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Category: Research: Project Summary
Key words: biodiversity, organic poultry, table birds, campylobacter, food safety

Project Title: **Enhanced biodiversity and the risk to food safety: Campylobacter and Poultry**

Sheepdrove Organic Farm

Short Title: Enhanced biodiversity, food safety campylobacter and poultry

Project Code: DL/5Camplyobacter/04/04

Project Leader: Josie O'Brien, Elm Farm Research Centre

Project Partners: Ian Alexander, English Nature

Start Date: November 2004

End Date: 28th February 2005

Funder: English Nature

Key Words: Biodiversity, organic poultry, table birds, campylobacter, food safety

EFRC Programme: Poultry

Project Aim: There is little evidence as to the extent organic systems are a risk to food safety relative to other risk sources. It is therefore not possible to say to what extent wild birds in an enhanced biodiversity organic farming system pose a threat to poultry in relation to campylobacter infection. The aim of the project was to undertake some preliminary work to address this issue and gather more information to evaluate the risk.

Abstract of Research: Organic farming is well documented and widely accepted as having a beneficial impact on the environment. However, this benefit is perceived to be

combined with a risk to food safety. It is suggested that as the biodiversity and biomass of wild animals and birds increase, the risk of these creatures introducing and transmitting food borne pathogens to farm animals, and then into the human food chain, is increased. Campylobacter has been suggested as a particular risk for organic and free-range poultry systems. This is because wild animals and birds are known to be potential carriers of this pathogen. It has been suggested that, through contact with faecal matter from these animals and birds, the pathogen could be transmitted to poultry flocks (Bates *et al*., 2004) and create a risk to subsequent carcase meat and therefore food safety. It is currently unclear if increasing biodiversity does increase the risk and presence of campylobacter.

Preliminary trials based at a UK organic farm were used to explore this issue. The presence of campylobacter through the production cycle, and around the range, was investigated, alongside the various areas of the farm, including livestock and biodiversity 'hot spots' and aspects of management including vehicles used to service the poultry system. This was done to investigate whether, and if so how, where and when, campylobacter enters the system. The study was also undertaken to investigate whether campylobacter can be associated with increased biodiversity.

The preliminary study suggests no real effect of the increase in biodiversity found on organic farms, in the level of campylobacter. The samples, which were found to be campylobacter positive, are from species that are present on conventional broiler farms as well as organic farms, including rats and sparrows, and have been found to be transmission vectors for conventional broilers (Bates *et al*., 2004, Chuma *et al*., 2000, and Hänninen, 2004). This work suggests some possible issues with management that may be acting as a route of transmission of campylobacter between different flocks on the farm. The study also identified a possible role for livestock in the transmission of campylobacter between different flocks, and suggested that efforts should be made to keep these enterprises as separate as possible. However, issues have been raised about the difficulty, when sampling for biodiversity, of identifying samples with viable campylobacter pathogen within it. Although the fragility of the campylobacter pathogen in relation to oxygen and cold would seem to be an inhibiting factor in terms of the transmission from wild animals to poultry flocks, the sheer volume of poultry on the farm means that this fragility could be overcome. Further work is needed to explore the complex relationship between campylobacter presence and its transmission into organic poultry flocks.

Objectives: To carry out a preliminary investigation to establish whether, and if so how, when and where campylobacter enters the poultry system on organic farms and whether this can be associated with the increased biodiversity of the system.

Expected Benefits: Campylobacter has been suggested as a particular risk for organic poultry systems and products as wild animals and birds. Although the method of transmission of campylobacter into poultry flocks is still unclear it has been hypothesised that through contact with faecal matter from these animals and birds the pathogen can be

transmitted to poultry flocks. This would then create a risk to subsequent carcase meat and food safety.

It has been suggested that organic poultry are at particular risk from *campylobacter* as they are more likely to pick up campylobacter from the environment, than flocks in conventional housing. However it is currently far from clear whether increasing biodiversity, as occurs in organic farming, does in fact increase the risk or presence of campylobacter within these systems.

Proposals of how to overcome this perceived risk to food safety run counter to the principles of organic production and prohibit the production for organic poultry. For example it has been proposed that poultry flocks should be kept free of pathogens by keeping them permanently. Currently there is little evidence as to risk to food safety and organic bio-diverse systems relative to other risk sources. This project will examine this and gather information relating to the degree of risk if any at which enhanced biodiversity has on organic poultry systems in relation to their campylobacter loading.

Output:

- Final report completed
- Submitted, accepted and presented at 4th SAFO Workshop in Frick, Switzerland 17th-19th March 2005 –"Systems development: Quality and safety of organic livestock products". Full paper to printed in conference proceedings.
- Submitted and accepted for 15th IFOAM Organic World Conference 2005, Shaping Sustainable Systems in Adelaide, South Australia, under Researching Sustainable Systems Conference, under the topic of Food Quality and Health Research. Full paper to be printed in Conference proceeding