Surveillance and control programmes for terrestrial and aquatic animals in Norway
National Veterinary Institute

*Annual Reports · 2008*

# The surveillance and control programme for *Campylobacter* spp. in broiler flocks in Norway

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*A total of 4.1% of all samples (from app. 4,675 flocks) were positive for Campylobacter*

## Introduction

Campylobacteriosis is currently the most commonly reported bacterial infectious disease in the Norwegian human population. In almost half of the cases, the infection is acquired in Norway. Consumption of poultry meat purchased raw has been identified as a significant risk factor together with drinking undisinfected water, eating at barbecues, occupational exposure to animals, and eating undercooked pork (1).

The action plan regarding *Campylobacter* in Norwegian broilers has been running since spring 2001 (2, 3, 4). The action plan is a joint effort involving several stakeholder groups from "stable-to-table". The Norwegian Zoonosis Centre at the National Veterinary Institute coordinates the programme, and is responsible for the collection and analyses of data and the communication of results.

The action plan is updated regularly and the details for 2008 together with other information regarding the action plan can be found at www.vetinst.no.

## Aim

The objective is to reduce the human exposure to thermophilic *Campylobacter* through Norwegian broiler meat products.

## Materials and methods

In 2008, all Norwegian broiler flocks that were slaughtered before 50 days of age were sampled pre-slaughter by the owner maximum four days before slaughter. The sample consisted of ten pooled swabs from fresh faecal droppings. The samples were submitted to the National Veterinary Institute's laboratory in Trondheim, where they are analysed by PCR. The carcasses from the positive flocks were either heat treated or frozen for a minimum of three weeks before being marketed.

In 2008 a marked change from previous years was implemented when the testing of all flocks upon arrival at the slaughter plant was terminated. Only a few flocks with "unknown status" were sampled at slaughter. In addition, samples were taken at slaughter from known positive flocks to collect isolates for testing of antimicrobial resistance.

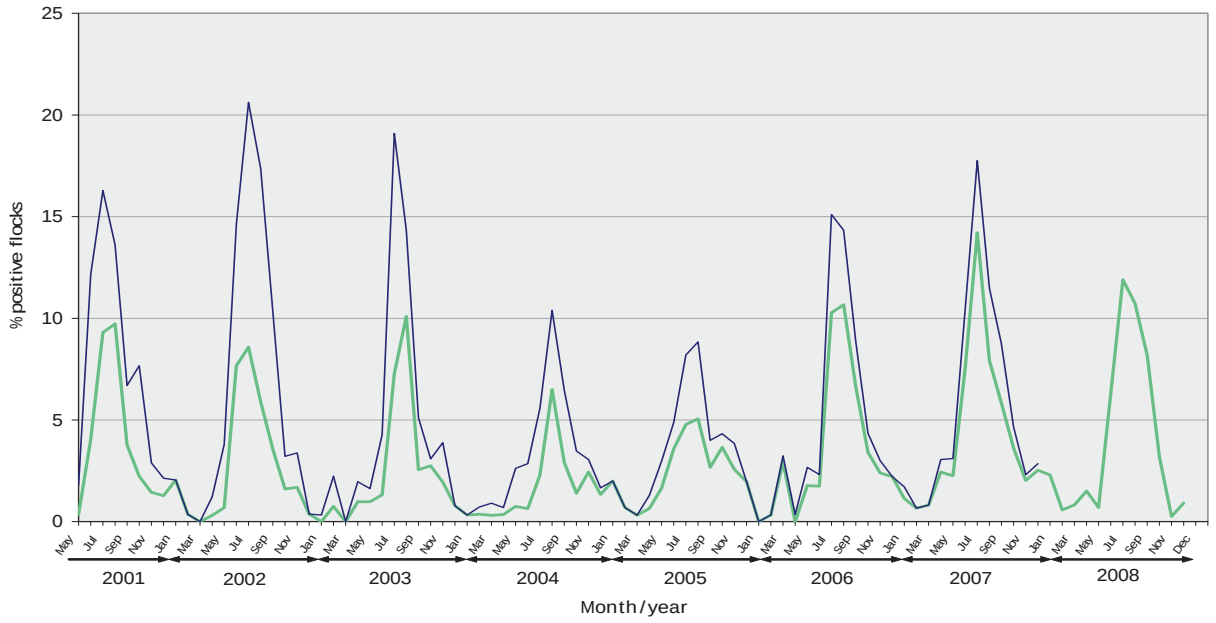
## Results

A total of 4,675 samples (approximately corresponding to number of flocks, although a few flocks might have been sampled more than once) were taken at farm. A total of 628 farms submitted samples. A total of 193 (4.1%) of the samples were positive for Campylobacter. In addition, 26 samples from flocks with "unknown status" were taken at slaughter. These flocks were from 23 farms. A total of five of these flocks were positive and are included in the following calculations.

The positive samples originated from 137 (21.8%) of the farms. These 137 farms were distributed as follows regarding number of "positive events" (a positive event is defined as one positive sample or as several positive samples within a short time span (can indicate several samples from one flock or samples from different houses): A total of 115 had only one "positive event", a total of 17 had two "positive events" and five had more than two "positive events".

The proportion of *Campylobacter* positive flocks and the proportion of flocks testing positive already at the pre-slaughter sample has varied substantially since the action plan was launched (Figure 1). Regional differences in the proportions of positive flocks and farms are shown in Table 1 and Figure 2.

**Figure 1.** Monthly incidence of *Campylobacter* in slaughtered Norwegian broiler flocks from May 2001 throughout 2008. The blue line represents flocks positive for *Campylobacter* (up to and including 2007 these data are based on two samples; before slaughter and at slaughter). The green line represents flocks (in 2008 samples) positive for *Campylobacter* at the sampling at farm four days before slaughter.




Tabell 1. *Campylobacter* positive farms by county in Norway in 2008.

| County | N | No. positive (%) | |
|---|---|---|---|
| Østfold | 93 | 15 | (16) |
| Akershus | 14 | 2 | (14) |
| Hedmark | 124 | 40 | (32) |
| Oppland | 8 | 1 | (13) |
| Buskerud | 11 | 3 | (27) |
| Vestfold | 36 | 9 | (25) |
| Telemark | 3 | 1 | (33) |
| Aust-Agder | 4 | 0 | (0) |
| Vest-Agder | 3 | 0 | (0) |
| Rogaland | 114 | 19 | (17) |
| Hordaland | 11 | 3 | (27) |
| Møre og Romsdal | 3 | 0 | (0) |
| Sør-Trøndelag | 81 | 20 | (25) |
| Nord-Trøndelag | 123 | 24 | (20) |
| **Totalt** | **628** | **137** | **(21,8)** |

## Discussion

In the first years of the action plan, when the pre-slaughter samples were taken approximately eight days before slaughter, approximately 50 % of the positive flocks were detected only at slaughter. From 1 March 2005 onwards, all flocks had to be sampled maximum four days before slaughter. This contributed to the fact that in

2005, 31.8 % of the positive flocks were detected only at slaughter, in 2006 this was further reduced to 25.3 %, and in 2007 the corresponding figure was 24.5 %.

If one anticipate that 2008 was equal to 2006 and 2007 in respect to the percentage of positive flocks being discovered four days before slaughter being approx. 75%, then 2008 would have had approx. 257 positive flocks in total (approx. 5.5% of positive flocks), indicating that the Norwegian Campylobacter status in 2008 was quite similar to 2007, when a total of 5.7% of the flocks were positive. The number of flocks becoming psoitive the last four days before salughter, having the potential of going out on the market withoud being frozen or heat treated would in that case be approx. 64 in 2008, quite equal to 2007.

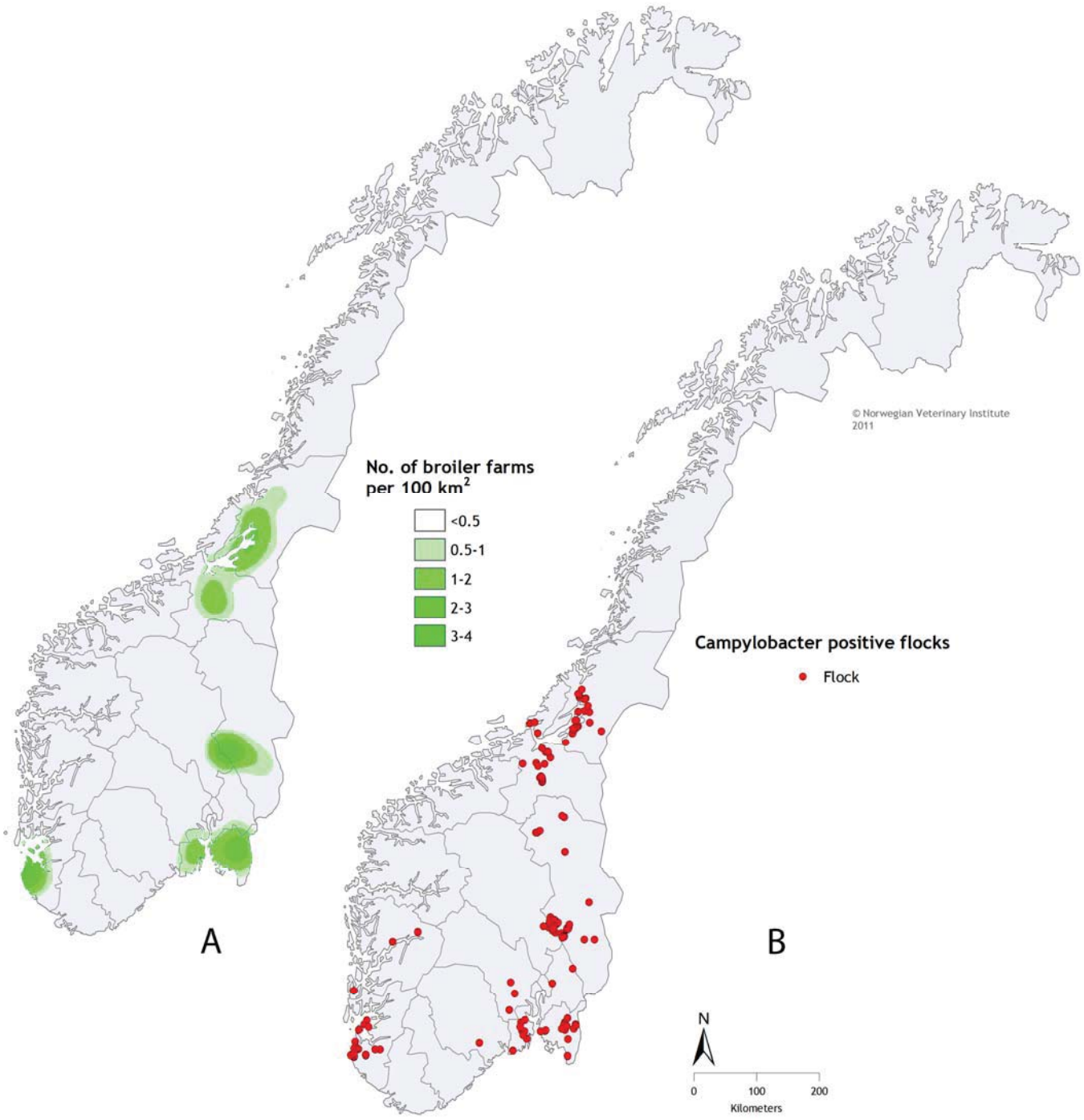



**Figure 2.** Geographical distribution in 2008 of the broiler farm density (A) and the location of farms with one or more *Campylobacter* positive flocks (B).

## References

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The National Veterinary Institute has its main laboratory in Oslo, with regional laboratories in Sandnes, Bergen, Trondheim, Harstad og Tromsø, with about 360 employees in total.

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The NFSA advises and reports to the Ministry of Agriculture and Food, the Ministry of Fisheries and Coastal Affaires and the Ministry of Health and Care Services.

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