Occurrence of Campylobacter in foods from animal origin in Belgium since 1997

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Introduction

Campylobacter is the most common cause of bacterial gastro-enteritis in terms of numbers of reported incidence by the public health. The prevalence and the level of contamination are essential for an efficient risk assessment program but all the different species have not the same virulence potentiality.

Material and Methods

Since 1997, the Belgian zoonosis surveillance program has assessed the contamination with *Campylobacter* in cattle, pig, poultry, rabbit and fish. The number of sample was approximately 120 in 1997, 150 in 1998 and 1999 for each matrix. Each year, the analysed sample amount has been adjusted to obtain semi-quantitative results. The matrixes investigated and the sample size investigated are shown in table 1.

The detection of *Campylobacter* has been carried out with the official method from the Ministry of Public Health (SP-VG M003). Briefly, this method consist of an enrichment into Preston broth incubated 48h at 42°C under micro-aerophilic atmosphere followed by a streaking of a 10µl onto mCCDA. After an incubation time of 24h and 120h, plates were read for the presence of typical colonies, a biochemical or PCR confirmation was performed in order to confirm the presence of *Campylobacter*. The antibiotic resistance profile of the isolates was established by MIC method (results not shown).

Table 1: Matrixes and sample sizes since 1997.

		1997	1998		1999	
		Sample	Sample	Dilution	Sample	Dilution
Cattle	Carcasses	400cm²				
	Retail cuts	25g				
	Livers	400cm²				
	Minced meat	25g				
Calf	Carcasses	400cm²				
	Livers	400cm²				
	Minced meat	25g				
Pork	Carcasses	600cm²	600cm²	2,4cm²	600cm²	24g
	Retail cuts	25g	25g	0,1g	25g	1g
	Livers	700cm²	700cm²	2,7cm²		
	Minced meat	25g	25g	0,1g	25g	1g
Broiler	Carcasses	25g	25g	0,1g	0,1g	0,01g
	Livers	25g	25g	0,1g		
	Breasts	25g	25g	0,1g	1g	0,01g
Layer	Carcasses	25g	25g	0,1g	0,1g	0,01g
Turkey	Carcasses	25g	25g	0,1g	0,1g	0,01g
Rabbit	Carcasses	600cm²				
Fish	Flesh				25g	

Results and discussion

In cattle, calf, rabbit and fish, the study has been stopped after one year of investigation due to the very low prevalence (Fig. 1).

In pork, the prevalence seems to be at a constant level (carcasses: 15-21%; Retail cuts: 3-13%; Livers: 28-33% and minced meat: 2-6%) and isolated strains belonged to the same biotypes (*C. coli*: 42-71%; *C. jejuni*: 5-39% and among other biotypes (9-32%), *A. cryaerophilae* (3-14%) is the most common) (Fig. 2 and 4).

In poultry, the prevalence is also at a constant but higher level (broilers: carcasses: 71-76%, livers: 62-75% and breasts: 52-83%; layers: carcasses: 82-92%; turkeys: carcasses: 73-87%). *C. jejuni* is the major biotype in poultry (49-93% in turkeys (the low result may be due to the loss of several isolates), 63-79% in layers and 66-84% in broilers) with *C. coli* (7-47% in turkeys, 16-36% in layers and 15-34% in broilers). Other biotypes such as *C. lari* and *A. cryaerophilae* have also been detected (Fig. 3, 5 and 6).

In pork, the analyse of the dilution (25- or 250-fold) led nearly to negative results except for carcasses in 1999 (prevalence of 9% in 0,1g). In poultry, the 25-fold dilution has almost no inference on the contamination rate of broiler and layer carcasses and of broiler livers. Other matrixes lowered with a ratio of 3,0 (turkeys) and 3,8 (broiler breasts) for the 25-fold dilution but for broiler breasts, the reduction rate for the 250-fold dilution is the same than for the 25-fold dilution.

Fig. 1 : Prevalence in cattle, calf, rabbit and fish

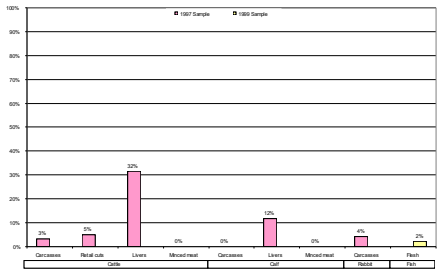


Fig. 2 : Prevalence in pork

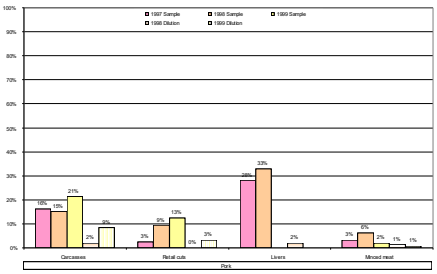


Fig. 3 : Prevalence in poultry

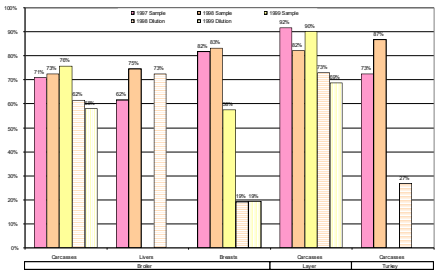


Fig. 4 : Major biotypes in pork

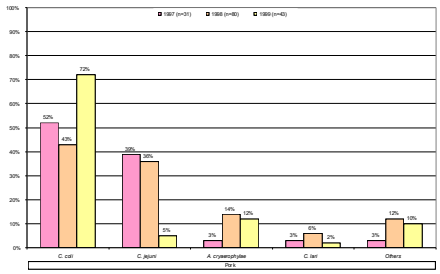


Fig. 5 : Major biotypes in broiler

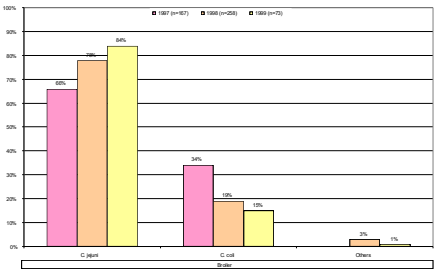
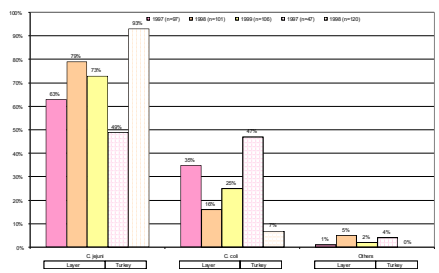


Fig. 6 : Major biotypes in layer and turkey



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.

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