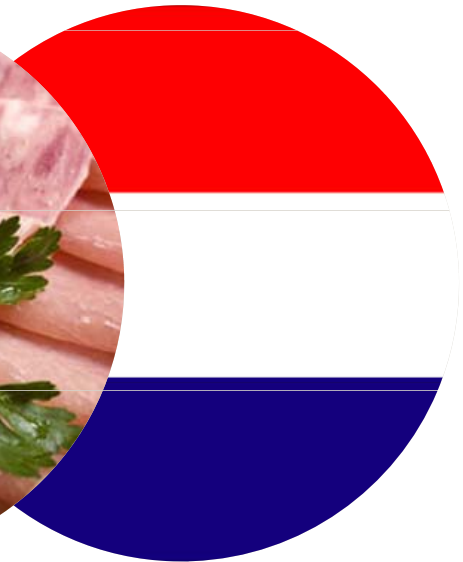
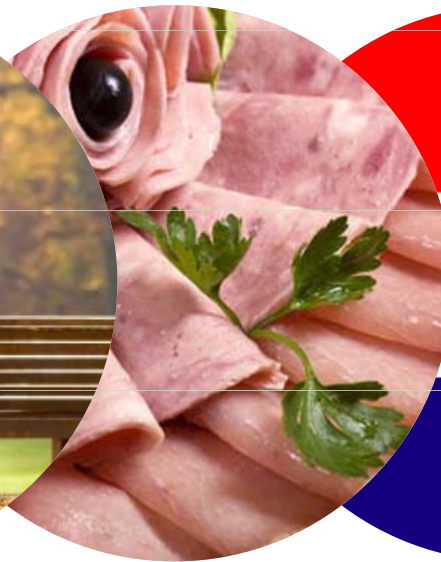
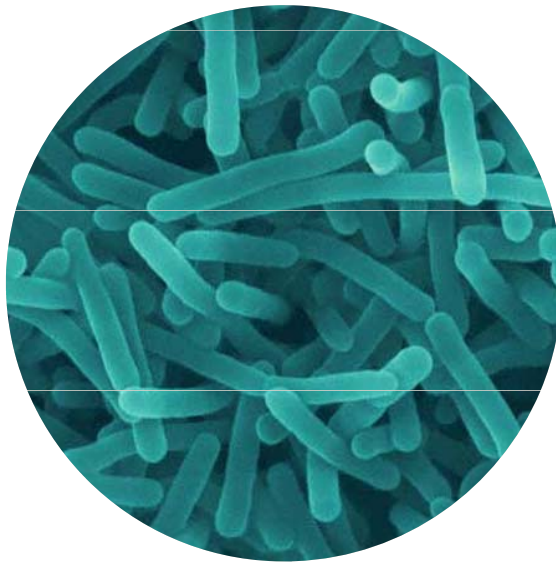

Refrigerated storage and handling practices of deli meats by Dutch elderly consumers

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Introduction

- *Listeria monocytogenes*
 - Gram +, facultatively anaerobic, 0-42°C
- Listeriosis
- Risk group: YOPI
- Risk food: Deli meats



Aims

Gain insight:

- Deli meat handling practices of high risk group
- Consumer perception of correct practices
- Refrigerator temperature
- Storage time
- Possibility of cross-contamination at the kitchen environment
- Hygiene levels



Materials & Methods

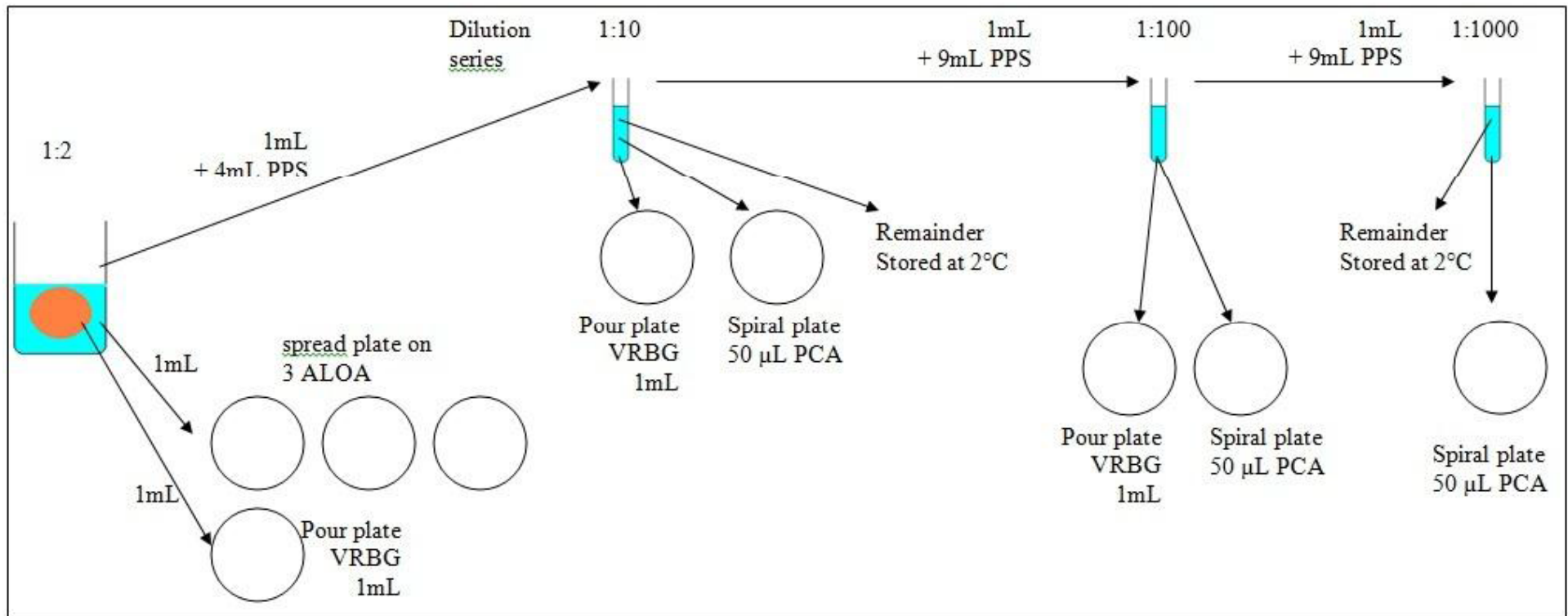
Visit 134 households (60+, living independently)

- Interview - about refrigerator temperature, hygiene and storage of RTE meat products
- Temperature refrigerator measurement with Peak Tech multimeter & 24h 'observation' with iButton
- Sampling - sliced deli meats and environmental swabs (refrigerator/kitchen sink): detection of *Listeria monocytogenes*, Enterobacteriaceae & TVC



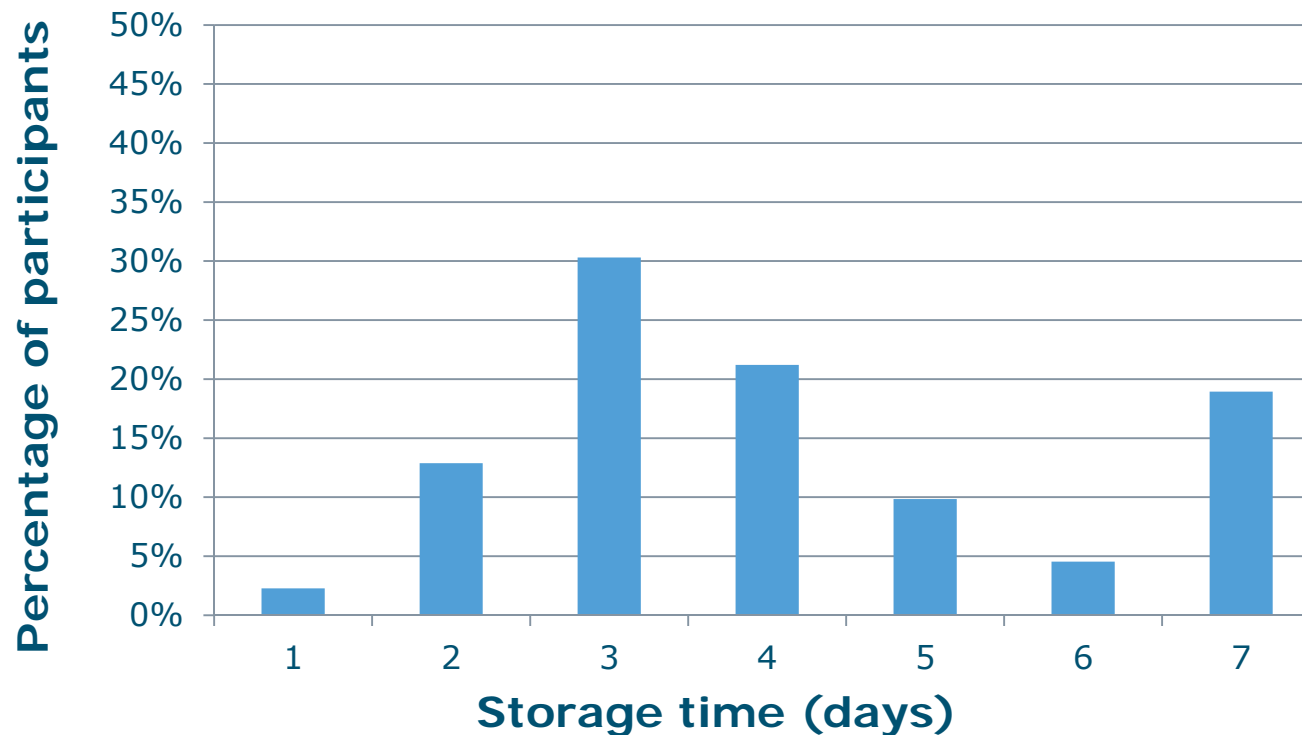
Materials and Methods

Sampling scheme



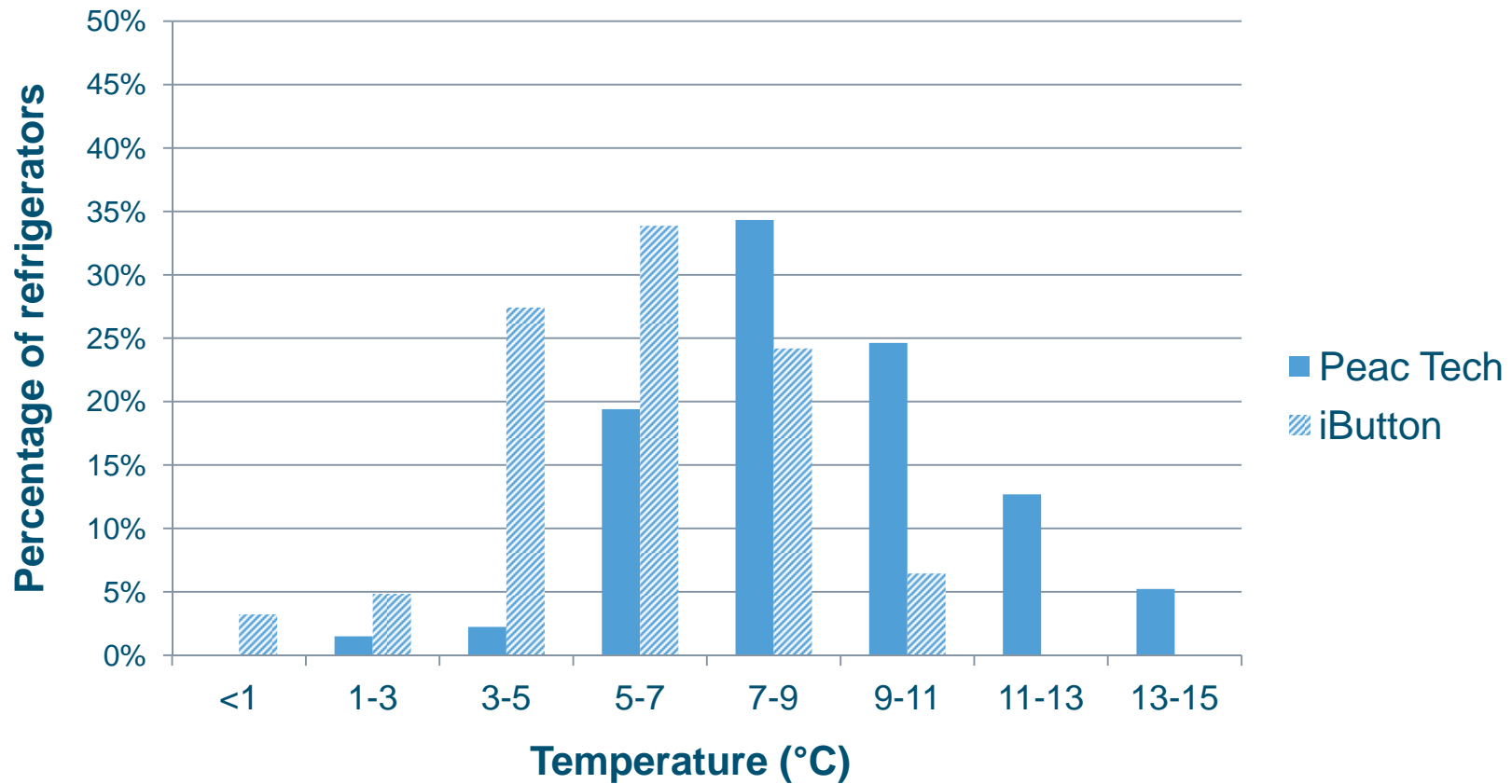
Results: Storage time of deli meats

- Closed packages: 4.7% knowingly consumes product after use by date
- Opened packages: All participants consume within one week after opening

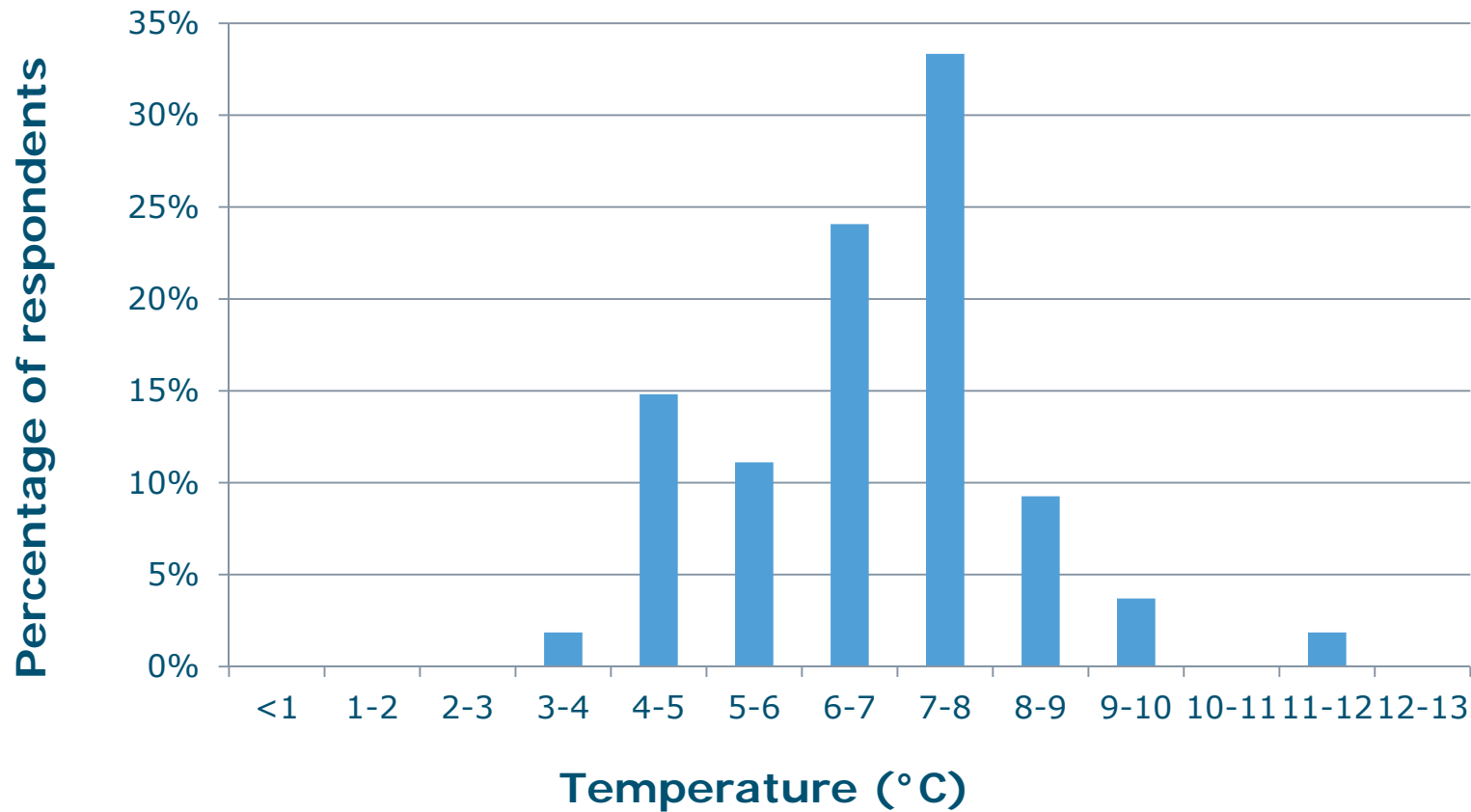


Results: Refrigerator temperature

Comparisons of measured fridge temperatures between the iButtons and the Peak Tech multimeter.



Results: Consumer perception of fridge temperature



Results: Prevalence of *Listeria*

- Samples: Prevalence at consumption
 - 117 samples
 - 2 positive = 1,71% (all below 100 CFU/g)
- EFSA: Prevalence at retail (Netherlands 2005-2010)
 - 3706 samples
 - 62 positive = 1.67%
- No *Listeria* found in fridge shelves or kitchen sinks



Results: Hygiene indicators - deli meats

Categorization of deli meat samples* on the basis of their hygiene

Total Viable Count	Number of samples (%)
Satisfactory	46 (39.3)
Acceptable	26 (22.2)
Unsatisfactory	45 (38.5)
Enterobacteriaceae	
Satisfactory	105 (89.7)
Acceptable	9 (7.7)
Unsatisfactory	3 (2.6)

*Gilbert et al. 2000



Results: Hygiene indicators– fridge shelves

Categorization of fridge shelves on the basis of their hygiene *

Total Viable Count	CFU limit ¹	Number of samples (%)
Satisfactory	<50 CFU/cm ²	76 (57)
Fairly satisfactory	50-10 ⁴ CFU/cm ²	39 (29)
Unsatisfactory	>10 ⁴ CFU/cm ²	19 (14)

Enterobacteriaceae	CFU limit ²	Number of samples (%)
Satisfactory	<10 ² CFU/cm ²	131 (97.8)
Unsatisfactory	≥10 ² CFU/cm ²	3 (2.2)

*Legnani et al. 2004; Little and Sagoo. 2009

¹ Legnani et al., 19??

² Little and Sagoo, 19??

Results: Hygiene indicators– sinks

Categorization of kitchen sink surfaces on the basis of their hygiene*

Total Viable Count	CFU limit	Number of samples (%)
Satisfactory	<50 CFU/cm ²	7 (5)
Fairly satisfactory	50-10 ⁴ CFU/cm ²	64 (48)
Unsatisfactory	>10 ⁴ CFU/cm ²	63 (47)
Enterobacteriaceae	CFU limit	Number of samples (%)
Satisfactory	<10 ² CFU/cm ²	93 (69.4)
Unsatisfactory	≥10 ² CFU/cm ²	41 (30.6)

*Legnani et al. 2004; Little and Sagoo. 2009

Highlights

- 49% claims awareness of the maximum recommended fridge temperature
- 41% checks the temperature
- 30% has a fridge temperature higher than the recommended upper limit of 7°C
- 4.7% consciously consumes closed deli meat packages after use by date
- All consume opened deli meat packages within one week
- *Listeria* prevalence similar to EFSA data for NL
- Vast majority of deli meats of acceptable/satisfactory quality

Thank you for
your attention!



M9

You may consider thanking all students here

Martine; 07.06.2013