Campylobacter prevalence in foods from animal origin in Belgium

G. Daube[1], Y. Ghafir[1], JM. Dumont[2], H. Goossens[4], JY. Francois[1], M. Cornelis[5], M. Jouret[5] and L. De Zutter[3]

[1] *Food Microbiology, Faculty of Veterinary Medicine, University of Liege, Liege, Belgium*
[2] *Public Health Institute - Louis Pasteur, Brussels, Belgium*
[3] *Food Microbiology, Faculty of Veterinary Medicine, University of Gent, Gent, Belgium*
[4] *Medical microbiology, University of Antwerp, Belgium*
[5] *Institute of Veterinary Expertise (Public Health), Brussels, Belgium*

Introduction

- *Campylobacter* is the most common cause of bacterial gastroenteritis in term of numbers of reported cases by the Public Health. The determination of the prevalence and the level of contamination is essential for an efficient risk assessment program but all the different species have not the same epidemiology and the preventive measures are probably different.

Material and Methods

- The surveillance plan was designed to detect a contamination rate of 2% in the sample population, with a probability of 95%.
- Several matrixes of pork and poultry were sampled and all samples were investigated two times (sample itself and a dilution of it, see Table 1)
- The analytical method used was a enrichment in Preston broth (48 hours, 42°C), plating of 10µl on mCCDA agar (24-120 hours, 42°C), followed by biochemical (Api Campy) and genetic (PCR multiplex) characterizations .
- Isolates were then tested for resistance to various antibiotics by the MIC method.

Table 1: Matrixes and quantities tested.

		Sample	250-fold dilution
Porks	Carcasses (skin)	598 cm^2	2,4 cm^2
	Liver	697 cm^2	2,8 cm^2
	Retail cuts	25g	0,1g
	Minced meat	25g	0,1g
Broilers	Carcasses	25g	0,1g
	Liver	25g	0,1g
	Boneless breast	25g	0,1g
Layers	Carcasses (skin)	25g	0,1g
Turkeys	Carcasses (skin)	25g	0,1g

Results and discussion

Campylobacter is frequently isolated from pork and poultry even from a little quantity of matrix (Figure 1 and 2) with stable prevalences (Figure 7).
In pork, *C. coli* and *C. jejuni* represent more than the half of the isolates (Figure 3). In Layers (Figure 4), *C. jejuni* is isolated in at least 80% of the cases. In broilers (Figure 5), the dominance of *C. jejuni* is similar to those found in layers. In turkeys, *C. jejuni* is yet more important with more than 94% (Figure 6).
As shown in Table 2-3, the results of resistance to antibiotics are similar to those obtained in humans.

Figure 1: Prevalence in pork

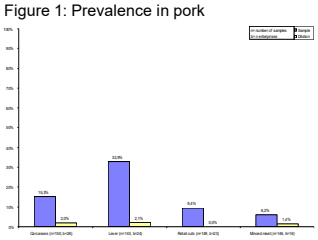


Figure 2: Prevalence in poultry

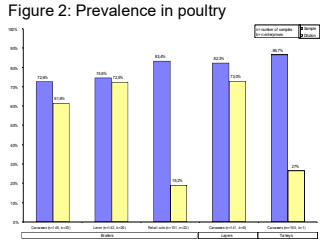


Figure 3: Biotypes from pork samples

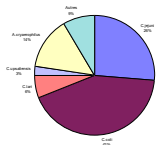


Figure 4: Biotypes from layers samples

Figure 5: Biotypes from broilers samples

Figure 6: Biotypes from turkeys samples

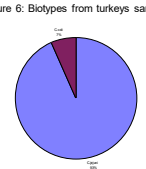


Table 3: Resistance to antimicrobials of *C. coli* (in %)

	Human*	Food**		
		Pigs	Broilers	Layers
	n=27	n=38	n=46	n=25
Erythromycin	11,1	64,9	32,6	20,0
Ampicillin	25,9	13,5	15,2	4,0
Oprofloxacin	0	27,0	65,2	32,0
Nalidixic acid		29,7	60,9	36,0
Tetracycline		62,2	52,2	24,0
Gentamycin	0	2,7	0	0

* Data 1988-89 from Sweden (Sjogren, 1992)
** Data 1998

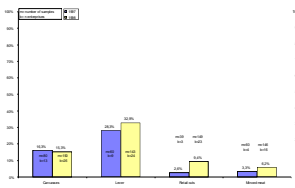
Table 4: Resistance to antimicrobials of *C. jejuni* (in %)

	Human*	Food**		
		Broilers	Layers	Turkeys
	n=110	n=271	n=87	n=93
Erythromycin	6,4	5,2	3,4	5,4
Ampicillin	20,9	23,2	17,2	31,2
Oprofloxacin	0,9	43,2	21,8	34,4
Nalidixic acid		44,6	23,0	44,1
Tetracycline		32,5	21,8	35,5
Gentamycin	0,9	0	0	0

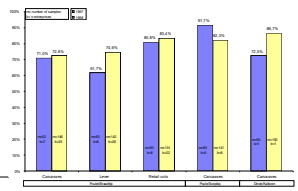
* Data 1988-89 from Sweden (Sjogren, 1992)
** Data 1998

Figure 7: Prevalence of *Campylobacter* in 1997 and 1998

In pork



In poultry



Conclusion and discussion

- *Campylobacter* is frequently isolated from pork and poultry.
- Isolated strains belong to same species and have same antibiotic resistance profiles that isolated strains from human.
- An advanced analysis of the results is needed in order to precise the sources of human campylobacteriosis.
- The rate and the level of contamination, and thus the risk, is higher in poultry than in pork.
- These results should be used to take preventive measures in order to lower the contamination rate of *Campylobacter* and the resistance to antibiotics.
- These results should be compare with those of others European countries.

Bibliography

- Trends and sources of zoonotic agents in animals, feeding stuff, food and man in the European Union in 1996. An evaluation of the trends reports provided for the year 1996 by the Member States to the European Commission according to Art. 5 of the Directive 92/117/EEC.
- Annual report on Zoonoses in Denmark 1998, Ministry of Food, Agriculture and Fisheries, Denmark.
- Surveillance des maladies infectieuses par un réseau de laboratoires de microbiologie (1997), Public Health Institute, Belgium.
- *Campylobacter* isolates at the University of Antwerp Hospital, unpublished data.
- Antimicrobial susceptibilities of *C. coli* and *C. jejuni* isolated in Sweden: a 10-year follow-up report, E. Sjogren and al., in : Antimicrobial agents and chemotherapy, Dec 1992, p. 2847-2849.

This study was financially supported by the Institute of Veterinary Expertise (Public Health).