Ministry for Primary Industries
Manatū Ahu Matua

Salmonella Risk Management Strategy 2013-2014

July 2013

New Zealand Government

Growing and Protecting New Zealand

Disclaimer

Every effort has been made to ensure the information in this report is accurate.

The Ministry for Primary Industries does not accept any responsibility or liability whatsoever for any error of fact, omission, interpretation or opinion that may be present, however it may have occurred.

Requests for further copies should be directed to:

Publications Logistics Officer
Ministry for Primary Industries
PO Box 2526
WELLINGTON 6140

Email: brand@mpi.govt.nz
Telephone: 0800 00 83 33
Facsimile: 04-894 0300

This publication is also available on the Ministry for Primary Industries website at
http://www.mpi.govt.nz/news-resources/publications.aspx

Contents

Page

1   Executive Summary

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

MPI's mandate is to protect consumers 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 therefore established two strategic goals in relation to non-typhoid *Salmonella*:

- to maintain the 30% reduction in reported annual incidence of foodborne salmonellosis achieved over the last five years (2008-2012), for the period 2013-2014; and
- to support market access.

 MPI's *Salmonella* risk management strategy continues to focus on intelligence gathering from those food and food-related sectors, particularly associated with foodborne outbreaks and where little is known about their *Salmonella* status, to better inform the strategic direction. The current work programme within this document reflects this commitment.

2 Introduction

MPI recognises the importance of the non-typhoid *Salmonella*, as a cause of human illness being ranked as one of the three most important foodborne pathogens in NZ.

The strategic approach to *Salmonella* control has a broad scope, given that there is currently no primary exposure pathway established in New Zealand. Information gathering from a wide range of food sectors and diverse sources including imported food, continues to be a key factor in this Strategy.

MPI has two strategic goals in relation to non-typhoid *Salmonella*:
1. to maintain the 30% reduction in reported annual incidence of foodborne salmonellosis achieved in the last five years[1]; and
2. to support market access.

This document describes the MPI *Salmonella* risk management strategy and work programme for the next twelve months.

---

[1] By end 2012, (i.e. below 9.9 per 100,000 population)

3 Background

3.1 WHAT IS *SALMONELLA*?

There are more than 2,500 different types of *Salmonella* bacteria. These can be further sub-divided into genotypes which often have different virulence and pathogenic characteristics such as antibiotic resistance. A small proportion of these types are endemic in New Zealand; uncommon[2] types can enter via imported foods, animal feeds or as a result of overseas travel. Whether or not *Salmonella*e will infect a narrow or wide range of animals varies considerably. For example there are two types *S.* Typhi and *S.* Paratyphi which only infect humans. There are parallels among livestock and wild animals. However, some have low host specificity and may survive outside an animal host for long periods, in the environment or in low moisture foods and/or ingredients and are thus potential foodborne pathogens.

S. Typhi and Paratyphi have been excluded from the strategy because the MPI goal refers to salmonellosis, a clinical syndrome which differs from typhoid and paratyphoid diseases. The reservoir is humans; rarely domestic animals for S. Paratyphi. Transmission of these organisms can result from ingestion of water contaminated by faeces from a human case or occasionally by an asymptomatic carrier, including fruit or vegetables washed in water contaminated by sewage and shellfish. In New Zealand the vast majority of cases are associated with overseas travel; the very occasional cases being associated with a food worker who is a carrier. The public health management of cases of typhoidal disease is a responsibility under the Health Act 1956.

MPI's core business[3] includes effective operation of food safety systems, and refers to management of rates of foodborne illness to agreed levels. This includes priority pathogens such as non-typhoidal Salmonellae.

The *Salmonella*e cause an acute gastroenteritis which is generally self-limiting and uncomplicated. The acute symptoms are diarrhoea, abdominal pain, vomiting, nausea and fever lasting 1-7 days. The hospitalisation rate is estimated at 10-15% of notified cases and the case fatality incidence 0.8%. The young, old, pregnant and immuno-compromised are particularly at risk from more severe disease. In a small proportion of cases longer term effects occur. Septicaemia and subsequent non-intestinal infections can occur. Reactive

---

[2] Reported serotypes or phage types where there are less than five isolates per year either from human or non-human sources
[3] MPI Statement of Intent 2013 – 2018 located at www.mpi.govt.nz

arthritis or Reiter's syndrome may occur 3-4 weeks after gastrointestinal symptoms. Approximately 2% of a population exposed to a triggering infection will develop reactive arthritis, which may last for up to a year or longer.

Fluid replacement may be required, especially in the elderly or young children. Less than 2% of clinical cases require antibiotic treatment. The site of infection and the immune status of the case determine the choice of treatment. The genotype of *Salmonella* involved may affect the outcome. For example, cases due to *S.* Typhimurium DT104 are of increasing concern in the UK due to the organism's virulence and resistance to many antibiotics. The result is that the disease, due to some strains, are becoming more difficult to treat.

3.2   PATHWAYS TO HUMANS

There are many possible foodborne pathways, and once a significant pathway has been identified, its relative significance in prioritising areas for control, must be established using attribution techniques. Available scientific evidence shows that the pathways shown in Figure 1 may have significant public health impacts.

Figure 1: Possible pathways for pathogenic *Salmonella* from a wildlife or domestic animal reservoir to humans
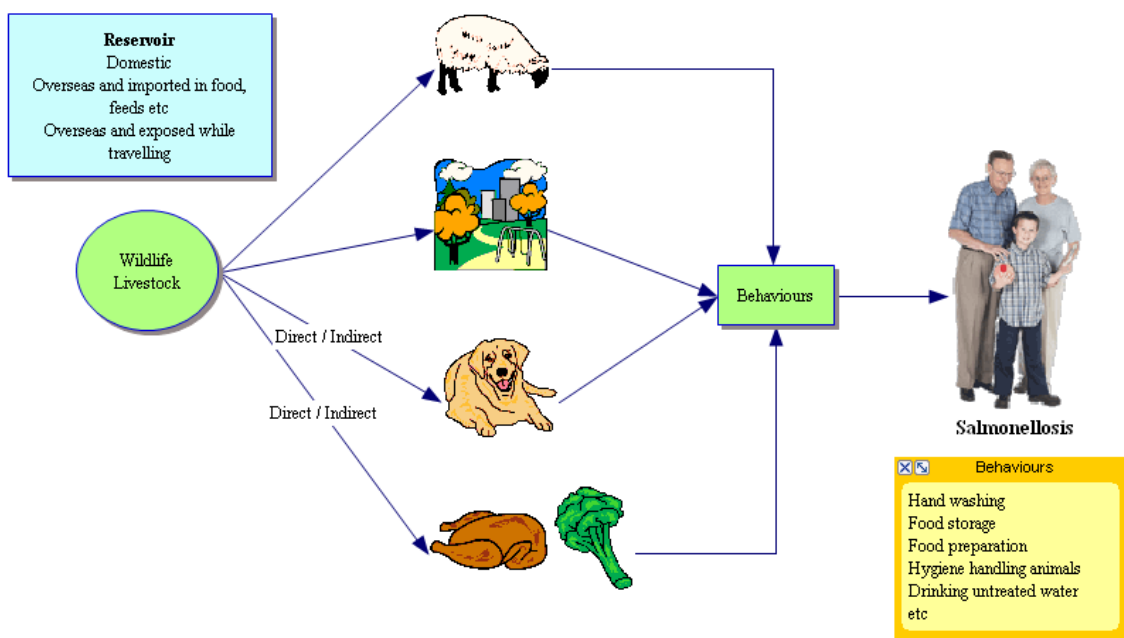
Foodborne infection is one such pathway; food may be contaminated directly from the host or indirectly via water or fomites. Humans may be the source of *Salmonella*, e.g. for shellfish growing areas.

3.3 SPECIFIC SOURCES OF *SALMONELLA*

3.3.1 Large animals and large birds

Hazard identification has shown that for slaughtered animals, food-borne risks to human health are almost entirely due to asymptomatic carriage of enteric pathogens, of which *Salmonella* is one. Reducing contamination of the carcass and viscera during dressing and subsequent handling to the lowest level practicable is now recognized as being the most important meat hygiene activity.

Operators slaughtering large animals (including wild mammals) and large birds have been required to have Risk Management Programmes (RMPs) since inception in 1999 that control hazards to human health, including *Salmonella*. There also is mandatory testing under the National Microbiological Database (NMD) programme for *Salmonella* in cattle, young calves, goats, farmed deer, ostrich and emus. Sheep and pigs are currently not included within this programme after their status has been reviewed and found to be of little significance to foodborne salmonellosis in New Zealand.

3.3.2 Poultry

New Zealand is fortunate in having a poultry industry in which types of *Salmonella* that have caused major human health problems overseas (S. Enteritidis PT4 and *S*. Typhimurium DT104) are not endemic). The current low prevalence of contamination by *Salmonella* in poultry is evidence of good risk management. The poultry meat processing sector has been subject to mandatory RMPs under the Animal Products Act 1999 designed to control hazards to human health including *Salmonella* since July 2004. There has also been mandatory testing under the NMD programme for *Salmonella* in broilers at the end of primary processing (slaughter and dressing) for several years. This has resulted in a significant reduction in the prevalence of *Salmonella* in fresh raw poultry meat, achieved through understanding transmission, taking responsibility for the issue, effective action and monitoring systems and rapid response to problems. There continues to be occasional *Salmonella* detections that anecdotally are being attributed to contaminated feed. Industry is currently achieving a 0.4% prevalence rate nationally[4].

---

[4] NMD poultry *Salmonella* data first quarter 2013

3.3.3   Eggs

Most of the egg production and packing sector has been required to have RMPs from 2003-2004 to control hazards to human health, including *Salmonella*. Retail egg surveys (1994-2007) have shown an absence of internal contamination of eggs by *Salmonella*e.

Except for two foodborne outbreaks in 2010, specifically implicating *Salmonella* in eggs, no further significant foodborne disease has been associated with *Salmonella* and eggs over 2011-2012[5].

3.3.4   Rendered animal product

Rendered animal product is an important ingredient in animal feeds for non-ruminant food-producing animals. All rendering and blood-drying businesses producing animal product intended for animal consumption are required to operate under an RMP that documents procedures to ensure that mandatory requirements are met. Two key requirements are:

- subjecting medium risk raw material[6] to a thermal process to destroy all vegetative bacteria, viruses and protozoa, and inactivate chemical substances that are potentially harmful if consumed by animals; and

- protecting post-treatment rendered animal product from recontamination and deterioration.

While achieving an acceptable thermal process is relatively straightforward, experience has shown that issues arise with the recontamination of rendered animal products after thermal processing. This may result in the presence of *Salmonella* in the final meal. While this should be avoided, discussions are still ongoing as to whether the meal is still fit for its intended purpose where *Salmonella* exists in the final product.

3.3.5   Other animal feed

Animal feed is a complex group of products ranging from bulk animal feeds to specific nutritional supplement preparations. Compounded feed can be made of animal material, plant material or both produced either in NZ or imported.

All animal feeds are currently exempt from registration under the ACVM (Exemptions and Prohibited Substances) Regulations 2011 if they meet the conditions associated with the exemption. The ACVM Act was amended in 2007 to include protection of public health in

---

[5] Foodborne disease in NZ 2010, 2011 & 2012

[6] A class of animal material or product, defined in the Animal Products (Products Intended for Animal Consumption) Notice 2006, which requires further processing prior to being fit for animal consumption.

the objectives of the Act. Consequently the 2001 ACVM Regulations were updated (2011 Regulation) to reflect this change and to amend the conditions of general application to exempt products. One of the key changes made is to ensure the animal feed manufactured/imported/sold/used is fit for purpose and one of the considerations is the risks to public health.

3.3.6   Other foods in New Zealand

Salmonella contamination of other foods such as dairy products, grains, oils/sugars, fruit, vegetables, and seafood have occurred from time to time and have been implicated in human cases of salmonellosis including notified outbreaks[7].

3.3.7   Imported food

Categorisation of food/hazard combinations associated with imported foods often consider *Salmonella* as an important hazard. Import Food Requirements that have identified *Salmonella* spp as a hazard include: fermented meat products, meat pastes and pâté, peanut butter, desiccated coconut, crustaceans, tahini or crushed sesame seeds, or any products containing these, and spices – pepper, paprika and cinnamon. In a recent example from 2012, *Salmonella* was found in tahini (S. Mbandaka, S. Montevideo and S. Maastricht) and product was recalled[8].

Currently *Salmonella* is considered an issue in seven of the sixteen prescribed (high risk) foods stopped at the border for food safety purposes, including Tahini, fermented meat products and peanut butter.

The existing system for capturing prescribed foods relies on Customs stopping product based on Tariff codes. A *Salmonella* event in 2012 was precipitated by an incorrect Tariff being entered and contaminated Tahini going into the market without testing. The new Joint Border Management System (JBMS) provides for a much finer level of consignment information, for example using GS1 Bar codes.

While both of these changes will take some years to fully implement the outcome will be an improved targeting and capturing of *Salmonella* risk products.

---

[7] ESR reports on Salmonella and foodborne outbreaks 2010 – 2012
[8] Food recall after Salmonella found in tahini http://www.foodsafety.govt.nz/elibrary/industry/recall-salmonella-tahini.htm

3.4   MARKET ACCESS IMPLICATIONS

The United States and the European Union have accepted the *Salmonella* sampling regime within the current NMD programme, as equivalent. This means that any changes to the NMD programme must be assessed for impact on these equivalence agreements.

Other countries may require different *Salmonella* sampling programmes stipulated in the MPI overseas market access requirements. In addition to centralised MPI – coordinated programmes (NMD), there is a significant amount of *Salmonella* testing done by New Zealand's export industries from which the results may not be captured centrally.

Regardless of any specified overseas market access requirements, effective control of and an absence of detectable *Salmonella* is an expectation of most markets for most produce, dairy products, shellfish and animal feeds. Some markets also operate a zero detectable tolerance for *Salmonella* for raw meats and other animal products regardless of them normally being subject to a further cooking process prior to consumption.

Salmonella detected in New Zealand product at the border or in overseas markets by foreign authorities results in market rejections and also puts New Zealand's wider market access and reputation at risk. There is similar risk from an outbreak of human or animal salmonellosis associated with product originated from New Zealand, or if there is a perceived 'uncontrolled' outbreak of human or animal salmonellosis in New Zealand that may have a link to human food or animal feed. Outbreaks of salmonellosis in overseas markets, especially related to imported foods, where there may be no association with New Zealand product, can heighten the sensitivity of foreign governments who may apply restrictions on access to their market.

Restrictions to market access could result in the closure of borders to New Zealand product, point of entry or foreign in-market testing, an increased requirement for in-process testing prior to export, and statements of *Salmonella* freedom required on export certificates. Each increase adds costs to New Zealand processors and exporters without necessarily improving the protection of consumers. Damage to reputation can impair the ability to negotiate access to markets based on the New Zealand standard.

3.5 RESEARCH

MPI's research programme on *Salmonella* has been primarily directed at defining the foods that are contaminated. A focus has been on the prevalence of *Salmonella* in raw foods, animal feeds and salads. Risk profiles currently available include:

- *Salmonella* (non-typhoidal) in and on eggs (2004).

- *Salmonella* (non-typhoidal) in Poultry (whole and Pieces)(2004).

- *Salmonella* (non-typhoidal) in pork and pork products (2010).

- *Salmonella* (non-typhoidal) in cereal grains (2010).

- *Salmonella* (non-typhoidal) in high lipid foods made from sesame seeds, peanuts or cocoa beans (2010).

- *Salmonella* species in animal feed (2011).

Microbiological surveys have been conducted on products available at retail sale in New Zealand:
- Ready- to- eat red meats;
- Ready-to-eat poultry meats;
- Pre-packaged fresh salads;
- Nuts and seeds, and nut and seed products; and

Salmonella was not isolated.

3.6 CURRENT STATUS OF INFORMATION ON *SALMONELLA*

MPI has built up some information on *Salmonella* contamination in some of the foods and on some food pathways from a variety of science projects and reviews. However gaps remain in this knowledge and this section summarises the current status.

3.6.1   Current human health status

All human cases of salmonellosis are reported to the Ministry of Health and in Figure 2 the human case numbers are shown per quarter from 2003 to the second quarter 2013. The reduction over the last 5 to 6 years has been modest.

Figure 2: Number of human cases of salmonellosis per quarter (to 30 June 2013)
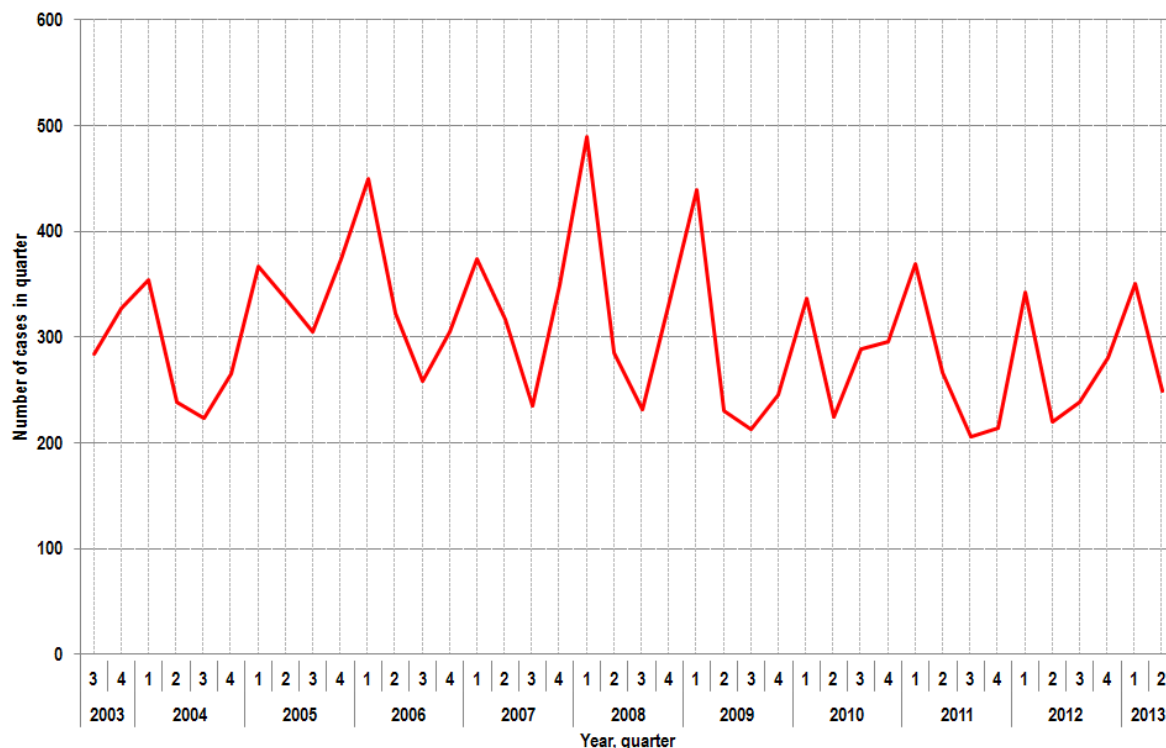
3.6.2   Current food chain status

Attribution studies

The following human salmonellosis 'risk attribution' studies have been commissioned by MPI over the last three years 2010 – 2013:

- Attribution of potentially foodborne enteric diseases: human salmonellosis. Enhanced surveillance including outbreaks.

- Attribution of potentially foodborne enteric diseases: human salmonellosis – an epidemiological approach.

- http://www.foodsafety.govt.nz/elibrary/industry/attribution-potentially-foodborne-research-projects/FW10008-Salmonella-attribution.pdf.

- Diagnostic and public health management practices of foodborne bacterial diseases.

- http://www.foodsafety.govt.nz/elibrary/industry/diagnostic-public-health-research-projects/FW1044_Diagnostic_practices.pdf.

- Attribution of potentially foodborne enteric diseases: human salmonellosis – feasibility of microbial subtyping approaches (Stage I).

- Source attribution for salmonellosis using microbial subtyping (2013) (pending).

Foodborne outbreaks associated with *Salmonella*

Surveillance reports (2010 – 2012)[9] from the Institute of Environmental Research Limited (ESR) show that there were 1,085 cases of salmonellosis for 2012, of which 474 were estimated to be foodborne. The most commonly reported risk factors for salmonellosis cases notified for 2012 were consumption of food from retail premises, contact with farm animals and consumption of untreated water.

Comparing previous years, *Salmonella* was associated with:

- 7.1% of foodborne outbreaks in New Zealand in 2010;
- 6.6% of foodborne outbreaks in New Zealand in 2011;
- 10% of foodborne outbreaks in New Zealand in 2012.

These figures are based on the percentage of total human cases estimated to have come from a food source (expert elicitation, 2005) at 60.7%.

---

[9] Summary of Outbreaks in New Zealand 2010, 2011, and 2012. ESR
www.surv.esr.cri.nz

3.7   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 3. Effective risk management incorporates appropriate risk communication and stakeholder representation at all steps.

Figure 3: Risk Management Framework
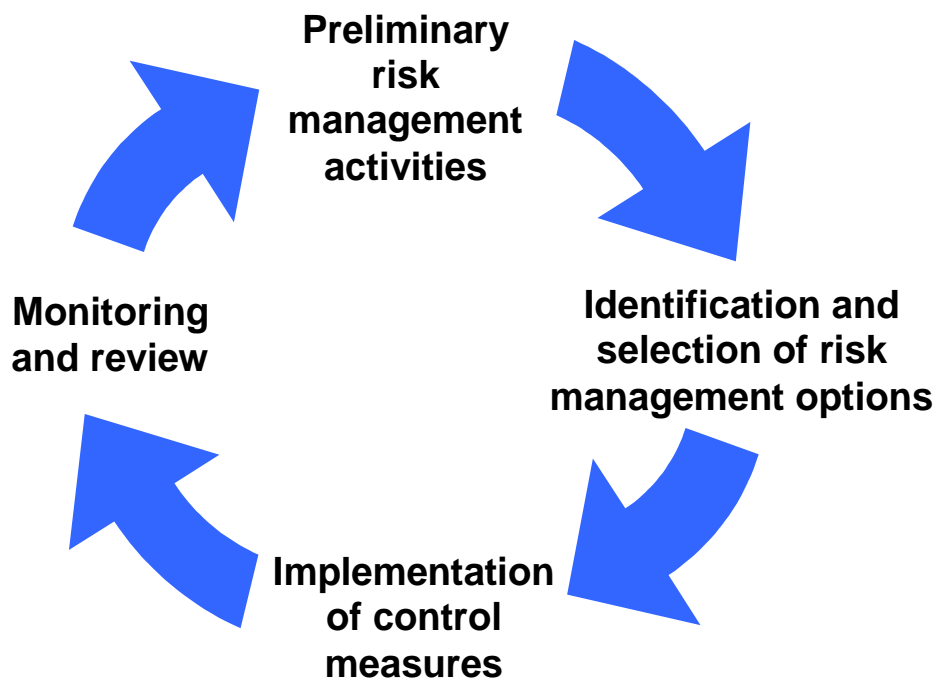
3.8 *SALMONELLA* RISK MANAGEMENT STRATEGY WORKING GROUP AND ITS RELATIONSHIP TO THE PATHOGEN MANAGEMENT GROUP

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 *Salmonella* risk management strategy working group is a sub-set of the Pathogen Management Group tasked with achieving the objectives specifically relating to *Salmonella.* The working group primarily represents Directorates within the Standards Branch of MPI.

3.9 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.

3.10 KEY ACHIEVEMENTS 2010 – 2013

Key achievements include:

- Achievement of a 30% reduction in the estimated human foodborne cases of salmonellosis after five years[10]

- Monitoring of animal products including pig meat 2010 – 2013 as shown in Figure 3.

Figure 3: NMD total prevalence of *Salmonella* in animal products 2010 – 2013
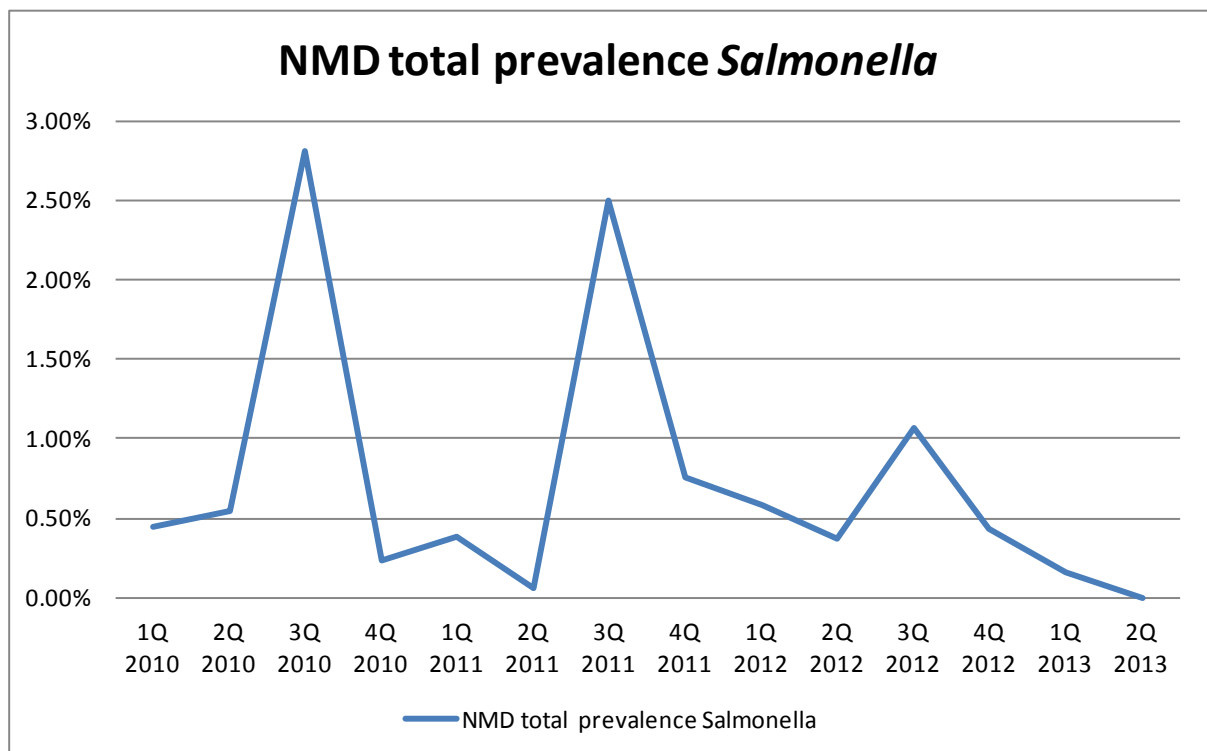
The above graph covers all NMD *Salmonella* testing; including all species and product types (carcasses, cuts and bulk as required) tested since 2010. Species tested under the NMD programme over this period were bovine, bobby calf, caprine, cervine, porcine, poultry and ratites.

3.11 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

---

[10] Foodborne illness in New Zealand 2012 (ESR, June 2013)

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 *Salmonella* 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 4 of this Strategy.

4   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.

4.1   PRELIMINARY RISK MANAGEMENT ACTIVITIES

The identification of salmonellosis as a food safety issue has been well established and six risk profiles on *Salmonella* (non-typhoid) have been completed. Preliminary risk management activities currently focus on gathering data about various sources so that a good knowledge of science, emerging *Salmonella* serotypes and relationship to human foodborne illness can be ascertained

4.1.1 Key Objectives

- To accurately determine the incidence of foodborne human salmonellosis from specific food types: e.g. animal products, plant products, wildlife reservoirs, domestically produced versus imported foods and multi-resistant and virulent *Salmonella* genotypes.

- To apply genotyping of strains to assist with food source attribution and other epidemiological studies.

- To further develop and refine the infrastructure for data collection and collation.

- To provide data to support prioritised areas of work and to protect market access

4.1.2 Completed work 2010 – 2013

1. Attribution Studies:

- Attribution of potentially foodborne enteric diseases: human salmonellosis. Enhanced surveillance including outbreaks.

- Diagnostic and public health management practices of foodborne bacterial diseases.

- Attribution of potentially foodborne enteric diseases: human salmonellosis – feasibility of microbial subtyping approaches (Stage I).

- Development and application of the new tools for the analysis of *Campylobacter* and *Salmonella* surveillance data identifying spatial and temporal determinants of raised notifications in New Zealand.

2. Scientific evaluation:

- Discussion document on plant based animal feeds – palm kernel, copra and distiller's dried grain.

- Risk Profiles:
    - *Salmonella* (non-typhoidal) in pork and pork products (2010);
    - *Salmonella* (non-typhoidal) in cereal grains (2010);
    - *Salmonella* (non-typhoidal) in high lipid foods made from sesame seeds, peanuts or cocoa beans (2010);
    - *Salmonella* species in animal feed (2011);

- Survey of *Campylobacter* and *Salmonella* of End-of-Lays and Breeders.

- Information gathering on rendered product.

- Survey of ready-to-eat red meats.

- Survey of pre-packaged fresh salads.

- Survey of nuts and seeds, and nut and seed product.

4.1.3 Current work programme

1. Attribution studies:

- Finalisation of Source attribution for salmonellosis using microbial subtyping (2013).

2. Scientific evaluation

- Microbiological survey of fresh cut RTE fruit salads.

- Microbiological survey of seed sprouts.

- Discussion document: review of the use of water and natural fertilisers during the growing , harvest and packing of fresh produce (delayed from previous work programme).

- Lit review of the ability of *Salmonella* on egg shells to penetrate the shell and grow during storage for up to 35 days (delayed from previous work programme).

- A microbiological survey of processed animal feeds (*pending*).

4.2   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

4.2.1   Key objectives

- 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.

- To identify and prioritise 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.

4.2.2   Completed work 2010 – 2013

- Updated guidance for safe cooking of poultry meat – time temp applications (background, chiller, hot holding).

- Young calf process hygiene (meat hygiene).

- Young calf decontamination studies (meat hygiene).

- Regulatory controls for animal feeds (ACVM Act).

4.2.3   Current work programme

- Imported foods:
  − Fresh chicken and duck meat and meat products requirements (associated with import health standards)

4.3   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. MPI's systems auditors carry out independent audit of regulatory functions and apply sanctions where control measures have not been properly implemented

4.3.1   Key objectives

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

4.3.2   Completed work 2010 – 2013

- Compliance audit – renderers.
- Compliance audit – primary poultry processors.
- Compliance audit – secondary processors.
- Systems audit – processors of RTE meat.
- Systems audit – secondary processors of poultry meat.

4.3.3 Current work programme

- Nil.

4.4 MONITORING AND REVIEW

Monitoring and Review encompasses human health surveillance associated with foodborne illness caused by *Salmonella*. Data on the level of control of *Salmonella* throughout the food chain is gathered and 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.

4.4.1 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 and surveillance – to ensure appropriate monitoring and surveillance is undertaken to pick up emerging issues such as new strains, new pathways and or changed risk profiles associated with new technologies, processes or consumer behaviour.

- Monitoring – to identify data gaps and produce credible data for MPI to promote equivalence determinations.

- Monitoring – to accurately determine the prevalence of *Salmonella* in any specific source in New Zealand considering the relevant stage of the food chain.

- Monitoring – to collaborate with industry, consumers and the research institutes of New Zealand.

- Monitoring – to collaborate with the international science community on all aspects of risk assessment and risk management relevant to foodborne *Salmonella* control.

- Review – to review effectiveness of strategy outputs in contributing to the achievement of a reduction in food-borne salmonellosis.

- Review – to identify and prioritise areas for future research / improvement under this strategy.

4.4.2   Completed work

- Monitoring of uncommon *Salmonellae.*

- Review of porcine NMD programme.

- Review of ovine *Salmonella* status for market access.

4.4.3   Current work programme

- NMD monitoring.

- Revise poultry NMD Salmonella target to be more realistic for NZ conditions.

- Review spikes in NMD *Salmonella* results.

- Market access reports.

- Monitoring *Salmonella* isolates across MPI (human health, animal health environmental) and better data identification at labs.

- Identify and evaluate options for the application of microbiological criteria Standard 1.6.1 and other MPI requirements, according to the revised Codex principles, for the control of *Salmonella* in the New Zealand food supply.

4.5   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, reports, research and resources can be found at http://www.foodsafety.govt.nz/

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

4.5.1   Key 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, and in a timely manner.

4.6   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 *Salmonella* for inclusion into New Zealand's risk management strategy.

- International Association for Food protection (IAFP) 2013, North Carolina, USA.
- Codex Committee for Food Hygiene (CCFH) – Draft Code of Hygienic Practice for low moisture foods.