

## RESEARCH NOTE



### Phage protects smoked salmon, naturally contaminated with *Listeria monocytogenes*

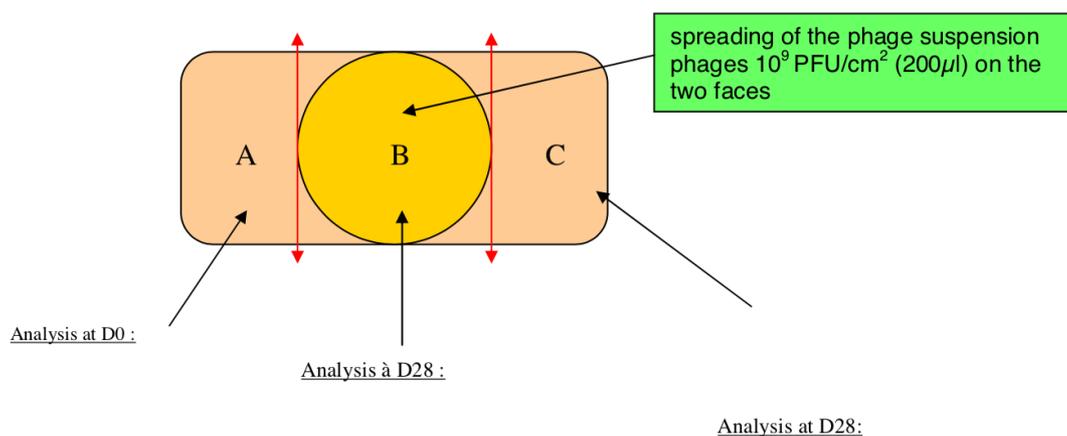
#### Objective

Study the efficacy of phages applied on smoked salmon that have been naturally contaminated with *Listeria monocytogenes*

#### Protocol

A total of 48 smoked salmon slices were divided in three parts:

- Part A was analyzed at day zero (D0) in order to detect the presence/absence of *Listeria monocytogenes* (control without phages D0)
- Part B was treated with Phageguard Listex at  $10^9$  PFU/cm<sup>2</sup>. This part was analyzed for *Listeria* at the end of the shelf-life.
- Part C was analyzed at the end of the shelf life in order to detect the presence/absence of *Listeria monocytogenes* (control without phages D28)



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For the slices were part A was positive for *Listeria monocytogenes*, parts B and C were vacuum packaged and stored for 10 days at 4°C and for 18 days at 8°C. Enrichment of *L. monocytogenes* was performed according to the validated AFNOR Aloa One Day method and numerations were done according to either the validated AFNOR ALOA One Count method or the AFNOR NF V 45-008 method.

## Results

48 samples of sliced smoked salmons were analyzed at day zero, see table below. *Listeria monocytogenes* was detected on 21% of the samples (10 out 48). The initial contamination level on these 10 samples was low (< 2 CFU/g).

Of the 10 samples that tested positive at day zero for *Listeria monocytogenes*, 6 control samples were negative on Day 28 and at 4 samples the *Listeria* counts were ranging from 100 to 1400 per gram. For the smoked salmon treated with phage, *Listeria monocytogenes* was not detected in any of the samples.

| samples | Day 0      |            | Day 28     |            |                     |            |
|---------|------------|------------|------------|------------|---------------------|------------|
|         | Control    |            | Control    |            | Phage treated       |            |
|         | Numeration | Enrichment | Numeration | Enrichment | Numeration          | Enrichment |
| 1       | < 0.5      | presence   | 1400       |            | < 0.5               | absence    |
| 2       | < 2        | presence   | 400        |            | < 0.5               | absence    |
| 3       | < 0.5      | presence   | 300        |            | < 0.5               | absence    |
| 4       | < 0.5      | presence   | 100        |            | < 0.5               | absence    |
| 5       | < 0.5      | presence   | < 100      | absence    | < 0.5               | absence    |
| 6       | < 2        | presence   | < 100      | absence    | < 0.5               | absence    |
| 7       | < 2        | presence   | < 100      | absence    | < 0.5               | absence    |
| 8       | < 0.5      | presence   | < 100      | absence    | < 0.5               | absence    |
| 9       | < 0.5      | presence   | < 100      | absence    | Listeria sp on Lawn | absence    |
| 10      | 0.5        | presence   | < 100      | absence    | Listeria sp on Lawn | absence    |

## Conclusions

These results demonstrate that phage effectively controls *Listeria* on sliced smoked salmon naturally contaminated with *L. monocytogenes* and stored during 28 days at low temperature.

- *Listeria monocytogenes* was detected at day zero on 10 out of 48 samples 21%
- For 4 samples, the contamination levels at the end of shelf-life were ranging from 100 to 1400 *Listeria monocytogenes* per gram for the slice part not treated with phages (control) while for the slice part treated with phages, *Listeria monocytogenes* was not detected.

## Source

Ofimer research report 2011. Use of phages to control *Listeria monocytogenes* in smoked salmon. Research partners CITPPM, Adria and Micros Food Safety.

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