Risk of Campylobacter from chicken in Denmark 2013-17

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Risk of *Campylobacter* from chicken in Denmark 2013-17

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Background

Campylobacter is the most common cause of foodborne bacterial illness in Denmark, with a human incidence between 67-82 per 100,000 inhabitants (Figure 1).

Around 1/3 of domestically acquired cases are attributable to the consumption of chicken-meat.

One Health surveillance and control approaches are necessary to protect public health.

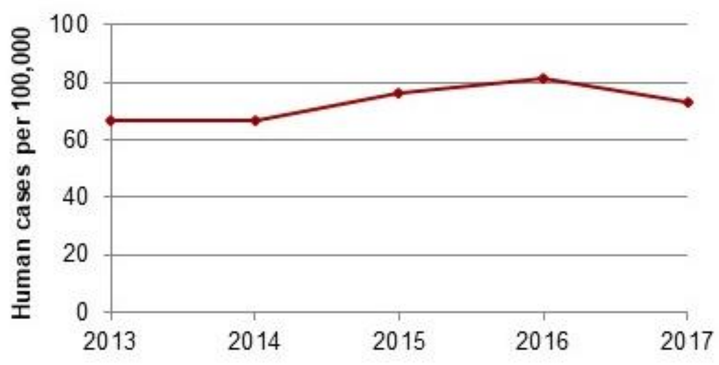

Figure 1. The Danish human incidence of campylobacteriosis per 100,000 inhabitants.

Photo: Colourbox.com

Methods

An average of 952 legskin samples were collected annually from conventionally produced chicken in Denmark.

Chicken legs were selected at random from two major slaughterhouses. 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).

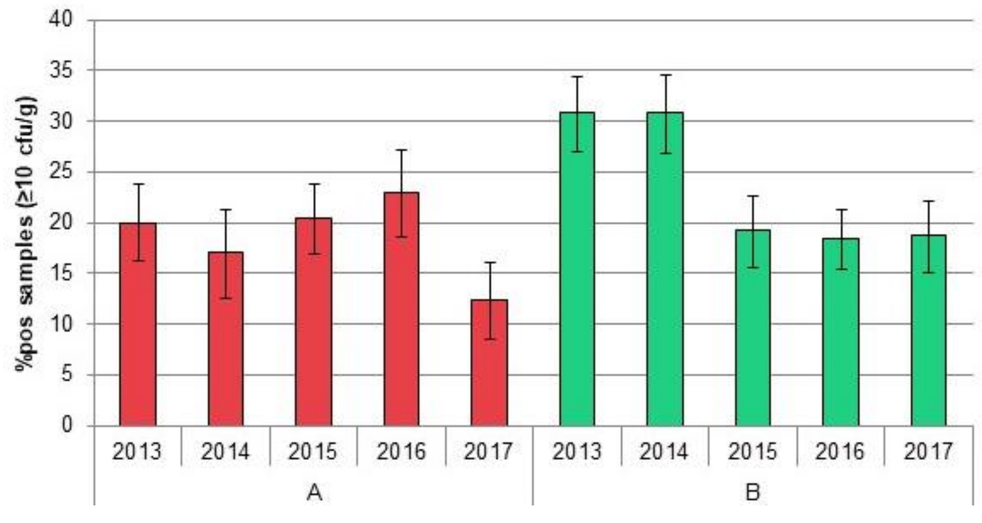

Figure 2. The prevalence of *Campylobacter* in samples of chicken legs, collected from the two major slaughterhouses (A and B) in Denmark, 2013-2017.

The risk to public health was calculated using a risk assessment model combining the measured concentration and prevalence with a consumer phase model [1], and a dose-response model [2,3].

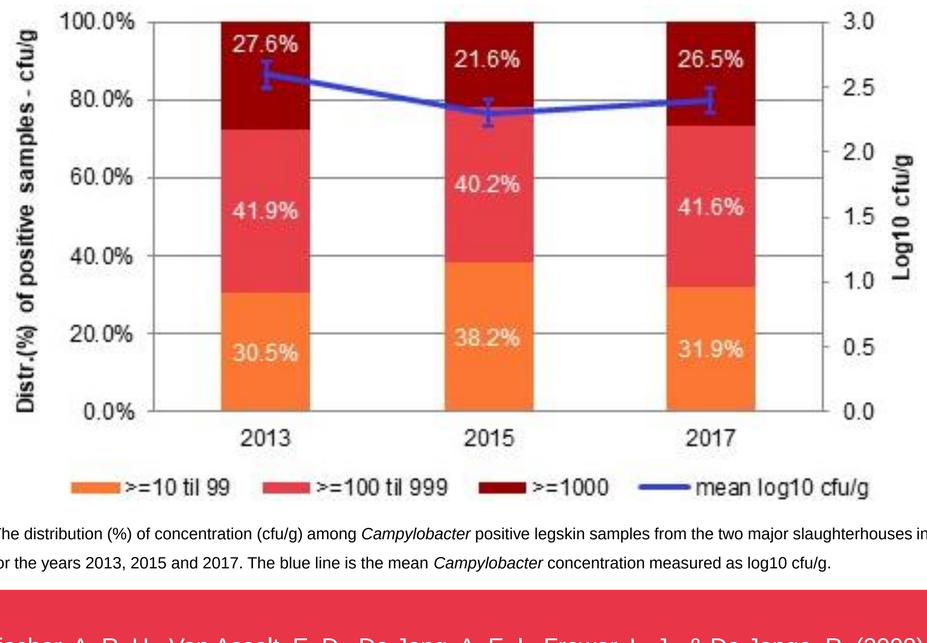

Figure 3. The distribution (%) of concentration (cfu/g) among *Campylobacter* positive legskin samples from the two major slaughterhouses in Denmark, divided by levels for the years 2013, 2015 and 2017. The blue line is the mean *Campylobacter* concentration measured as log10 cfu/g.

The relative risk calculated by month and slaughterhouse, was obtained by comparison to 2013, which was the year the surveillance component was implemented as part of the national action plan against *Campylobacter*.

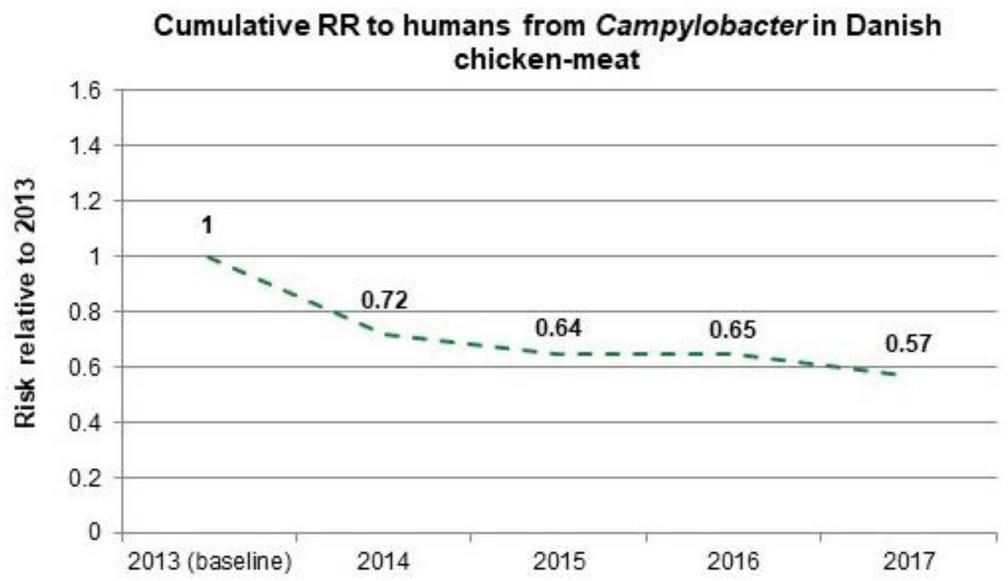

Figure 4. The cumulative relative risk to humans from *Campylobacter* in Danish chicken-meat from 2013-2017, with 2013 as the baseline.

Results

Slaughterhouse A:

- 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 (Figure 2).

Slaughterhouse B:

- The prevalence of *Campylobacter* decreased from 30.8% (95%CI: 26.4-35.0) in 2013 to 18.7% (95%CI: 15.0-22.1) in 2017 (Figure 2).

For both slaughterhouses a small but non-significant decrease in average concentration was observed over the period (Figure 3).

In 2017, the cumulative relative risk was 0.80 and 0.40 for the two slaughterhouses respectively, giving an overall relative risk of 0.57, thus continuing the decline from previous years (Figure 4).

Conclusions

Between 2013 and 2017, the 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* in chicken.

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.

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