

## Research Summary

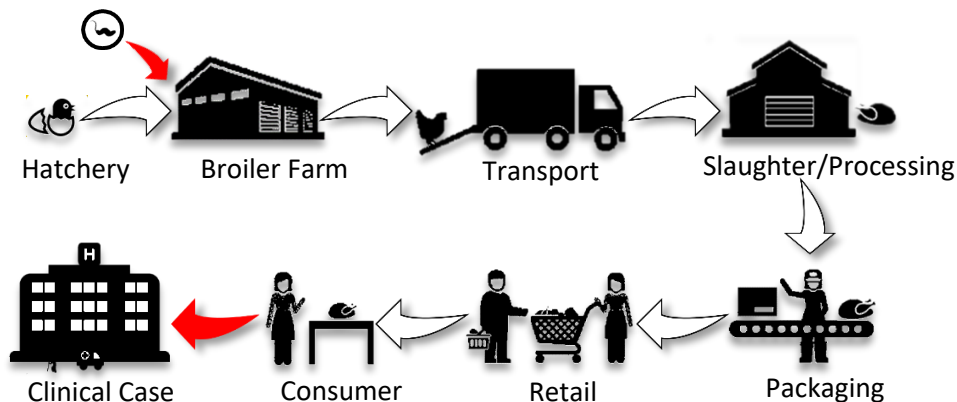
# Comparative genomics of *Campylobacter* strains prevalent in Canadian poultry production associated with human disease: identification of biomarkers relevant to the development of targeted mitigation strategies

Campylobacteriosis is an acute intestinal illness caused by infection by bacteria within the genus, *Campylobacter*; it is the most commonly reported bacterial foodborne infection in Alberta and in Canada. Most cases of campylobacteriosis are caused by *Campylobacter jejuni* (Cj) and many studies suggest that a significant proportion of Cj infections are associated with the handling of and/or consumption of undercooked chicken products (Fig 1). Cj infections threaten the health and well-being of Canadians and have a significant negative impact on the Canadian economy through losses in worker productivity, direct costs to the health care system, and loss of consumer confidence in the safety of foods.



Recent estimates show that ≈40% of Canadian chicken meat at retail is contaminated with Cj, thus, interventions to reduce both the level of contamination and overall prevalence of Cj-positive chicken products are a high priority to the poultry sector. Critically, our data on Cj from the chicken supply chain and from human clinical cases shows that Canadian strains in circulation are extremely diverse and fewer than 5% of strains are responsible for >50% of human infections (Fig 2). Thus, only a subset of Cj associated with chickens are a high risk to people.

Fig 1. *Campylobacter* in the Canadian poultry supply chain.



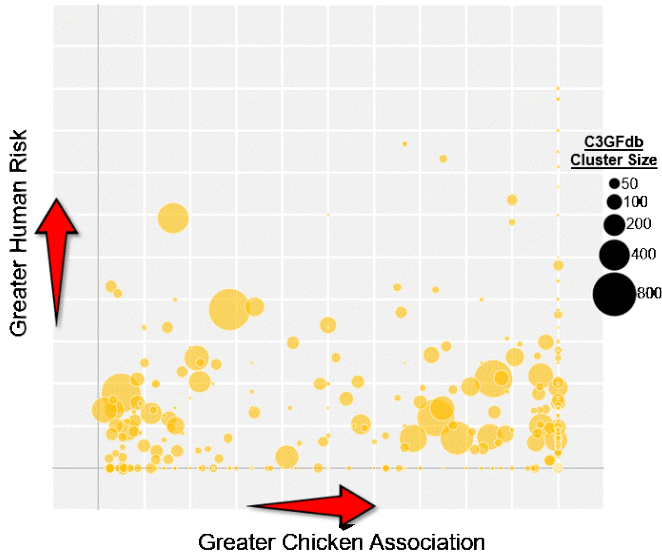
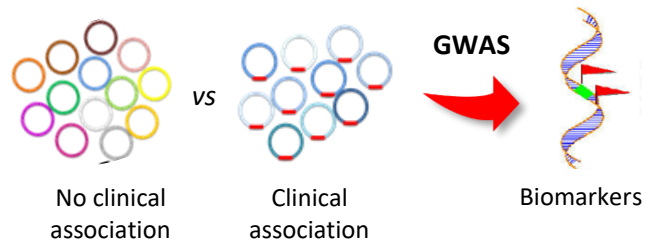


Fig 2. Epidemiological characteristics of Cj subtypes observed in the Canadian chicken supply.

Fig 3. Use of the Genome-Wide Association Study (GWAS) to screen complete genomes for genetic variation associated with a trait of interest. Comparison of non-Clinically-Relevant Cj subtypes (CRCS) isolates vs. CRCS isolates from chicken to identify biomarkers for the accurate and sensitive identification of high-risk *Campylobacter*.



### Researchers

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