

# The effect of the cutting process on *Campylobacter* contamination levels in broiler meat cuts.

Workshop:

***Campylobacter* in slaughterhouses and cutting plants:  
risks and opportunities for better control**

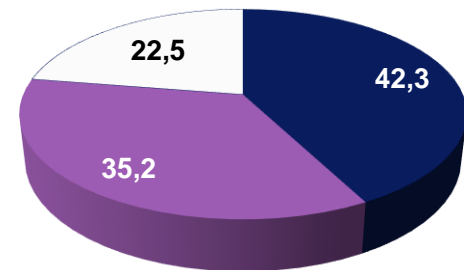
28 January 2016, Brussels

***Prof. Dr. Lieven De Zutter***

## Simplified broiler meat production chain



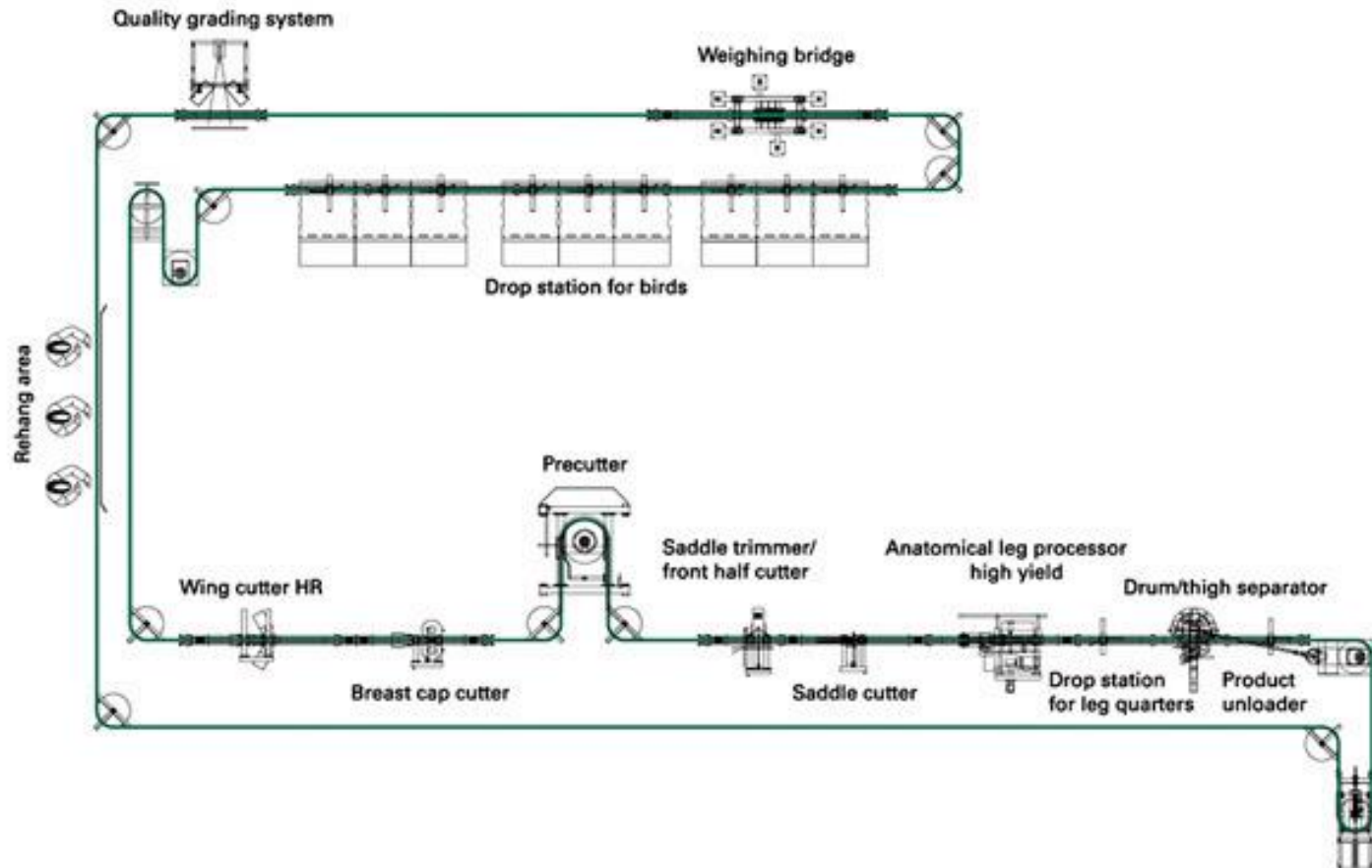
■ Meat preparations ■ Meat cuts □ Whole carcass



## Aims

To quantitatively assess the effect of cutting process on the *Campylobacter* contamination of broiler meat cuts.

## An example of cutting line



- 2 cutting plants
- 3 visits per plant:

During each visit

batch 1



6 carcasses after chilling

3x

3x

3x



1 min

15 min

30 min

Breast caps

3x

3x

3x



1 min

15 min

30 min

Fillets

batch 2, 3, 4

3x

3x

3x



1 min

15 min

30 min

After chilling

3x

3x

3x



1 min

15 min

30 min

Wings

3x

3x

3x



1 min

15 min

30 min

Thighs



FACULTY OF VETERINARY MEDICINE  
approved by EAEVE

## ▪ *Campylobacter* enumeration

### ~10 g of sample

- \* skin from carcasses, wings, breast caps, thighs
- \* external fillets' surfaces with a max. of 5 mm thickness

**1/10 dilution with Peptone Water  
homogenisation**

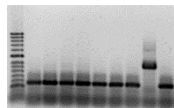
**serial dilution and direct plating**  
(RAPID *Campylobacter* Bio-Rad, France)

**incubation: 41.5°C 48h, MA**

**enumeration**



**confirmation by PCR**



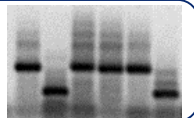
## ▪ *flaA* genotyping

### Samples selection (per batch)

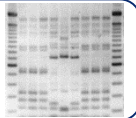
- \* One carcass after chilling sample; 1 and 30 min
- \* One fillet samples; 1 and 30 min

**up to 20 isolates were collected per sample**

**Species identification by PCR**

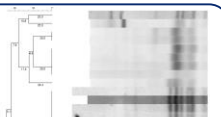


**RFLP *flaA* typing**



**Fingerprints analyses**

(GelCompar II 6.6.11; Applied Math, Belgium)



## ***Campylobacter* status of sampled batches**

- Based on the direct plating of caecal content samples

Plant	Visit	Batch	<i>Campylobacter</i> status
A	I	1	positive
		2	negative
		3	negative
		4	positive
	II	1	positive
		2	negative
		3	positive
		4	negative
	III	1	negative
		2	positive
		3	negative
		4	positive

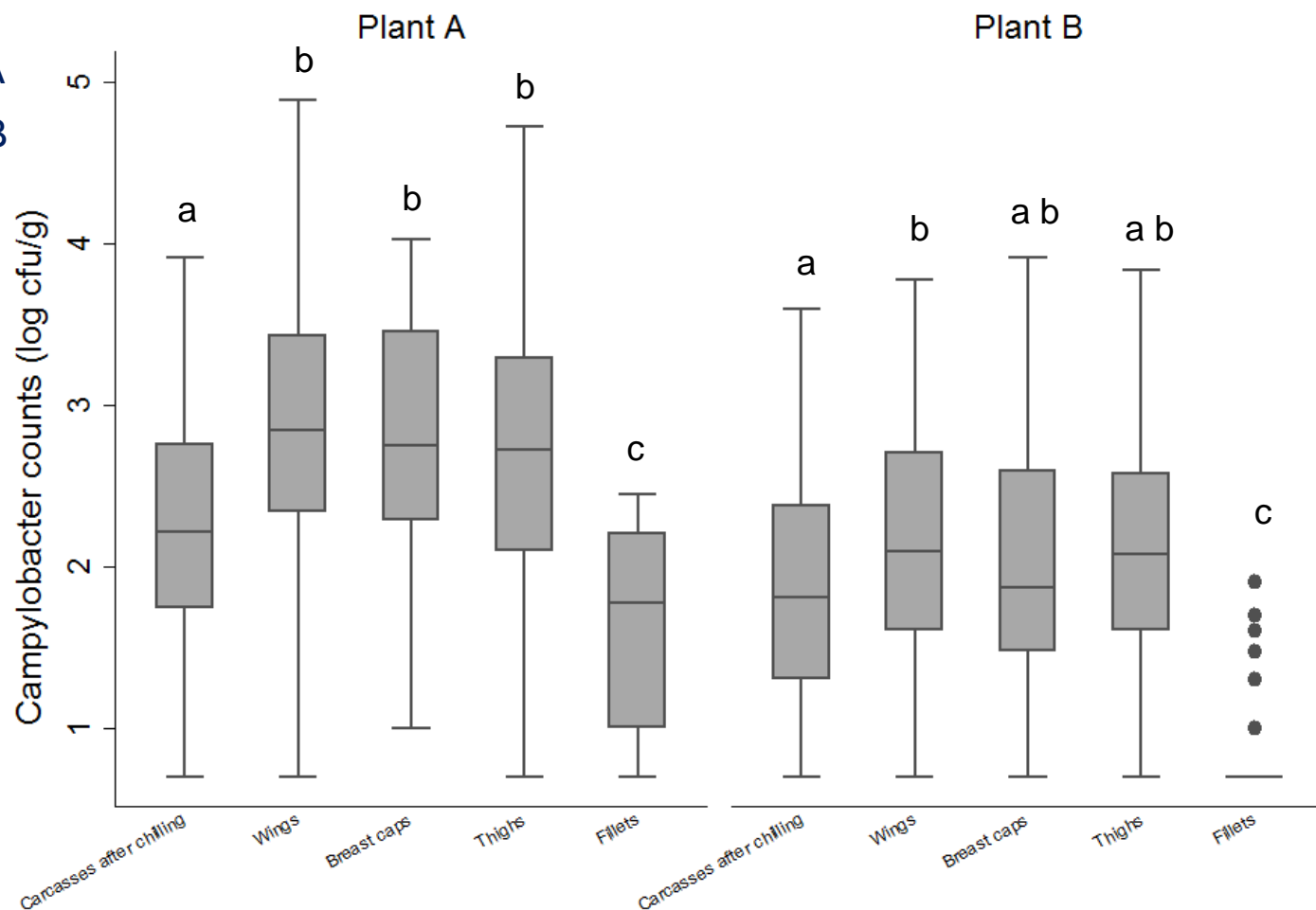
Plant	Visit	Batch	<i>Campylobacter</i> status
B	I	1	negative
		2	negative
		3	negative
		4	positive
	II	1	negative
		2	positive
		3	positive
		4	positive
	III	1	positive
		2	positive
		3	negative
		4	positive



## Cutting process of *Campylobacter* positive batches

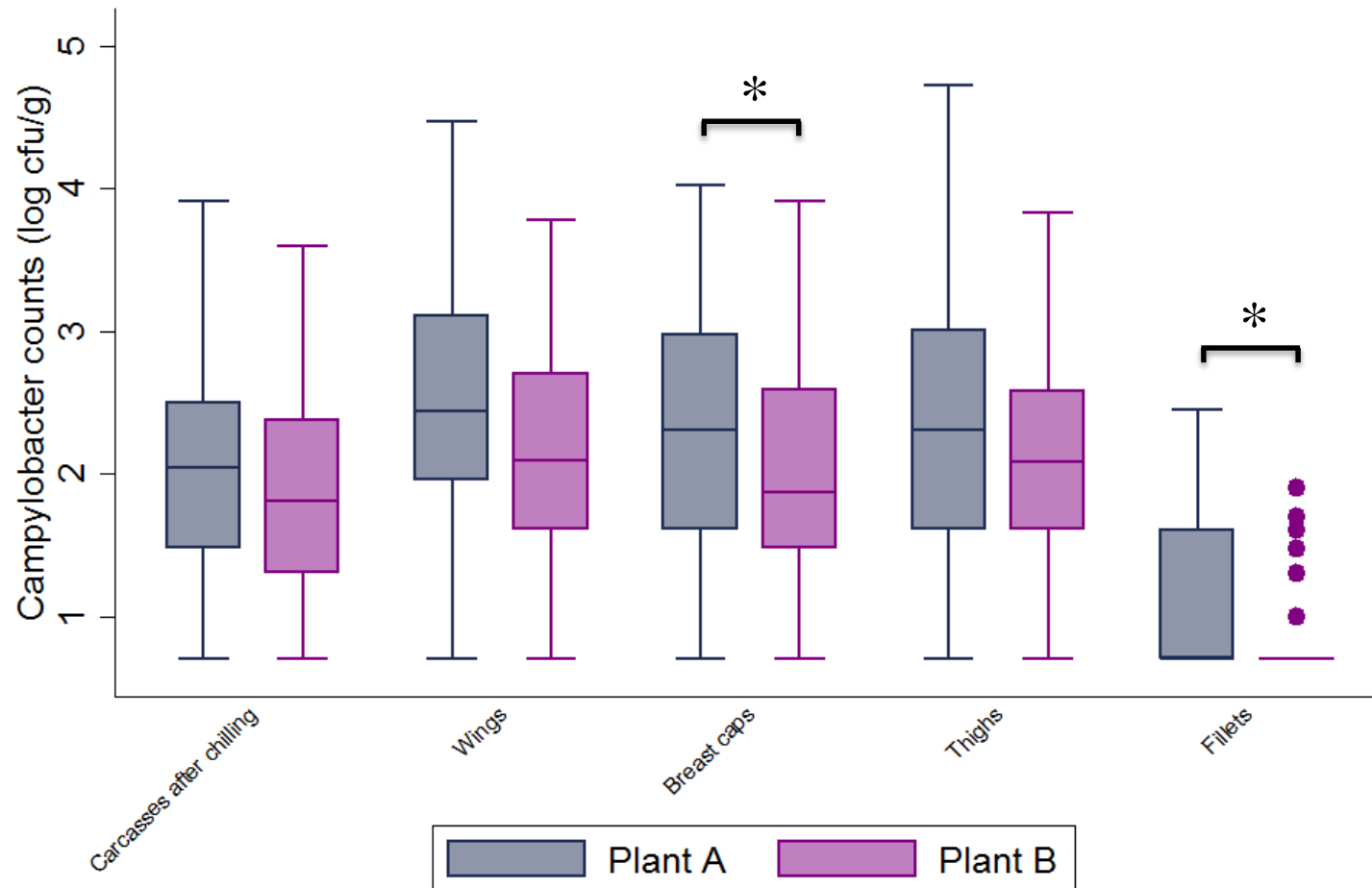
- Comparison of sampling sites within the plant

- 4 batches in Plant A
- 6 batches in Plant B



## Cutting process of *Campylobacter* positive batches

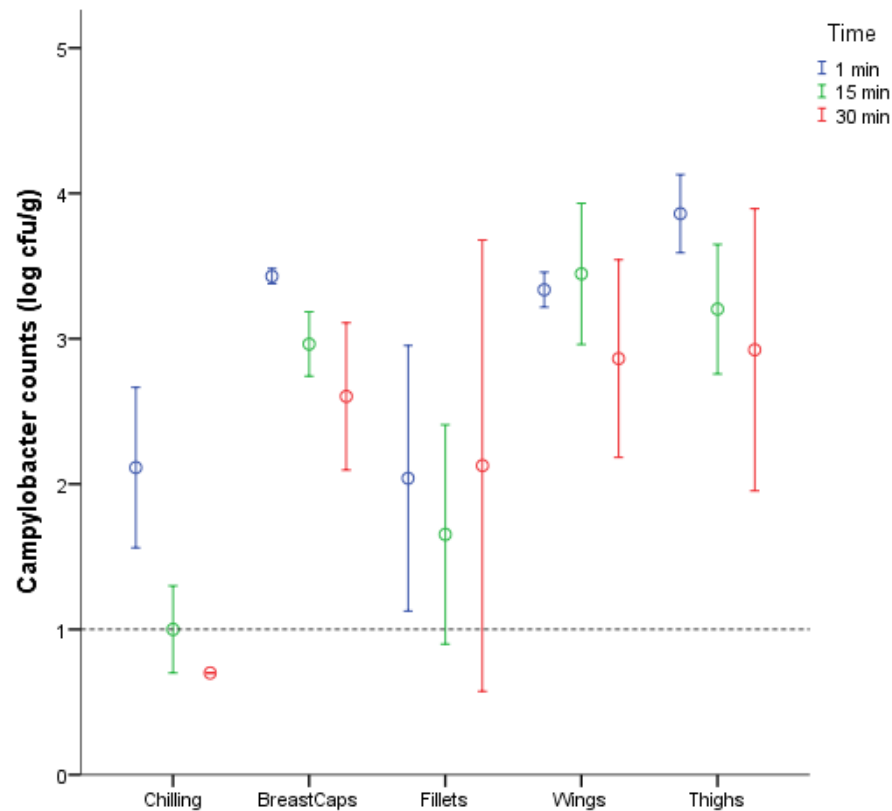
- Comparison between plants per sampling site



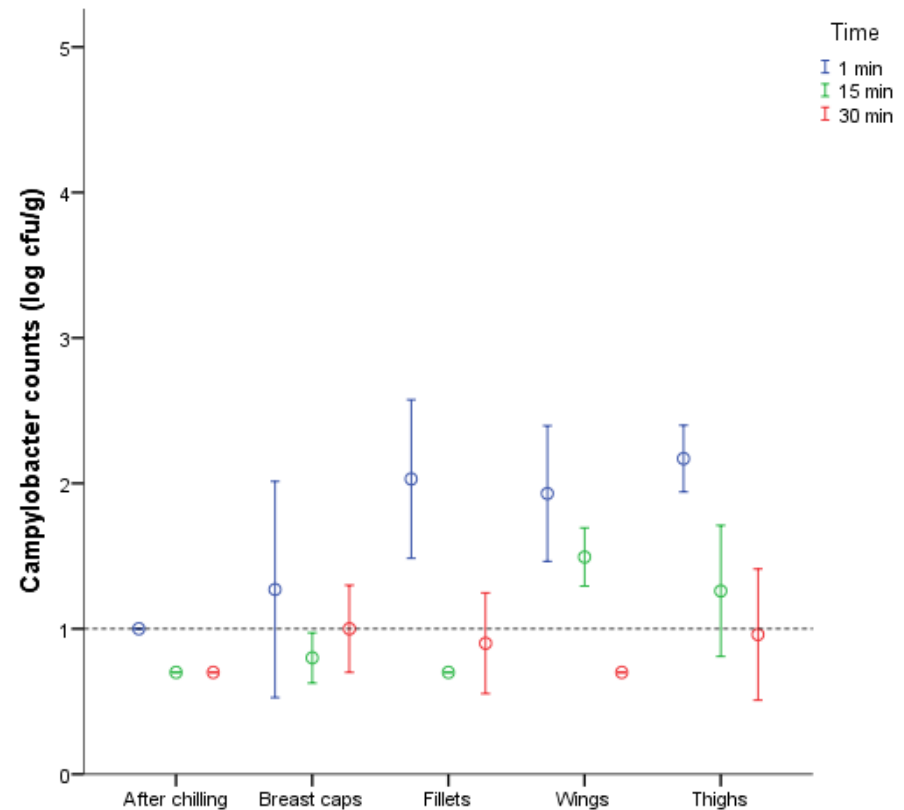


## Transfer of *Campylobacter* from positive to negative batches during cutting

Contamination after chilling of preceding pos. batch  
**3,01 (1,04)**




























Contamination after chilling of preceding pos. batch  
**2,43 (0,50)**

























## Genotyping of *Campylobacter* isolates (selected visits)

### Plant A

Visit	Batch		
I	1 (positive)	 	
	2 (negative)	 	 
	3 (negative)	 	 
	4 (positive)	 	 
III	1 (negative)		
	2 (positive)		
	3 (negative)		
	4 (positive)	 	  

### Plant B

Visit	Batch		
II	1 (negative)		
	2 (positive)	 	
	3 (positive)		
	4 (positive)	 	 
III	1 (positive)	 	
	2 (positive)	 	 
	3 (negative)	 	
	4 (positive)	  	

- ❑ The present study provides novel insight in the current knowledge on the *Campylobacter* contamination during post-harvest processing of broiler carcasses.
- ❑ Cutting process contributes to the increased microbiological load on broiler meat cuts with skin.
- ❑ Decrease in *Campylobacter* contamination levels on fillets in comparison to carcasses or breast caps due to the skin removal.
- ❑ *Campylobacter* contamination is transmitted to negative carcasses and meat cuts from preceding positive batches.
- ❑ *Campylobacter* counts decline with the processing time of negative batches. However, *Campylobacter* counts on broiler meat cuts decrease slower than those on carcasses.



FACULTY OF VETERINARY MEDICINE  
approved by EAEVE

## Research team

Dr. Tomasz Seliwiorstow, Prof. Mieke Uyttendaele, Małgorzata Lewandowska,  
Antonia Analatoua, Sofia Ingresa Capaccionia

## Managers of slaughterhouses and cutting plants

The research that yielded these results, was founded Study was founded by  
the Belgian Federal Public Service of Health, Food Chain and Environment  
CAMPYVAR and CAMPYTRACE projects



# Thank you for listening!