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

Campylobacter species are Gram-negative spiral, rod-shaped, or curved bacteria which do not sporulate. There are more than 20 species of *Campylobacter*, and the most common pathogenic species causing gastroenteritis in humans are *C. jejuni* and *C. coli*. Other species, such as *C. concisus, C. lari, C. hyointestinalis* and *C. ureolyticus*, may be rarely involved in gastroenteritis (Kaakoush, Mitchell and Man, 2015). *Campylobacter* is the most common cause of bacterial gastroenteritis in the UK, with an estimated 300,000 cases in England and Wales annually (Holland and Mahmoudzadeh, 2020).

Infection with *Campylobacter* typically leads to diarrhoea (frequently bloody), abdominal pain, fever, headache, nausea and/or vomiting. In rare cases, it can also lead to long term complications such as reactive arthritis and Guillain-Barré syndrome (ACMSF, 2019).

The main reservoir of *Campylobacter* is poultry but it can also live in the gastrointestinal tract of mammals including livestock and pets, such as cats and dogs (Kaakoush et al., 2015). A recent study found that approximately 70% of *C. jejuni* and almost 50% of *C. coli* infections were linked to chicken as the source (Oxford University, 2021). Undercooked poultry meat presents a risk of campylobacteriosis and while thorough cooking kills *Campylobacter*, infection may also result as a consequence of cross-contamination during preparation or storage of chicken.

Implementation of controls during poultry slaughter is thought to reduce contamination of carcases, leading to a reduced public health risk (EFSA Panel on Biological Hazards (BIOHAZ), 2011). Measures such as appropriately cleaning and disinfecting equipment like evisceration machines, and processes like scalding, steam-ultrasound treatment and chilling can decrease the Campylobacter contamination on carcases (Rasschaert et al., 2020).

The EU Commission established process hygiene criteria (PHC) for *Campylobacter spp*. on broiler carcases to indicate the acceptable functioning of the slaughter process and increase the number of carcases that comply with microbiological criteria with a critical limit of 1,000 CFU/g *Campylobacter spp* *(footnote 1)*. The PHC requires the Food Business Operator (FBO) to test 5 pooled samples of 15 neck skins, once a week, for *Campylobacter spp*. If more than 15 samples out of 50 have high levels of *Campylobacter* in a period of 10 consecutive weeks, this is considered unsatisfactory and actions need to be taken, such as improvements in slaughter hygiene, review of process controls, of animals' origin and of the biosecurity measures in the farms of origin.

Low-throughput broiler slaughterhouses are disproportionately impacted economically by the current sampling requirements (FSA, 2019a). This report lists the evidence gathered for the campylobacteriosis disease burden attributable to low-throughput broiler slaughterhouses in comparison to high-throughput plants and provides recommendations for alternative sampling schemes.

1. This will be referred to as ‘high levels of Campylobacter’ within the text.