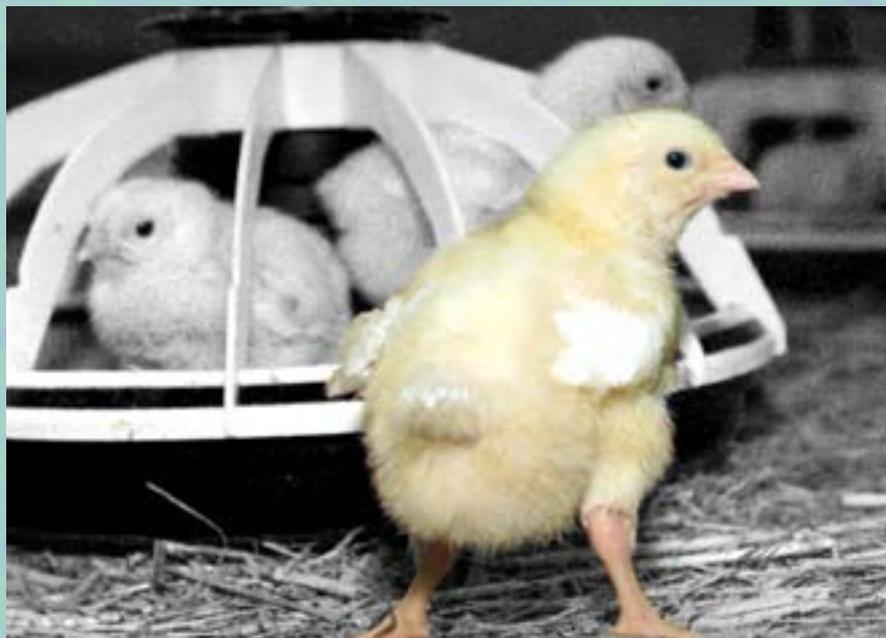


The surveillance programme for *Campylobacter* spp. in broiler flocks in Norway 2015



Surveillance programmes for terrestrial and aquatic animals in Norway

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The surveillance programme for *Campylobacter* spp. in broiler flocks in Norway 2015

Mona Torp, Margrete Vigerust, Bjarne Bergsjø, Merete Hofshagen

In 2015, a total of 93 (4.4 %) out of 2,133 sampled flocks were positive for Campylobacter spp. All flocks were sampled during the months May - October. The result is comparable to previous years.

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* spp. in Norwegian broilers has been running since spring 2001 (2). The action plan is a joint effort involving several stakeholder groups from “stable-to-table”. The Norwegian Zoonosis Centre at the Norwegian 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 2015 together with reports and plans from previous years can be found at www.vetinst.no.

Aim

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

Materials and methods

In 2015, all Norwegian broiler flocks slaughtered before 51 days of age during the period May-October were sampled by the owner maximum four days before slaughter. The sample consisted of ten pooled swabs from fresh faecal/caecal droppings. The samples were submitted to the Norwegian Veterinary Institute’s laboratory in Trondheim, where they were analysed for *Campylobacter* spp. by real-time PCR. The carcasses from the positive flocks were either heat treated or frozen for a minimum of three weeks before being marketed.

In addition, flocks with unknown status at the time of slaughter, were sampled at the slaughter house and analysed by cultivation on mCCDA agar.

Results

A total of 2,147 samples were taken before or at slaughter, representing 2,133 flocks from 620 farms. The discrepancy between number of flocks and number of samples was due to problems with the postal services being delayed and also to split slaughter of some flocks. A total of 94 samples, representing 93 flocks (4.4%) tested positive for *Campylobacter* spp.

The positive samples originated from 76 (12.3%) of the farms. Four farms had three positive flocks, nine farms had two positive flocks, while 63 had one positive flock. This shows that 13 (2.1%) of all farms produced 32.3% of the positive flocks. Regional differences in the proportions of positive farms are shown in Table 1.

The proportion of *Campylobacter* positive flocks has varied substantially since the action plan was launched (Figure 1).

Table 1. Farms positive for *Campylobacter* spp. by county in May - October 2015.

County	N	No. Positive	(%)
Østfold	98	16	(16.3)
Akershus	13	0	(0)
Hedmark	135	14	(10.4)
Oppland	5	1	(20.0)
Buskerud	8	0	(0)
Vestfold	29	3	(10.3)
Telemark	2	0	(0)
Aust-Agder	3	0	(0)
Vest-Agder	3	0	(0)
Rogaland	122	16	(13.1)
Hordaland	4	0	(0)
Møre og Romsdal	1	0	(0)
Sør-Trøndelag	73	9	(12.3)
Nord-Trøndelag	123	16	(13.0)
Nordland	1	1	(100)
Total	620	76	(12.3)

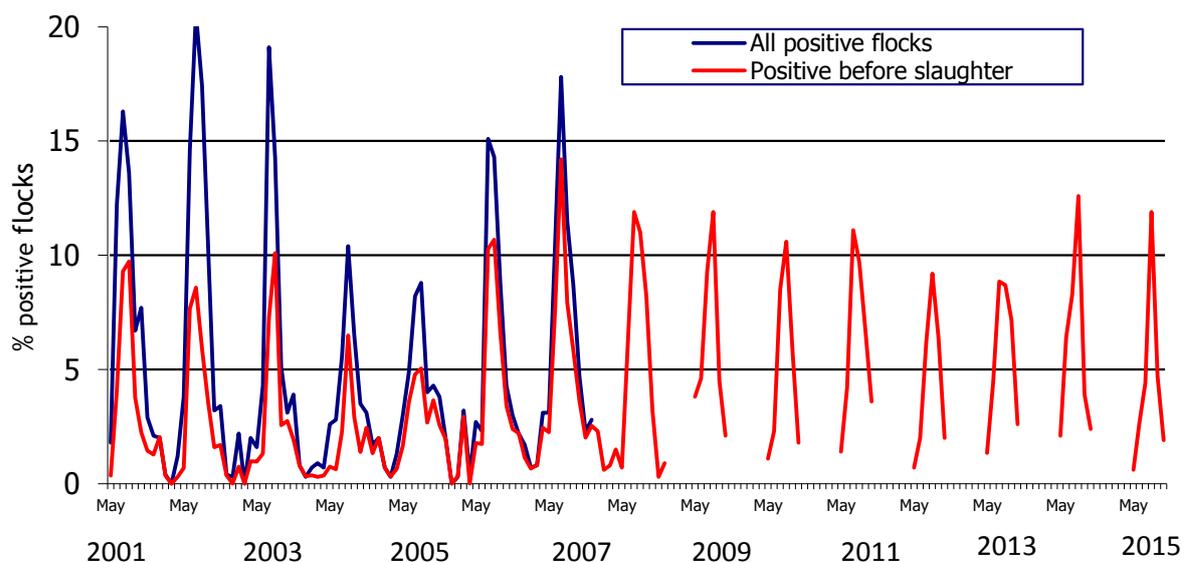


Figure 1. Monthly incidence of *Campylobacter* spp. in slaughtered Norwegian broiler flocks from May 2001 throughout 2015. The blue line represents flocks positive for *Campylobacter* spp., these data are based on two samples; before slaughter and at slaughter. The red line represents flocks positive for *Campylobacter* spp. at the sampling at farm before slaughter (from 2005 onwards: sampling approx. four days before slaughter). No sampling in January-April and November-December in 2009 - 2015.

Discussion

The results for 2002 - 2007, when all flocks were sampled twice, are presented in Table 2.

Up to and including February 2005, the pre-slaughter samples were taken approximately eight days before slaughter, and approximately 50% of the positive flocks were detected only at slaughter. From 1 March 2005 onwards, all flocks were sampled maximum four days before slaughter, and in 2005, 31.8% of the positive flocks were detected at slaughter only. In 2006 this was further reduced to 25.3%, and in 2007 the corresponding figure was 24.5%.

From 2008 onwards, the sampling at slaughter was terminated, and more recent data to calculate the number of flocks which were going on the market positive for *Campylobacter* without being frozen or heat treated are therefore lacking. Assuming that 2008 - 2015 equals 2007 with respect to the proportion of positive flocks being identified at the pre-slaughter sample (approx. 75%), the seasonal distribution (approx. 80% of positive flocks are slaughtered during the six summer months) and that the number of samples equals the number of flocks, calculations can be made (Table 3).

Table 2. Results from the Action Plan against *Campylobacter* spp. in broilers in the period 2002 - 2007.

Year	Number of sampled flocks	Number (%) of positive flocks	Number of positive flocks discovered at slaughter only*
2002	3 627	228 (6.3)	127
2003	3 550	175 (4.9)	85
2004	3 626	118 (3.3)	58
2005	3 652	132 (3.6)	42
2006	3 908	190 (4.9)	48
2007	4 145	237 (5.7)	58

* This is the maximum number of flocks positive for *Campylobacter* spp. which had the possibility to reach the market without previous freezing or heat treatment.

Table 3. Estimated results from the Action Plan against *Campylobacter* spp. in broilers in the period 2008 - 2015.

Year	Number. of investigated / positive (%) samples*	Estimated number of flocks the whole year**	Estimated number (%) of positive flocks per year	Estimated number of non-identified positive flocks***
2008	4 675 / 193 (4.1)		257 (5.5)	64
2009	1 924 / 117 (6.1)	4 000	195 (4.9)	78
2010	2 170 / 110 (5.1)	4 400	184 (4.2)	74
2011	2 282 / 139 (6.1)	4 560	232 (5.1)	93
2012	2 417 / 106 (4.4)	4 830	177 (3.7)	71
2013	2 710 / 149 (5.5)	5 420	248 (4.6)	99
2014	2 685 / 160 (6.0)	5 370	267 (5.0)	107
2015	2 133 / 93 (4.4)	4 260	155 (3.6)	62

* Equals approximately number of slaughtered (positive) flocks.

** In 2009 - 2015, this estimate for the whole year is based upon number of slaughtered flocks in the period May - October.

*** The estimated maximum number of flocks positive for *Campylobacter* spp. which had the possibility to go out on the market without previous freezing or heat treatment.

The estimated whole year flock prevalence has varied between 3.3% and 6.3%. The result for 2015 is the most favourable in ten years.

The estimated number of flocks positive for *Campylobacter* spp. reaching the market without freezing or heat treatment is the lowest since 2007.

Since 2009, no sampling has been done during the six “winter months” November - April. Positive flocks in that period have therefore not been detected.

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The Norwegian Veterinary Institute (NVI) is a nationwide biomedical research institute and Norway's leading centre of expertise regarding biosafety in aquatic and terrestrial animals. The aim of the Institute is to become Norway's contingency centre of preparedness for One Health.

The primary mission of the NVI is to give research-based independent advisory support to ministries and governing authorities. Preparedness, diagnostics, surveillance, reference functions, risk assessments, and advisory and educational functions are the most important areas of operation. The Institute has its main laboratory in Oslo, with regional laboratories in Sandnes, Bergen, Trondheim, Harstad and Tromsø, with about 330 employees in total.

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