria
- Abuse temperatures are not as significant as the time factor
- Lactic Acid Bacteria may favour the inhibition of the pathogen

## Literature cited and acknowledgments

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## Further information

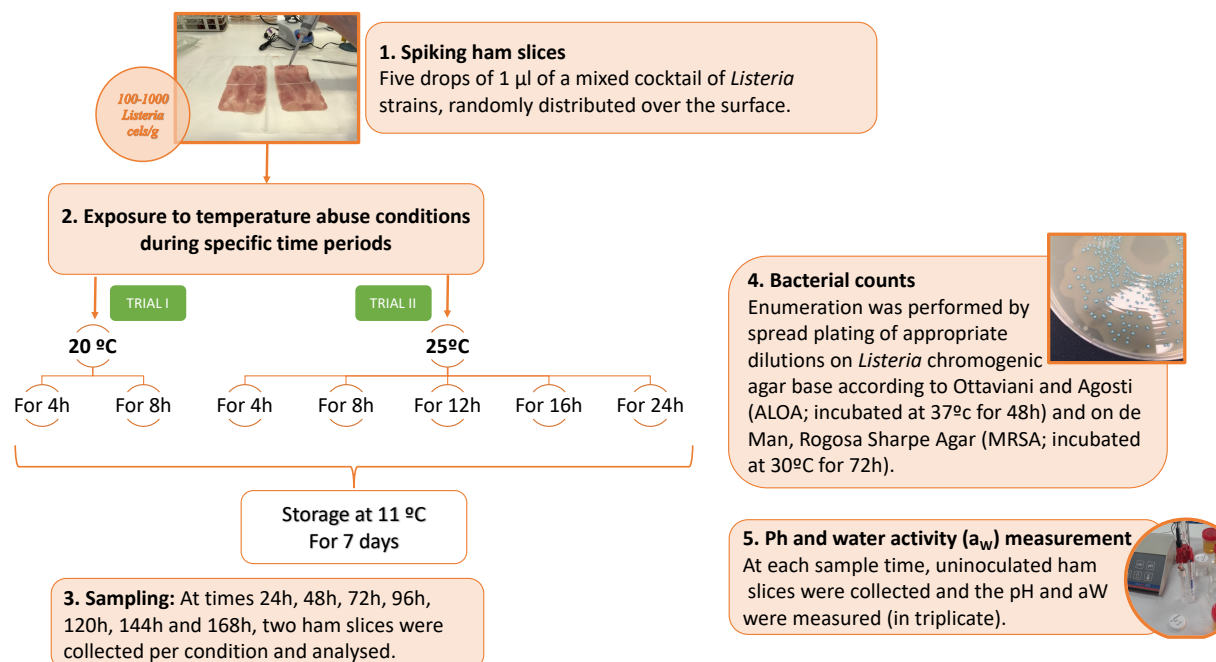
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## Lactic Acid Bacteria, pH and a<sub>w</sub> measurements

Table 1. Mean values and standard deviation for LAB counts, pH and a<sub>w</sub>

	Time	BAL (Log CFU/g)	pH	a <sub>w</sub>
Trial I	T0	5.5±0.0	5.82±0.01	0.98±0.00
	T7d	6.6±0.7	5.09±0.03	0.98±0.01
Trial II	T0	7.8±0.0	6.27±0.06	0.98±0.00
	T7d	7.7±0.3	5.28±0.06	0.98±0.00

## Methodology



\*Controls: inoculated and uninoculated ham slices were stored continuously at 4 and 11°C. Two independent replicates were performed in each Trial

Figure 1. Schematic representation of the experimental methods