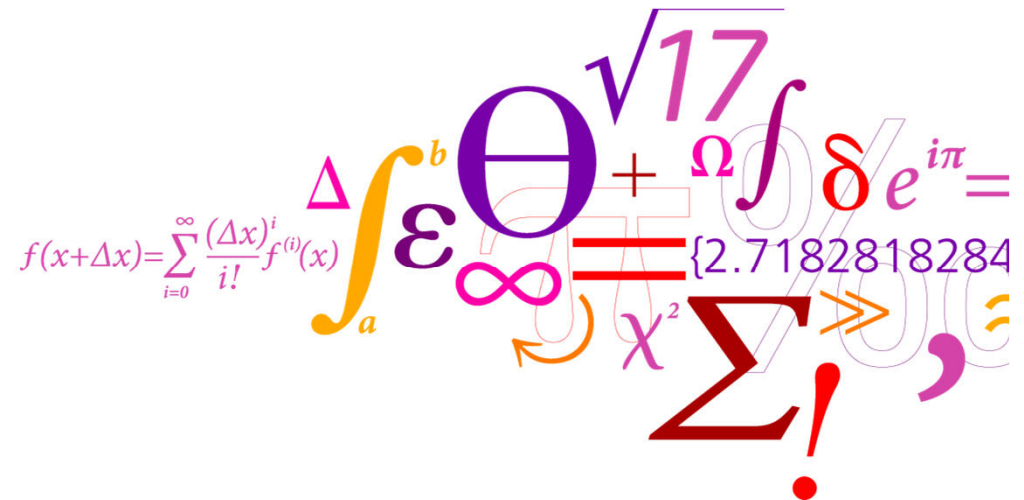


Listeria-outbreak in Denmark spring-summer 2014

Jens Kirk Andersen
Eva Møller Nielsen
Charlotta Löfström



- 44 Cases traced to Jørn A. Rullepølser in Hedehusene – 16 fatal! (36 % fatality)
- The production has been closed down – products have been recalled
- Success - or failure?

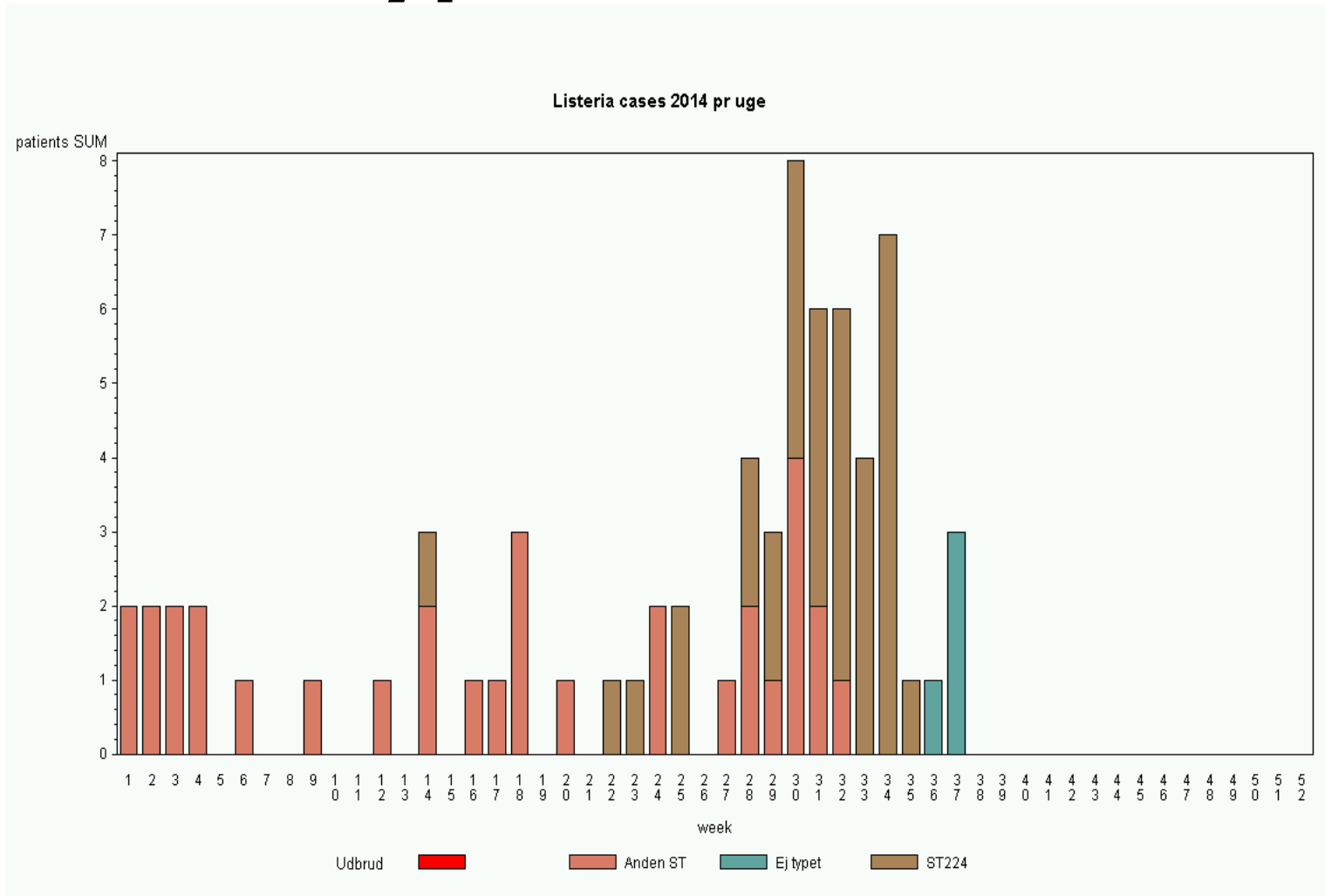


Time - line

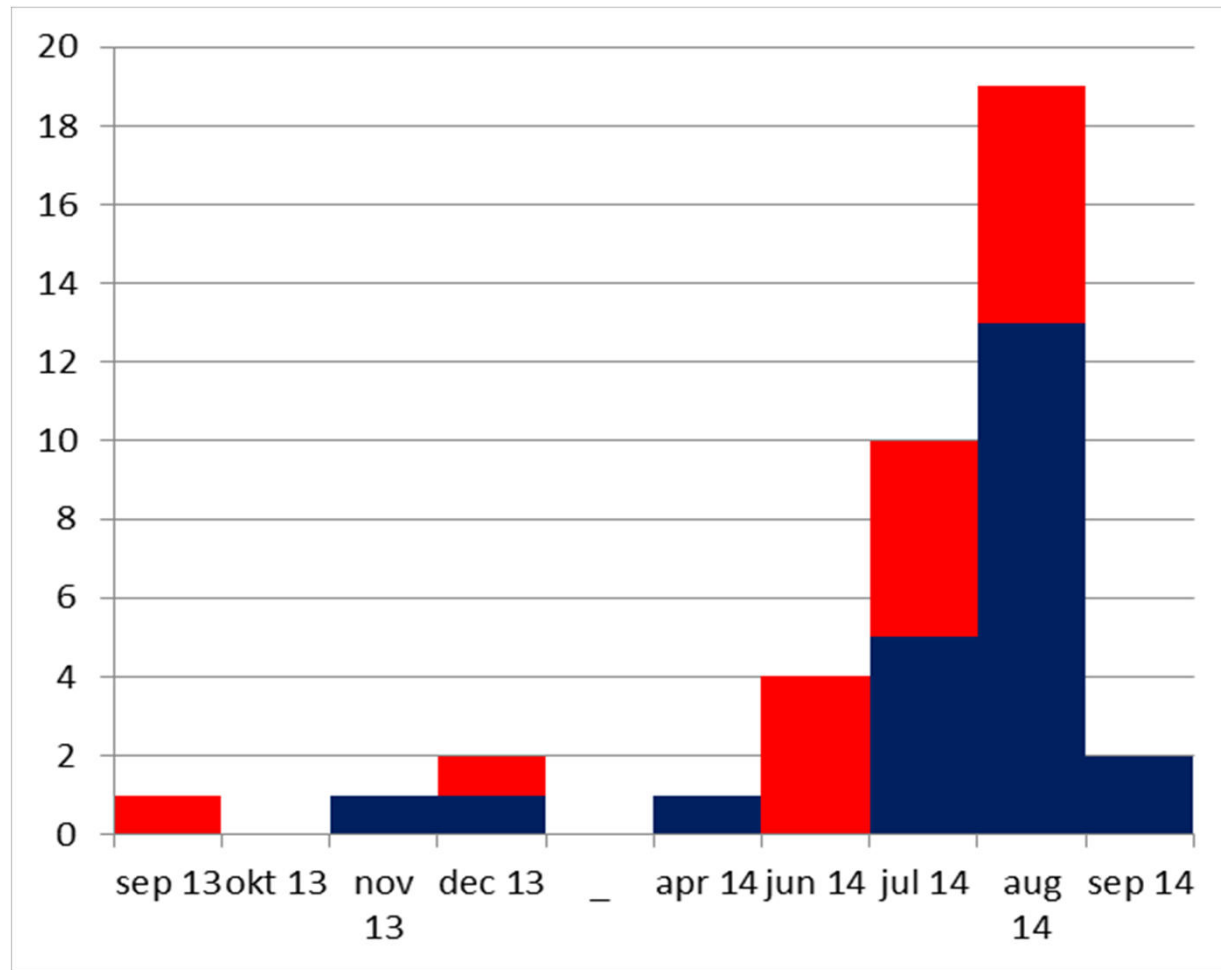
- SSI starts WGS on human isolates in December 2013
- From spring 2014 also food isolates are WGS typed
- 28. April 2014: a routine sample collected by CA at Jørn A.
- 6 May: Listeria is detected in the sample – product is withdrawn/recalled
- 27 May: FVST controls that withdrawal is performed OK

Listeria cases 2014 per week

WGS types



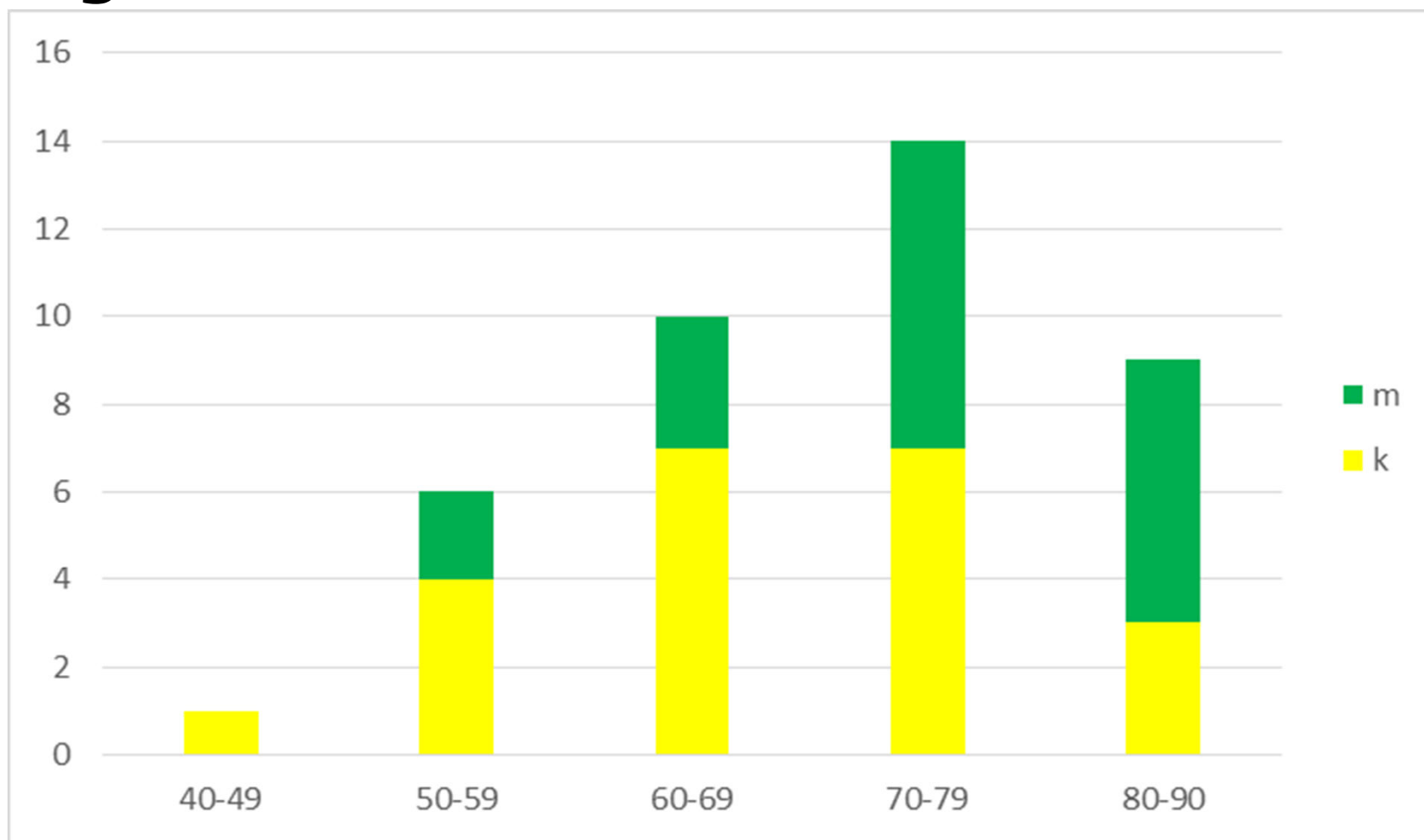
Epicurve



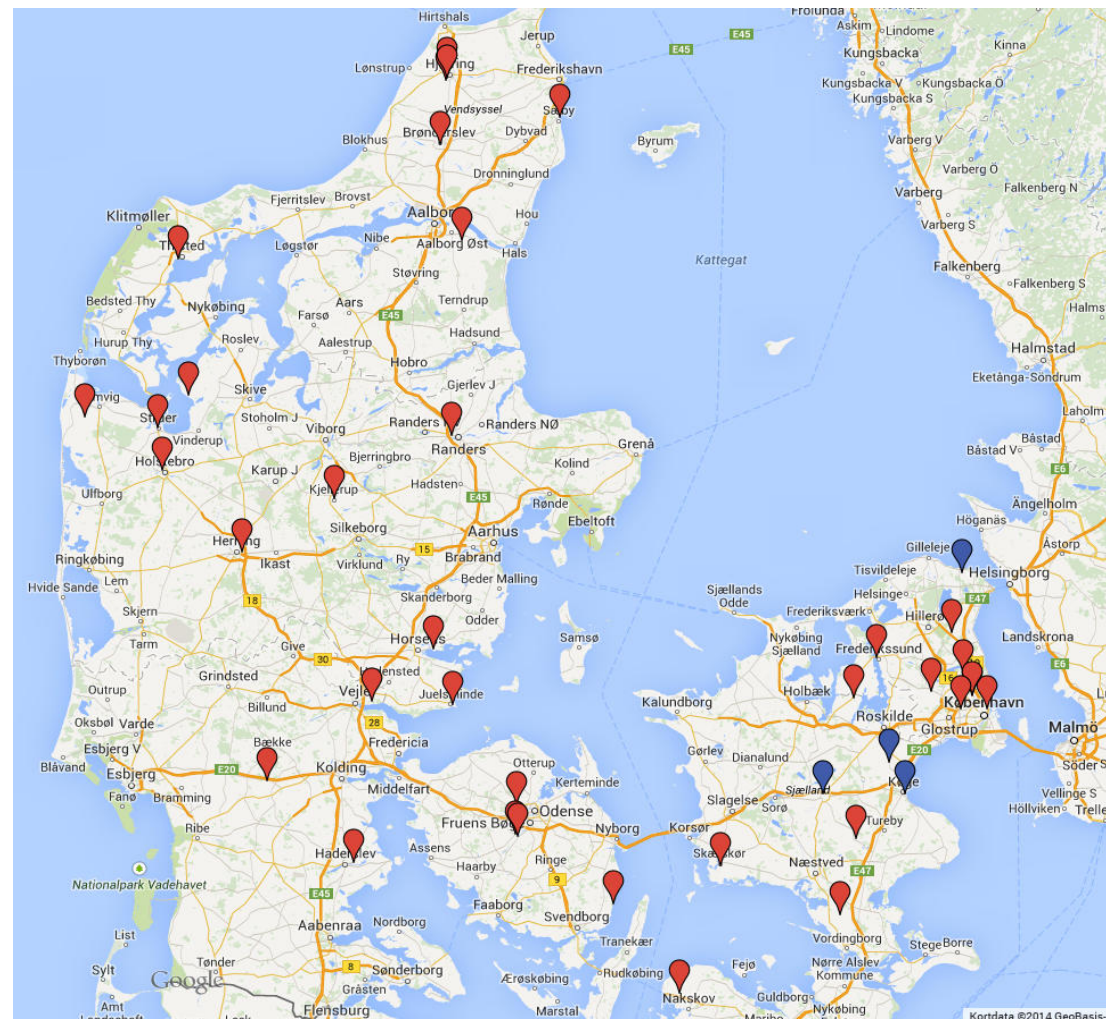
Blå: Lever (24)

Rød: Død indenfor 30 dage (16)

Age and sex distribution



Geographical distribution



- 26 June: SSI informs of finding of 5 possible identical strains – indicating an outbreak
- 3 July: WGS typing reveals that only 2 strains are identical. But **5 more strains** of the same type has been identified from patients in 2013 and 14.
- 16 July: SSI identify that the strain from a meat product from Jørn A is of identical type

- 8 August: CA (FVST) collects numerous samples from food and environment
- 11 August: presumptive *Listeria* are detected in many samples – the production is shut down +
 - Recall of products produced after April 28
 - Recall of products handled by sub-contractors
 - **600 control visits and 6000 contacted by phone**
- 17 August: SSI identify identical WGS types to outbreak strain in 29 isolates!

Result of FVST sampling/testing

- Product A: **2 / 5**
- Product B: **4 / 5**
- Product C: **0 / 5**
- Product D: **5 / 5**
- Product E: **3 / 5**
- Product F: **5 / 5**
- Product G: **2 / 5**
- Product H: **5 / 5**
- Product I: **1 / 5**
- Product J: **1 / 5**
-
- **1 environmental sample positive**: floor in the room where products are handled after heat treatment

29 isolates
detected

Result of FVST sampling/testing

- Product A: **2 / 5**
- Product B: **4 / 5**
- Product C: **1 / 5**
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- Product F: **5 / 5**
- Product G: **2 / 5**
- Product H: **5 / 5**
- Product I: **1 / 5**
- Product J: **1 / 5**

29 isolates
detected

WGS Typing of 1 strain
from each product:

**All identical to the
outbreak strain**

- **1 environmental sample positive**: floor in the room where products are handled after heat treatment

Quantitative results:

Qualitative

Product A: **2 / 5**

Product B: **4 / 5**

Product C: **0 / 5**

Product D: **5 / 5**

Product E: **3 / 5**

Product F: **5 / 5**

Product G: **2 / 5**

Product H: **5 / 5**

Product I: **1 / 5**

Product J: **1 / 5**

Quantitative analysis

both <10/g

all <10/g

<10 <10 <10 70 380/g

<10 <10 20/g

<10 <10 10 20 30/g

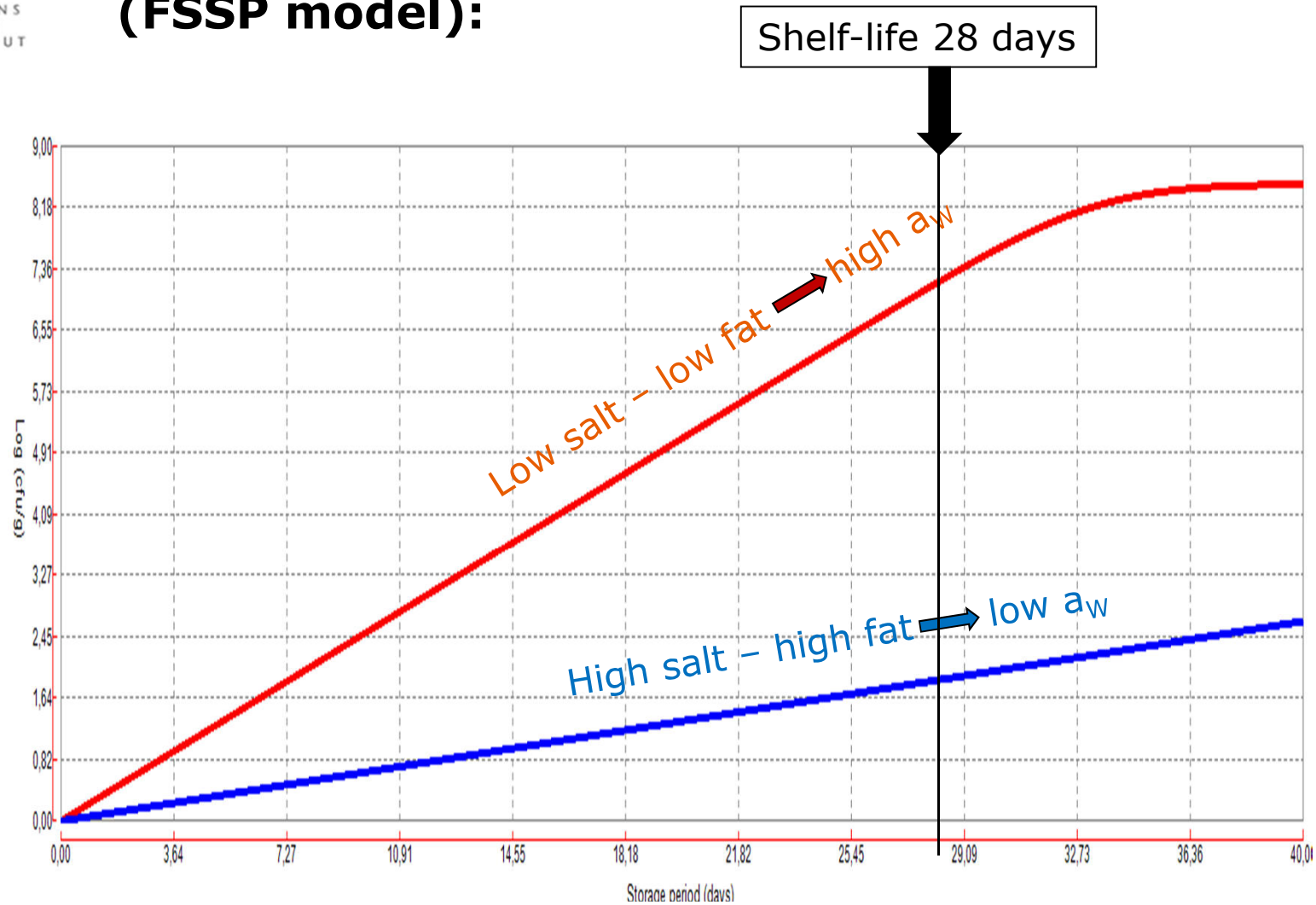
both <10/g

all <10/g

<10/g

<10/g

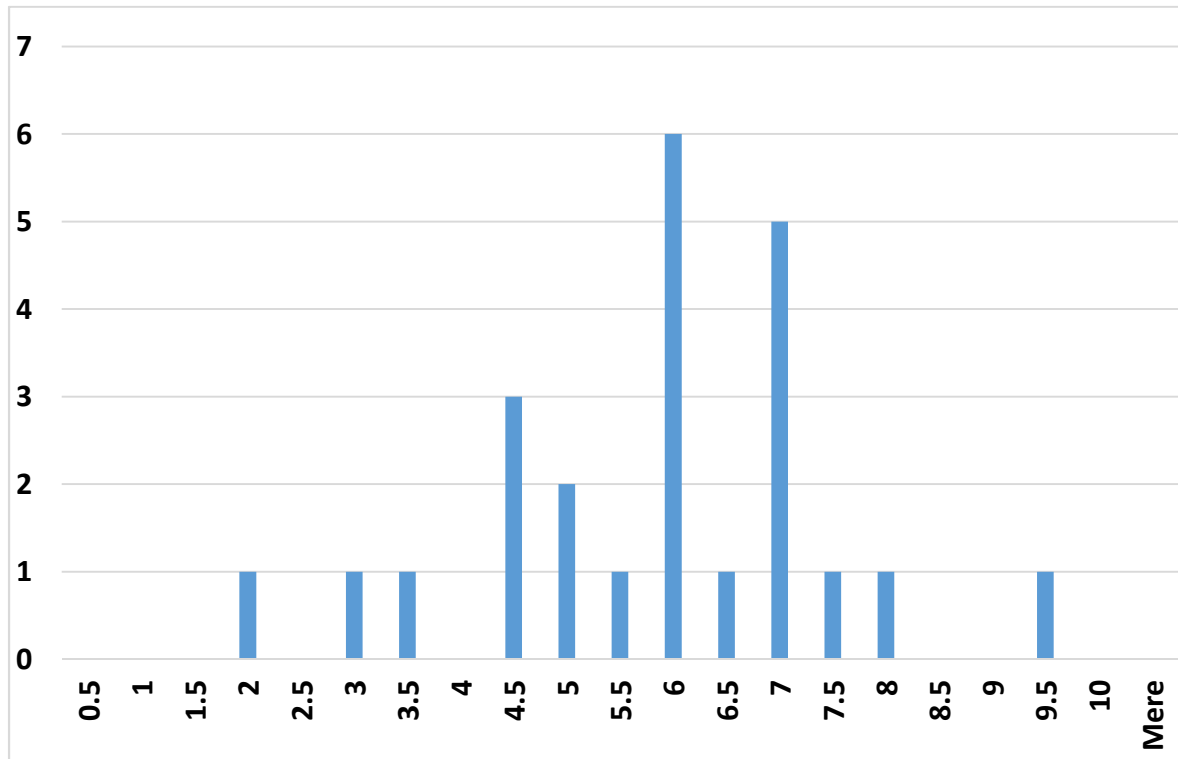
Prediction of growth in rullepølse at 5° C (FSSP model):



Temperature in household refrigerators

25 observations

No observations



Temperature ° C

Hypothesis:

- The plant has a house Lm strain - in plant environment
- Inadequate hygiene - or procedures - has allowed the house strain to contaminate the products
 - Cleaning and disinfection should keep the plant contamination low – to an acceptable level
- Inadequate cooling, in the plant and/or consumer fridge, has lead to growth to levels presenting a risk

Critical review:

Evaluation of the procedures

Workshop with authorities, industry, universities and consumer representatives

International experts

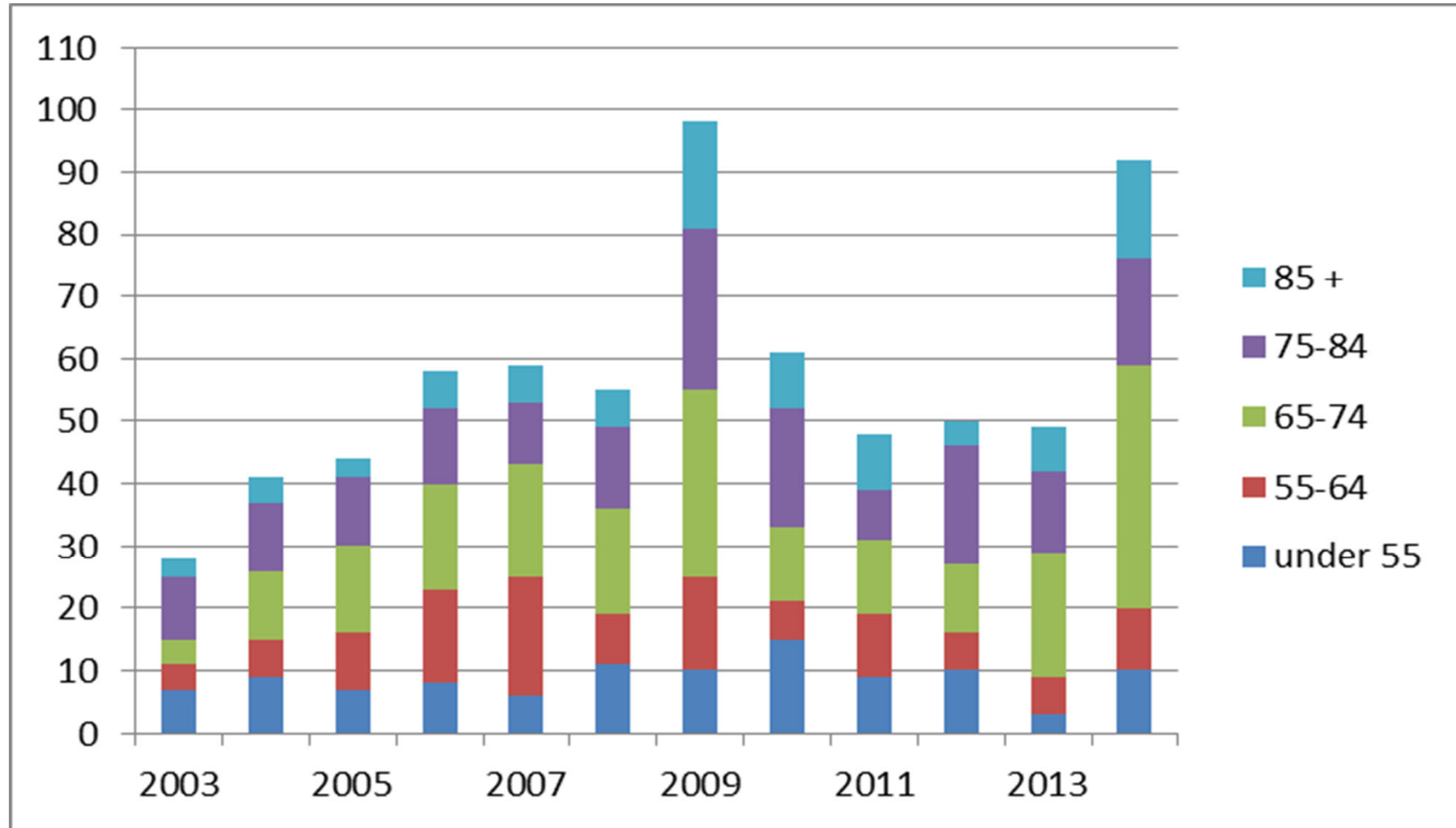
Working groups established

- Expertise for controlling authorities
- Knowledge in FBO
- Vulnerable population – recommendations and demands for production
- Own control – use of data

Critical review:

- Recommendations:
 - Sharing of data and isolates from self-checking
 - Vulnerable groups: understanding shelf-life and storing of food?
 - Changing food production – gaps?
 - Develop plans for intelligent sampling
 - Use of trend analysis in self-checking
 - Acces to data from self-checking

Listeriosis in Denmark 2003 – 2014 age distribution



Registered cases in Denmark

