Risk of campylobacteriosis from low-throughput poultry slaughterhouses: Hazard characterisation

Common reservoirs of Campylobacter include:

- raw or undercooked meat, especially poultry.
- unpasteurised milk
- untreated water

3.1 Cases and outbreaks

The Infectious Intestinal Disease study determined that Campylobacter was the most common bacterial pathogen isolated from the stools of patients reporting infectious intestinal disease, with an underreporting factor of 9.3 (Tam et al., 2012). The study estimated that Campylobacter caused 500,000 cases per year and was the most common foodborne pathogen in the UK. A further study refined the figure to 300,000 foodborne cases in the UK in 2018 (Holland and Mahmoudzadeh, 2020).

Campylobacter rates reported in the Advisory Committee of the Microbiological Safety of Food (ACMSF) Epidemiology of Foodborne Infections Group meeting showed a fairly constant trend in recent years, with reduced reporting in 2020 likely due to the COVID-19 pandemic (Figure 1). In 2021, 67,588 cases were reported in the UK.

Figure 1: Rate of reported Campylobacter infections by country per 100,000 population 2012 – 2021 (Epidemiology of Foodborne Infections Group, 2022, unpublished data).

Although most campylobacteriosis cases are sporadic, Holland et al. reported *Campylobacter* being associated with 147 outbreaks with 2950 cases, and 36,895 hospital discharges between

2001 and 2016 (Holland et al., 2020). Deaths from foodborne disease are not routinely recorded and when death occurs from infectious intestinal disease the pathogen is not always specified. Despite this, *Campylobacter* is the pathogen most often mentioned on a death certificate, when the underlying cause is an infectious intestinal disease (Holland et al., 2020).

3.2 Disease characterisation

The infectious dose of *Campylobacter* has been reported to be as low as 500 cells (Robinson, 1981), however the probability of infection at low doses is very low. A recent overview of challenge studies found that the infective dose required to infect 50% of the population is 3,300 cells (Teunis et al., 2018).

The incubation period for *Campylobacter* is usually 2 to 5 days with a range of 1 to 11 days.

The most common clinical symptoms of *Campylobacter* infections are diarrhoea (frequently bloody), abdominal pain, fever, headache, nausea and/or vomiting. These symptoms typically last 3 to 6 days. Gastroenteritis induced by *C. coli* is clinically indistinguishable to that of C. jejuni, but patients infected with other *Campylobacter spp.* report milder symptoms (Kaakoush et al., 2015). The estimated hospitalisation rate for campylobacteriosis in the UK is around 1%, which is less than other bacterial gastrointestinal pathogens such as *Salmonella* and Shiga toxin-producing *Escherichia coli* (O'Brien et al., 2016).

Campylobacter infection can lead to long term complications such as reactive arthritis (9 in every 1,000 cases), Guillain-Barré syndrome (1 in every 1,000 cases) and other rare late consequences, such as Miller Fisher syndrome, haemolytic uremic syndrome, inflammatory bowel disease and functional gastrointestinal disorders (ACMSF, 2019).

Campylobacter infections are equally common in males and females, with infants and children in the 0–4 years age group more likely to be affected. It is more prevalent during the summer months.