Keep the focus on contaminated poultry to further curtail New Zealand’s campylobacteriosis epidemic

This letter was prompted by a recent paper in the Journal on the epidemiology of campylobacteriosis by Nelson and Harris, which we consider distracts from the key issues related to the control of this disease. We also wish to provide an update on the recent decline in campylobacteriosis incidence in New Zealand following successful food safety interventions targeting contaminated poultry.

In their paper, Nelson and Harris query “…the popular assumption that poultry is the primary source for human campylobacteriosis…”. They also question whether the decline in human cases could be associated with the recently implemented “chicken health scheme”.1

There is however overwhelming evidence that contaminated poultry has been the dominant source for human campylobacteriosis in New Zealand for many years. In particular, multilocus subtyping techniques have shown that poultry-associated subtypes of *Campylobacter* are the main contributors to sporadic campylobacteriosis in this country.6 On the basis of this evidence, public health professionals have advocated for more rigorous controls on foodborne pathways of campylobacteriosis, particularly poultry.7

The recent decline in New Zealand’s campylobacteriosis epidemic is further evidence of the dominant role of poultry as the major source. This decline occurred during the second half of 2007, with the 2008 notification and hospitalisation rates >50% lower than the annual average rates for 2002–2006 (Figure 1).2

Our research indicates that this improvement is almost certainly attributable to the implementation of food safety interventions aimed at reducing *Campylobacter* contamination of poultry, and provides evidence of the success of these interventions.2, 8, 9

In their paper, Nelson and Harris also query the timing of this decline in relation to the implementation of *Campylobacter* control strategies aimed at poultry.1 They ask the question “If chicken-consumption is truly the source for most cases, why did rates generally decrease in 2007, before the chicken health scheme began…?”. In fact, the New Zealand Food Safety Authority (NZFSA, now the Ministry of Agriculture and Forestry) introduced its first ‘*Campylobacter in Poultry Risk Management Strategy*’ in August 2006, prior to the decline in human cases. This strategy outlined a range of voluntary and regulatory interventions to reduce *Campylobacter* contamination of poultry, which were implemented progressively through 2007 and 2008.

It is important to note that the “chicken health scheme” referred to by the authors was a public health intervention to improve human not animal health, with *Campylobacter* being a commensal in chickens and not affecting animal health.
From April 2007, poultry processors were required to report *Campylobacter* contamination levels on poultry at the end of primary processing to NZFSA’s National Microbiological Database. From April 2008, mandatory *Campylobacter* performance targets were introduced, with NZFSA setting maximum limits for *Campylobacter* contamination on poultry carcasses at the end of primary processing. Even before these requirements were in place, the poultry industry had begun monitoring *Campylobacter* levels, with the proportion of poultry carcasses with detectable *Campylobacter* counts decreasing from 63.3% in October 2006 to 39.8% in November 2007. Therefore, the timing of the decline in human campylobacteriosis is consistent with the implementation of food safety interventions targeting poultry.

Source attribution modelling (based on multilocus subtyping of *Campylobacter*) provides probably the most definitive evidence that the decline in human campylobacteriosis can be largely attributed to a reduction in infection arising from poultry (Figure 2).

In the pre-intervention period, over 70% of human cases were attributable to poultry, whereas in the post-intervention years, 2008 through to 2010, this estimate declined to 50%, due to an absolute decline in poultry attributable cases. Despite the relative increase in the contribution of ruminant sources to human cases, poultry remains the most important source of human infection in the Manawatu (the sentinel site for the source attribution study).
Campylobacter is a multi-host pathogen, which amplifies in food-producing animals and wildlife without any evidence of disease in animals. This characteristic provides challenges for the control of human campylobacteriosis. However, there is a clear hierarchy in the relative importance of sources of human disease, with poultry sources identified as being the greatest contributor to human cases.\textsuperscript{6,12}

On this basis, we do not think it is justifiable for authors such as Nelson and Harris to argue that the epidemiology of campylobacteriosis in New Zealand is a complex mystery or that there is an unknown “substantial underlying factor” driving our epidemic.

Now that the burden of disease from contaminated poultry has reduced we are beginning to develop a picture of other sources and vulnerable groups. Such groups include children living in rural areas as we have previously reported.\textsuperscript{7} More research is underway in New Zealand, in addition to the extensive literature already published, examining the contribution of other, albeit less important, sources. An updated Campylobacter Risk Management Strategy has also been released.\textsuperscript{10}

New Zealand still has one of the highest campylobacteriosis rates among developed countries,\textsuperscript{8} and source attribution studies continue to show that poultry remains the dominant source.\textsuperscript{9} This situation suggests that ongoing efforts are required by poultry
producers, with the support of regulators and researchers, to further reduce the disease burden from this source.

Michael G Baker, Ann Sears, Nick Wilson
Department of Public Health, University of Otago, Wellington
michael.baker@otago.ac.nz

Nigel French, Jonathan Marshall
mEpiLab, Massey University, Palmerston North

Petra Muellner
mEpiLab, Massey University, Palmerston North / Epi-interactive, Wellington

Donald Campbell, Peter van der Logt
Ministry of Agriculture and Forestry (formerly New Zealand Food Safety Authority) Wellington

Rob Lake
Institute of Environmental Science and Research Ltd, Christchurch

References:
