Risk of Campylobacter from chicken in Denmark 2013-17

Petersen, Channie Kahl; Borck Høg, Birgitte; Gantzhorn, Mette Rørbæk; Nauta, Maarten; Ellis-Iversen, Johanne

Publication date:
2020

Document Version
Publisher's PDF, also known as Version of record

Citation (APA):
Petersen, C. K., Borck Høg, B., Gantzhorn, M. R., Nauta, M., & Ellis-Iversen, J. (2020). *Risk of Campylobacter from chicken in Denmark 2013-17*. Abstract from 6th World One Health Congress.

Background:
The Danish human incidence of campylobacteriosis has been between 67-82 per 100,000 inhabitants from 2013-2017. Around 1/3 of the domestically acquired cases are attributable to the consumption of chicken-meat and One Health surveillance and control approaches are necessary to protect public health. This study describes one of the main surveillance components that enables control in chicken to protect public health in Denmark.

Methods:
Between 2013-2017, an average of 952 legskin samples were collected annually from conventionally produced chicken in Denmark. The chicken legs were selected at random from the two big slaughterhouses in Denmark. The skin was analysed using a semi-quantitative method providing an estimate of concentration (cfu/g) of *Campylobacter* on each legskin (NMKL 119, 3. Ed., 2007).

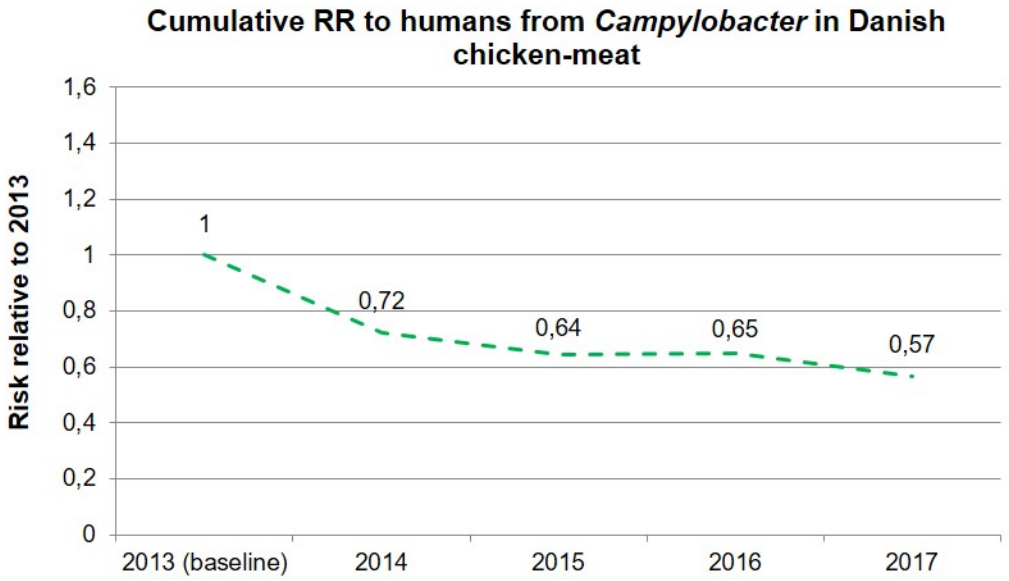
The risk to public health was calculated using an exposure model combining the measured concentration and prevalence with a consumer phase model based on Nauta et al. (2008) and a dose-response model Teunis and Havelaar (2000) as in EFSA (2011) .The relative risk was obtained by comparison to 2013, which was the year the surveillance component was implemented as part of the national action plan against *Campylobacter*. The relative risk was calculated by month and by slaughterhouse.

Results:
For one slaughterhouse, the prevalence of *Campylobacter* decreased from 20% (95%CI: 16.2-23.8) in 2013 to 12.4% (95%CI: 9.3-15.2) in 2017. The prevalence of *Campylobacte*r also decreased for the other slaughterhouse, from 30.8% (95%CI: 26.4-35.0) in 2013, to 18.7% (95%CI: 15.0-22.1) in 2017.

The average concentration of *Campylobacter* decreased from 2.5 log10 cfu/g in 2013 to 2.3 log10 cfu/g in 2017 for one slaughterhouse. For the other slaughterhouse, the concentration also decreased from 2.6 log10 cfu/g in 2013 to 2.5 log10 cfu/g. However, the decreases were not significant.

The cumulative relative risk declined both overall and separately for the two slaughterhouses compared to the baseline year (2013). In 2017, the relative risk was 0.80 and 0.40 for the two slaughterhouses respectively, giving an overall relative risk of 0.57 (Figure 1).

Figure 1. The cumulative relative risk to humans from *Campylobacter* in Danish chicken-meat from 2013-2017, with 2013 as the baseline.



Conclusions:

Between 2013 (the baseline year of the model) and 2017, the cumulative relative risk of *Campylobacter* has decreased, overall as well as separately in both slaughterhouses. The decline in public health risk was caused by a marked decrease in prevalence combined with only a smaller decrease in the concentration of *Campylobacter*.

Continued monitoring of the relative risk enables a One Health effort to protect public health from *Campylobacter* contaminated chicken and facilitates real-time control in slaughterhouses.

References:

EFSA Panel on Biological Hazards (BIOHAZ). (2011). Scientific Opinion on Campylobacter in broiler meat production: control options and performance objectives and/or targets at different stages of the food chain. *EFSA Journal*, *9*(4), 2105. https://doi.org/10.2903/j.efsa.2011.2105

Nauta, M. J., Fischer, A. R. H., Van Asselt, E. D., De Jong, A. E. I., Frewer, L. J., & De Jonge, R. (2008). Food safety in the domestic environment: The effect of consumer risk information on human disease risks. *Risk Analysis*, *28*(1), 179–192. https://doi.org/10.1111/j.1539-6924.2008.01012.x

Teunis, P. F. M., & Havelaar, A. H. (2000). The Beta Poisson dose-response model is not a single-hit model. *Risk Analysis*, *20*(4), 513–520. https://doi.org/10.1111/0272-4332.204048

Social media:

Monitoring of the relative risk to humans from *Campylobacter* in Danish chicken-meat is an example of how One Health surveillance and control efforts facilitate real-time control in slaughterhouses to protect public health.