Campylobacter infection symptoms

The species Campylobacter is part of the family Campylobacteriaceae and contains 16 species. The Campylobacter spp. is one of the most common agents of bacterial gastroenteritis (campylobacteriosis) in Europe, with 1% of the European population becoming infected each year (around nine million infections annually in the European Union (EFSA, 2011)), costing the EU economy approximately €2. 4 billion (EFSA, 2012; Humphrey et al., 2007) whilst in the USA it costs the economy $2. 9bn (Batz et al., 2011). Whilst globally is responsible for 400-500 million cases of diarrhoea yearly (9). Over 90% of all human Campylobacter infections are instigated by *C. jejuni* and *C. coli* , both of which can be found easily in the environment, wild birds, and mammals. All campylobacter species have one polar unsheathed flagellum at one or both ends of the cell except *Campylobacter gracilis* (which is non-motile) and *Campylobacter showae* (which has multiple flagella),

C. jejuni is a Gram-negative, curved rod gastrointestinal pathogen that uses polar flagella for motility and is a major cause of human gastroenteritis across throughout the world. It was first identified in 1972 however specific isolation from humans and animals was not achieved until 1979 (Butzler and Skirrow, 1979; Dekeyser et al., 1972).

Campylobacter jejuni is a foodborne pathogen and a leading cause of enteritis in humans and has the ability to cause significant mortality in the children of developing nations. Human infection is a result of ingestion of food sources such as meat, milk and water contaminated with *C. jejuni* contaminated resulting in diarrheal disease. When infected with some strains of *C. jejuni* the risk of developing Guillain-Barr`e syndrome(GBS) increases.

Although *C. jejuni* is normally a gut colonizer, there has been some strains found to be have hypervirulent sites and so may be able to move across intestinal epithelium, creating bacteraemia and systemic infections (13). As well as being a foodborne illness, *C. jejuni* also has the ability to be a primary etiological agent for ruminant abortion (14). Recently, it has been reported that there is some forms of an antibiotic resistance developing as well as a the development of a hypervirulent clone of *C. jejuni* in the United States (15).

The mechanism by which *C. jejuni* causes human infection and survives within the host isn't fully understood, although it is believed to be a multifactorial process involving motility, attachment, colonisation, toxin production and invasion (Bolton, 2015; Wassenaar and Blaser, 1999).

The Campylobacter species are of a particular research interest as they consistently cause the highest number of confirmed foodborne bacterial infections in developed countries.

Symptoms of infection:

After exposure to *C. jejuni,* the bacterium firstly colonises the lower intestinal tract (ileum, jejunum, and colon) usually without causing any symptoms. In the majority of symptomatic cases, campylobacteriosis is a self-limiting disease and will present as 1-3 days of prodromal symptoms with leukocytes, fever, vomiting, and headaches followed by 3-7 days of watery or bloody diarrhoea with abdominal pain. There is a lot of variation in the severity of the illness, it can range from a mild case of the disease to dehydration that could require hospitalisation. Recently it has been thought Campylobacter

enteritis could be a risk factor for the development of inflammatory bowel disease (Garcia Rodriguez et al., 2006).

Diagnosis is made with direct or enriched culturing of stool samples or rectal swabs on selective media containing blood under microaerobic conditions at 42-C. *C. jejuni* −infected individuals may be treated with antibiotics such as erythromycin or ciprofloxacin, however it is rarely needed (Allos, 2001; Blaser, 1990). Best treatment includes fluid replacement.

The effectiveness of the pathogen is dependent on the immune status of the host as well as the virulence characteristics of the Campylobacter strain. In a minority of individuals Campylobacter infection is a precursor of more serious illness, including immunoreactive complications such as Guillian-Barre Syndrome (GBS) and Millere Fisher Syndrome (MFS), a chronic and potentially fatal form of paralysis (EFSA, 2011).