

# Beheersing van voedselpathogenen in de vers vleesketen van varkens

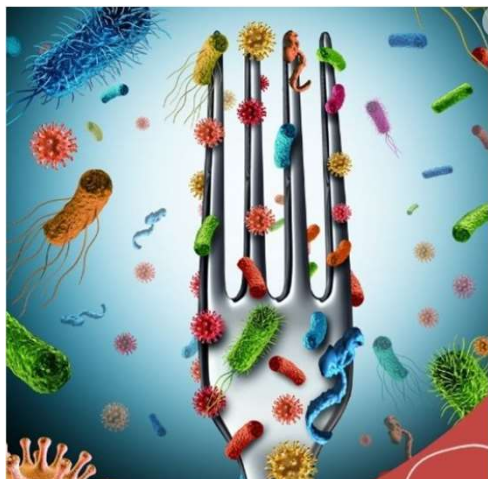
Geertrui Rasschaert

Studienamiddag 9 mei 2023

*Salmonella*  
*Listeria monocytogenes*

**ILVO**

 **VARKENSLOKET**  
[www.varkensloket.be](http://www.varkensloket.be)





## *Salmonella*



*Case Report*

# Identification of the Source for *Salmonella* Contamination of Carcasses in a Large Pig Slaughterhouse

Hang Zeng <sup>1,2</sup>, Geertrui Rasschaert <sup>1</sup> , Lieven De Zutter <sup>2</sup> , Wesley Mattheus <sup>3</sup> and Koen De Reu <sup>1,\*</sup> 

**UNCLEAN AREA**

Stunning & killing

Bleeding

Scalding

Dehairing

Singeing

Polishing

**CLEAN AREA**

Chilling

Carcass dressing

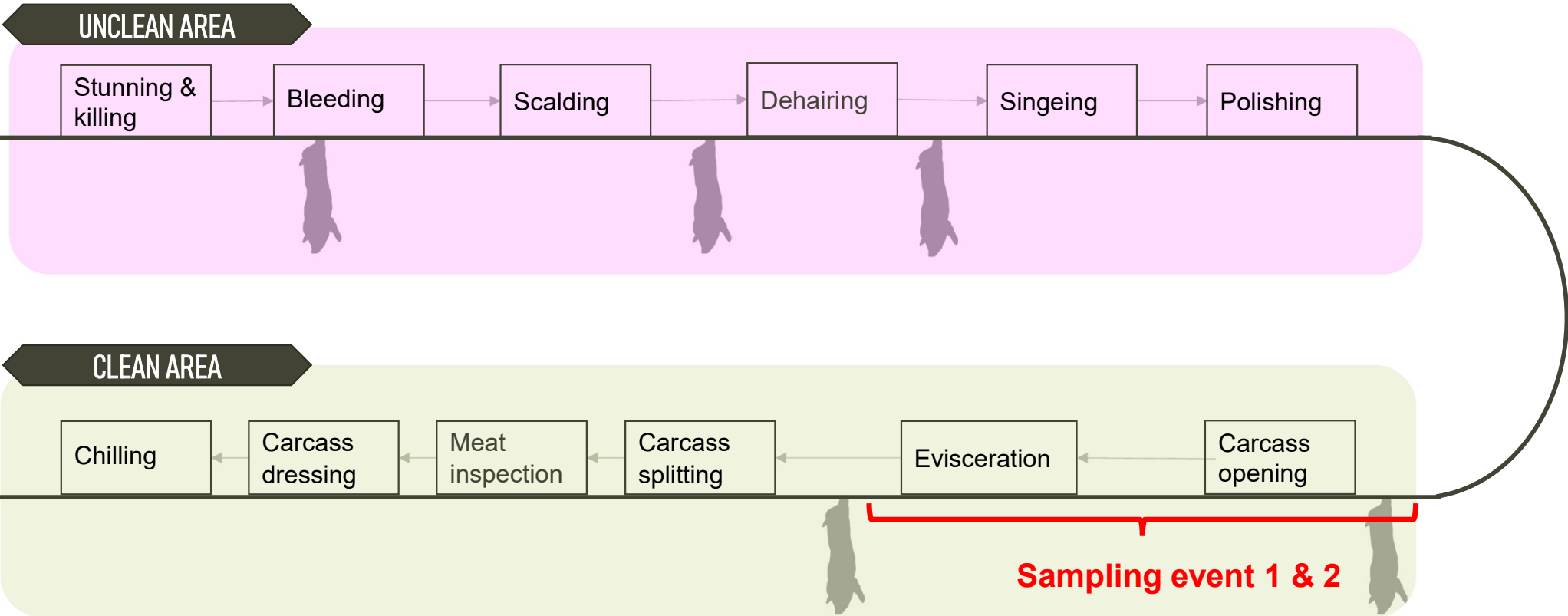
Meat inspection

Carcass splitting

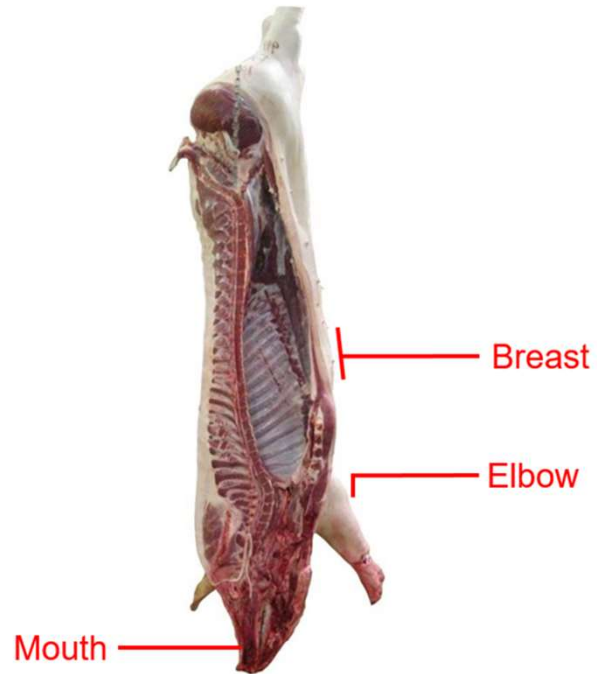
Evisceration

Carcass opening

**Sampling event 1 & 2**



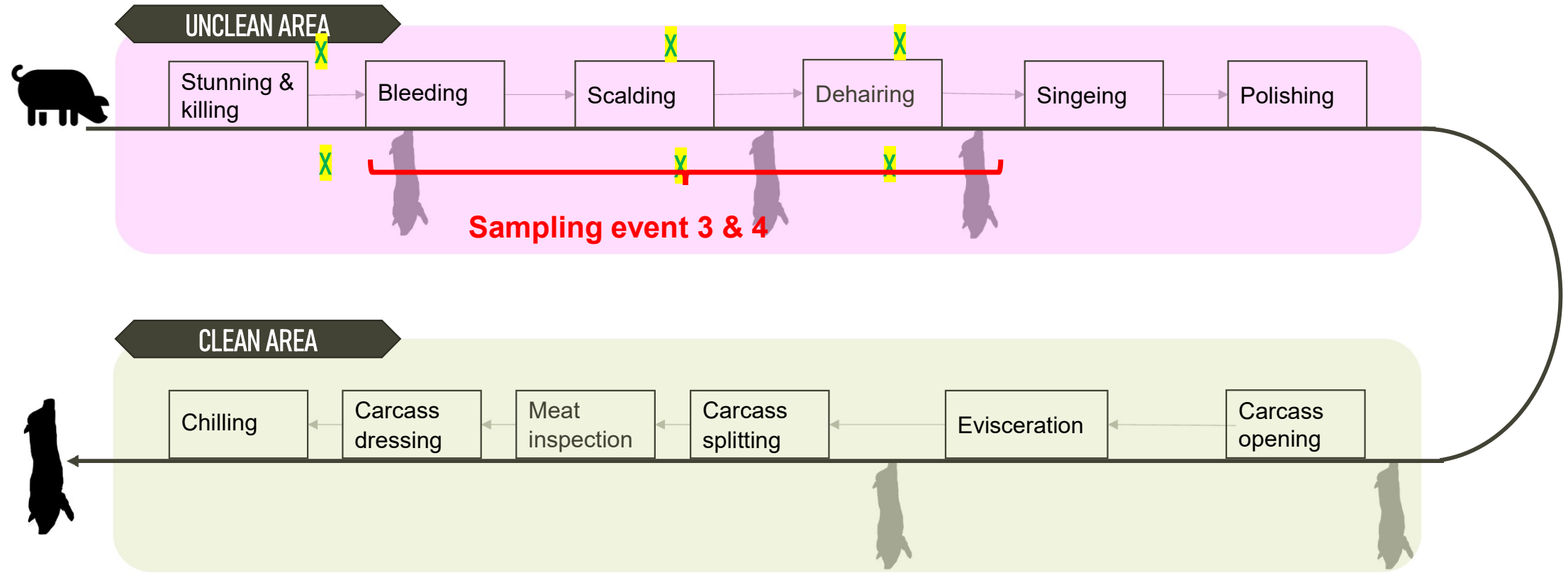
## Sampling event 1 & 2



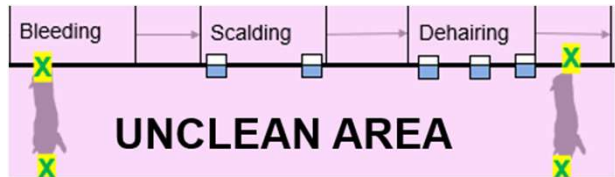
### SAMPLING LOCATIONS

1. mouth swabs + carcass swabs, LEFT (brisket; elbow)
2. intestines / rectum content
3. carcass swabs, RIGHT (brisket; elbow)

Before evisceration		After evisceration	
Breast	Elbow	Breast	Elbow
3/30	3/30	2/30	0/30



## Sampling event 3



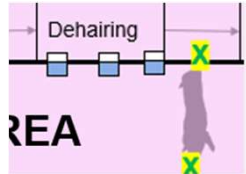
1. Mouth and rectum swabs during bleeding
2. Mouth and rectum swabs after dehairing
3. Water samples from the scalding tank
4. Water samples from the dehairing machine

After bleeding		After dehairing	
Mouth	Rectum	Mouth	Rectum
3/30	3/30	28/30	29/30

Water samples		Temperature °C	Sample analysis/ml				
			10	1	0,1	0,01	
Scalding water	Beginning of tank	Before starting	60,3	N	N	N	NA
		After finishing	60,2	N	N	N	NA
	End of tank	Before starting	59,7	N	N	N	NA
		After finishing	59,2	N	N	N	NA
Dehairing machine 1	Before starting	38,2	P	P	P	N	
	After finishing	35	P	P	N	N	
Dehairing machine 2	Before starting	28,4	P	P	P	N	
	After finishing	35,5	P	P	P	P	
Dehairing machine 3	Before starting	34,8	P	P	P	N	
	After finishing	37,59	P	P	P	P	

Note: P: Positive N: negative. NA: Not available.

## Sampling event 4



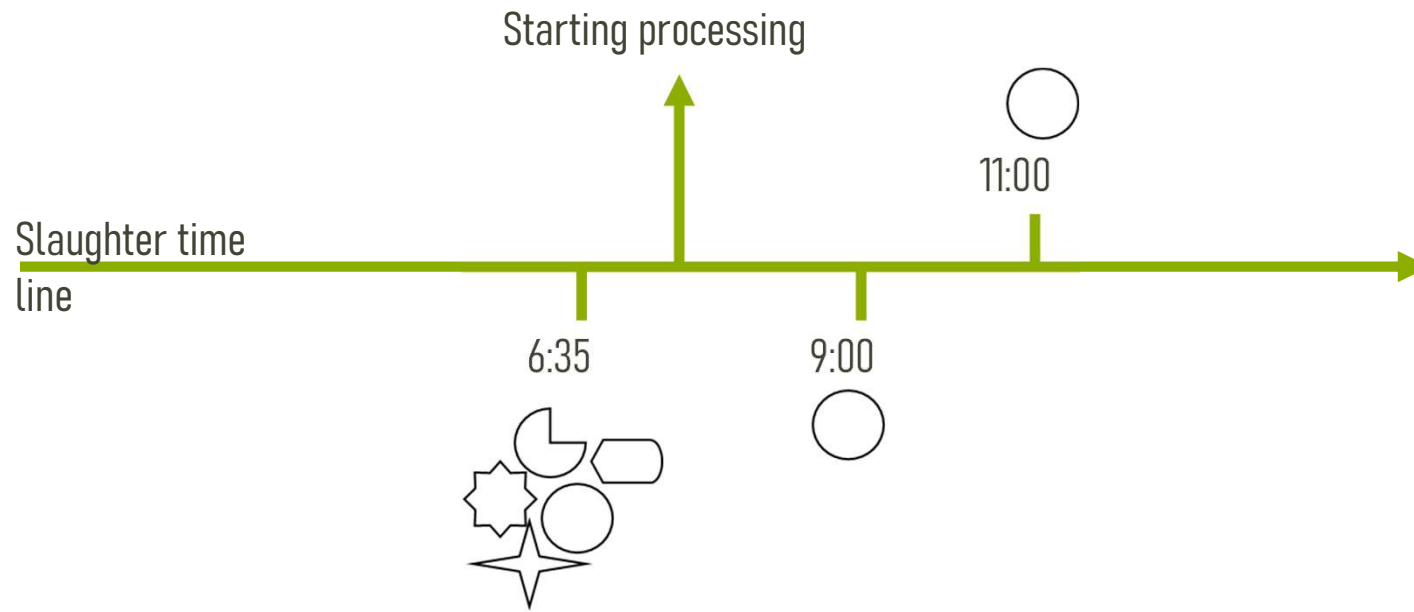
1. Mouth swabs **before dehairing**
2. Mouth swabs **after dehairing**
3. Water samples from the **dehairing machine**

Before dehairing	After dehairing
Mouth	Mouth
1/30	28/30

Water samples	Temperature °C	Sample analysis/ml				
		10	1	0.1	0.01	
Dehairing machine 1	Before starting	36.2	P	P	N	N
	After finishing	36.1	P	P	N	N
Dehairing machine 2	Before starting	32.2	P	P	N	N
	After finishing	32.1	P	p	N	N
Dehairing machine 3	Before starting	37.3	P	P	N	N
	After finishing	37.9	P	P	N	N

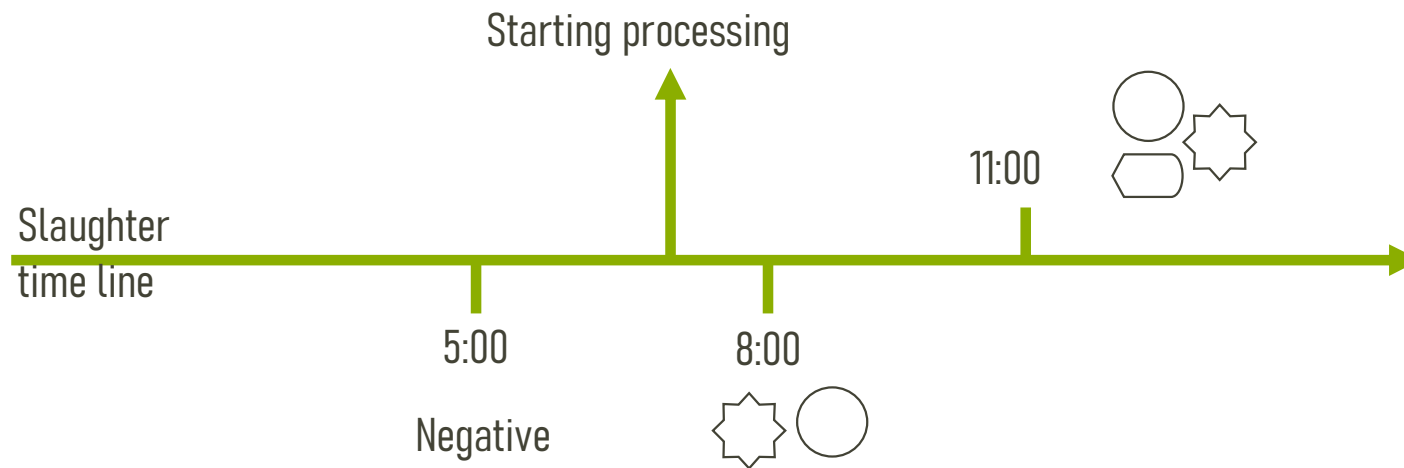
Note: N: negative

## Remediation 1: extra cleaning and disinfection by slaughterhouse



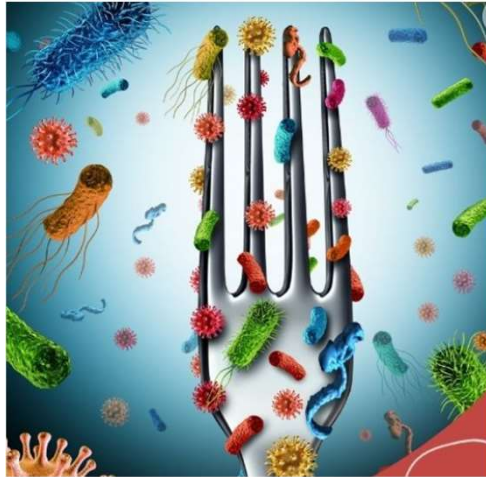


## Remediation 2: extra cleaning and disinfection by specialized company



## Conclusions

1. The **recycled water** used in the dehairing machine = important source for *Salmonella* contamination
2. The recycled water was injected into the machine at 50 °C, but temperature at exits varied between 30 °C and 40 °C
  - Not high enough to eliminate *Salmonella*
  - Allows the growth of *Salmonella*



## *Listeria*



Meat Science  
Volume 169, November 2020, 108177



### Occurrence, distribution and diversity of *Listeria monocytogenes* contamination on beef and pig carcasses after slaughter

N. Demaître<sup>a</sup>, I. Van Damme<sup>b</sup>, L. De Zutter<sup>b</sup>, A.H. Geeraerd<sup>c</sup>, G. Rasschaert<sup>a</sup>, K. De Reu<sup>a</sup>  



Article

### Genetic *Listeria monocytogenes* Types in the Pork Processing Plant Environment: From Occasional Introduction to Plausible Persistence in Harborage Sites

Niels Demaître<sup>1</sup>, Geertrui Rasschaert<sup>1</sup> , Lieven De Zutter<sup>2</sup> , Annemie Geeraerd<sup>3</sup>  and Koen De Reu<sup>1,\*</sup> 



# Drie doden door listeriabesmetting vleeswaren bij Ter Beke



JAN DE SCHAMPHELAERE, JENS CARDINAELS | 04 oktober 2019 15:07

## In Offerman-fabriek wordt bijna 3 weken na listeriadrama nog geen plakje vlees gesneden

Sanne Schelfaut 22-10-19, 17:54

De fabriek van vleeswarenbedrijf Offerman in Aalsmeer ligt bijna drie weken na de grote [terugroepactie](#) nog steeds stil. Offerman moest de locatie begin oktober sluiten nadat bleek dat vleeswaren die hier werden gesneden en verpakt, waren besmet met de listeriabacterie. Zeker twintig mensen werden ernstig ziek na het eten van besmet vlees, drie personen overleefden het niet en een vrouw kreeg een miskraam.

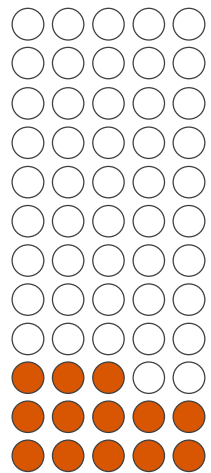
## Fabriek Offerman sluit deuren definitief na listeria in vleeswaren

'Listeriaslagerij' Offerman in Aalsmeer sluit definitief de deuren. De besmetting met de levensgevaarlijke bacterie is zo hardnekkig, dat de Belgische eigenaar er gedwongen mee stopt. Zestig werknemers verliezen hun baan.

Herman Stil 21 januari 2020, 13:45

## Prevalence positive carcasses and best sampling place

Positive carcasses



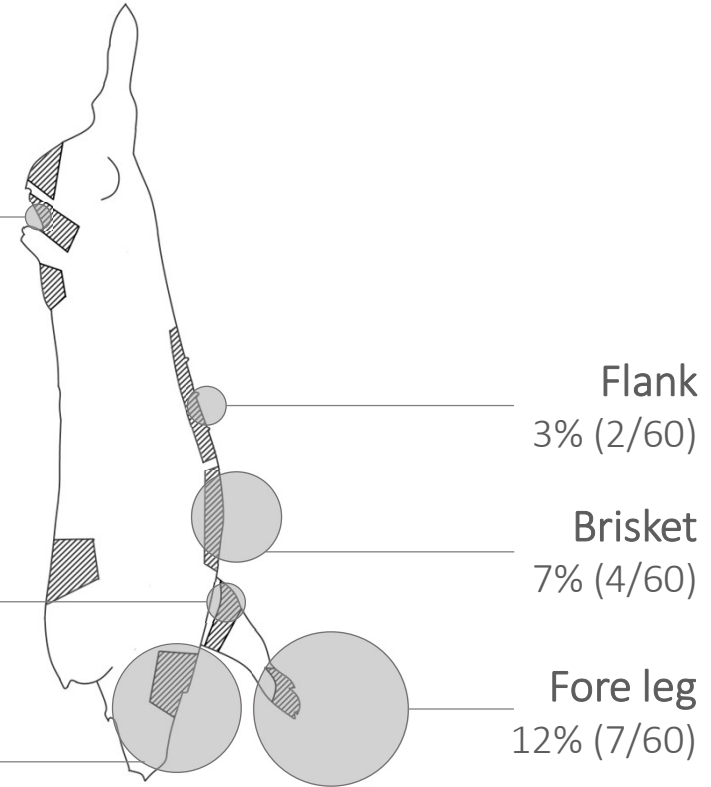
21%  
(13/60)  
*L. mono*

Location

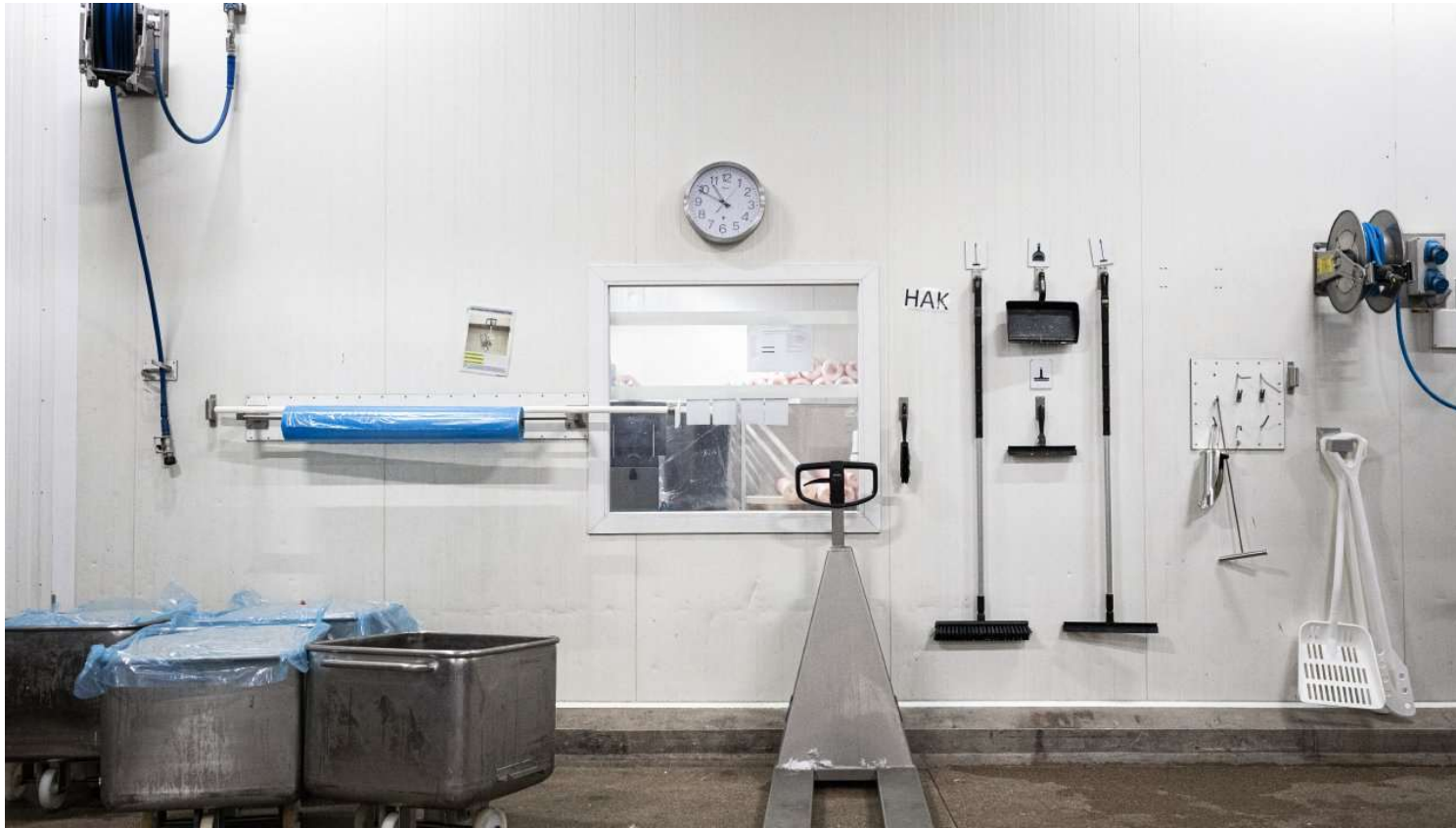
Pelvic duct  
2% (1/60)

Elbow  
3% (2/60)

Throat region  
10% (6/60)



## *L. mono* in meat processing facilities



3 cutting plants  
2 visits

After C&D



During  
production

Type 2  
NFCS close to product contact surface

Type 1  
Food contact surfaces  
(FCS)

Type 3  
NFCS not close to zone 1

# Type 1 surfaces: after C&D and during production

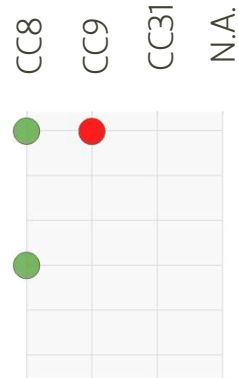
After C&D: 5% (10/214)

- Circular saw (blade)
- Meat hooks
- Meat cutting table
- Cutting board
- Meat containers (inside)
- Conveyor (belt)

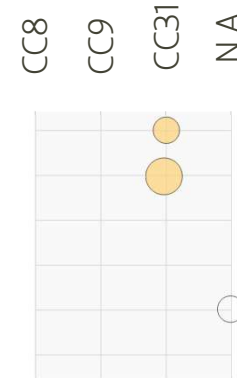
Production: 7% (15/222)

- Carcass divider
- Chainmail (gloves)
- Chopping block
- Meat hooks
- Meat cutting table
- Cutting board
- Conveyor (belt)
- Meat spikes
- Pork skinning peeling machine
- Stainless steel cart

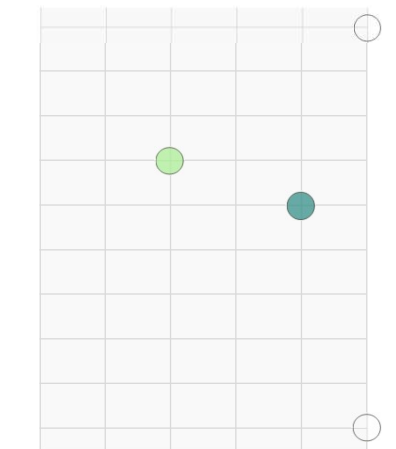
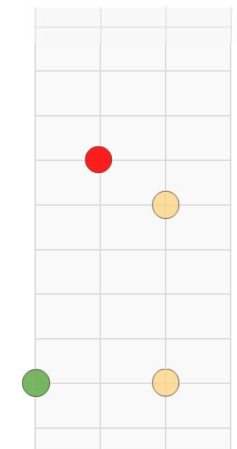
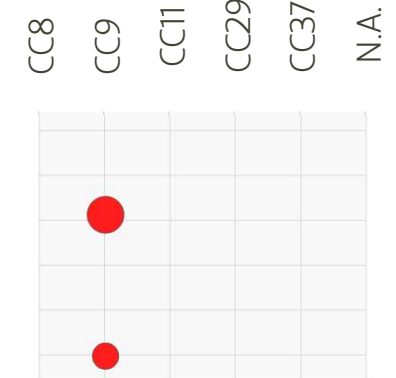
1.



2.



3.



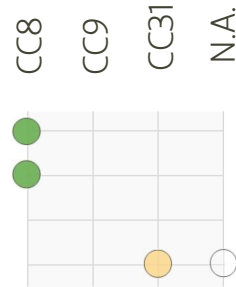


## Type 2 surfaces: after C&D and during production

After C&D: 9% (6/65)

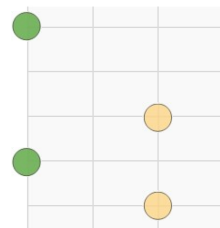
Circular saw (handle)  
Cutting board (handle)  
Meat containers (outside)  
Conveyor (undercarriage)

1.

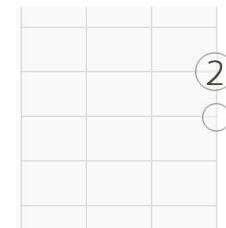
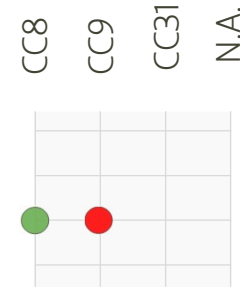


Production: 8% (7/89)

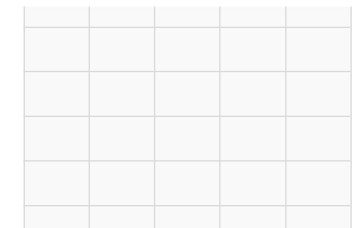
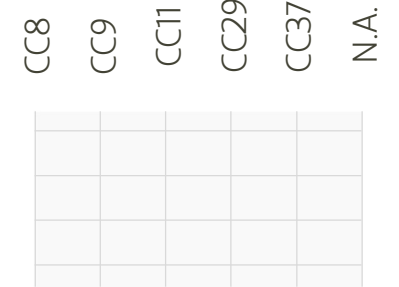
Circular saw (handle)  
Meat containers (outside)  
Conveyor (undercarriage)  
Conveyor (wheels)  
Plastic apron



2.



3.



## Type 3 surfaces: after C&D and during production

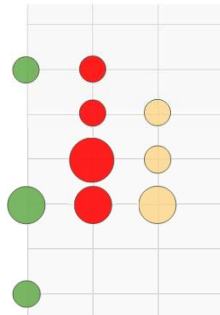
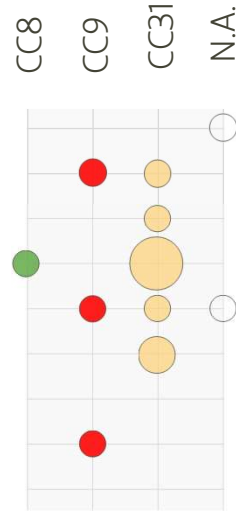
After C&D: **28%** (41/149)

Pallet truck (handle)  
 Pallet truck (wheel)  
 Plastic transport pallet  
 Floor drain  
 Floor  
 Cleaning material (brush)  
 Cleaning material (shovel)  
 Cleaning material (floor squeegee)  
 High pressure washer (handle)

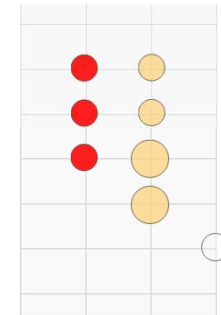
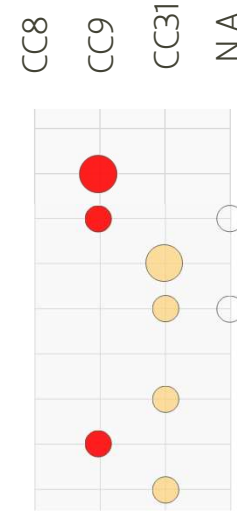
Production: **24%** (31/129)

Pallet truck (handle)  
 Pallet truck (wheel)  
 Plastic transport pallet  
 Floor drain  
 Floor  
 Handle (door)  
 Round knife wizard

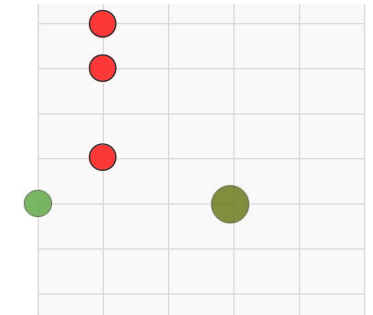
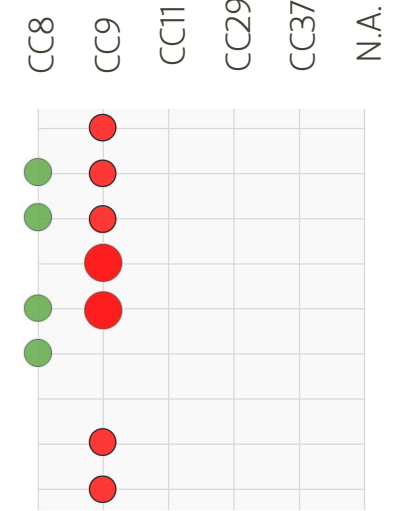
1.



2.

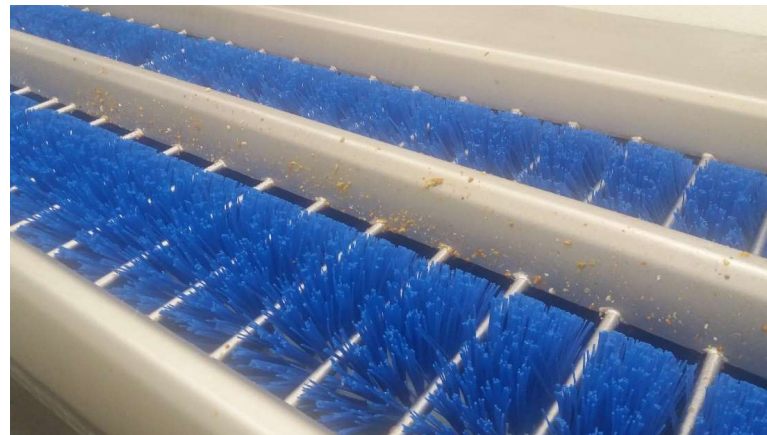


3.



## Conclusions

- 22% of the pig carcasses are contaminated with Listeria after slaughter
- Importance of C&D in cutting plants
  - Correct protocol and correctly applied !
  - Be aware of difficult to reach places
- Importance of monitoring of the environment
  - Persistent strains vs. passants





# BEDANKT VOOR UW AANDACHT

Koen De Reu  
Hang Zeng  
Niels Demaître  
QAML Labo  
Moleculair Labo  
Prof. Annemie Geeraerd  
Prof. Lieven De Zutter  
Marc Heyndrickx

Ik beantwoord graag uw vragen