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Target Audience

AFQ Inspectors inspecting the food industries

SG Specialist Inspectors

CAMPYLOBACTER INFECTION IN POULTRY PROCESSING

This SIM gives guidance to inspectors on prevention of *Campylobacter* infection which will assist during visits to poultry-processing sites and in answering queries. It provides general information, advice on infection prevention and reportability under RIDDOR.

THE ORGANISM

1 The *Campylobacter* organism is a bacterium that can cause disease in humans and animals. In a recent Public Health Laboratory Service study, 92% of human illness is caused by *Campylobacter jejuni*, just less than 8% due to *Campylobacter coli* and a couple of other species accounting for a handful of cases. This is likely to be the case for the whole of the UK. *Campylobacter* is commonly found in the intestinal tracts of farm animals, chickens, wild birds and household pets - without causing any symptoms of illness. But eating contaminated or undercooked poultry/meat or drinking unpasteurised milk or contaminated water, may cause *Campylobacter* infection, or Campylobacteriosis. Although *Campylobacter jejuni* does not normally grow in foods, it can survive in the environment much better than previously believed. All strains of *Campylobacter* grow best at temperatures of 42⁰C to 45⁰C with 5-10% oxygen and a pH of around 6.5-7.5. It does not grow at temperatures below 30⁰C.

PREVALENCE

2 The incidence of *Campylobacter* infection in the human population in England, Scotland and Wales fluctuates seasonally during the year from about 20 cases per 100,000 people in winter to about 40 cases per 100,000 people in summer. Faecal isolations (samples) taken from people who have contracted *Campylobacter* infection have risen from about 48,000 in 1995 to nearly 62,000 in 2000. The reason for this increase is uncertain. A graph showing the incidence of *Campylobacter* and a table showing faecal isolation results are in the [appendix](#).

HUMAN ILLNESS

Infection and symptoms

3 ***Campylobacter* bacteria must be swallowed to cause an infection.** Illness caused by *Campylobacter* lacks unique specific symptoms, therefore it is difficult to distinguish gastrointestinal problems caused by *Campylobacter* from other food-borne illnesses. Most people

who get ill with *Campylobacter* experience abdominal pain, fever and nausea within 2 to 5 days following exposure to the organism, typically lasting an average of 11 days. Generally people infected with *Campylobacter* recover well on their own without treatment, though antibiotics may be prescribed for severe cases.

4 Complications are relatively uncommon. The most often described complication is reactive arthritis. The bacterium is recognised as one of the main bacteria associated with Guillaine-Barre syndrome - an autoimmune attack on the peripheral nerves which can cause weakness and paralysis.

5 Health experts are concerned at the world-wide increase in new strains of *Campylobacter* bacteria which are drug-resistant, particularly to fluoroquinolones (one of the drugs of choice for treating humans infected by *Campylobacter*). Fluoroquinolone is also the antibiotic which poultry farmers around the world have used for nearly a decade to control various diseases in their poultry flocks. Various surveys and studies carried out indicate the risk of infection in humans is rising, the reasons for this are unclear.

Contamination of poultry, food and water

6 Many poultry flocks are silently infected with *Campylobacter*, ie the chickens are infected with the organism but show no signs of illness. Researchers have found that infection of poultry broiler flocks typically occurs at week 3 in the 6-week growing cycle. It is not unusual for *Campylobacter* to infect the whole flock.

7 *Campylobacter* can be easily spread from bird to bird through a common water source (ie drinking trough) or through contact with infected faeces. When an infected bird is slaughtered, *Campylobacter* can be transferred from the intestines to the meat.

8 Studies have also identified that there can be a 100% increase in the number of *Campylobacter* bacteria detected on the birds' exterior on the farm to that detected on arrival at the slaughterhouse - due possibly to stress, resulting in cross-contamination from defecation during transportation of the birds.

9 Risk of contracting *Campylobacter* infection is not confined to poultry. Unpasteurised milk can become contaminated if the cow has an infection with *Campylobacter* in her udder or the milk is contaminated with faecal matter. Surface water, mountain streams and lochs can become contaminated from infected faeces from wild birds or cows.

Transmission of infection

10 Most cases of Campylobacteriosis (*Campylobacter* infection) are associated with handling raw poultry or eating raw or undercooked poultry meat. Poultry is also thought to be an important source of organisms cross-contaminating other foods during food preparation, eg contaminated knives and cutting boards or through poor hygiene practices.

11 *Campylobacter* can be spread from one person to another through poor hygiene practices, eg cross-contamination from an infected individual such as a fellow worker. People can also be infected from contamination of *Campylobacter* bacteria via the general environment, eg contact with animals and environments contaminated with animal faeces.

Diagnosis

12 Campylobacteriosis is diagnosed through laboratory testing of a stool sample from the

affected individual.

REPORTABILITY OF CAMPYLOBACTER INFECTION

Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995

13 L73 RIDDOR 1995 - Guidance on occupational diseases/activities, Schedule 3, Part 1, Item No 27 states that reportable infections include:

'Any infection reliably attributable to the performance of the work specified in the entry hereto: Work with micro-organisms; work with live or dead human beings in the course of providing any treatment or service or in conducting any investigation involving exposure to blood or body fluids; work with animals or any potentially infected material derived from any of the above.'

Consequently *Campylobacter* infection is reportable under RIDDOR where the above definition applies, but only if diagnosis is confirmed by a medical professional.

The Public Health (Control of Disease) Act 1984

14 The Public Health (Control of Disease) Act 1984 requires medical practitioners to notify the proper local authority officer (usually the Consultant in Communicable Disease Control), if a patient is suffering from a notifiable disease or food poisoning. Campylobacteriosis is not therefore notifiable to the Public Health Medicine department unless acquired from food.

Food Safety (General Food Hygiene) Regulations 1995

15 In order to protect the public, the Food Safety Regulations 1995, reg.5 states that any person working in a food-handling area must report certain illnesses or conditions (eg gastro-intestinal problems caused by *Campylobacter*) to the proprietor where there is any likelihood of them directly or indirectly contaminating food with pathogenic micro-organisms. Further guidance is available in *Food Handlers: Fitness to Work* (1995) published by the Department of Health.

OCCUPATIONAL EXPOSURE

16 Recent survey figures report isolation rates of between 50% and 60% for retail chicken meat. *Campylobacter jejuni* counts often exceed 10^3 per 100g. Skin and giblets have particularly high levels of contamination. Bacterial counts on poultry carcasses have been known to increase by approximately tenfold to one hundredfold during defeathering, reaching the highest level after evisceration.

17 Studies of various decontamination methods, ie adding biocides/chemicals to the carcass wash water have suggested that these may reduce *Campylobacter* carcass contamination.

18 The Poultry Meat, Farmed Game Bird Meat and Rabbit Meat (Hygiene and Inspection) Regulations 1995 state only potable water may be used in EU processing plants. Until May 2001, 25 to 50ppm free chlorine was used in UK poultry processing plants. This could be in the form of chlorine gas, sodium hypochlorite and chlorine dioxide. However, the Food Standards Agency decided to comply with the EU legislation because they accepted that there was little evidence that chlorination had any public health benefit. Processing of

poultry now involves carcass washing with potable water at almost every stage of the process flow. A final inside/outside wash of the carcasses via a high-pressure wash machine is carried out at final inspection of the evisceration stage.

OCCUPATIONAL RISK

19 Workers are most at risk from exposure at pre-slaughter 'hanging on' and evisceration stages when direct or indirect contact with poultry faecal matter is greatest. Temporary or seasonal workers are thought to be affected more than long-term workers but the reasons for this are unclear. DNA-based subtyping tests have been developed which may be helpful in identifying occupational infection in further research studies.

20 FOD inspectors should be aware of the guidance in the FOD Health and Safety Policy Supplement 37 *Hazards from biological agents* - particularly in relation to (ACDP) Hazard Group 2/3 biological agents.

PREVENTION

21 The following precautions to avoid infection should be adopted in poultry-processing plants:

- 1) suitable protective clothing and equipment should be provided and worn as determined by the COSHH assessment, eg washable coat and trousers, washable boots, gloves (single use or changed at breaks), snoods, air fed masks (at pre-slaughter 'hanging on');
- 2) avoid direct and indirect contact with material or surfaces potentially contaminated with faecal matter, eg machinery, door handles, protective clothing;
- 3) remove contaminated clothing as soon as possible and wash hands after removing clothing;
- 4) adopt good standards of personal hygiene, eg keeping hands away from mouth, thorough hand washing with soap, warm running water and paper towels;
- 5) clean any cuts/abrasions as soon as possible and cover with waterproof dressing;
- 6) avoid spreading contamination outside production areas, eg corridors, doors, toilets (surfaces in these areas should be regularly cleaned);
- 7) remove poultry debris regularly in production areas and regularly clean floor/plant/machinery surfaces;
- 8) ensure any LEV (eg at pre-slaughter 'hanging on') or other hardware precautions required by the COSHH assessment are maintained in efficient working order and are regularly cleaned.

22 The British Poultry Council is issuing a guidance leaflet *The control of Campylobacter infection* to member companies which sets out guidance on the organism, the health risk, agricultural operations, primary processing, hygiene, protective clothing etc.

ACTION

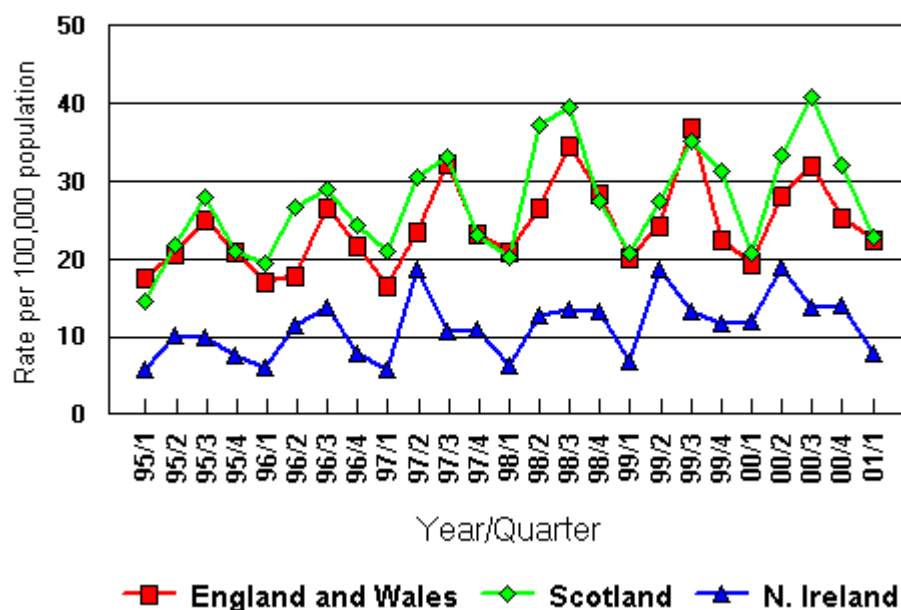
23 No specific visits are required. However, inspectors will wish to be aware of this guidance when visiting poultry-processing sites or answering queries.

Date first issued: November 2001.

APPENDIX
(para 2)

INCIDENCE OF CAMPYLOBACTER

**Faecal isolates from Humans - England & Wales, Scotland, N.Ireland
Rate per 100,000 population 1995-2001**



CAMPYLOBACTER HUMAN FAECAL ISOLATION RESULTS

Year	England and Wales		Scotland		Northern Ireland	
	Number	Rate#	Number	Rate#	Number	Rate#
1995	43876	84.67	4377	85.21	557	33.66
1996	43337	83.32	5098	99.41	652	39.06
1997	50177	96.10	5528	107.92	778	46.30
1998	58059	110.74	6375	124.51	775	45.90
1999	54987	104.36	5861	114.49	858	50.72
2000	55376	105.10	6482	126.74	993	58.69

Ref: Statistics supplied by: Public Health Laboratory Service Communicable Disease Surveillance Centre,
61 Colindale Avenue, London NW9 5EQ, UK.