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Campylobacter hazard in the pork food chain: a quantitative and qualitative approach

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Campylobacteriosis is the most frequently reported zoonotic disease in humans in EU with

175,561 reported confirmed cases in 2006. Pigs are known to be largely contaminated by Campylobacter in farms, but few data exist about the status of the pork food chain.

The purpose of this study was to characterise the Campylobacter contamination of the French pork food chain : prevalence, contamination level, bacterial species and genotypic diversity in primary production (sows, piglets and fattening pigs), and in first and second transformation process (from carcasses before chilling to deboned meat cuts).

A total of 1995 rectal samples (from 350 sows, 359 piglets 4 days old, 1036 piglets 25 days old, and from 250 slaughtered fattening pigs) and 3500 meat samples (from 550 carcasses and 300 meat cuts, 2 or 8 samples/carcass and 2 samples/cut, 25 cm²/sample) were collected from nine confined farrow-to-finish farms (3 batches per farm were tested over a year), randomly selected, and five slaughterhouses and six cutting plants.

Bacteriological results showed that 85% of the sows, 39% of the 4 days piglets, 77% of the 25 days piglets and 100 % of the fattening pigs were infected with high levels of contamination: 40 000 cfu/g of faeces (50 to 5 000 000 cfu/g). Before chilling, 23% of the carcasses (2 sites) were contaminated with low levels (2.3 cfu/cm² as a mean value) with high variations between samples (0.4 to 330 cfu/cm²), and 9.7% of the carcasses (8 sites) after chilling were contaminated. Primal cuts contamination was lower than 1%, and no Campylobacter detected after deboning.

On the basis of multiplex-PCR identification, no isolate was identified as *C. jejuni*, 91% (1028/1128) as *C. coli* and 9% (100/1128) campylobacter-like. Subtyping by pulsed-field gel electrophoresis and gel analysis after SmaI macrorestriction, showed a higher genotypic diversity of Campylobacter in first steps of pork food chain than in poultry.

From these data we concluded that despite an early and high Campylobacter coli carriage in pork primary production, the contamination of carcasses and meat cuts could be maintained to a low level by the respect of hygiene procedures (GHP, HACCP...). The respect of hygiene procedures and the considerable genotypic diversity of *C. coli* must be taken into account for risk analysis of Campylobacter in the French pork food chain.