

ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD

CAMPYLOBACTER RESEARCH OPPORTUNITIES

1. The *Campylobacter* Working Group met on 23 January 2004 to consider whether there were any *Campylobacter* research opportunities and requirements for the longer-term which it would be worthwhile drawing to the attention of the Food Standards Agency (FSA). The objective was not to amend the draft of the Committee's Second Report on *Campylobacter* but to supplement it with any further thoughts that Working Group members might have about the longer-term research position.
2. *Campylobacter* Working Group members took as the basis for their consideration of this issue the draft Second Report on *Campylobacter*. They endeavoured to identify those areas where the draft Report might have been more acutely focused had particular research outputs been available to the Group at the time it undertook its work.
3. The memorandum summarising the conclusions from the Group's research review meeting is attached. It is proposed that this should go to the FSA, to supplement the draft Report itself. Members are invited to :-
 - comment on the draft memorandum; and
 - agree that the memorandum, amended as necessary to reflect their comments, should be forwarded on behalf of the ACMSF to the Agency.

**Secretariat
March 2004**

**Advisory Committee on the
Microbiological Safety of Food**

Second Report on *Campylobacter*

Memorandum on Research

**Advises the Food Standards Agency
on the Microbiological Safety of Food**

Introduction

1. The Advisory Committee on the Microbiological Safety of Food (ACMSF) recently submitted a draft of its Second Report on *Campylobacter* ('our Report') to the Chairman of the Food Standards Agency, prior to consulting publicly on the draft.
2. In the draft, we explained that, in order for our Report to be as useful as possible to the FSA in developing its *Campylobacter* reduction strategy, we had focused on short to medium-term practical options for tackling *Campylobacter*. We had not addressed those research opportunities and gaps falling into a longer time frame. However, we signalled the ACMSF *Campylobacter* Working Group's intention to meet again with the aim of identifying where research outputs, had they been available, would have contributed to progressing more quickly the objectives identified as desirable in our Report.
3. The *Campylobacter* Working Group met on 23 January 2004 to take matters forward. A summary of research¹ opportunities identified by the Working Group is given in the following paragraphs.

Research opportunities

Human immunity

4. There are still large gaps in our knowledge of human immunity to *Campylobacter* infection, and this lack of information hampers risk assessment and epidemiological studies. As we note in our Report, infected people mount a strong immune response to *Campylobacter*. Vaccination may therefore offer a possible control option. We also note that immunity against *Campylobacter* is possible in the absence of acute infection, many abattoir workers apparently being immune to infection after initial exposure. Given the continuing uncertainties surrounding human vulnerability and immunity to *Campylobacter* infection, improving our understanding of the mechanisms of protective immunity continues to be an important research objective. We do not discount the possibility that acquired immunity may be having a significant biasing effect on case-control studies.
5. We propose that the Food Standards Agency (FSA), in collaboration with the Health Departments, should consider the possibility of undertaking further research to increase our knowledge and understanding of the human immune response to *Campylobacter* infection. We also take this opportunity to draw fresh attention to the recommendation in paragraph 2.38 of our Report that serological markers for recent infection and prior immunity should be developed and tested through structured

¹ For the purposes of this exercise, the ACMSF has not defined 'research' rigidly. The term 'research' therefore also covers 'surveillance', particularly where surveillance results can play an important role in epidemiological research.

epidemiologically-robust, population-based studies. We hope that this will assist in estimating the prevalence of asymptomatic infection in the population and, hence, estimating more accurately the magnitude of *Campylobacter*-associated sequelae.

Immunity in chickens

6. We note in our Report that a number of suggestions have been made to explain why chickens do not usually become *Campylobacter*-positive until the third week of life. However, current data on immune responses by chickens to *Campylobacter* remain equivocal, and further investigation could prove useful. Research to improve understanding of lag phase immunity could help inform the development of vaccination or other protection strategies.

Responses to stress

7. We touch in Chapter 2 of our Report upon *Campylobacter*'s response to environmental stresses and the debate as to the extent to which the organism is sensitive to these. We believe that further research in this area would enhance our understanding of the persistence and survival of *Campylobacter* in the environment and in food. Consideration should be given to funding work which seeks to explain bacterial behaviours as well as observing them.

Seasonality

8. *Campylobacter* infection in humans and in food animals displays a noticeable pattern of seasonality. However, while seasonality patterns are well described, their underlying cause is poorly understood. We believe that further work is needed to improve understanding of both temporal and spatial variations in infection. One of the recommendations from our Report is that population studies should be undertaken to investigate the seasonality of *Campylobacter* infection, and that an approach combining epidemiological, microbiological, environmental and veterinary expertise is likely to be needed.

Food vehicles

9. We strongly believe that there is an important association between poultry meat and human *Campylobacter* infection. At the same time, we recognise that, in addition to the contribution of poultry to human *Campylobacter* infection, many studies also point to numerous other sources and vehicles of infection. It is important that these are not overlooked and we recommend, in our Report, that more extensive data are gathered on the levels of *Campylobacter* in water and specific foods (eg. dairy products, vegetables, poultry and red meat), as well as in food producing animals and companion animals. We also recommend that consideration be given to on-going surveillance, as well as to the 'snapshot' surveillance projects which tend to be the norm.

Processing aids

10. We cover at some length in Chapter 4 of our Report the possible use of carcass treatments and other processing aids aimed at reducing *Campylobacter* on chicken carcasses. We believe that this is an area worth reviewing at regular intervals, to assess the effectiveness of such aids in reducing *Campylobacter* loadings. Of course, it is necessary to keep in mind any EU proscriptions on the use of processing aids, as well as consumer resistance to their use. We also wish to emphasise that the main focus for the control of *Campylobacter* in chickens should be the farm, and robust biosecurity regimes. Carcass treatments should not be regarded as a substitute for good hygiene practice.

Poultry other than chickens

11. It seems that all other commercial poultry species are as susceptible as chicken to *Campylobacter* colonisation. However, as we note in our Report, there are few data about the *Campylobacter* status of poultry meat (other than chicken) on retail sale. We have therefore recommended FSA surveillance to help clarify the picture.

12. We recognise that, compared with the market for chicken, consumption of other poultry is much lower (although turkey consumption is significant, especially over Christmas). We nevertheless believe that flock prevalence surveillance would yield useful data about the *Campylobacter* status of the live birds and suggest that this is something Defra might contemplate undertaking, perhaps on a 5-year cycle.

Tackling the immediate problem

13. The research opportunities identified in our review exercise may only yield results in the medium to longer-term, given the time lag involved between identifying research and surveillance opportunities, and being able to apply practical outputs. **We therefore wish to stress that implementation of the practical measures covered in our Report should not be delayed until the results of this further research or surveillance are available.**