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The surveillance programme for *Campylobacter spp.* in broiler flocks in Norway 2022

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Content

Summary

Surveillance in 2022 showed that a total of 106 flocks (4.8%) tested positive for *Campylobacter* spp. when all broiler flocks slaughtered before 51 days of age during the period 1st of May – 31st of October were tested. In total 2189 flocks from 515 farms were sampled. Of all farms sampled, 72 (14.0%) had at least one positive flock, and of these, 22 had two or more positive flocks. Even though these farms only represent 4.3% (22/515) of all farms tested, they contributed with 52.8% (56/106) of all positive flocks tested in 2022.

The carcasses from the positive flocks were either heat treated or frozen for a minimum of three weeks before being marketed. This year's result is somewhat more favourable than the results from 2019 - 2021 with 5.1%, 6.1% and 5.8% positive flocks, respectively. The prevalence is still very low, compared to most other European countries.

Introduction

Campylobacteriosis is currently the most commonly reported bacterial infectious disease in the Norwegian human population (Campylobacteriose). In 2020 and 2021 most of the human campylobacteriosis infections were acquired in Norway, probably due to the restricted travel restrictions during the Covid-19 pandemic. The total number of infections registered in the Norwegian human population was also lower in 2020 and 2021 compared to previous years. In 2022, there was an increase in human campylobacteriosis acquired from abroad and from unknown geographical area, while the number of campylobacter infections acquired in Norway was lower compared to 2020 and 2021. Consumption of poultry meat purchased raw has been identified as a significant risk factor together with drinking non-disinfected 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 Food Safety Authority (NFSA) is responsible for implementing the surveillance programme, while the Norwegian Veterinary Institute (NVI) coordinates the programme, performs the laboratory investigations, analyses the data and communicates the results. The carcasses from positive flocks are either frozen for a minimum of three weeks or heat treated before being marketed.

The action plan is updated regularly, and the details for 2023 together with reports and plans from previous years can be found at https://www.vetinst.no/overvaking/campylobacter-fjorfe.

Aims

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

Materials and Methods

In 2022, all Norwegian broiler flocks slaughtered before 51 days of age during the period 1 st of May – 31st of October were sampled by the owner or the keeper. The sampling was performed maximum six days before slaughter. When correctly sampled, one sample consisted of ten pooled swabs from fresh faecal/caecal droppings. The samples were analysed by real-time PCR for detection of *Campylobacter* spp. at the NVI (3). In general, the test results could be accessed within one working day through a shared database (EOS). All positive test results are also reported individually to the Norwegian Food Safety Authority (NFSA), the slaughterhouse and the farmer.

In the case of undetermined status for a flock at the time of slaughter, caeca from ten broilers per flock were sampled at the slaughterhouse for cultivation at NVI. This is to ensure correct follow up of the flock. The carcasses from positive flocks are either frozen for a minimum of three weeks or heat treated before being marketed.

Results and Discussion

In 2022, 2189 flock samples were analysed for *Campylobacter* spp, representing 515 farms. A total of 106 flocks (4.8%) tested positive for *Campylobacter* spp. Four of the 2189 flocks were sampled at the slaughter house for cultivation due to unknown status at the time of slaughter, and two of these were confirmed positive for *Campylobacter* spp.

The positive flocks originated from 72 (14%) of the farms. Of those farms having more than one positive flock, 12 farms had two positive flocks, eight farms had three positive flocks and two farms had four positive flocks. This shows that 22 (30.6%) of the farms where *Campylobacter* was detected had more than one positive flock. Even though these farms only represent 4.3% (22/515) of all farms tested, they contributed with 52.8% (56/106) of all positive flocks detected in 2022.

The percent of *Campylobacter* positive flocks has varied substantially since the action plan was launched (Figure 1 and 2).

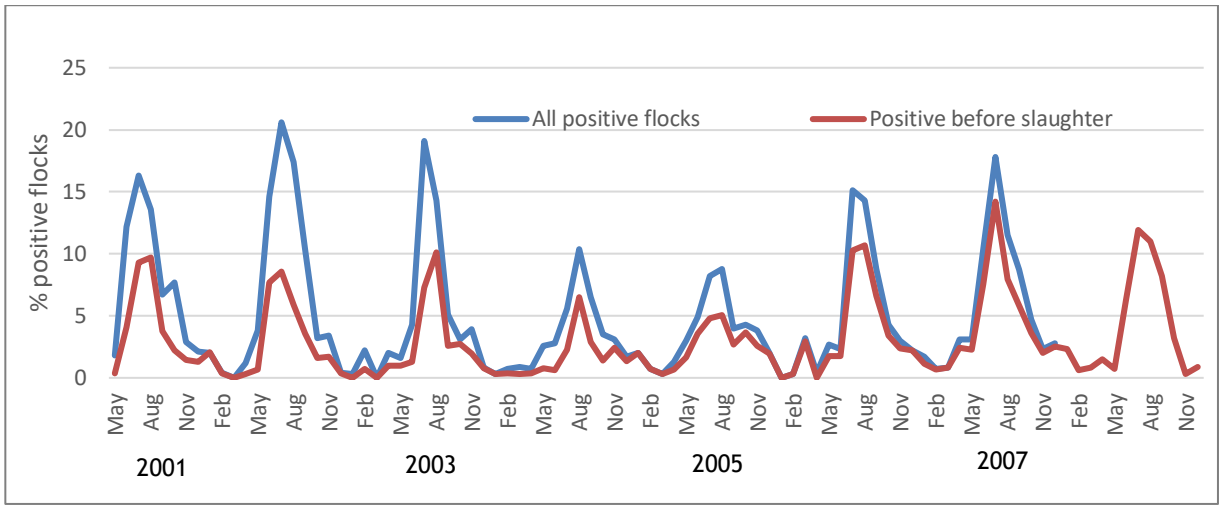

***Figure 1**. Monthly incidence of* Campylobacter *spp. in slaughtered Norwegian broiler flocks from May 2001 throughout 2008. The blue line represents flocks positive for* Campylobacter *spp., these data are based on two test results; before slaughter and at slaughter. The red line represents flocks tested positive for* Campylobacter *spp. at the sampling at farm before slaughter (from 2005 onwards: sampling approx. four days before slaughter).*

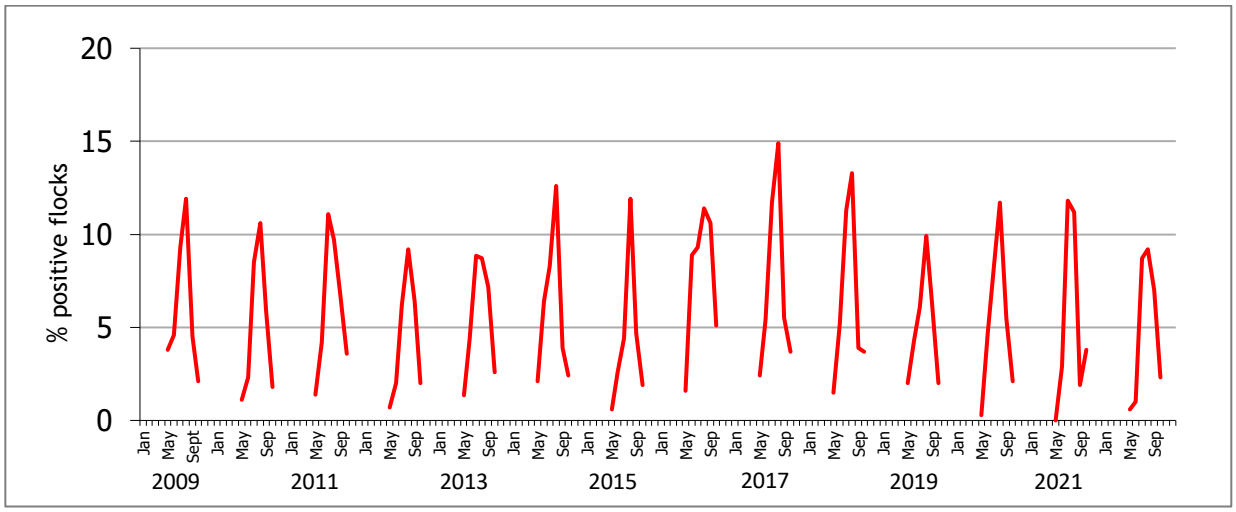

***Figure 2**. Monthly incidence of* Campylobacter *spp. in Norwegian broiler flocks from May throughout October 2009 - 2022. The red line represents flocks positive for* Campylobacter *spp. when sampled at farm before slaughter.*

Up to and including February 2005, samples before slaughter were taken approximately eight days before slaughter, and approximately 50% of the positive flocks were detected only by sampling and testing at slaughter. From 1st of March 2005 and 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%. This confirms the importance of sampling close to the slaughter date for the detection of *Campylobacter* positive flocks.

The results for 2002 – 2007, when all flocks were sampled twice, are presented in Table 1 along with the results of 2008 when the sampling was performed all year but only before slaughter. From 2008, 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 before slaughter (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 was made for the years 2008 – 2015 (Table 1 and 2).

***Table 1**. Results from the Action Plan against* Campylobacter *spp. in broilers in the period 2002 - 2008.*

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
2008	4 675	193 (4.1)	64**

* 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.
** For 2008 this is the estimated maximum number of flocks positive for *Campylobacter* spp. which had the possibility to reach the market without previous freezing or heat treatment.

***Table 2**. Results and estimated results from the Action Plan against* Campylobacter *spp. in broilers in the period 2009 - 2021.*

Year	Number. of tested / positive (%) samples*	Estimated number of flocks the whole year**	Estimated number (%) of positive flocks per year	Estimated number of not identified positive flocks***
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
2016	2 262 / 175 (7.7)	ND	ND	ND
2017	1 919 / 136 (7.1)	ND	ND	ND
2018	1 986 / 126 (6.3)	ND	ND	ND
2019	2 018 / 103 (5.1)	ND	ND	ND
2020	1 893 / 115 (6.1)	ND	ND	ND
2021	1 891 / 110 (5.8)	ND	ND	ND
2022	2 189 / 106 (4.8)	ND	ND	ND

* Equals (for 2009-2021 approximately) number of slaughtered / positive flocks.
** In 2009 - 2015, the estimate for the whole year is based upon number of slaughtered flocks in May – October.
*** The estimated maximum number of flocks positive for *Campylobacter* spp. which had the possibility to reach the market without previous freezing or heat treatment.
ND: Not determined.

Estimates of the whole year flock prevalence and the number of flocks positive for *Campylobacter* spp. reaching the market without freezing or heat treatment, have not been calculated since 2015 because no sampling has been done in the action plan during the six "winter months" November – April for the last thirteen years. Estimates would probably be hampered with too many uncertainties to be of great value. Also the fact that the sampling since 2016 was performed a maximum of six days before slaughter, not four days as previous years, adds to the uncertainty of such estimates.

This year's result of 4.8% is more favourable than the results from 2019 - 2021 with 5.1%, 6.1% and 5.8% positive flocks, respectively. The prevalence is still very low, compared to most other European countries (4).

Acknowledgement

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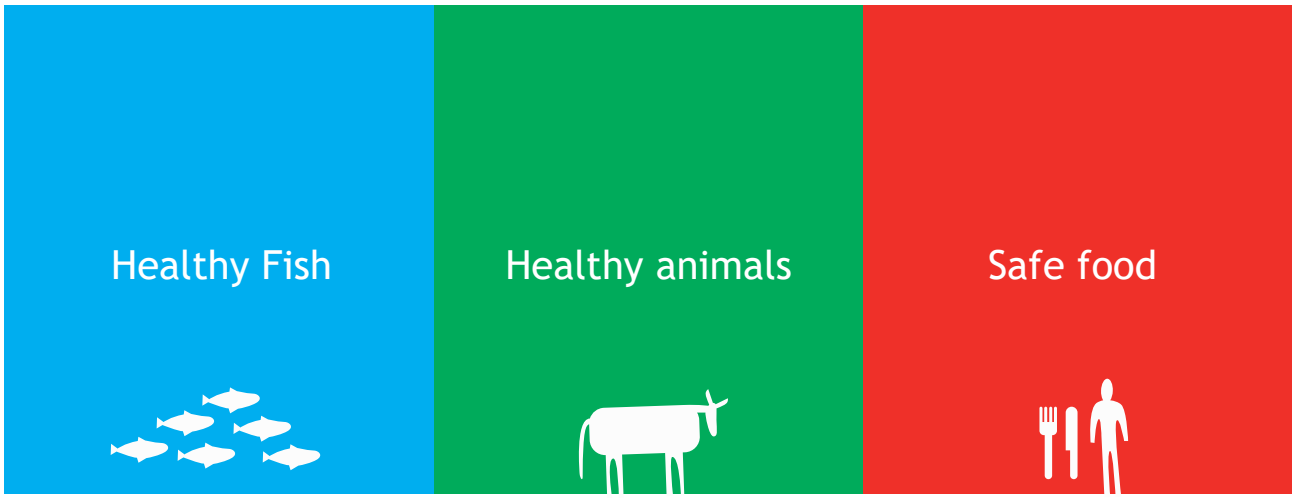
References

1. Kapperud G, Espeland G, Wahl E, Walde A, Herikstad H, Gustavsen S, Tveit I, Natås O, Bevanger L, Digranes A. Factors associated with increased and decreased risk for Campylobacter infection. A prospective case-control study in Norway. Am J Epidemiol 2003; 158 (3): 234-42.
2. Hofshagen M, Kruse H. Reduction in flock prevalence of Campylobacter spp. in broilers in Norway after implementation of an action plan. J Food Prot 2005; 68: 2220-3.
3. Detection of Campylobacter spp. in Chicken Fecal Samples by Real-Time PCR. Lund, Nordentoft, Pedersen, and Madsen. Journal of Clinical Microbiology, 2004, p. 5125-5132, Vol. 42(11).
4. EFSA (European Food Safety Authority) and ECDC (European Centre for Disease Prevention and Control). The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2016. EFSA Journal 2017;15(12): 228 pp. doi: 10.2903/j.efsa.2017.5077.



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