

NZ's long-running Campylobacter epidemic from poultry: Now with antibiotic resistance

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NZ has a long-running Campylobacter infection epidemic with contaminated fresh poultry the major source. Added to this problem is the recent rapid emergence of antibiotic resistance in these Campylobacter infections acquired from locally produced poultry. In this blog we briefly detail these problems and explore potential solutions: (i) build on the past NZ success of regulating lower contamination levels in poultry; (ii) publicise contamination levels by poultry brand; (iii) label fresh poultry with information about Campylobacter contamination and how to reduce the risk; and (iv) encourage consumers to switch to frozen or cooked poultry – or switch completely to other protein foods.

Rapid spread of antimicrobial resistance (AMR) in NZ poultry

NZ has a long-term problem with Campylobacter infection from contaminated fresh chicken meat [1]. In addition, recently presented research on AMR has found that a tetracycline and fluoroquinolone resistant strain of Campylobacter, first detected in poultry in 2014, has spread rapidly across the North Island [2]. By 2015 this strain was causing about a third of human Campylobacter infection cases in Auckland.

This AMR problem will, fortunately, only affect the clinical treatment of a minority of patients – those with invasive illness requiring in-hospital treatment. The larger concern is that this episode shows how vulnerable our heavily contaminated poultry is to the entry of AMR organisms. In the current episode we don't know where this AMR came from or how it rapidly spread through the poultry industry. It is therefore reasonable to assume this could happen again. And next time the AMR organisms could have far more serious implications for patient treatment.

AMR is considered a major threat to global health and the World Health Organization is urging all states to take immediate action in response to this increasing problem [3]. Reducing the level of Campylobacter contaminated poultry would be one of many important steps that NZ could take.

The large persisting burden of Campylobacter-related illness from fresh poultry meat

Contaminated fresh poultry meat is estimated to cause more than 30,000 cases of human Campylobacter infection a year in NZ. This estimate is based on 6776 notified cases in the last calendar year [4], a multiplier obtained from the high-quality Infectious Intestinal Diseases Study conducted in the UK [5], and source attribution of about 50% from poultry [1].

Contaminated poultry is therefore responsible for about 300 of the 600 serious Campylobacter infection cases hospitalised each year [4]. About 30 of these infections will cause paralysis (Guillain-Barré syndrome [6]), and others will result in serious invasive illness and death. One example was Rod Donald, co-leader of the Green Party, who died in 2005 at the age of 49 years from myocarditis secondary to Campylobacter infection [7]. The economic cost to the country from Campylobacter-contaminated poultry runs to tens of millions of dollars [8]. This cost is largely paid for by sick consumers, employers and the taxpayer-funded health sector rather than by the poultry industry which is the source of the problem.

A risk to NZ's international reputation as a food exporter

NZ is known as the “Campylobacter capital of the world” in food safety circles for having the highest rates reported by any country. Now that our rates have halved (due to past regulations [9]) we may, thankfully, have slipped from first place, but our rate (150 per 100,000 in 2014 [4]) is still much higher than other countries we typically compare ourselves with. It is more than 10 times that of the US (13 per 100,000 in 2014 [10]) and more than 50% higher than Australia (94 per 100,000 in 2013 [11]). Largely eliminating poultry as a source could virtually halve our incidence and show that we can manage this food safety problem effectively.

NZ's reputation as a trusted exporter of safe food took a battering following the botulism and milk powder scare in August 2013 (the “whey protein concentrate incident”). We need to demonstrate our low tolerance of food contaminated with real microbial hazards, as is clearly the situation with Campylobacter in fresh chicken.

Readily available solutions

The fact that around half of NZ's Campylobacter infections in humans come from a single food source provides a great opportunity for preventing these cases (there are multiple sources for the other 50% of cases so these are much harder to control). The UK Food Standards Agency (FSA) is now focussing on poultry with a view to halving Campylobacter infection rates in humans by the end of 2015 [12]. Below we outline some key control measures:

Regulate lower contamination levels. A first step would be for the responsible agency (Ministry of Primary Industries [MPI]) to lower the regulatory limits for Campylobacter permitted on fresh poultry. When the former NZ Food Safety Authority introduced such regulatory limits in 2006-07 the incidence of human disease halved over a 3-month period [9]. Since then the rate has remained more or less at this reduced – but still unacceptably high level. Those poultry suppliers who cannot comply with a lower regulatory limit could potentially divert their product to be sold in a cooked form (which eliminates Campylobacter) or frozen (which greatly reduces contamination levels). But even low levels

of contamination on frozen poultry might still pose an unacceptable risk for some consumers.

The Ministry of Health (MOH) should have an interest in encouraging MPI to regulate given the considerable disease burden resulting from contaminated chicken meat. Health services pick up much of the tab for these illnesses so one would expect the MOH to be highly supportive of moves to close off this source. In addition, they have a lead role in developing NZ's Antimicrobial Resistance strategy.

Publish the contamination levels in fresh poultry by manufacturers and major retail outlets. In the UK, following surveys showing high levels of contamination of retail chicken meat, the Food Standards Agency is now publishing contamination levels found on whole retail chickens and their packaging sampled from major food retailers such as Sainsbury's and Tesco [13]. This regular reporting appears to be working with retailers now driving improvements in food safety throughout the poultry supply chain [14].

Warning labels: Suppliers could be required by law to include suitable consumer food safety warnings and handling instructions on all packaging of fresh poultry. Much of the fresh chicken sold in NZ has little or no labelling about the high likelihood that it is contaminated with harmful bacteria and requires careful handling at every step from purchase to the point of consumption. For example, some overseas health authorities give the somewhat counterintuitive advice "don't wash raw chicken" to avoid spreading this bacteria around the kitchen by splashing [15]. But as many people don't read food labels and have limited cooking skills, this educational approach is probably far less important than regulation to lower contamination levels.

Consumer action: Finally, consumers can also 'vote with their feet' (or wallet) and switch to safer and lower cost protein foods [16]. If they continue to purchase poultry, then changing to cooked and frozen product would greatly lower their risks of Campylobacter infection.

In summary - NZ has a serious long-term Campylobacter epidemic but now with the added hazard of rapidly emergent antimicrobial resistance. Fortunately a range of control options exist, many of which have been proven to work in the past in this country and internationally. Now all we need is the political will to act on this important and costly public health problem.

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