Ministry for Primary Industries
Manatū Ahu Matua

Campylobacter Risk Management Strategy 2013-2014

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New Zealand Government

Growing and Protecting New Zealand

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Contents

Page

1 Executive Summary

This document provides the Ministry for Primary Industries (MPI) risk management strategy for *Campylobacter* for 2013-2014.

MPI's mandate is to protect consumers by providing an effective food regulatory programme covering food produced and/or consumed in New Zealand. MPI has therefore established a strategic goal to maintain the 50% reduction in reported annual incidence of foodborne campylobacteriosis achieved during the period 2010 – 2013.

Achievements to-date include considerable progress in decreasing the number of human foodborne cases of campylobacteriosis by focusing on broiler chicken meat as the primary exposure pathway. Establishment of mandatory performance targets for *Campylobacter* applied at the end of primary processing of broiler chicken meat in 2008, has driven this result. MPI has now revised the requirements for the primary processors as from January 2013.

The estimated proportion of human cases attributable to poultry has decreased considerably over the last five years to less than 50%. This has been associated with an estimated proportionate increase in cases attributed to other sources, primarily ruminants. MPI continues to investigate other exposure pathways for humans in relation to foodborne illness.

Ongoing extensive collaboration is needed to support the strategy, both in New Zealand and internationally and MPI continues to take advantage of these opportunities as they arise.

2 Introduction

The Ministry for Primary Industries (MPI) strategy 2030 associated with growing and protecting New Zealand, includes in its focus the protection from biological risk by protecting and enhancing the integrity and reputation of New Zealand's primary products including food. The Minister for Food Safety has the reduction of foodborne illness as one of five priorities.

MPI will contribute by providing an effective food regulatory programme covering food produced and consumed in New Zealand as well as imports and exports of food products. MPI has set an indicator performance target for 2013-2014 of maintenance of the 50% reduction in the reported annual incidence of human foodborne campylobacteriosis already achieved over the past five years (2008 – 2012). This represents a holding position while further clarification is sought on the contribution of other sources and pathways of *Campylobacter* infection for humans.

It has been scientifically established that poultry meat is still a significant exposure pathway in New Zealand. MPI continues with its comprehensive risk management strategy aimed at achieving sustainable reduction in *Campylobacter* levels in chicken meat through setting industry performance targets and industry meeting these through improved dressing and decontamination procedures. MPI continues to investigate problems as they arise and how performance of industry can be improved overall. The strategy continues to include investigation and management of other potential exposure pathways for humans, besides poultry meat.

The *Campylobacter* risk management strategy includes:

- developing targeted controls throughout the food chain;
- focusing on hazard -based controls in the medium term;
- focusing on risk-based controls in the longer term;
- clarifying the proportionality of poultry compared with other transmission pathways;
- intensifying monitoring programmes by establishing new targets and monitoring changes over time;
- promoting good hygienic practice (GHP) by consumers;

- collaborating with other government agencies, industry, consumers and research institutes of New Zealand on all aspects of risk management;
- collaborating with the international science community on all aspects of risk assessment and risk management.

While the ideal is for risk-based controls, given the scale of the public health problem, overseas experience, and the evolving science, hazard-based interventions have been demonstrated to significantly contribute to the reduction of the consumer's exposure to *Campylobacter*.

3 Goal

MPI's overall performance target in relation to foodborne illness is: "A continual improvement in rates of food-borne disease through the effective risk management of priority pathogens".

MPI's indicator performance target for *Campylobacter* risk management is "to maintain the 50 % reduction of the incidence of foodborne human campylobacteriosis over the period 2013-2014".

4 Objectives

In order to further implement the MPI *Campylobacter* Risk Management Strategy, objectives have been set as follows:

1. To continue to determine the relative contributions of different interventions throughout the food chain in reducing risks to human health by:
    a. targeted operational research;
    b. evaluating the National Microbiological Database (NMD);
    c. risk modelling.
2. To continue to make well-informed risk management decisions on appropriate control measures and their implementation.
3. To assess the effectiveness of risk management decisions by utilising a monitoring and review programme.
4. To continue research work to estimate the proportion of foodborne cases attributable to poultry and other sources.

5 Background

5.1 WHAT IS *CAMPYLOBACTER*?

Campylobacter is a bacterial organism that causes the gastrointestinal disease campylobacteriosis when it lodges in the walls of a person's intestine. In particular, there are two species of *Campylobacter* that cause human illness and these are *Campylobacter jejuni* and *Campylobacter coli*.

5.2 HUMAN CAMPYLOBACTERIOSIS

Illness usually strikes within 2 – 5 days of exposure but can take up to 10 days. Symptoms include general muscle pain, stomach cramps, nausea, headache or fever followed by sudden watery diarrhoea that may contain blood. Most people feel ill for about a week. During the illness, and up to a fortnight afterwards, bacteria are shed from the gut and can survive on hands and moist surfaces for up to an hour or more.

The relationship between exposure and human illness continues to be explored. The dose-response relationship of *Campylobacter* and human illness is not well established. The role of immunity is not clear either. Nevertheless it can be assumed that the smaller the exposure, the more likely a reduction in the incidence of human illness will be.

The incidence of human campylobacteriosis in New Zealand remains unacceptably high, even though an initial downward trend and plateauing effect has been achieved in the past five years. Focused research is being undertaken to identify solutions capable of reducing these high rates even further.

5.3 COMPREHENSIVE RESEARCH

MPI's[1] research programme on *Campylobacter* has been comprehensive and longstanding over more than fifteen years, including involvement of the Ministry of Health, Massey University and the Institute of Environmental Science and Research (ESR). Government agency collaboration is essential.

[1] Previously as Ministry of Agriculture and Forestry (MAF) and the New Zealand Food Safety Authority (NZFSA)

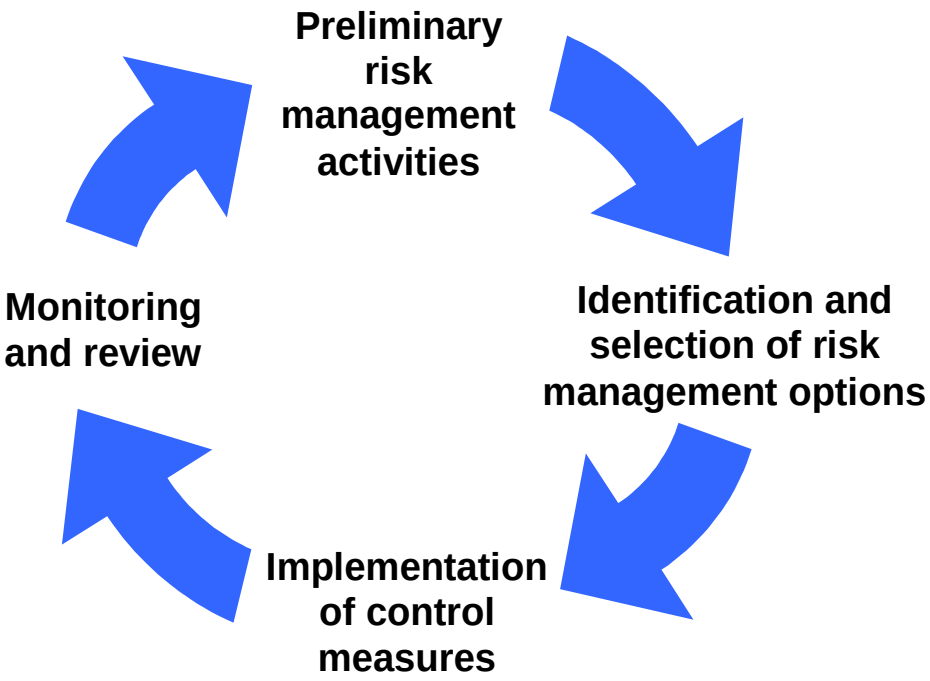
5.4 SOURCES AND PATHWAYS

There are many sources and pathways for *Campylobacter* to reach the human population in New Zealand and knowing the relative importance of each of these impacts on prioritizing areas for control. Once a significant source has been identified, its relative significance as a pathway for human foodborne illness must be established using attribution techniques, and monitored. Available scientific information shows that poultry meat remains the main food pathway to-date but other sources are of significance, e.g. ruminants.

5.5 RISK MANAGEMENT FRAMEWORK

The risk management framework (RMF) provides a systematic process whereby knowledge on risk and evaluation of other factors relevant to control of hazards are used to choose and implement regulatory standards or other measures. The components involved in applying a RMF are shown in Figure 1. Effective risk management incorporates appropriate risk communication and stakeholder representation at all steps.

Figure 1: Risk Management Framework



5.6 *CAMPYLOBACTER* RISK MANAGEMENT STRATEGY WORKING GROUP AND ITS RELATIONSHIP TO THE PATHOGEN MANAGEMENT GROUP

MPI has an overarching Pathogen Management Group reporting to the Standards Branch Senior Business Leadership Team (SBLT) with advice on:

- what pathogens MPI should focus on;
- the significance of any emerging pathogens;
- recommendations for change.

The *Campylobacter* risk management strategy working group is a sub-set of the Pathogen Management Group and is tasked with achieving the objectives specifically relating to *Campylobacter* risk management. The working group represents Directorates within the Standards Branch of MPI and input from MPI Verification Services.

5.7 STAKEHOLDERS

MPI works closely with a variety of stakeholders in New Zealand in order to ensure understanding of the comprehensive risk management strategy and to share and obtain feedback on results from the work programme on an ongoing basis.

Stakeholders include:

- Industry, e.g. food businesses from primary production to retail;
- Consumers;
- Industry associations, e.g. those covering growers, processors, retail and food service;
- Government agencies such as the Ministry of Health;
- FSANZ;
- Science organisations, e.g. Crown Research Institutes, Universities.

5.8 KEY ACHIEVEMENTS

These include:

- Achievement of a 50% reduction in the estimated human foodborne cases of campylobacteriosis after five years (85.3/100,000).[2]

[2] Foodborne disease in New Zealand 2012 (ESR, June 2013)

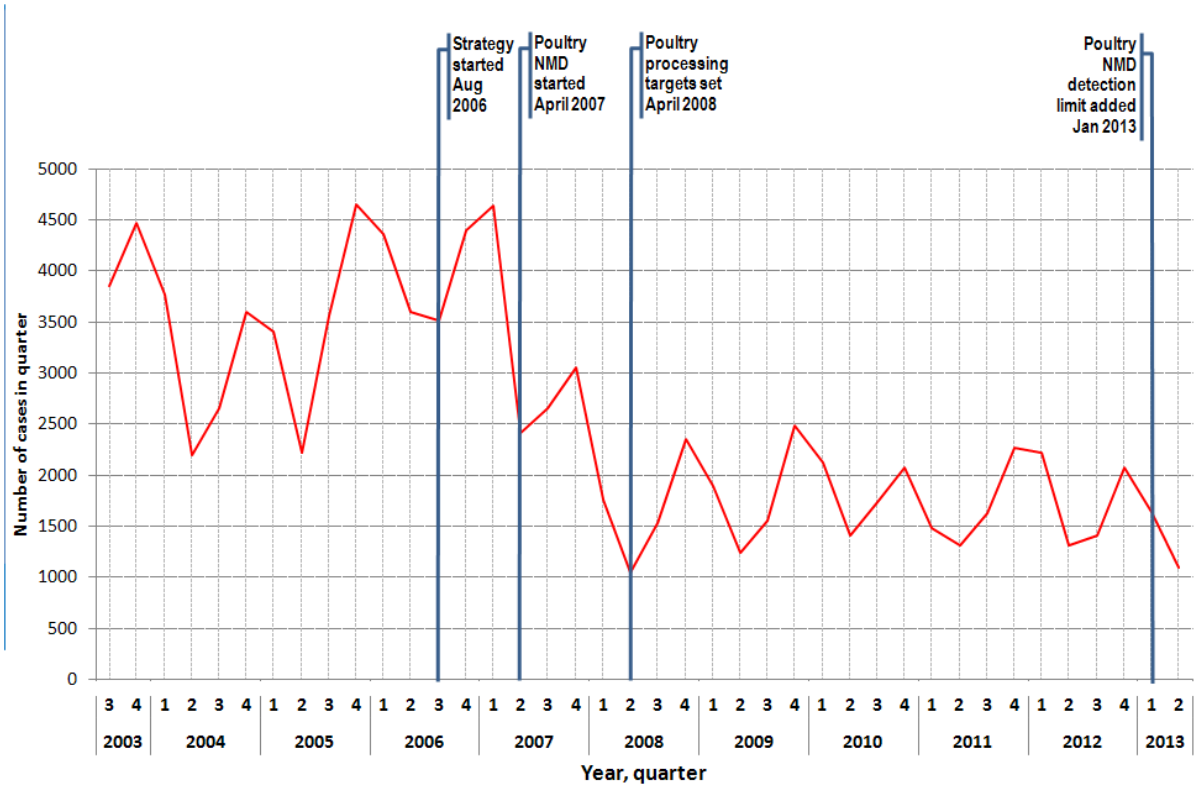
- Review and modification of the mandatory *Campylobacter* performance targets for broiler chicken carcasses at the end of primary processing.

- Monitoring and Review progress as follows for:

    a. Surveillance – human cases of campylobacteriosis

Figure 2 shows quarterly results as at 30 June 2013, for reported cases of human campylobacteriosis in New Zealand.

Figure 2: Reported Cases of Human Campylobacteriosis in New Zealand (to 2nd Quarter 2013)



b. National Microbiological Database (NMD) for poultry meat

Table 1 shows quarterly results for broiler chicken carcass sampling covering prevalence (positive carcasses) and enumeration (mean log $_{10}$) [3] to 31st March 2013.

[3] Samples where *Campylobacter* was not detected were given a value of 2.00 $\log_{10}$CFU/carcass.

Table 1: Quarterly results for broiler chicken carcass sampling 2011-2013 (1st Quarter 2013)

NMD Results	Number of carcasses tested	Prevalence %	Mean Log Count all samples
Q1. 2011	1459	37.0	2.44
Q2. 2011	1590	36.9	2.45
Q3. 2011	1635	37.4	2.45
Q4.2011	1542	40.3	2.48
Q1.2012	1555	37.1	2.46
Q2.2012	1563	29.2	2.34
Q3.2012	1625	27.1	2.32
Q4.2012	1659	37.7	2.47
Q1 2013	1428	38.8%	2.44

5.9 STRATEGY UPDATE

The Strategy update process occurs as necessary and takes into account all aspects of implementation of the RMF and progress to-date. This includes consideration of any other relevant sources of information. The update process guides the choice of further scientific work and the future direction of the Strategy.

This updated Strategy document describes the MPI *Campylobacter* risk management strategy for 2013 – 2014, and specifically, spells out the work programme aligned to the RMF that will be achieved over this period.

Details are found in section 6 of this Strategy.

6 Work programme

This work programme is based on application of the RMF and includes the following parts:

- Preliminary Risk Management Activities;
- Risk Management Options;
- Implementation of Control Measures;
- Monitoring and Review;
- Risk Communication; and
- International Collaboration.

For each part, a short overview is given and the key objectives where applicable, are set out.

6.1 PRELIMINARY RISK MANAGEMENT ACTIVITIES

The identification of campylobacteriosis as a food safety issue has been well established and risk profiles on *Campylobacter* in poultry, mammalian and poultry offals, and red meat have been completed. Activities currently focus on source attribution data and scientific evaluation of data

6.1.1 Key Objectives

- To accurately determine the incidence of foodborne human campylobacteriosis from poultry and other sources.
- To apply genotyping of strains to assist with food source attribution and other epidemiological studies.
- To quantify the influence of specific controls at different steps in the food chain on risk estimates in NZ, and create a "menu" of such controls and the resulting risk estimates.
- To model "what if" scenarios for new controls that become available e.g. decontamination processes.
- To demonstrate the most effective ways to manage the risk to the consumer from Campylobacter in poultry while ensuring practicality and feasibility of intervention.

6.1.2 Completed work 2010 – 2013

1. Attribution Studies:

- Source Attribution Studies for Campylobacteriosis in New Zealand:
  A review of work carried out to determine the source of human campylobacteriosis (July 2012).
- Attribution of Campylobacteriosis: Sentinel Site Comparison (May 2013).
- Source Attribution October 2011 to December 2012 of human *Campylobacter jejuni* cases from the Manawatu (May 2013).

2. Scientific evaluation:

- Survey on ducks and turkeys.
- *Campylobacter* in uncooked retail meats.
- Survey on End of lays/Breeders.
- AMR survey of *Campylobacter* on pig, poultry and bobby calf carcasses.
- Contamination of selected poultry products.
- Survey – pre-packaged fresh leafy salads at retail.

3. Risk assessment:

- Survival of NZ-relevant *Campylobacter* strains under dynamic environmental conditions simulating poultry processing.
- *Campylobacter* in food and the environment, examining the link with public health.

6.1.3 Current work programme

1. Attribution studies:

- Feasibility study phase I &II.
- Source pathway attribution of campylobacteriosis.
- Dynamic attribution studies.
- Case control study (pending).
- Ongoing MLST work 2013-2014.
- Liaison with MOH on source pathway attribution.

2. Scientific evaluation

- Scientific paper – Effect of chlorinated water on contamination of broiler chicken by Campylobacter, Salmonella and other micro-organisms during immersion chilling.

- Prevalence and enumeration of *Campylobacter* and *E. coli* on broiler chicken carcasses and portions at retail sale.
- Updated risk profile on *Campylobacter* jejuni/coli in poultry (whole and pieces)
- Raw milk survey (final report).

6.2 RISK MANAGEMENT OPTIONS

Potential risk management options are identified and then selected according to appropriate criteria. Stakeholders are involved to the extent possible, and a clear rationale must be presented for the final decisions taken. All parts of the food chain should be taken into account when selecting control measures.

6.2.1 Key objectives:

- To identify the most effective and practical intervention(s) and other (e.g. non regulatory) measures at relevant points in the food chain and ensure their implementation.
- To establish a quantitative link between implementation of hazard-based controls and achievement of any performance targets that may be established.

6.2.2 Completed work 2010 – 2013

- Effectiveness of current practices on level of faecal contamination and cross contamination.
- Updated guidance material on safe handling of poultry meat and relevant time temperature applications(Background, chilling and hot holding).
- Effect of caprylic acid on *Campylobacter* concentration in broiler caeca
- Industry intervention table updated.

6.2.3 Current work programme

- Updated guidance material – D values.
- Intensified sampling at process steps to inform risk management options.

- Guidance material for small meat operators, secondary processing for reducing cross contamination (DOBS, Retail, Wholesale).

6.3 IMPLEMENTATION OF CONTROL MEASURES

Sectors throughout the food chain have the primary role in implementation of control measures. Verification of control measures implemented by the food sector will be necessary. The *Campylobacter* Response team or MPI's systems auditors may carry out independent audits of regulatory functions and apply sanctions where control measures have not been properly implemented

6.3.1 Key objectives

- To effectively implement regulated and non-regulated measures at relevant points in the food chain.

6.3.2 Completed work 2010 – 2013

- Primary processors audit.
- Secondary processors audit.
- NMD amendment (7 January 2013).

6.3.3 Current work programme

- NMD requirements for poultry primary processors of broiler chicken.

6.4 MONITORING AND REVIEW

Monitoring and Review encompasses human health surveillance associated with foodborne illness caused by *Campylobacter*. Data on the level of control of *Campylobacter* throughout the food chain is gathered, analysed, and reviewed in conjunction with audit reports and human health surveillance data to determine the effectiveness of regulatory activities. Where monitoring indicates that food safety goals are not being achieved, decisions and/or control measures will need to be reviewed and future research/improvement may be requested.

6.4.1 Key objectives

- Surveillance – in cooperation with ESR and MoH, to contribute to an effective surveillance programme that will enable demonstration of mid- and long term trends.
- Monitoring – to accurately determine the prevalence and level of *Campylobacter* in poultry (broilers) in New Zealand considering each key stage of the food chain:
  - at point of slaughter (reflecting farm practices/one-off studies or intermittent);
  - during processing;
  - at retail (one-off studies or intermittent).
- Review – to review effectiveness of outputs from the strategy in contributing to the achievement of a reduction in food-borne campylobacteriosis.
- Review – to identify areas for future research / improvement under this strategy

6.4.2 Completed work 2010 – 2013

- Quantification of *Campylobacter* on poultry after consecutive rinses and removal/homogenisation of skin
- Review of PIANZ Broiler Growers Biosecurity Manual
- Review of CPT and other NMD requirements for broiler chicken

6.4.3 Current work programme

- Review of human health surveillance data for campylobacteriosis
- Review of NMD results for poultry primary processors including risk modelling of this data

6.5 RISK COMMUNICATION

Risk communication encompasses a continuous and interactive exchange of information between all parties involved in food safety. It describes the work done by MPI to bridge the gap between the evaluation of risk by experts and the views of other stakeholders. MPI takes into account knowledge, attitudes, values, practices and perceptions of stakeholders when communicating risk management options and decisions.

Further information including press releases, research and resources can be found at: http://www.foodsafety.govt.nz/science-risk/programmes/hazard-risk-management/campylobacter.htm

Details of various MPI- funded reports, risk profiles and research can be found at: http://www.foodsafety.govt.nz/science-risk/

6.5.1 Objectives

- To proactively inform interested parties (both public and industry) of major developments, milestones and decisions (and the reasons for those decisions).
- To communicate via multiple methods, where appropriate, to ensure that interested parties have every opportunity to get the information they need, in the way they need it, in a timely manner.

6.6 INTERNATIONAL COLLABORATION

MPI works closely with international counterparts to coordinate research, and to share and discuss scientific approaches and results in order to maximize the benefits of scientific knowledge on *Campylobacter* in poultry for inclusion into New Zealand's risk management strategy.

6.6.1 Completed work 2010 – 2013

- Codex:
  - Co-lead CCFH working group on draft *Guidelines for Control of Campylobacter and Salmonella in chicken meat* before 42nd Session and contribute towards 42nd Session plenary discussion supporting progressing draft Guidelines to Step5/8. CAC adopted report at July 2011 meeting.
  - Present Microbiological Criteria (MC) example for 44th Session CCFH
  - Presentation of MC example & finalisation of MC work at Step5/8 for 44th Session CCFH.
- Collaboration with United Kingdom Food Standards Agency (UKFSA 2009 – 2013).

6.6.2 Current work

- Collaboration with UKFSA 2013 – 2014.
- Presentation at International Association for Food protection (IAFP) 2013, North Carolina, USA.
- Participation at the Campylobacter, Helicobacter and Related Organisms Conference (CHRO) 2013: 17th International Workshop on *Campylobacter*, Helicobacter and Related Organisms, Aberdeen, Scotland.
- Publish Codex MC example in Food Control with other Codex MC examples.