CAMPYLOBACTER IN POULTRY; ONGOING ACTIVITITES WITHIN EU AND EXPERIENCES FROM THE NORWEGIAN ACTION PLAN

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Introduction

Campylobacteriosis is an important public health problem in most areas of the world. According to the EU reporting of zoonoses, the incidence of campylobacteriosis is significant throughout EU and there has been a general trend towards an increase in the incidence over the last decade. In several Member States, the incidence of campylobacteriosis has surpassed that of salmonellosis in recent years and has become the most commonly reported bacterial gastrointestinal disease (1).

The epidemiology of thermophilic *Campylobacter*, the etiological agents of campylobacteriosis, is complex. The principal reservoirs are the alimentary tracts of wild and domesticated mammals and birds. *C. jejuni* is predominantly associated with poultry, but can also be isolated from cattle, sheep, goats, pigs, dogs and cats, while *C. coli* is predominantly found in pigs, but can also be isolated from poultry, cattle and sheep (1,2,3). Typically, about 90% of the isolates from human campylobacteriosis cases are identified as *C. jejuni*, while *C. coli* accounts for most of the remaining cases. *Campylobacter* may be spread to humans by direct contact with contaminated animals or animal carcasses, or indirectly through the ingestion of contaminated food or water. Campylobacteriosis in industrialised countries is primarily a foodborne disease, with poultry as a principal source (4,5). Several case-control studies have identified handling and consumption of poultry products as important risk factors for human campylobacteriosis (5,6). However, the contribution of the various food and non-food sources to the incidence of campylobacteriosis within EU will be country and time dependent due to various factors such as climate, consumption patterns, drinking water distribution, food production systems, degree of implementation of control measures, etc.

Poultry as source of *Campylobacter*

Campylobacter spp. are commonly isolated from poultry and poultry products. Prevalences vary, however, as a function of country, time period of sampling, type of birds (broilers, other type of poultry, free range, organic) and products (fresh, frozen, heat treated), methodology of detection (direct plating *vs.* enrichment), and type of sample (caecal contents, faeces, litter) (1). In many countries a seasonality of the prevalences is common, with a peak at the end of summer and the early autumn (1). When a flock is infected, contamination will within a short time involve most if not all birds.
Transmission of *Campylobacter* to the birds from environmental sources (poultry house surroundings), including drinking water, is the most likely route of infection. Split slaughter (thinning) is a risk factor for introducing *Campylobacter* to a flock. The most efficient measures for controlling *Campylobacter* contamination of broilers at farm-level concern biosecurity measures and farm practices aimed at preventing the introduction of *Campylobacter* in the flocks (7). Cross-contamination from positive to negative flocks at slaughter and processing is a common problem. The application of good hygienic measures and introduction of techniques to reduce fecal spread are important preventive measures. Consumer exposure to *Campylobacter* is inevitable if poultry meat is not handled hygienically, i.e. if cross-contamination from raw poultry meat to ready-to-eat food products is allowed to happen, and/or if the meat is not properly cooked before consumption. Studies show that unhygienic food handling procedures are commonly practiced. Thus, proper and targeted risk communication is critical in the prevention of campylobacteriosis.

EU activities in regard to *Campylobacter*

On November 17, 2003 the European Commission adopted a new Regulation on the control of *Salmonella* and other specified food-borne zoonoses (No. 2160/2003) as well as a new Directive on the monitoring of zoonoses and zoonotic agents (2003/99/EC). The central idea of the Regulation is the setting of pathogen reduction targets along the food chain, mainly for animal populations, and the establishment of national control programmes in order to meet these targets. In this context, targets for *Campylobacter* could be established. The Directive contains a possibility to harmonise the monitoring of certain zoonotic agents, when it is necessary to make the data collected easier to compile and compare. This option may be used to gather more detailed information on *Campylobacter* spp. in order to fill data gaps. The Commission has also started a revision of the microbiological criteria in Community legislation. Criteria would be set for food products at different stages of the manufacturing process as well as for products on the market. During the discussions with the Member States and the consultation of the stakeholders, wishes to set criteria for *Campylobacter* spp. in raw milk, poultry carcasses as well as live bivalve molluscs have been expressed.
In late 2003, the Commission asked the European Food Safety Authority (EFSA) to deliver a scientific opinion on *Campylobacter* spp. in animals and foodstuffs, and in particular:

- identify categories of foodstuffs where *Campylobacter* spp. represents a significant risk to public health;
- identify possible control options to reduce this risk along the food chain, and evaluate their effectiveness, with special reference to the measures taken at the primary production and the setting of microbiological criteria;
- identify the gaps in available data together with the best means of collecting this information.

This work is still going on, and an opinion is expected to be adopted before the end of 2004.

Experiences from the Norwegian action plan against *Campylobacter* in poultry

Campylobacteriosis is the most commonly reported bacterial gastroenteritis in humans in Norway. The incidence increased substantially during the 1990s and peaked in 2001 with a total of 64 reported cases per 100.000 inhabitants. For close to half of the cases, the infection is acquired in Norway (8). Consumption of poultry meat purchased raw has been identified as a significant risk factor together with the drinking of undisinfected water, eating at barbecues, occupational exposure to animals, and eating undercooked pork (6). The action plan against *Campylobacter* spp. in Norwegian broilers has the objective to reduce human exposure to *Campylobacter* spp. through Norwegian broiler meat products. The action plan regarding *Campylobacter* in Norwegian broilers was implemented in the spring of 2001 (9). The objective is to reduce the human exposure to *Campylobacter* through Norwegian broiler meat products. The action plan is a joint effort involving several stakeholder groups from "stable-to-table". The Norwegian Zoonosis Centre developed the action plan in cooperation with the Norwegian Food Safety Authority, the National Veterinary Institute, the Norwegian Institute of Public Health, the Norwegian School of Veterinary Science, the Centre for Poultry Science, and the poultry industry. The Norwegian Zoonosis Centre coordinates the programme, and is responsible for collection and analyses of data and dissemination of results.

The action plan consists of three parts; a surveillance program including all Norwegian broiler flocks slaughtered before 50 days of age, a survey of broiler meat products, and a follow-up advisory service on farms with flocks positive for *Campylobacter* spp. In the surveillance, pre-slaughter sampling of a flock is performed eight to four days before slaughter by the owner and consists of ten swabs from fresh faecal droppings. Positive flocks are slaughtered at the end of the day, and the carcasses from these flocks are either heat treated or frozen for a minimum of five weeks before being marketed. All flocks are tested again upon arrival at the slaughter plant by sampling of ten cloacal swabs per flock at the slaughter line. Broiler farms that deliver *Campylobacter* positive flocks are subject to a follow-up visit by advisors from the poultry industry or the district veterinary officer. The visit should result in interventions on the farm aimed at reducing the risk of flocks being contaminated with *Campylobacter* in the future. In the product survey approximately 100 samples from retail are analyzed each month.

In the three years period from May 2001 through April 2004, a total of 10396 flocks from 569 farms were examined, of which 578 (5.6%) flocks were positive, approximately 90 % of these with *C. jejuni*, the remaining with *C. coli* or *C. lari*. There is a pronounced seasonal variation in the proportion of positive flocks, with a distinct peak in late summer. Of the positive flocks, 47.4% were identified at the pre-slaughter sampling and thereby subject to sanitary slaughter and freezing/heat treatment of carcasses, while the remaining flocks were identified at slaughter only. The positive flocks originated from 270 (47. %) of the farms. A total of 142 (52.6%) of the positive farms had only one positive incidence during these three years, whereas 66 farms (24.4 % of the positive farms and 11.6% of all the farms) had three or more positive incidences accounting for 51% of the positive flocks. Of these 66 farms, 28 had positive flocks all the three years, and these 28 farms accounted for 26% of the positive flocks. Thus, a considerable proportion of the positive flocks origins from the same few farms. A substantial decrease in flock prevalence from the second to the third year was observed, from 6.5% to 4.8 % positive flocks. The product surveys from May 2002 to April 2003 detected 8.8% positive samples of 1080 tested, while from May 2003 to April 2004 only 4.2% out of 1106 samples tested were positive. The seasonal variation in prevalence of positive products corresponded well with the prevalences of positive flocks (9).

The Norwegian Action Plan against *Campylobacter* spp. in broilers has been a successful cooperation between the various stakeholders. During the first three years, approximately 3.5 million positive carcasses have been prevented from entering the market fresh and thus significantly reduced human exposure to *Campylobacter* spp. through Norwegian broiler meat products. The significant reduction in the proportion of positive flocks from the second to the third year can probably partly be attributed to general improvements of hygienic practices in the Norwegian poultry industry stemming from the action plan. There are indications of a positive public health effect, but due to the complex epidemiology of *Campylobacter* and campylobacteriosis, it is difficult to assess this effect.

Acknowledgements

Merete Hofshagen, Norwegian Zoonosis Centre

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