Food Refrigeration & Process Engineering Research Centre

THE GRIMSBY INSTITUTE of Further & Higher Education

# FSA Project M01039:

## Reducing campylobacter cross-contamination during poultry processing.

## Duration

1st July 2005 - 30th September 2008

## Project Partners:

Division of Food Animal Science (DFAS), University of Bristol

Food Refrigeration and Process Engineering Research Centre (FRPERC), University of Bristol

Food Microbiology Collaborating Unit Bristol (FMCUB), University of Bristol

## Background

Improved biosecurity on poultry farms in the UK, has reduced the proportion of campylobacter infected broiler flocks, but some flocks still arrive at the abattoir colonised by high numbers of campylobacter in their intestines. The overall aim of this project is to identify methods of minimising campylobacter contamination of carcasses during processing, including contamination of carcasses from campylobacter negative flocks by campylobacter positive flocks. To achieve this aim the main contamination pathways need to be identified and effective control steps within and at the end of production need to be determined. Uptake of any practical control strategies arising from the project should contribute to the Agency's target to reduce campylobacter contamination of raw poultry. A five-stage strategy is being followed to achieve the overall aim:

Identify a 'typical' poultry processing system and any features present in current lines that are not typical but are likely to influence contamination.

Quantify and identify the main contamination paths in current processing.

Develop methods of reducing contamination and cross contamination.

Evaluate various intervention steps for reducing contamination and cross-contamination.

Identify the key scientific data that could be used to develop a best practice guide.

## Research Summary to Date

Visits have been made to various poultry processing facilities in the UK - six chicken, two turkey and one duck processing lines have been surveyed and reported on. In each case the project team followed the production line from lairage to portion cutting,

and interviewed production and management staff. The information gained is being used to direct continuing studies of current industrial practice and allow targeting of more detailed experimental evaluative measurements. The results from all chicken plants have further been combined into an anonymous description of a 'typical' UK chicken processing plant. There were too few turkey and duck plants to form a representative sample. Where applicable, the typical chicken plant was contrasted to the turkey and duck lines.

Hygiene, disinfection and cleaning regime surveys were also made and detailed in a separate report. Cleaning and disinfection (C&D) materials and advice are supplied to the different processing plants by a small number of different companies. Similar disinfectants and cleaning agents are used throughout the industry. Effective C&D is done between shifts but not during short breaks in production.

Isolates of campylobacter and pseudomonas were obtained from several plants and their susceptibility to several commonly-used disinfectants was tested. Results indicated that both groups would be inactivated by disinfectants at the recommended concentration, and that the pseudomonas strains were more resistant than the campylobacters.

Most chicken plants had similar processing machinery and cleaning and disinfection regimes. Two plants had an extra piece of equipment whose effect on numbers of campylobacters has been investigated in one plant on two occasions. This showed that the equipment produced some benefits, although not over the entire surface of the carcass.

Another plant, which regularly processes several flocks of organic and free-range chickens first in the day (flocks that are almost invariably campylobacter positive (C+)) has been visited on five occasions to determine the relationship between numbers of campylobacters, Enterobacteriaceae and pseudomonads in the caeca) contents and on the neckflaps after processing and chilling. This was done in order to investigate the cross contamination of campylobacters from C+ to C- flocks in terms of contamination of neckflaps at the end of the production line, and also because the company was changing their evisceration machine. The same plant has also been sampled intensively on two occasions in order to investigate the contamination pathways of campylobacter and other bacteria.

Laboratory experiments using a spray rig are underway to investigate the effect of potable water containing permitted levels of chlorine or chlorine dioxide on the numbers of campylobacters and other bacteria on carcasses. Trials using sprays with higher levels of these and other chemical decontaminants (acidified sodium chlorite and trisodium phosphate) are planned.

## Some Publications from this Project

This work is continuing and further updates and details of publications will be added here as they become available.

## Contacts

**Please contact us on +44 (0)1472 582400 or email us on frperc@grimsby.ac.uk**