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# **Food Safety in Small and Medium Hospitality Enterprises in New Zealand**

**A thesis presented in partial fulfilment of the  
requirements for the degree of**

**Doctor of Philosophy  
in  
Health Science**

**at Massey University, Wellington  
New Zealand.**

**Jan Kramer**

**2013**

Ethics approval for this research as a low risk project was received on 21<sup>st</sup> February 2008. The approval states:

“This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University’s Human Ethics Committees. The researcher named above is responsible for the ethical conduct of this research.

If you have any concerns about the conduct of this research that you wish to raise with someone other than the researcher, please contact Professor Sylvia Rumball, Assistant to the Vice-Chancellor (Research Ethics), telephone 06 350 5249, e-mail: [humanethics@massey.ac.nz](mailto:humanethics@massey.ac.nz)”.

Please note that the statement has now changed to:

“This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University’s Human Ethics Committees. The researcher named above is responsible for the ethical conduct of this research.

If you have any concerns about the conduct of this research that you wish to raise with someone other than the researcher, please contact Professor John O’Neill, Director, Research Ethics, telephone 06 350 5249, email: [humanethics@massey.ac.nz](mailto:humanethics@massey.ac.nz)”.

# Abstract

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Present food safety legislation (Food Act 1981) has seen very few adjustments made over a period of more than 30 years. The need for food safety is unquestionable, and legislation is essential for the maintenance of healthy standards in food preparation. Small and medium enterprises find it challenging to meet the required food safety standards as most proprietors work extremely long hours just to remain viable. Their staff's levels of training and trade knowledge are, due to minimum wages and unsociable hours worked, often insufficient and their employment is not seen as a career path. Any extra work load to be completed by management in filling in forms as part of a food control or food safety plans may be unmanageable. This study investigates the feasibility of food safety legislation and its implementation in small to medium enterprises in the hospitality industry – a study guided and influenced by the researcher's lifelong association with the hospitality industry.

This study explores food safety and its origins across the world. Carefully worded interviews and surveys with experts, who were either working in, or had close relationships with the Hospitality Industry, were used to question how the proposed legislation would affect them, and could affect those in small and medium enterprises.

Two surveys were undertaken over a period of three years. The results from both of these surveys indicated that it is likely that the greater majority of small to medium enterprises' management and staff do not possess sufficient knowledge to comply with the proposed standards of the legislation and the documentation needed.

## Acknowledgements.

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The majority of those engaged in the hospitality industry, or industries associated with hospitality enterprises, work very hard. I would like to express my genuine gratitude for their willingness to participate and offer their time for the interviews, and for assisting me to making this study a reality. Foremost are those in the Leaders group but also those in the Managers, Chefs, Suppliers and Environmental Health Officers groups.

In addition, I wish to thank the chefs and chef-owners who gave up their conference time to assist me in completing a second survey questionnaire.

I am deeply indebted to my friend Hamuera Orupe (Joe) McLeod for the many discussions we have had over the last 25 years about Maori culture, and from whom my understanding of the Maori perspective, not only on food safety but also spiritualism and medicine, has been obtained.

A special thanks to my supervisor Professor P J Dickinson, who came recommended to me by his many graduate Ph.D., students. It was his encouragement, patience, and kindness which made it possible for me to complete this study. I am very grateful to have had such a wise and generous mentor.

I am also very grateful to my proof reader who put in many hours of work making sure the thesis had as few typographical and syntax errors as possible.

What should not be forgotten are those who encouraged me as they heard about my project and gave me much appreciated advice, and who also became enthused by the topic. Among those are my wife, friends, acquaintances, contacts, business associates and total strangers, who are aware of the problems with food safety and the need to make improvements.

Last, but not least, my thanks go to ALF, a great friend who right through his terminal illness supported and encouraged me to continue studying.

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# Food Safety Acronyms and Abbreviations

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Throughout this paper, a considerable number of acronyms and abbreviations are used and found in the readings. Food safety is not alone in this phenomenon, and a completely new language is evolving.

Following is a number of these used:

## **AGPs**

*Antibiotic growth promoters*

## **ALARA**

*As low as reasonably achievable.* Also read MRA approach below.

## **ALOP**

*Appropriate Level of Protection*

In the context of food safety, an ALOP is a statement of the degree of public health protection that is to be achieved by the food safety systems implemented within a country. Typically, an ALOP would be articulated as a statement related to the disease burden associated with a particular hazard/food combination and its consumption within a country, and is often framed within a context for continual improvement in relation to disease reduction.

## **CAC**

In 1963, the FAO/WHO *Codex Alimentarius Commission* was formed both to protect the health of consumers, and to ensure fair practices in world trade.

## **CAC/CFH**

*CAC Committee on Food Hygiene*

## **CCP**

Critical Control Points, part of the HACCP system and process.

## **(CMSF)**

*Committee on Microbiological Safety of Foods*

## **FAO**

The Codex Alimentarius established in 1962 by the World Health Organisation (WHO) and the *Food and Agriculture Organisation* includes the issues of transport and storage in the overall recommendations for the preservation of food.

## **FDA**

In addition to Hazard Analysis Critical Control Points (HACCP) regulations, which have been in effect for several years in most food industries, new regulations from the *Food and Drug Administration*, United States Department of Agriculture (USDA) and European Union have created higher compliance thresholds and challenges.

## **FSA**

*Food Safety Authority (UK)*

**FSC**

*Australian Food Standards Code*

**FSANZ**

*Food Standards Australia New Zealand*. Was originally called National Food Authority (NFA)

**FSIS**

Food Safety and Inspection Service

**FSO**

*Food Safety Objectives*. An FSO converts the ALOP into parameters that can be controlled by food producers and monitored by government agencies. The ALOP is an expression of a public health risk, while an FSO expresses the level of a hazard in relation to this risk.

**GATT**

The *General Agreement on Tariffs and Trade*, concluded in 1947, included provisions for countries to apply measures necessary to protect human, animal, or plant life or health. Several GATT stipulations were that measures adopted by an individual country must not unjustifiably discriminate between countries where similar conditions prevail, and must not act as disguised restrictions on international trade.

**GHP**

*Good hygiene practices*, see also GMP below

**GMP**

Use of MRA as the scientific basis for food safety risk management is the focus of this document. However, it must be recognized that many food safety issues can be successfully managed without commissioning an MRA e.g. there is a long history of using Good Hygienic Practices (GHP), Good Manufacturing Practices (GMP), and HACCP to prevent, minimise or eliminate food-borne risks in the absence of MRA. Consequently, this document also provides guidance on deciding when a MRA may be useful and when it is probably not advisable.

**HACCP**

*Hazard Analysis and Critical Control Points* is a systematic preventative approach to food safety and biological, chemical, and physical hazards in production processes that can cause the finished product to be unsafe, and designs measures to reduce these risks to a safe level.

**(HITM)**

*Hospitality Institute of Technology and Management* is leading the way in staff training in Hazard Analysis Critical Control Points (HACCP) and Food Safety Programmes as are the Culinary Institute of America and the Food and Beverage Institute. The HITM has a total of 32 different courses dealing with food safety for staff of catering establishments and institutions.

**HSI**

*New Zealand Hospitality Standards Institute*

## **ICMSF.**

*International Commission on Microbiological Specifications for Foods.* Establishes microbiological safety criteria for foods in international trade. ICMSF and Codex to develop new ways of assessing and managing microbial risks.

## **MAF**

The New Zealand *Ministry of Agriculture and Fisheries*, until 1995 when fisheries became a ministry in its own right, and 'MAF' came to stand for the *Ministry of Agriculture and Forestry*. On 1 July 2011, the Ministry of Fisheries (MFish) merged again with the Ministry of Agriculture and Forestry. The new ministry became the Ministry for Primary Industries on 30 April 2012 after inclusion of the NZFSA.

## **MPI**

*Ministry for Primary Industries (MPI)* is a new New Zealand ministry formed from the merger in 2012 of the Ministry of Agriculture and Forestry, the Ministry of Fisheries and the New Zealand Food Safety Authority.

## **MRA**

Differences between governmental (quantitative) *Microbiological Risk Assessments* and the use of elements of MRA in the food industry.

For example, if a particular country has a reported incidence of salmonellosis attributable to poultry of 10 cases per 100 000 population and wants to implement a program that reduces that incidence, there are two possible approaches to converting this goal into an active risk management program. The first is an articulation of a specific public health goal. For example, the country could set a goal of reducing the reported incidence of salmonellosis attributable to poultry to 5 cases per 100 000 population. The underlying assumption in such a public health goal is that there are practical means by which this can be achieved. The alternative approach is to evaluate the performance of the risk management options currently available, and to select the ALOP based on the capabilities of one or more of the options. This is often referred to as an "as-low as reasonably-achievable" (ALARA) approach.

## **NACMCF**

*National Advisory Committee on Microbiological Criteria for Foods.* In 1988. The earliest projects of the NACMCF included the development of HACCP documents that described HACCP principles and guidelines for implementation.

Nearly paralleling the work of the NACMCF, the CAC Committee on Food Hygiene (CAC/CFH) began work on a HACCP document. The United States serves as the permanent chair of the CAC/CFH. Therefore, it was convenient for the two committees to collaborate to some extent in order to harmonize their HACCP documents, which resulted in the publication of nearly identical documents in 1997 (CAC, 1997; NACMCF, 1998).

## **NFA**

In May 1994, the then *National Food Authority*, now FSANZ, introduced a zero tolerance at the manufacturing and wholesale level for smoked fish products that may be eaten without further reheating and for marinated smoked mussels. 'At risk' fish products for export were assigned a zero tolerance level. At present in the Australian Food Standards Code (FSC), there is a zero tolerance for RTE foods such as pate, meat pastes, cheese with a moisture content >40% and pH >5, marinated smoked mussels and smoked fish. These standards apply to product sampled at the processing factory or wholesale level, and do not apply to product at retail level. Microbiological standards for *L. monocytogenes* are also contained in the new joint Australia New Zealand FSC.

**NZFSA**

The New Zealand Food Safety Authority (NZFSA) administers legislation covering: food for sale in New Zealand primary processing of animal products and official assurances related to their export exports of plant products and the controls surrounding registration, and use of agricultural compounds and veterinary medicines. NZFSA is the New Zealand controlling authority for imports and exports of food and food-related products. In 2012 the NZFSA was merged into Ministry of Primary Industries (MPI)

**QMRA**

*Quantitative microbiological risk assessment*, predictive modelling and HACCP have gained increased attention in food microbiology in recent years.

**SPC**

*Statistical Process Control*

**SPS**

A key provision of the World Trade Organization *Sanitary and Phytosanitary* (SPS) Agreement (27) is the requirement for countries to take the necessary SPS measures to assure the safety of foods in international trade. Governments have the right to reject imported food that could jeopardise the health of their consumers, i.e. that would not meet a specified Appropriate Level of Protection (ALOP). Codex standards, guidelines and codes of practice serve as guides for appropriate national standards. WTO member states are obliged to harmonise with these standards wherever possible. Codex standards are based on risk assessments. In the absence of Codex standards, risk assessments should be used to settle an issue when disputes in international trade in food would arise. This agreement prompted the development of microbiological risk assessments that could be used proactively to quantify risks to health posed by microbiological hazards in food, and whether the risks faced by consumers exposed to the imported product would be greater than equivalent products from the domestic industry.

**USDA**

*United States Department of Agriculture*

**WCC**

*Wellington City Council*

**WTO**

*Preceding by one year the formation of the World Trade Organization (WTO), the 1994 Sanitary and Phytosanitary Agreement (SPS) has "transparency" as its most important underlying concept. Some of its particular requirements are that trading partners share information, that there be a notification before regulatory enactment, that partners have an opportunity to comment, and that there be well organized procedures and independent, objective, and transparent risk assessments.*

# Chapter 1

## Introduction

---

The hospitality industry, part of the food industry, is an area that is subject to a great deal of attention at the present time, and about which there is much controversy and no little misconception.

Ideally all eating establishments would produce the most fabulous array of foods and be where food-borne illness could not occur. However, there is no such thing as a perfect world and if there was, eating establishments would not fit in. It is not only the commercial establishment where food is prepared and/or consumed that needs attention, but the growing, harvesting and transportation to the markets is only the start of a process which is flawed with imperfections. On top of this, food production and service staff touching food would be the greatest contributor to introducing food-borne illnesses. Not only is a well thought-out set of legislation required, but further steps need to be put in place, namely, management and staff taking responsibility for safe food as well as staff training. In addition, all persons would benefit from having a greater knowledge of food safety principles and thereby reduce the rather large health bill at present facing this country. A varied number of estimates of the cost of food-borne illness have been presented to the public, but these estimates are more often than not wildly inaccurate regarding the real cost to society. Needless to say, New Zealand is not the only country facing this problem and worldwide parallels can be drawn of similar problems within the food industry.

The previous systems designed for the seventies and eighties did little to keep ahead of the problems facing the consumers of those products presented by this large section of New Zealand's internal economy. Tourism is playing a large part in supplementing the economy and equally importantly, is a substantial earner of foreign currency. Furthermore, a reputation for a country that is 'clean and green' would benefit all New Zealanders.

### **Safer Foods**

The previous food hygiene legislation dealing with the production of safe food (The New Zealand Food Hygiene Regulations (1974) and the New Zealand Food Act (1981)) did not fulfil the need of a greatly changed environment. Since that time a great number of changes have taken place in New Zealand. These occurred, and are still progressing, changing New Zealand's economy to a point where cost cutting is starting to have a direct outcome in many sectors of society. Tinkering with a system appears to have the potential of unforeseen changes not always in the interest of the public.

The introduction of a new set of food safety legislation to regulate the food safety issues at present facing New Zealand is proving to take much longer than anticipated. The Food Bill will most likely have its name be changed to "Food Act 2012" when passed through Parliament. The former New Zealand Food Safety Authority (NZFSA), now incorporated into the Ministry of Agriculture and Fisheries (MAF), which in itself is now incorporated in the Ministry for Primary Industries (MPI), submitted the documentation to the Parliamentary system, and during its first three years in power, the governing coalition led by the National Party put the proposed legislation through its first reading. When taking into account the time lapse between submission and passing into legislation, including a reasonable five-year leading-in period, it is likely to be 2017 before it can be fully implemented. However, moves are afoot to have this time span shortened.

Previously, environmental health officers (EHOs) inspected premises regularly under the right circumstances but not so regularly under other circumstances. The individual local body councils oversaw the EHOs under their jurisdiction and a wide range of variance in interpretation between the different councils developed. This was not always negatively as a number of councils proceeded to introduce bylaws for the protection of the dining public. One example is the Wellington City Council developed "Wellington Consolidated Bylaw" 1991, Amendment No. 5 (Food Hygiene). This bylaw introduced a greater level of self-regulation by hospitality management.

With self-regulation becoming more widespread throughout a variety of industries, the legislation to ensure food safety is not without its idiosyncrasies. Organisations/establishments being granted an exemption to the present regulation can now make decisions which may not be part of the present Food Act. One example is a New Zealand-wide organisation that, in its wisdom, made the ruling that nail brushes would no longer be required at hand wash stations. The reasoning was that these items were too hard to clean. Asking the question as to why nail brushes get dirty would not be out of place. When asking a representative of the NZFSA as to how such a situation could occur, the answer was that such action was not foreseen.

The wide variety of different types of business's styles in the hospitality industry alone, would be a far too great a challenge to research. Establishment size in New Zealand differs greatly from the larger North American, European and Asian hospitality establishments to the small units, but understandably, small units are small anywhere in the world. Few New Zealand establishments would seat more than 200 persons but are definitely not the exception elsewhere. The Royal Dragon restaurant in Thailand (Figure 1.1) is able to serve 5000 customers by its 1000 staff. In 1992 this was the largest restaurant, but by size alone.



**Figure 1-1 The Royal Dragon restaurant, Thailand** (Photograph from restaurant's brochure)

Topping this is the 6014 seats in the Damascus Gate restaurant located in Damascus, Syria, which shadows all belief of dining in restaurants in New Zealand. (Figure 1.2)



**Figure 1-2 The Damascus Gate restaurant, Syria** (Photograph from restaurant's brochure)

The researcher, with a wealth of experience in the hospitality industry, is of the opinion that discrepancies would most likely occur in the smaller establishments. Small-to-medium-sized enterprises (SME) in the hospitality industry are the target group of this study. Identifying which businesses would fall into this category is loosely defined and the researcher decided that this could be done in two ways, namely the number of seats or alternatively the number of staff employed. It was decided to use the criteria of both, and safely assume that by making this decision the research itself would not be compromised.

Ethnicity style of the SME would not be taken into account nor would staff ratios between males and females. As the research is to establish the viability of the proposed legislation this would have no bearing on the research.

A commonly accepted rule, formulated in the 1960s, that a business would have to have 60 seats to be economical, can perhaps be attributed to the Liquor Licensing body, which decided that if a wine license was to be granted, the establishment had to seat 60 people and had to have separate male and female toilets, other than staff toilets as per regulations. At present there are a considerable number of SME eating establishments that seat less than 60 people and are economically viable. This economic business balance is very fragile when taking into consideration a down-turn in the economy.

The reason for accepting that a SME must seat less than 60 people and have up to 15 staff members (both full and part time) is based on this researcher's industry experience and consultation with professional bodies. The view on the establishment size by different city councils was ignored on the grounds that this, more often than not, was based to set respective licensing fees. Parts of this thesis will actually ignore the size reasoning when it becomes important to draw comparisons between large and small business size. One instance where this is relevant is when the number of items offered for sale is little different between the different sized businesses. In such instances the reader will be informed when this is the case. The researcher suspects that proportionately the difference of administration duties time to control food safety would be nearly equal. This leaves the small business owners the need to fudge the figures to maintain a reasonable home life in their profession.

In July 2011 the New Zealand Food Bill passed its first reading in Parliament and in a press release the Minister of Food Safety, the right honourable Kate Wilkinson, announced that:

*“Ultimately this Bill will make it easier for food businesses to understand how safe food needs to be produced and ensure they take primary responsibility for everything they sell”*

There is much depending on this statement, as this needs far greater clarification than meets the eye initially. Poor control of present and future legislation which was set up to ensure safe food and to have the hospitality industry take control, in other words responsibility, indicates that only in the case of incidents are the authoritative government agencies likely to take action. This action is already tainted by making the food businesses responsible without having established at which level the problem was initiated, i.e. farm to distributor, distributor to establishment and establishment to customer, representing three areas where the control of abuse of present regulations is of uncertain quality. Local growers, manufacturing and distribution organisations may well have to issue Product Information Form (PIF) information details to stay in business. This would safeguard the smaller eating establishments from a developing court action which any smaller enterprise can ill afford.

In the United States, an issue with food poisoning, strongly believed to have originated in a large corporation, was blamed on one of their suppliers - a small meat processing (non-slaughter) plant (Munsell 2006). The plant was quite innocent but had to fight for 8 years to have its licence reinstated by the Federal Drug Administration's Food Safety and Inspection Service (FSIS). This action could ultimately be blamed on that government agency not being willing to confront the might of *'big business'* in court, thus selecting smaller organizations which passed on the product further down the line. If there were a similar happening in New Zealand the small to medium businesses, being the majority of hospitality establishments in New Zealand, would be unable to fight on this level.

The reverse situation might be a (currently unsubstantiated) claim that some small fruit and vegetable growers in New Zealand are supplying the popular weekend markets with unregulated products. If high pesticide and growth inducing substance levels are passed on to customers, which almost certainly include hospitality establishment owners, would these then be responsible? TV-Chef personality, Alistair Brown, publicised the purchases of products from markets during his programme screened on TV-One on October 22<sup>nd</sup> 2011. The innuendo of a tainted product could equally so be a false accusation spread by those most affected by the market sales. However, MPI is starting a process of investigating the unauthorised use of pesticides in the production of fruit and vegetables.

In summary, we need to carefully examine:

- The standard of food safety training

- The role of management in food borne illness prevention

- The practicality of food safety systems

- The difference between compliance and non-compliance of food safety systems

and see what changes are likely to be of consequence

## **The Organisation of this thesis**

### **Objectives**

This research has four objectives:

1. To identify inadequacies in the management of food safety in small and medium size enterprises in the New Zealand food industry, and how these inadequacies may be overcome.
2. To investigate the role of management in food borne illness prevention in small and medium size enterprises in the New Zealand food industry, and their ability to use Hazard Analysis and Critical Control Points (HACCP).
3. To determine how small and medium size enterprises in the New Zealand food industry, will cope with the legislation proposed in the New Zealand Food Bill 2010.
4. To assess the practicality of food safety systems in the legislation proposed in the Food Bill 2010 and find ways the food safety systems might be improved and made easier to apply.

### **Scope**

The scope of the research programme:

- a. Is limited to the ongoing changes taking place in a fast growing industry often influenced by social and economic changes taking place not only in New Zealand but also world-wide.
- b. Is limited by the considerable time lapse between the present operations in the hospitality industry and the publication of this information into the professional world. The researcher has drawn extensively on the information supplied by people directly involved with the hospitality industry ranging from the then Minister of Food Safety, and a Professor of Food Safety, to environmental health officers, manufacturers, and suppliers. It was hoped there would be an opportunity to gather information from the managers and staff of very small food businesses but only two were able to be approached.
- c. Is limited to small and medium enterprise (SME) food businesses, the choice of which is perhaps questionable. However, it is the opinion of the researcher, and that of industry personnel, that it is this type of business that will have to make the greatest changes to cope with the proposed new regulations—changes that are often of an administrative nature rather than based on their work-related expertise.
- d. covers within the target group of this research, the perceptions of the effects of the impending Food Bill, which inevitably are based on how the information has been forwarded from the New Zealand Food Safety Authority (NZFSA) and local enforcement agencies to the SME hospitality group. Not all operators belong to professional organisations and are often too involved in business survival to be aware of requirements.
- e. Includes surveys of major players in the hospitality industry and a review of a large range of industry-based literature, where the researcher has used his industrial and academic expertise to determine which publications justify their inclusion.

## Assumptions

Two fundamental assumptions were made at the commencement of the research:

1. It was assumed that by using an iterative process of structured and semi-structured interviews across the range of the people involved in promoting and maintaining food safety, it would be possible to identify any issues with the Food Safety Regulations (1974), and how these may be resolved.
2. It was assumed that an improved awareness of the necessity of making food safe to eat, is unlikely to be achieved solely by the issue of regulations and enforcement.

## Methods

The research methods involved the development of an iterative process of structured and semi-structured interviews pertaining to food safety, as it is not only a public health issue but also one requiring improved business standards. The overall approach chosen incorporated scientific and administrative techniques as follows:

- a. The data was collected through a series of in-depth interviews supplemented by a small quantitative survey to fine tune the direction the interviews would take, and to add credence to their findings.
- b. Using a variety of methods in this study takes advantage of both qualitative research with a small quantitative survey, to increase both the validity and reliability of the study, and to reduce the risk in gathering large amounts of data: In this case the sheer volume of the qualitative data only, would have the potential to become unmanageable in its interpretation.
- c. The quantitative data, although small, helped to more easily code and analyse the data.
- d. Convergence with the interview data of different sources gives evidence to support a single proposition.
- e. The danger of inconsistency, with different propositions that can contain both inconsistencies and ambiguities, is a possibility and needs careful control. The present exemptions to the regulations present a large flaw in the system. This is basically due to a piece of very sloppy legislation, which assumes rather than regulates standards. This will be further investigated.
- f. Resistance to change and attitudinal concerns have been around for a long time but have not been discussed openly in the hospitality industry. Although the way food is prepared and served to the customer has undergone remarkable changes, there is little to suggest that having a better managerial approach to business will also benefit food safety implementation. Interviews were used as a means of examining this important part of food safety control, and from the subsequent analysis of these interviews an assessment of the perceived food safety issues was developed.

## **Research Constraints**

Constraints to the research were primarily due to:

1. Budget - The research had limited funding, the costs being borne personally, assisted by some small grants from the postgraduate research fund.
2. The sheer size of the hospitality industry and the diversity of its businesses made the scaling of these establishments necessary. The interviews were conducted through a large section in order to provide a fair representation and different methods were used. SME still form the largest part of the food section and form the largest part of this thesis.
3. The changes in legislation and the New Zealand business world have made the requirements change. These requirements have been met, but due to their complexity, the changing nature will mean that items presented are relevant to research at that time.

## **Cited Reference to Chapter 1**

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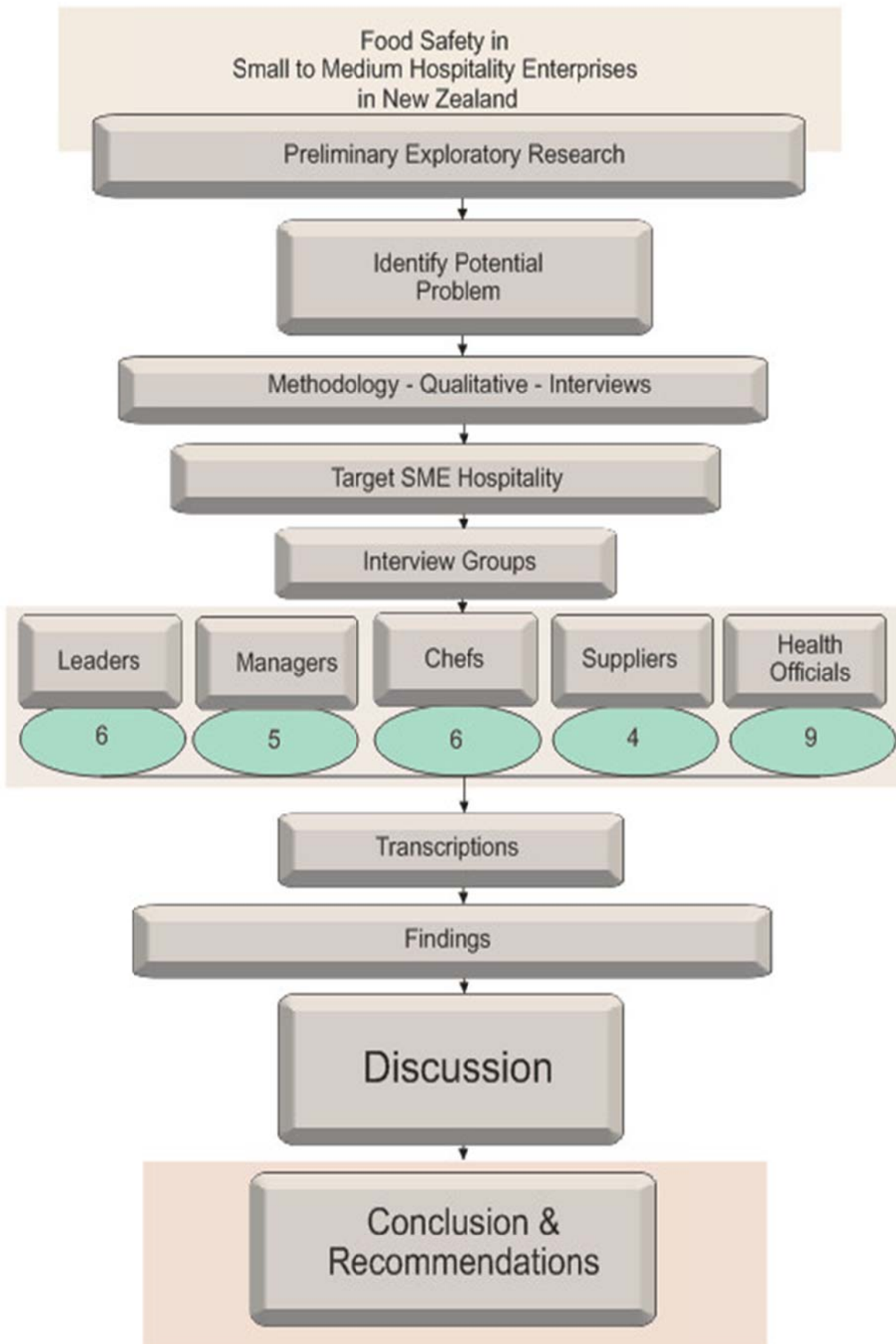


Figure 1-3 Research project flowchart

## Chapter 2

### Food Safety: An introduction to its history

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#### Introductory History

It can be argued that the change of mankind, traditionally being food gatherers to becoming food producers, led to important forward steps in the history of producing food which was safe to eat. The honour of having recorded this first step in history goes to the Chinese who produced tofu about 10,000 years ago. South West Asian, South East Asian, African and the MesoAmerican inhabitants all developed planting and harvesting techniques suitable for those areas at various dates throughout history (Flannery, 1973). Two examples from Mesopotamia dating back to 7000 BC are the Sumerians, who influenced agriculture and cattle breeding, and the Babylonians who produced 20 different types of beer (2500 BC).

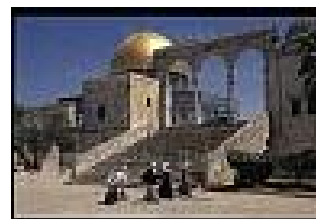
With the production of food came the associated problem of how to store foods without these becoming spoiled and unfit for human consumption. History has us believe that Egyptian food tasters must be classed as the first group of people solely engaged in the detection of substances that made food 'unsafe' to eat. They, as tasters, were so successful that throughout the next 2000 years food tasters continued to be in demand.

Although it is only during the last one hundred years that the human race started to fully understand safe food concepts, there were indicators that there was an earlier awareness of food safety issues. Religions were able to control the population from inflicting damage upon itself. Not understanding how food-borne illnesses occurred, people observed that disease and death often occurred through the consumption of food. Religious leaders were able to put in place restrictions on certain foods that, through observation, were regarded as harmful.

The Jewish religion, in observance of rules born from sacred precepts, forbids the consumption of pork meat, and certain types of fish as well as all shellfish. In addition to these forbidden foods there are very strict preparation rules in place based on separating certain foods and preparation techniques. These rules establish what is 'kosher' (meaning controlled), all that is valid, appropriate and good, with reference not only to food but also to man and his actions. On the other hand, all that is not kosher is 'treif' (meaning torn, not appropriate). In spite of all the limitations, or perhaps because of them, the food has been adapted to the products available, and has remained unvaried over time. A sense of the religious in food has rendered this population the last custodians of the oldest and most rigid traditions, which have changed very little over the course of centuries.



Islam is also a religion that has strict hygiene rules, both personal hygiene and food hygiene. The consumption of the meat of certain common animals such as pig, rabbit, and others is not allowed. Also if animals such as sheep, cow or chicken are not slaughtered according the prescribed Islamic way, that is in Halal way, then the consumption of such meat is also unfit for the Muslim. Furthermore, if any 'allowed' food

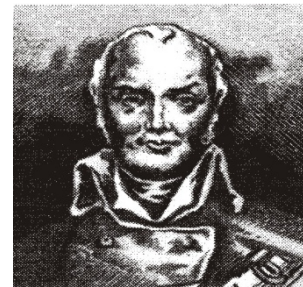


is contaminated by food which is not allowed, then that food also becomes unfit for Muslim consumption. As with the Jewish faith, fish that does not have scales is also unfit for consumption.

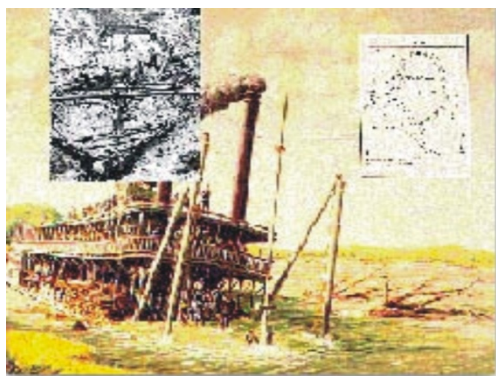
In the Western areas of control the 'state' started taking a greater role in the control of the wellbeing of its population. This shift away from religion towards the end of the 'dark ages' saw the beginning of regulations specifically associated with the production, sale and preparation of foods and drinks. This change coincided with the early development of the business culture. The fact that this was often associated with the collection of taxes may very well have sped up the process. Of secondary importance was the reality for most rulers that the greater their population, the more powerful they were. Populations decimated by disease did not improve their ranking as rulers.

As wars were fought on an increasingly bigger scale, the need for more reliable provisions increased accordingly. More than ever before, generals realised that the fighting qualities of their troops depended on their food being safe to eat.

Napoleon Bonaparte not only enforced the decimal system upon those conquered, but to ensure the welfare of his troops sponsored a competition to preserve foods in a scientific manner. This resulted in the next step of the food preservation race. Appert, a French confectioner, patented canning as a means of preserving food. By 1809 he had succeeded in preserving certain foods in glass bottles that had been immersed in boiling water, and he was awarded the prize. Since nothing was known of bacteriology and the causes of decay, Appert proceeded by trial and error. He based his methods on using an autoclave for heating food to temperatures above 100°C, and then sealing the food container to prevent putrefaction. Appert was also responsible for the invention of the bouillon cube and he devised an acid-free method of extracting gelatine from bones.



The following anecdote perhaps illustrates the success of this preservation method:



Salvaged in 1968 from the steamer *Bertrand*, which sunk in the Missouri river in 1865, were brandied peaches, oysters, plum tomatoes, honey, and mixed vegetables. In 1974, chemists at the National Food Processors Association (NFPA) analysed the products for bacterial contamination and nutrient value. Although the food had lost its fresh smell and appearance, the NFPA chemists detected no microbial growth and determined that the foods were as safe to eat as they had been when canned more than 100 years earlier.

There are other interesting anecdotes about the preservation of foods. One incident standing out is the export from New Zealand of a shipload of lettuces to England in 1882. Just past Australia the refrigerated cargo had to be disposed of, and the ship returned to New Zealand to load a cargo of meat. This was certainly more successful, especially from the perspective of a future meat industry. It is difficult to visualise our hills covered in lettuces.

The microscope initiated the ability to see the cause of food spoilage, microorganisms. Prior to its invention, humans did not understand what the cause of food spoilage could be and

were only aware of the consequence. It was understood that certain foods under certain conditions became a health issue.

Although, not the inventor of the microscope, Antony van Leeuwenhoek discovered bacteria, free-living and parasitic microscopic protista, sperm cells, microscopic nematodes and rotifers, blood cells, and much more in the 1680s. His research, which was widely circulated, opened up an entire world of microscopic life to the awareness of scientists. Leeuwenhoek's skill at grinding lenses, together with his naturally acute eyesight and great care in adjusting the lighting where he worked,



enabled him to build microscopes that magnified over 200 times, with clearer and brighter images than any of his colleagues could achieve. What further distinguished him was his curiosity to observe almost anything that could be placed under his lenses, and his care in describing what he saw. Although he himself could not draw well, he hired an illustrator to prepare drawings of the things he saw, to accompany his written descriptions. Most of his descriptions of microorganisms are instantly recognisable.

Pasteur was the first person to appreciate and understand the role of microorganisms in relation to spoilage. His demonstration that microorganisms soured milk was an important forward step. He used heat as early as 1860 to destroy organisms in beer and wine, the process now known as pasteurisation. In 1888 Gaertne first isolated bacteria from 57 cases of food poisoning which ever since have been referred to as Gärtner's Bacillus (*Salmonella enteritidis*). It was nearly one hundred years later that food-borne listeriosis was recognised in America (1981).

## **Codex Alimentarius Commission**

After the establishment of the United Nations Food and Agriculture Organization (FAO) in 1945 and the World Health Organization (WHO) in 1948, both organizations engaged in promoting higher food safety standards. In the 1950s international cooperation on food safety issues increased, which led in 1961 to the founding of the Codex Alimentarius Commission by the Food and Agriculture Organization (FAO). In 1963 the FAO and the World Health Organization established a joint food standards programme, taking over some earlier efforts by European institutions to establish an international food code. The current membership includes 165 countries.

The name Codex Alimentarius already explains the general purpose of the Commission's work — creating a code for food — and is drawn from a collection of food standards assembled between 1897 and 1911 in the Austro-Hungarian Empire and used as a legal reference by the courts. The commission deals with a wide range of food issues - from labelling and hygiene standards to such detailed work as defining what constitutes butter.

Both Britain and the U.S.A. produced legislation prior to the Hapsburg Empire's Codex standards. The Americans enacted the first national meat inspection law in 1890. This law did not have its population at heart and was export oriented only. By 1906 Congress passed the U.S. Federal Food and Drug Act. New Zealand passed its first legislation associated with food and drink in 1908. This act was initiated to protect the population rather than exports, which was in direct contrast to the 1890 American act.

There has been, throughout the time of their initiation, a constant update of those regulations to keep ahead of the threat of food poisoning.

One other important, if not the most important, catalyst in food safety prevention is the Hazard Analysis Critical Control Point (HACCP) concept. HACCP got its start in the 1960s. Supplying safe food to NASA's astronauts, the Pillsbury Company made a commitment to improve on already good quality control programmes. Howard Baumar, Vice President of Science and Regulatory Affairs at Pillsbury's, was the key figure in the development of food safety work for the 'Space Program' and its later application throughout the company.



In 1970, prior to identifying the HACCP acronym, Pillsbury had taken the food safety system outside the research-and-development and pilot-plan mode. By using expanded computer capabilities they focused on product control and specifications as well as automatic recall procedures in their pre-refrigerated dough plant. In that same year, after a declaration that cyclamate sugar substitute was a possible carcinogen, the 'Funny Face' drink powder produced by Pillsbury was withdrawn from the market. This led to the establishment of the Product Control and Identification System (PCIS) task force. By 1972 this task force, under consultant John Haaland, developed what was referred to as the Product Safety Documentation Instructions. The Corporate Food Safety Committee produced a manual covering the workings and their relationship to the freestanding business or profit centres in

regard to food safety. The ISO 9000 standards and the U.S. military food standards bear a significant resemblance to this manual. The HACCP process must be seen as the beginning of the procedural stage, starting to be used worldwide to combat food safety problems.

The history associated with microorganism spoilage will continue in the future. Microorganisms, especially bacteria and viruses, will continue to adapt rapidly to our prevention and adaptation strategies. The ability of bacteria to adapt to the threat of antibiotics, used to control them, has created more virulent species even more difficult to control. That controlling the production of safe foods for consumption has to take greater urgency, must be fully understood by all involved in its production.

## Historical Future of Food Safety

It is well documented that there is a need to make food safer to eat.

With international food oriented agencies dedicated to implementing HACCP programmes there is a growing trend of research in this field. The occurrence of food safety-related incidents is not only measured in human cost but the financial burden of food related poisonings is substantial (Brewer, Buzby, Riggs, & Roberts, 2000; Yeung & Morris, 2001; Abe, Yamamoto, & Shinakawa, 2002; WHO, 2002; Rocourt, Moy, Vierk & Schlundt, 2003). The World Health Organization (WHO, 2002) reported that approximately 1.8 million children in developing countries (excluding China) died from diarrhoeal disease in 1998, caused by microbiological agents, mostly originating from food and water.

Over the last decade the subject of microbial food poisoning has rarely been out of the news and there have been major scares with salmonella, listeria and botulism, to name but a few (Eley, 1997). During this period the incidence of food poisoning has risen dramatically in

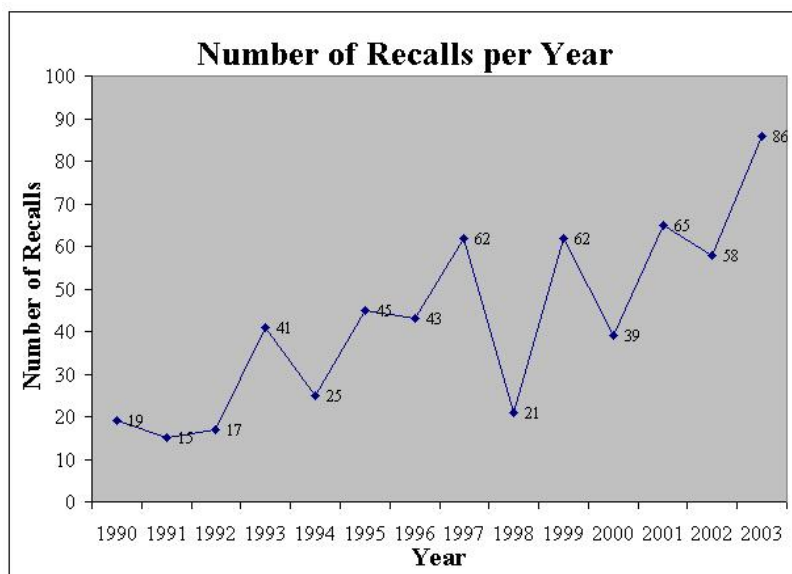
England and Wales, in other European countries and in the USA. Recently, the Food and Drug Administration (USA) stated that there might be as many as 81 million cases of food poisoning each year in the USA, with up to 9,000 resultant deaths. We will probably never know the full scale of food poisoning worldwide because many outbreaks go unrecorded and because there are a large number of sporadic cases, which result in no further epidemiological investigations.

During the 1960s and 1970s food safety training was given only to home economists, dieticians, health inspectors (officers) and apprentice chefs in New Zealand (Kramer, Frost and Cameron, 2000). Tebbutt (1992) showed that poor training was linked to increased health risks. These studies found that there was evidence of a high overall risk in 22% of premises with inadequate training standards whereas the risk was only 3% in premises in which training was considered to be satisfactory (Audit Commission, 1990). Staff training was much more likely to be provided in hospitals and educational establishments than in other types of food businesses. Poor training was identified in 8% of hospitals, in 52% of hotels and restaurants, and in 69% of take-away food shops.

The Tebbutt (1992) study showed that while a wide variety of training courses is available in England, some staff, particularly those working in smaller businesses, have no formal qualifications. In the USA the American Hospitality Institute of Technology and Management (HITM) is leading the way in staff training in HACCP and food safety programmes, as are the Culinary Institute of America and the Food and Beverage Institute. The HITM has a total of 32 different courses dealing with food safety for staff of catering establishments and institutions.

As HACCP emerged in the 1990s as the food safety system of choice, countries such as New Zealand and Canada adopted a voluntary approach to implementation by industry (Lee and Hathaway, 2000). This was based on the premise that the introduction of a food control system, designed and implemented by industry on a premises-by-premises basis, would require a high level of ownership and motivation.

As pathogens become more resistant to present day hygiene methods the search for more effective methods continues. Ensuring food safety depends on effective control measures, i.e. methods to prevent food contamination and, when necessary, effect decontamination. Present production methods cannot totally prevent food contamination, and the complexity of food handling and processing provides ample opportunity for contamination as well as survival and growth of pathogenic organisms (Molins, Motarjemi and Kaferstein, 2001). It is also unlikely that the methods of production can ensure foods totally free from contamination in the near future, for many pathogens are part of the normal flora of the environment. The application of an HACCP-based approach as a method for the management of hazards of the food chain demonstrates the need for applying a cold decontamination treatment as a control measure in the production of foods which are to be marketed raw or minimally processed. Irradiation (increasingly referred to as 'cold pasteurization') is such a control measure in the production of several types of raw or minimally processed foods such as poultry, meat and meat products, fish, seafood, fruits and vegetables. In the production of these foodstuffs, irradiation may thus be a critical control point.



**Figure 2-1 Number of recalls per year in the United States**

### **Within the last decade in New Zealand**

In 1996 the New Zealand Food Act 1981 (NZ Government, 1996) was amended. Page 3 states:

“The purpose of this Act is to facilitate a voluntary transition from compliance with the Food Hygiene Regulations 1974 to the adoption, by the food industry, of food safety programs.”

Whether this is a step in the right direction is difficult to ascertain. Hearnden, Skelly, Eyles and Weinstein (2003) found that New Zealand has one of the highest incidences of campylobacteriosis in the developed world, which leads a global trend of increasing notifications of Campylobacter infections over the last decade.

Foodborne and waterborne transmission have been implicated as significant mechanisms in the complex ecology of the disease in New Zealand. The regionality of campylobacteriosis seasonality in New Zealand was examined in detail and three different patterns were observed:

1. There is a marked difference in the seasonality of campylobacteriosis between the North and South Islands of New Zealand. The Far North and much of the rural North Island were found to display relatively low summer incidence and small inter-seasonal variation.
2. There appears to be a dispersed grouping of North Island urban areas, including Auckland, Hamilton, Napier and their hinterlands as well as a few areas on the South Island that exhibit higher summer incidence and more seasonality than the first group.
3. Christchurch, Dunedin, much of the South Island and the lower North Island cities of Wellington and Upper Hutt appear to experience the highest summer incidence and strongest inter-seasonal variation in New Zealand. (p. 337)

## The present situation

Microbial Ecology in Health and Disease (Rocourt 2003) reports that microorganisms have a long history of use in food production in the production of sausages, cheeses, etc. Roughly one quarter of all food products rely on microbiological processes, and the safe use of microorganisms for food production is essential. The transfer of novel traits to food microorganisms through recombinant gene technology will result in new potential food safety issues. This requires the elaboration of criteria for safety assessment of foods derived from genetic microorganisms.

In New Zealand, under the Food Act 1981 it is possible to apply for an exemption from the present food hygiene regulation and put into its place a food safety programme. Any person may apply to the Director-General or the relevant territorial authority for an exemption from the provisions of the Food Hygiene Regulations 1974 in respect of any premises of the applicant, or any vehicle of the applicant, or both.

Evolution of the global food safety system under the United Nations has produced a number of organisations specifically created to produce safer foods for an ever-growing population. Some of these and their year of creation are:

1945	<i>Food and Agriculture Organization (FAO)</i>
1947	<i>General Agreement on Tariffs and Trade (GATT)</i>
1948	<i>World Health Organization (WHO)</i>
1963	<i>FAO/WHO Codex Alimentarius Commission (CAC)</i>
1994	<i>Agreement on Application of Sanitary and Phytosanitary Measures (SPS)</i>
1995	<i>World Trade Organization (WTO)</i>
1997	<i>Codex Document on HACCP principles and application</i>

The need for exemptions to the legislation is, in the eyes of the author, a step towards making each operator in the food service industry take a greater responsibility to ensure the production and serving of safe foods.

A food safety audit is a systematic review of the procedures put in place as part of the food safety programme in New Zealand by those exempted from the provisions of the Food Hygiene Regulations. The audit is an independent assessment undertaken by a person granted permission by the Director-General of Health to conduct such audits.

## Background

The paper will explore past and present information related to the topic. In particular legislations within and related to the following documents and organisations:

- *Codex Alimentarius Codes of Hygiene Practice*
- *Food Act 1981 and its amendments*
- *Food Hygiene Regulations 1974 and its Amendments*
- *Health Act 1956*
- *Australia New Zealand Food Authority*
- *New Zealand Food Safety Authority (now MPI)*

As well as such authorities and journals associated with an interest in the production of Safe Food.

## **Preventive Measures**

Fundamental changes in the approach to food safety are on the horizon. The Food and Agriculture Organisation (FAO) of the United Nations and the World Health Organisation (WHO) are conjuring a series of preventive strategies. HACCP and risk assessment concepts are high on the list of priorities and eventually will be implemented worldwide.

For many of the food products that we manufacture with traditional processes such as canning, drying and freezing, there is a significant level of additional safety protection built in to these processes. Minor variations or even the occasional mistake during processing can be accommodated because the safety margins are particularly large (Winger, 2000). New consumer trends with minimal processing, fresh and natural foods and hurdle technologies have dramatically reduced this safety margin. Small mistakes with these foods, at any stage in the food chain, may result in catastrophic outcomes and consumers may die. We have seen examples of this on an unfortunately regular basis around the world.

## **Problems arising**

The author is of the opinion that there is a great reluctance by establishment owners in the New Zealand hospitality industry to instigate food safety programmes. This opinion is backed up by a very limited number of establishments who have been granted exemptions under the present legislation in New Zealand. This is particularly true for small and medium sized businesses. At present there is one government-approved food safety auditor in the greater Wellington area.

## **Study**

The study will be limited to establishments in the Hospitality Industry, in particular the Sitdown and Takeaway Meals section of this industry. At first glance it appears there are a number of procedures and methods to conduct food safety practices identified, but much remains to be achieved before there can be any realistic 'safe food' statement made. With the limited amount of material available, the study will have a practical 'flavour' backed up by established research methods. Whether auditing an effective food safety program will materially assist in preventing an outbreak of food poisoning is one major question to be answered. One reason can perhaps be the enormous number of variables influencing that dream.

## **Training**

Although the value of food-hygiene training is generally recognised, few studies have tried to identify the potential benefit it brings to the industry. Tebbutt (1991) showed that a satisfactory assessment of both training standards and knowledge of food safety was associated with a better overall inspection rating. Although the number of premises examined was small, this study has the potential to demonstrate if there are benefits in training staff in food safety. It should be remembered, however, that knowledge might be markedly influenced by factors other than formal training; experience, common sense, and a positive attitude towards food safety may all be important in some cases.

Proper food safety training in reducing food hazards in commercial catering premises is important (Richmond, 1990). Tebbutt (1992) showed that poor training was linked to increased health risks.

Little, Omotoye and Mitchell (2003) found that management food hygiene training is essential. The manager in 84% of premises had received food hygiene training; in 7% he/she had received no food hygiene training and in 9%, this information was not specified. Of those with food hygiene training, 75% had attended a 6 h basic course, 10% had attended an intermediate or advanced course, 7% had attended another recognised course (City & Guilds qualifications, National Vocational Qualifications and HACCP courses, internal company training), and in 8% (123) the type of training was not specified. Significantly fewer unsatisfactory or unacceptable samples were from premises where the manager had received food hygiene training (33%) compared with those from premises where the manager had received no food hygiene training (43%). Fewer unsatisfactory or unacceptable samples were from premises where the manager had received advanced or intermediate food hygiene training (26%) compared to those premises where the manager had received basic (34%) or other (38%) food hygiene training.

Walker & Jones (2002) maintain that there appeared to be little correlation between food hygiene training and premises' food hygiene standards. Two hundred and sixty six food handlers were employed in the 35 premises with documented systems, a high proportion (254) of whom had undertaken some form of food hygiene training (166 basic certificate course, 2 intermediate certificate course, 2 advanced certificate course, 84 in-house training). Leaving only 4.5% of the workforce with no training. In the 35 premises with undocumented systems, a significantly smaller number of food handlers (99) were employed. The training levels were comparable for the numbers of staff employed, but more in this group had received no training (15%). Eighty-four had undertaken some form of food hygiene training (69 basic certificate course, 3 intermediate certificate course, and 12 in-house training).

If the Government is serious about improving standards within the food industry, it should support the calls of many professionals to licence all food businesses. The implementation of HACCP needs to be clearly linked to this. Indeed the butcher's shop licensing exercise within this enforcement authority's area has clearly improved food hygiene standards.

“Licensed premises are now able to demonstrate better comprehension of food safety issues, including the ability to recognise hazards and understand how control measures work, and effectively link these into their existing operations.”  
(Walker & Jones, 2002, p 313)

This has, and will continue to have, a significant impact on food safety, enabling food handlers and managers to be proactive in achieving a safe food product, with the long-term possibility of reducing the incidence of food poisoning (Tebbutt, 1992).

Staff training was much more likely to be provided in hospitals and educational establishments than in other types of food businesses; poor training was identified in 8% of hospitals, in 52% of hotels and restaurants, and in 69% of take-away food shops. The Tebbutt (1992) study showed that while a wide range of training courses are available in England, some staff, particularly those working in smaller businesses, have no formal qualifications.

## Poor Personal Hygiene

### Effect of Manager Certification on Percent IN Compliance by Facility Type

Facility Type	Manager Certified				Manager Not Certified				Difference (%IN)
	Total IN	Total Out	Total Obs.	% IN	Total IN	Total Out	Total Obs.	% IN	
Hospitals	331	68	399	83.0%	65	16	81	80.3%	2.7%
Nursing Homes	218	42	260	83.8%	141	49	190	74.2%	9.6%
Elementary Schools	236	42	278	84.9%	164	36	200	82.0%	2.9%
Fast Food Restaurants	257	95	352	73.0%	107	70	177	60.5%	12.5%
Full Service Restaurants	167	80	247	67.6%	117	123	240	48.8%	18.8%
Delis	184	62	246	74.8%	220	62	282	78.0%	-3.2%
Meat and Poultry	163	26	189	86.2%	171	65	236	72.5%	13.7%
Seafood	191	29	220	86.8%	176	45	221	79.6%	7.2%
Produce	118	18	136	86.8%	133	54	187	71.1%	15.7%

**Table 2.1 Effect of manager certification on hygiene compliance**

A recommended method of achieving greater food safety awareness is the training of staff. A study conducted by Legnani, Leoni, Berveglierim, Mirolo and Alvaro (2004) brought to light unsatisfactory food safety conditions in the Health District of Ferrara (Emilia-Romagna region, Italy). The main aim of this study was to evaluate the hygiene quality of some catering establishments in the province of Ferrara as well as the microbiological safety of the foods provided by these services. This quantitative research involved a total of 236 inspections that were undertaken in 27 catering establishments.

Each inspection consisted of two parts: firstly, the hygienic state of the buildings and the equipment used, and an evaluation of the production process according to the HACCP system and secondly the collection of samples of raw and cooked foods (a total of 370). Most attention was focused on cooked preparations ready for consumption (about 60% of the food samples examined). In accordance with HACCP principles, all of the 27 food production centres have developed a HACCP plan, identified the critical control points for each operational or process step, and have adjusted the procedures and the frequency of monitoring.

The research (Legnani et al., 2004) identified the following points:

- *Unsatisfactory hygiene conditions that were, however, less frequent than those found in the previous surveys.*
- *Incorrect procedures concerning food preparation and storage were identified 36 times, compared to 47 in 1993–1994.*
- *Microbiological quality of foods improved, especially with regard to contamination from traditional indicators such as *E. coli* and *S. aureus*.*

- *The staff educational program introduced in the catering centres certainly helped to increase the level of awareness and the sense of responsibility regarding food hygiene.*
- *Direct inspection of surfaces and the results of the environmental swabs are still unsatisfactory and underline the need to improve further on the knowledge of good production practices.*
- *HACCP records concerning the sanitation procedures were inadequate in 7 of the 27 establishments.*
- *Surfaces examined showed an unacceptable contamination in 10% of samples, in comparison with 15% in 1994.*

These findings show that the sanitation protocols are still not applied yet in a way that will assure complete safety in many catering centres.

The results of this very pertinent study reveal a number of important points:

- *Microbiological quality of food and equipment has improved after the application of HACCP principles and widespread educational programs for the food staff over a ten-year period in the district of Ferrara.*
- *Some weak points in the general management of the food production process have been identified. The knowledge of how to identify these problems is essential for the improvement of the control system of food production establishments.*
- *Modifying and adjusting staff training programs will obtain a higher level of food safety in mass catering services.*



That procedures and protocols are not always followed or adhered to is highlighted in the Key (1996) report on a study of one of the most extensive hand washing studies ever conducted. The Compliance Control Center measured hand washing in restaurants, grocery stores, institutional food services and healthcare locations tracking performance over 1.3 million employee hours.

Key (1996) reported:

*“The findings showed that people in these critical public service environments fail to wash hands despite extensive training on the importance of frequent hand washing in the prevention of cross-contamination and infection. It showed that baseline performance was less than two washes per employee per day. When performance data gathered by the system was then shared with management and employees, hand washing compliance increased by over 380 per cent, achieving levels categorized to be "good" or "excellent". Later in the study, when performance feedback was discontinued, employee hand washing practices again fell to dangerous levels. (p.8)”*

In a study on food safety knowledge in New Zealand (Kramer and Scott, 2004) the levels of food safety qualifications were a greater concern as very few management held any certificates above a basic level. Just under half (49%) of the sample was not prepared to pay an additional premium for a "fully comprehensive food poisoning clause as part of your policy." Of the 51% who were prepared to pay an additional insurance premium the average increase in premium was 8.3%.

Management's willingness to pay an increased insurance premiums for a "fully comprehensive food poisoning clause"	
Amount of extra premium to pay	Total sample N=51 %
Not prepared to pay extra	49.0
0.5 to 2.5 %	11.8
2.5 to 5 %	17.6
5 to 7.5 %	0.0
7.5 to 10 %	11.8
10 % and more	9.8

For the 26 respondents who indicated they would pay a premium, the mean was 8.3% (SD 7.1%). The 95% confidence interval for the mean extra premium is (5.4%, 11.2%)

**Table 2.2 Attitudes to insurance for food poisoning**

Furthermore the investigators found that:

- The majority of the participants felt confident with their present level of knowledge.
- Management's awareness of the implications of a food poisoning outbreak was shown to be very real and identified staff with good food safety knowledge as most important. Closure of business was seen by the majority as the most likely outcome of a food-borne illness outbreak. That half of the managers were prepared to pay extra for insurance to cover the consequences of food poisoning is another indicator that management is very aware of the threat that food poisoning poses to their business.
- Management was supportive of its staff gaining food safety certificates. However, a number of managers who did not pay staff extra for having food safety qualifications were nevertheless of the opinion that staff should have such qualifications.
- Most managers were in favour of it being compulsory for all staff involved in the preparation of food to have food safety certificates. Retraining was also seen to be important when the participants indicated that food safety certificates should, on average, be current for only three years.
- Managers had a good working relationship with the Wellington City Council (WCC) EHOs, and were in favour of the WCC premises grading system.
- Although the average time the participants had been in this industry was 14 years and the majority had only basic food safety certificates, most indicated they understood the important food safety aspects, especially about the risks and consequences of food poisoning.

Fitchett (2000) in her research used personal hygiene practices, cross contamination and time/temperature controls as the main focus of the observations and interviews to assess safe food practice. These indicated that good personal hygiene practices were carried out most of the time. The most common non-compliances in personal hygiene practice were lack of effective, regular hand-washing, inappropriate use of gloves and staff who said they would not stay home if ill with vomiting and diarrhoea.

The lack of effective cleaning and sanitising was identified as a key issue. Further evaluation took place between six months and a year later. In all cases considerable changes in behaviour were observed and in particular, hand washing frequency and the techniques used improved. One weakness of the research was the small size of the sample, eight out of the original 57 premises surveyed partook in the latter survey.

In the USA, the American Hospitality Institute of Technology and Management (HITM) is leading the way in staff training in HACCP and Food Safety programmes, as are the Culinary Institute of America and the Food and Beverage Institute. The HITM has a total of 32 different courses dealing with food safety for staff of catering establishments and institutions.

The New Zealand Food Hygiene Regulations (1974) do not provide for the introduction of compulsory basic training for food handlers, as is the case with the English Food Safety Act (1990). The Wellington City Council (WCC) has in place a bylaw, the "Wellington Consolidated Bylaw 1991 Amendment No.5 (WCB5)", which grades food premises and has additional requirements for premises obtaining certificates of registration. These requirements state that as from 1995 no person was to hold a certificate of registration for Food Premises unless that person or a staff member was 'suitably qualified'. Management, the licence holders, are responsible for food safety policy, their commitment to and their support for training schemes. Since the instigation of the new bylaw a greater number of food premises' staff have been trained.

The New Zealand Hospitality Standards Institute (HSI), the NZQA-recognised controller of hospitality training, advocates on-the-job training and has developed a number of food safety programs. Ideally all staff, including those employed on a casual basis, should have undergone some initial food safety training prior to entering the industry. Already a number of secondary schools are providing basic food safety training in the form of Unit Standards to those students wishing to make a career in the industry.

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## Chapter 3

### Food Safety Issues

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“At a time of heightened public and political awareness surrounding food issues, policy- and decision-makers were interested in a publicly visible response. Thus, the emphasis of the debate surrounding the creation of the Food Standards Agency (FSA) was on its 'organization, structure and responsibilities ... [and] not the mechanisms for controlling food safety'. From our perspective, an understanding of the way in which both public and private interests regulate food is essential if we are to understand the way in which the consumer interest is articulated and represented in food quality debates.”

(Flynn, A., Marsden, T. and Smith, E. 2003)

According to Flynn et al (2003): One of the main innovations in food quality has been in the development of retailer-led food hygiene and hazard systems. Despite the rhetoric of free market principles, these have increasingly been developed as a condition of market entry for food suppliers and manufacturers. Hence, as far as the overall supply chains are concerned, it is increasingly not enough from the point of view of the retailers to supply quality foods of the right compositional standards. It is also necessary for their suppliers to demonstrate that systems of quality management or risk assessment (such as HACCP) have been put in place as a food assurance scheme. Hence the retailers expect more and more from their suppliers in terms of the policing of food delivery as well as the type and specifications of the food produced. This stands to give retailers a market advantage with customers and it demonstrates to government that they are taking existing food regulation seriously.

In 1989, the Committee on Microbiological Safety of Foods (CMSF) was established in the UK to evaluate the link between food-borne illness and methods of food production, processing and handling (Powell, S.C., Attwell, R.W., Massey, S.J. 1997). Recommendations contained in part one of the CMSF Report, 1990, included that managers and supervisors of food businesses should be adequately trained in food hygiene in order that they understand the microbiological significance of processes under their control. Regulations covering food hygiene were not, however, implemented until 1995 in the Food Safety Regulations 1995 (UK, Department of Health 1995), Schedule 1, Chapter 1. Chapter 10 of these regulations states that the proprietor of a food business must ensure that food handlers are instructed, supervised and/or trained in food hygiene to a level appropriate for their work activity.

Cowden (2002) states that among other benefits, these results have been helpful in informing the UK's newly created FSA. The FSA has committed itself to reducing the burden of food-borne disease in the UK by 31 March 2006. They have not yet decided exactly how they will define 'food-borne disease', but it is inferred that they do not merely mean reported food-borne disease. The estimate the study provides of the amount of disease invisible to routine national surveillance will therefore be invaluable. Of course our estimates are for Reported Disease (RD), not food-borne disease. Also, our estimates refer to the period 1994/1995. They will therefore be a decade old by the time the FSA's five-year programme ends.

Another prediction was made by the director of the Leatherhead Food Research Association (Kierstan, 1995) and has since proven very wrong. He was optimistic in stating that the manufacture of food will have become safe by the year 2000 through the implementation of new production techniques. Food manufacturing techniques are very different from the

processing of partly processed foods and raw products in each type of eating house in New Zealand. A newspaper article (Dominion, May, 1999) states that four out of five chickens harbour pathogenic bacteria. This not only poses a threat to the catering industry but even more so to the New Zealand public at large. Ideally the whole population will have to be made aware of food safety issues.

There are two key elements in producing safe and wholesome food:

*“The first, Risk assessment coupled with hazard analysis is vital. Each business must identify the potential hazards and develop systems to control them. The importance of applying HACCP cannot be overemphasised.*

*Lastly, training in food safety is absolutely critical, particularly for supervisors and managers. Judgements will have to be made about the nature of hazards and the role of operators who handle the food. It follows from this that managers and supervisors will have to be trained to a much higher level than can be achieved by the basic or primary one-day courses currently on offer by the various validating bodies. Over the past three to four years, many companies have had their operators trained at this level. It is now apparent that this has not made any contribution towards higher standards of food safety.”*

(Wheelock, 1994)

Management attitude is an important determinant in overall training standards.

A recent recommendation (Gilbert, Freshwater & Allman, 1996) that training programmes should be targeted at managerial staff before proceeding to other grades, has limited potential and depends largely on the size of the establishment and the manager's responsibilities. Basic training for all catering staff is an important goal, but the expected high cost and complexity of such a programme are major obstacles. The possibility of formal teaching for senior staff who could then organise 'on the job training' programmes is being considered as an alternative. The New Zealand Hospitality Standards Institute (HSI), the controller of hospitality training recognised by the New Zealand Qualifications Authority (NZQA), advocates on the job training and has developed a number of food safety programs. Ideally all staff, including those employed on a casual basis, should have undergone some initial food safety training prior to entering the industry. A number of secondary schools are at present providing basic food safety training in the form of Unit Standards to those students wishing to make a career in the hospitality industry. When working in that industry additional food safety training could then effectively be taught on the job.

In a study by Kramer and Scott (2004), managers of ready-to-eat food establishments rated “staff with good food safety knowledge” the most important aspect of ensuring safe food. Half were prepared to pay higher wages to staff holding a current food safety certificate. Although respondents considered that closure of the establishment was the most serious business consequence of a breakdown in safe food handling, less than half, (49%) were prepared to pay an additional insurance premium to cover this risk. Table 3.1.

**Table 3-1 Aspects of food safety by type of eating house**

Aspect	Total Sample	Hotel	Restaurant	Café	Bistro	Sitdown takeaway	Takeaways	Caterer	Other
Number surveyed	50	2	8	22	2	7	5	1	3
	Mean score (a)								
Staff with food safety knowledge	1.3 (b)	1.0	1.4	1.5	1.0	1.0	1.0	1.0	1.0
Sufficient refrigeration space	1.8	2.5	1.8	1.6	1.0	2.3	1.6	2.0	1.7
Quality cleaning materials	1.8	2.0	2.4	1.8	1.0	1.4	1.6	2.0	1.3
Up to date clean schedule	1.8	1.0	1.8	2.0	1.0	1.6	2.0	3.0	1.3
Quality ingredients	1.9	3.5	1.8	2.3	1.5	1.7	1.4	3.0	1.7
Strict environmental health officers	2.3 (b)	2.0	2.3	2.3	1.0	2.4	2.6	2.0	1.7

(a) Those surveyed were asked to score each identified aspect from one to seven in order of importance, one being most important. A mean score was calculated for each aspect by weighting the numerical value of score by the numbers of respondents nominating that score.

(b) A paired t test applied to the total sample indicated that there was significant difference ( $p < 0.01$ ) between the highest and lowest scores.

Worsfold, D. and Griffith, C. (1997) presented a study that was based on observing the food safety behaviour of a sample of over 100 people in their own homes. This showed that many basic food handling procedures were not conducted according to the government’s recommendations.

*“Some of the findings, such as the incidence of temperature abuse during food transport and storage, are consistent with the literature which relies on self-reported behaviour; while others, such as the failure to wash hands and ingredients, or to use separate equipment for raw and cooked foods and to keep equipment and surfaces clean, are not. This study shows that there is a great potential for indirect and direct cross-contamination in the domestic kitchen, a potential of which many of the study’s participants appeared to be unaware.”*

(Worsfold, D. and Griffith, C. (1997) p. 103)

Potentially unsafe handling practices, such as the holding of cooked food for prolonged periods at room temperature and the widespread failure to assist the cooling of cooked food prior to refrigeration, were malpractices that in the main have been ignored by previous social surveys. The study further found that there was a wide variation in the cleanliness of the kitchens and in the hygiene standards of the participants. While there is plenty of information that the public is aware of the importance of hygienic food handling practices in the home, there must be doubt about the relationship between awareness and behaviour.

Behavioural scientists have conducted extensive research on nutrition, but they have largely overlooked the question of food safety. Information is needed on how food becomes unsafe in the home and on what changes in environmental conditions, and in beliefs and behaviour, must be accomplished in order to reduce food hazards. (ibid p.104)



Good hygiene can reduce the risk

That publicity has a role to play in the control of food safety has been reinforced by Martin (1998), who reports on a sweeping zero-tolerance crackdown by California health inspectors, who'd been embarrassed by a KCBS-TV news series on spotty enforcement. This gained steam when new rules took effect, obliging the county's 20,000 restaurants to hang A, B or C letter grades on their front doors to reflect inspection scores. Lawmakers, who also ordered restaurants in

the county to train shift managers in food safety, credited the televised exposés for prompting the health-code reforms and the swift closure of hundreds of restaurants.

Emboldened by the reforms in Los Angeles, chief health inspectors from San Francisco and around California drafted legislation calling for the food-safety training of all restaurant shift managers in the nation's largest state by January 1<sup>st</sup> 2000. The measure was scheduled to be introduced in the state Legislature with swift passage on the strengths of support shown by voters in Los Angeles.

One month earlier in Iowa, where reports of food poisoning outbreaks had mounted, a Republican state legislator revived his bill to increase restaurant inspection frequencies and related fees, drawing support from a fellow Republican legislator - a restaurant owner who had formerly opposed the measure.

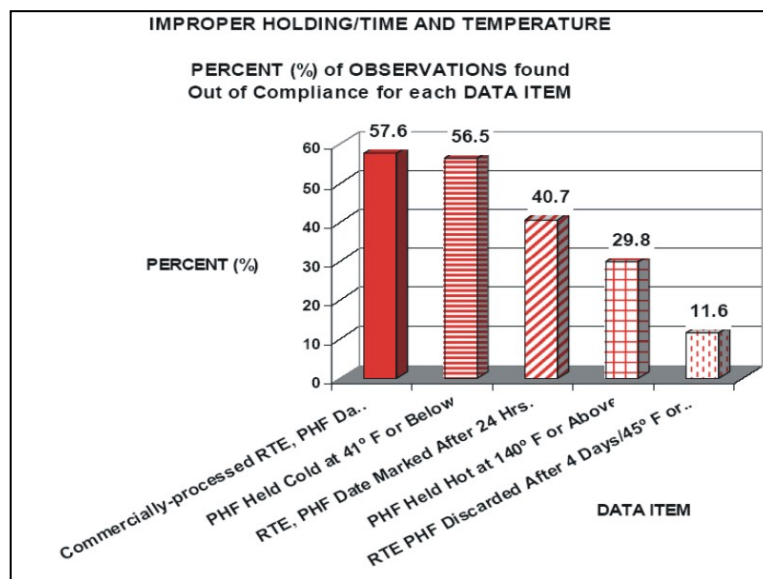
Ironically the Los Angeles County health department, before undertaking its recent reforms, resisted KCBS' request for nearly a year before turning over the 24 months' worth of data used in the controversial study of inspection inadequacies. The CBS-owned station, whose ratings windfall from the exposé inspired press reports nationwide had paved the way for a pending similar inspection study by its sister station in Chicago, now has raised the stakes on the data dissemination front.

In conjunction with a news-series sequel called "Back Behind the Kitchen Door," KCBS' web site began posting searchable, on-line results of multi-year health-record audits of 40,000 restaurants in neighbouring Los Angeles, Orange, Riverside and San Bernardino counties.

Organized by 'best' and 'worst' groupings, the data can be browsed by restaurant name, score, city or zip code. Health scores are averaged over a two- or three-year period, and findings for Los Angeles County include a two-and-a-half-year average score for each listed restaurant and the date and result of its latest inspection.

In fact, sanitarians from three influential restaurant towns —San Francisco, Chicago and New York — stressed that the dining public is better protected than ever before, despite the recent KCBS-TV probe in Los Angeles or the Center for Science in the Public Interest's charge in 1996 that most state and municipal health departments fail to enforce national health restaurant standards. Figure 3.1

Figure 3-1

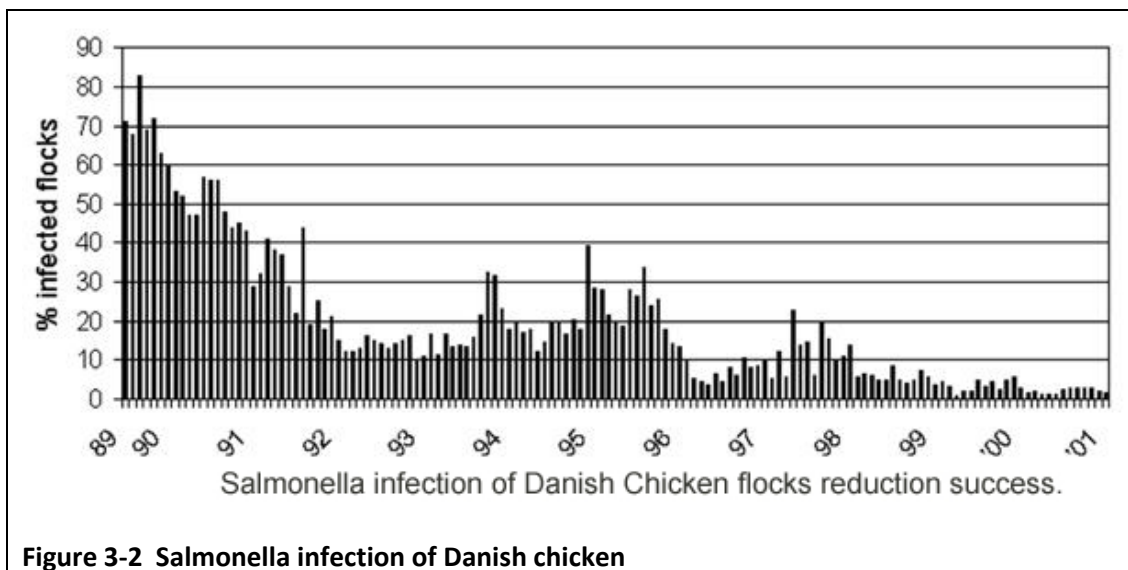


It is understandable how a scandal like the hidden-camera exposé in Los Angeles could occur there or elsewhere, even in cities that do a good job of enforcement. According to the KBCS spokesperson, it's very easy for any jurisdiction to let its guard down when it comes to public health regulation. It's human nature not to deal with a problem until it blows up in your face and is on your doorstep. It's just like measles. Jurisdictions don't push for immunisation until there's an outbreak. He continues, one of the reasons Chicago's diners have been so well protected is the economic threat of shutting a business down if lackadaisical operators ignore violations.

A spokesman for the New York City Health Department agreed. In New York, he said, about 100 inspectors are responsible for visiting some 18,000 restaurants once every 10 months. Visits can be routine, based on follow-ups and motivated by complaints. "Generally, I think restaurant owners recognize that in a small way we are helping to improve their businesses," he said. "I admit that it is rare that any restaurant passes one of our inspections with flying colors, but in virtually all cases, they learn something from it."

Of interest is a similar TV programme trialled in New Zealand. As reported in the Weekend Herald (2005) an Auckland café was closed down after featuring on a television programme with severe cockroach infestation.

Morales and McDowell (1998) take us one step further. They found that for many years, food safety management — as well as management of a host of other risks in the agricultural system — was guided by a zero or near-zero risk standard. However, emerging food safety issues and improved understanding of traditional hazards make it clear that zero risk is neither technologically nor economically feasible. The pathogen is sustained by a complex epidemiology involving both horizontal and vertical transmission and other factors potentially related to our increasingly intensive food production systems. Figure 3.2.



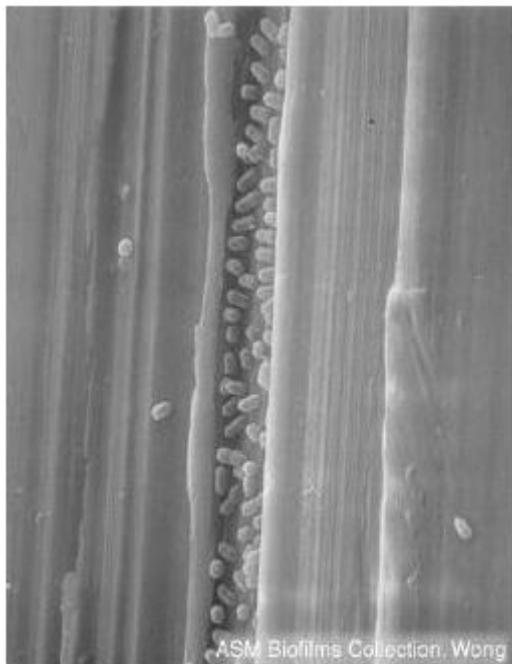
**Figure 3-2 Salmonella infection of Danish chicken**

Infected animals frequently appear healthy (Morales et al 1998). Conventional inspection methods do not disclose the presence of the pathogen. The food product does not appear to be contaminated. Traditional food preparation and consumption practices do not kill the organism. Concentration in production and processing systems can result in exposure of large numbers of people over wide geographic areas within a short period of time. These pathogens have also exhibited a potential for global spread as evidenced by the simultaneous worldwide appearance of *Salmonella enteritidis* in the 1980s and *Salmonella typhimurium* definitive type 104 at present. *E coli* O157:H7 in hamburger, *Salmonella*

enteritidis in eggs, *Vibrio vulnificus* in oysters, and *Cyclospora cayetanensis* in raspberries share many of these characteristics and defy our current food inspection systems. Further complicating our food quality assurance systems are pathogens capable of causing serious illness or even death when ingested in very low numbers. Two recent food-borne disease outbreaks involving *E. coli* O157:H7 in hamburger and *Salmonella enteritidis* in ice cream resulted in numerous clinical illnesses (and in the *E. coli* outbreak, deaths) with the ingestion of fewer than 10 organisms—several orders of magnitude below levels previously thought necessary to cause illness.

Scholthof (2003) explains that agriculture links people both locally and globally.

*“Plant health and the environmental conditions associated with growing crops are and will continue to be important indicators for human health. Direct health implications that link agriculture, plant pathology, and public health include emerging and re-emerging plant diseases, mycotoxigenic fungi, agricultural biotechnology, allergens, and food safety. Integrating agricultural expertise and education into public health programs (and vice versa) offers an additional means to improve environmental and human health. (ibid p. 171)”*



**Figure 3-3** *Listeria M.* on stainless steel surface

Rocourt et al. (2003) portray that while diarrhoea is the most common syndrome following the consumption of a contaminated food, some diseases are more serious. Clinical manifestations of listeriosis (Figure 3.3) include bacteraemia and central nervous system infections, especially in patients with an impairment of T-cell mediated immunity (neonates, the elderly, immuno-compromised patients) and abortion in pregnant women, with an overall case-fatality rate of 25%. Food-borne botulism results from the potent toxin of *Clostridium botulinum* that causes paralysis of skeletal and respiratory muscles which, when severe, may result in death in 8% of cases. In addition to the consequences of toxoplasmosis on the foetus (birth defects), *Toxoplasma gondii* is also the most frequent cause of lesion in the central nervous system in patients with AIDS. Hepatitis A is an infectious disease for

which age is the most important determinant of morbidity and mortality, with severity of illness and its complications increasing with age. The duration of illness varies, but most cases are symptomatic for three weeks. Complications during the acute illness phase are unusual, with fulminant hepatitis and death being uncommon.

Lindquist et al. (2000) summarised reported food-borne incidents in Sweden from 1992 to 1997 based on information provided by the Swedish National Food Administration and the Swedish Institute for Infectious Disease Control. From a total of 555 incidents, of which 84 per cent were outbreaks, calicivirus (which includes the Norwalk group) was the most reported agent both in terms of incidents and cases. Mixed dishes was the food category most often implicated in outbreaks and casseroles or stews were the subcategories that caused most cases. In about 60 per cent of the incidents, the implicated food was consumed in commercial food establishments. (See Table 3.2)

**Table 3-2 Outbreaks of foodborne disease reported by OzFoodNet**



An Australian Government Initiative



**Outbreaks of foodborne disease reported by OzFoodNet sites, July to September 2003**

State	Month of Outbreak	Setting	Agent responsible	Number exposed	Number affected	Evidence <sup>a</sup>	Responsible vehicles
NSW	July	Home	Unknown	7	1	D	Soccerball ham
	August	Restaurant	Unknown	11	4	D	Unknown
	August	Restaurant	S. Typhimurium 170	-	20	A	Tofu, eggplant & prawn dish
	August	Take away	S. Typhimurium 126 var 4	-	10	M	Pigs ear salad, ducks gizzards
	September	Restaurant	Unknown	-	4	D	Unknown
	September	Residential college	S. Typhimurium 135	~100	20	D	Unknown
NT	August	Bus	<i>Staphylococcus aureus</i>	5	5	D	Rice, beef and black bean sauce
	August	Home	Unknown	21	18	D	Pizza
Qld	July	Restaurant	Norovirus	70	31	A	Trifle
	August	Home	Ciguatera	5	5	D	Barracuda ( <i>Sphyraena</i> spp.)
	September	Function	Norovirus	100	13	D	Unknown
	September	Picnic	Norovirus	38	15	D	Unknown
SA	September	Community	S. Typhimurium 4	-	6	A	Cheesecake
Vic	July	Workplace	Unknown	13	7	D	Unknown
	July	Aged Care	Unknown	120	5		Unknown
	July	Community	S. Litchfield/Kinondoni	-	6	M	Suspect cucumbers
	August	Community	S. Montevideo	-	3	M	Lebanese tahini
	September	Restaurant	Unknown	-	14	D	Unknown
	September	Aged Care	<i>C. perfringens</i>	~600	28	D	Unknown
	September	Aged Care	<i>C. perfringens</i>	30	15	D	Unknown
WA	September	Aged Care	<i>C. perfringens</i>	190	42	AM	Suspect gravy mixed into vitamised meals

<sup>a</sup> Key

D = Descriptive evidence implicating the suspected vehicle or suggesting foodborne transmission;

A = Analytical epidemiological association between illness and one or more foods;

M = Microbiological confirmation of agent in the suspect vehicle and cases.

Evans, Madden, Douglas, Adak, O'Brien and Djuretic (1998) reviewed general outbreaks of infectious intestinal disease reported in England and Wales in 1995 and 1996 to the PHLS Communicable Disease Surveillance Centre in the United Kingdom. Small, round-structured viruses (43 per cent) and Salmonella (15 per cent) were the most commonly reported pathogens. Over half the outbreaks (64 per cent) were reported as being transmitted from person to person most of which were due to viruses and occurred in residential homes and hospitals. Twenty-two per cent were described as mainly food-borne, 51 per cent of which were due to Salmonella.

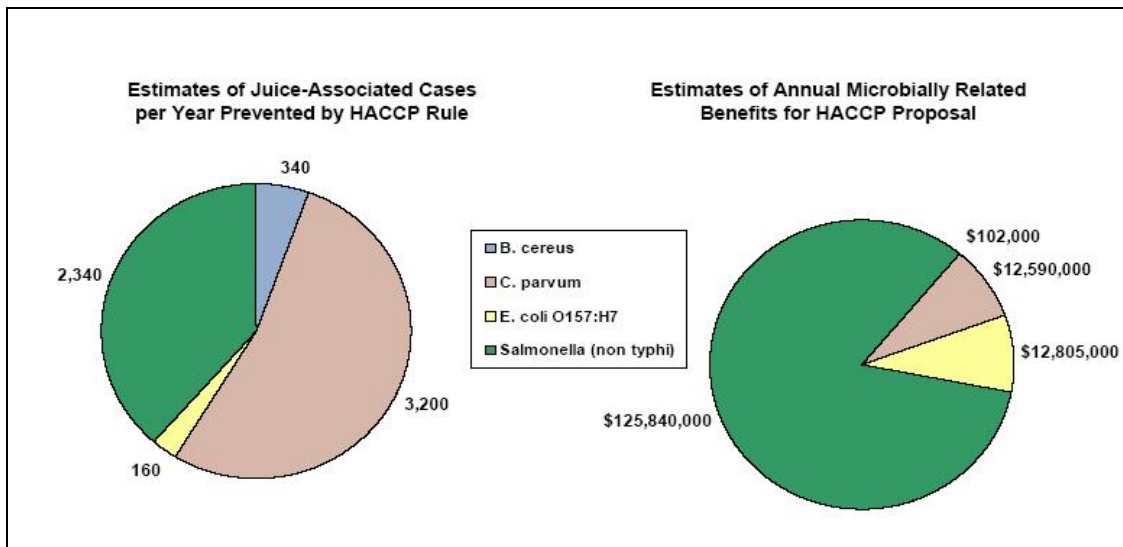
## Cost of Food-borne Illness

The impact of BSE in Great Britain and Europe has been devastating on the beef industry. Some countries may never recover. Four children died and more than 600 became ill from an outbreak of E. coli in the northwest of the U.S. in the early 1990s. That changed the way we will look at food safety forever. An E. coli outbreak in Japan resulted in the U.S. losing 40% of its meat market in Japan, due in part to perceptions of safety. These perceptions impact demand. They must be addressed before the fact and not after. Now a high percentage of our efforts will be dealing with perceptions rather than real threats to public health. (Stephens S 1996 p.40)

In the late 1980s Roberts (1988) wrote that reducing pathogen contamination in foods costs money. It may require changing animal husbandry practices, purchasing Salmonella-free feed, installing better refrigeration in meat coolers, reducing cross-contamination along the slaughter line, throwing out over-age food sooner in grocery stores and restaurants, teaching food preparers about proper food handling and sanitation techniques, or implementing new technologies such as irradiation of packaged poultry to kill Salmonella. It is not known yet which combination of strategies will have the greatest payoff in reducing food-borne salmonellosis. Twenty-five years later there appears to have been little progress made.

The statistics presented on cost associated with food-borne illness varies widely from country to country. In order to prevent or minimise outbreaks of communicable diseases, control measures are obviously necessary. However, the design of such measures is not self-evident (Persson and Jendteg, 1992). Existing preventive measures and control systems in different countries consist of both public and private, compulsory and voluntary, activities, which vary in extent from one country to another.

Economists view food-borne illness as arising out of a market activity such as purchasing meat at a supermarket or a restaurant and consuming it (Figure 3.1). This exposes the individual to a risk or hazard, namely the possibility of acquiring a food-borne illness (Roberts, 1988). Only some of the exposed persons become ill. Costs associated with the illness include direct costs imposed on the parties in the market transaction – the person becoming ill from buying and consuming the product, and the firm selling the product. The monetisable direct costs (those easily measured in dollars) include lost wages and medical costs for the risk person and lost sales, product recall, and costs associated with legal liability suits for the restaurant or supermarket. In addition, there are the nonmonetisable direct costs such as the pain and inconvenience of the ill person who purchased the food, imposed on the parties in the market transaction – the person becoming ill from buying and consuming the product and the firm selling the product.



**Figure 3-4 Estimates of benefits of HACCP Proposal (Henson & Northern, 1998)**

Henson and Northern (1998) went one step further and calculated the transaction cost. Economics posits that food retailers will aim to minimize the costs associated with food safety controls in the procurement of own-branded products. In doing so, however, they face a potential trade-off between transaction costs and the perceived risk of product failure (Fig. 3.4). Individual retailers will make their own judgments as to which cost-risk trade-off is acceptable. It is reasonable, therefore, to expect that each may adopt different approaches to the control of own-branded food product safety. The drive to reduce the transaction costs associated with the procurement of own-branded products was particularly acute in the 1990s. First, there was pressure to reduce overall operating costs as a means to maintain or increase operating margins. For example, the largest multiple retailers all indicated the need to significantly reduce the costs of supply chain management. Second, in an increasingly competitive marketplace, there was a drive to allocate existing resources to activities that were perceived to yield real competitive advantage, for example, maintaining high rates of new product development

Persson and Jendteg (1992) state that one British experience provides a typical illustration of the impact of food-borne diseases. In 1988-1989, the so-called salmonella-in-eggs crisis caused a food scare among British people which made egg consumption fall by up to 90% initially. Eventually it cost the Government and the egg producers approximately £170 million due to increased surveillance and regulatory measures, sales losses and slaughter of more than one million birds. During the period March 1989 to December 1990 a total of 1,700,000 infected birds were slaughtered.

Among industry functions in the food system (production, processing, distribution, retailing, food service), processing generally offers the most opportunity to improve the safety of food beyond that of the raw materials, yet there is increasing demand for raw, unprocessed foods (Cliver 2000). The expectation, then, is that the producers will create a risk-free production environment so that disease agents are absent from the food when purchased, and no amount of mishandling by the consumer will make the food dangerous. Where food-borne illness is concerned, people increasingly refuse to accept responsibility for the consequences of their own folly.

Although 'No fault' laws in New Zealand spare us the cost of product liability, companies can still be sued for damage to property, and in cases of injury exemplary damages can be sought (Edlin, 2000). But the fines and awards are small in comparison with the huge sums

awarded for injury compensation in American courts. Class actions are not possible in New Zealand, and while lawyers can now take on cases on a contingency basis, the situation is much different. In the United States lawyers will do everything on speculation, while in New Zealand plaintiffs must still pay ongoing expenses like filing fees, airfares and expert witness expenses (ibid). Juries also do not hear compensation cases in New Zealand (except for defamation), while in the United States juries rule. They will often greatly increase an award if they think the case has been taken on a contingency basis in order to ensure something ends up in plaintiffs', as well as lawyers', pockets.

Bell Gully solicitor Andrew Howman told The Independent "Changes to the ACC Law in 1992 had opened the door a little to making compensation claims for product defects causing injury. The 1992 changes make a new and more restricted definition of the term 'accident'." As a result, compensatory damages could be claimed when injury was suffered by means other than those defined in the law. This, he believed, "...could lead to claims involving manufactured products in the case of food poisoning, for example, or when a product has caused nervous shock, since the changes to ACC legislation courts have taken a more relaxed attitude to claims for exemplary damages. Even those covered by ACC can seek punitive (or exemplary) damages from a manufacturer as a result of gross or wanton carelessness."

In addition to product cost St. John (2000) wrote that food-borne infectious disease has become a major public health burden costing New Zealand \$55 million a year. Research, published in the New Zealand Medical Journal, shows the number of cases of food-borne infection disease is increasing. There are an estimated 199,000 cases each year. The total number of cases of all infectious intestinal disease could be as high as 823,000 p.a. Food-borne disease is responsible for about 19,000 general practitioner visits, 400 hospital admissions, 22 cases of long-term illness and two deaths every year.

Food poisoning costs around NZ \$2.1 million in medical expenses, \$48.1 million in lost productivity and an intangible cost of loss of life of \$4.7 million.

"More resources should be spent on preventing food-borne infectious disease," according to the Massey University and ESR researchers (St John, 2000, p. 1 ). "Much greater efforts should be made to reduce the incidence of campylobacteriosis, which costs the most to treat." Campylobacteriosis was found to be responsible for more than 72 per cent of the total health care costs of food-borne disease. Infectious intestinal disease caused by food-borne pathogens does not incur high direct medical costs, but the loss of production is substantial and was the largest cost category," the researchers wrote.

It is not unexpected that politics have a part to play in food safety.

"The split in responsibilities between the Ministry of Health, for domestically sold food, and the Ministry of Agriculture and Fisheries, for exported food, was deemed to be neither in the interests of consumers nor exporters. There were different levels of surveillance and inconsistencies between the two regimes. The two should be brought together. The Food Amendment Bill would have done the job by establishing a single food safety authority inside MAF simply by moving 12 Health Ministry staff there. This was much too sensible for politicians. The Shipley government watched the reforms founder in Parliament's Government Administration Select Committee, where Labour MPs dragged genetic engineering worries into the calculations and questioned MAF's fitness to care for consumers' interests. Labour promised to establish a ministry of food if it became the government, National

declared it would do likewise, and no-one gave much thought to who should administer bio-security.” (Edlin 2001 p. 9)

The incoming Clark government instructed a team of officials to examine the issues and the officials recommended that the relevant Health Ministry officials move in with the Ministry of Agriculture and Forestry (MAF) and rule out spending on a new ministry. The food industry has long agreed, emphasising that more than 80% of the food regulations are intended to meet the highest standards demanded in the world.

Although the Clark Government completed a great deal of work towards a Food Bill to replace the 30 plus years old Food Act 1981 through both Annette King and Lianne Dalziel as Ministers of Food Safety it was not until 2010, under Kate Wilkinson as Minister for Food Safety, that this piece of legislation received its first reading in Parliament (22 July, 2010).

The Food Bill provides a much needed modernisation of New Zealand’s food safety legislation. It provides the framework for an efficient, effective and risk-based regulatory regime for managing the safety and suitability of food produced, processed, manufactured, traded, transported and imported to New Zealand.

MAF Director Biosecurity and Food Policy, Julie Collins reported.

“Although the Food Bill is on the Order Paper awaiting the second reading in the House, it is likely that this will not now happen before the general election. Factors such as the Christchurch earthquakes have reduced the time available for the Governments’ legislative programme in what is already a short House sitting year.” (MAF 2011)

MAF (now MPI) has won the respect as a regulatory authority from a raft of global forums. The New Zealand Food Forum gave urgency to the matter, saying consumer health interests require the early establishment of a unified food agency with specific responsibilities and autonomy to act across a full range of health, safety, bio-security, trade and regulatory issues.

"Divided food administration in the United Kingdom has been discredited, not least because it took authorities there so long to get on top of the BSE problem," the forum cautioned.

Cleaning companies have also moved in on the cost associated with food safety as portrayed by an unknown author(2000). Recent estimates indicate that the food industry spends £815 million to clean and sanitise. Of this 4% is spent on equipment, 6% is spent on chemicals and consumables and over 89% is spent on employing over 50,000 people specifically to do the cleaning. The majority will work on what has been described as the third shift, from 10 pm to 6 am, and many of them are working under a relatively low level of supervision. This part of food production is viewed by an important section of management as a non-productive overhead. To produce safe wholesome food cleaning has to be done and it is further underpinned by legislation. There is no profit for food producers in cleaning; there is only assurance.

The question the food industry has to ask itself is “How competent is the cleaning function, how is performance measured and are the team equipped with the most suitable methods to clean?” The ways that companies manage their cleaning fall into two groups. Those using their own managers and employing their own staff to do the work and those companies who use specialist cleaning companies to provide the management and staff to do the work.

On the one hand the 'in-house' companies believe they have better control of standards and costs, but on the other hand those companies who 'contract out' believe they will benefit

from the know-how and specialist experience of their cleaning service provider. It is believed that outside cleaning companies provide as much as 10% of the needs of the food industry.

In a Spanish study, Cowden (2002) estimates that 20% of the population suffered a food-borne illness in one year. This represented 9.5 million cases annually, and 1.5 million general practitioner consultations. Two estimates were made of the under-ascertainment by national surveillance. In the 'direct method', names of cases in one part of the study were sought in the national database. It was estimated that for every 136 cases in the population, one appeared in national laboratory reported statistics. The ratio of cases in the population to cases in national statistics varied from organism to organism, being:

- 3 to 1 for salmonella,
- 8 to 1 for campylobacter,
- 35 to 1 for Rotavirus group A,
- 1600 to 1 for Norwalk-like virus.

However, in the 'indirect method', in which the number of cases the study identified was compared with the number in national surveillance, it was estimated that only 88 cases needed to occur in the population for one to appear in national statistics.

Food poisoning outbreaks can be very expensive. For example, in the U.S. an outbreak may cost millions of dollars in penalties, lawsuits and lost business (Springen, 1998). "In July, the US firm Odwalla Inc. agreed to pay a US\$1.5 million fine for selling apple juice that killed a 16-month-old girl and sickened 70 other people in 1996. In February 1996, beef suppliers agreed to pay the US parent company of Jack in the Box, a fast-food chain, \$58.5 million in a settlement over tainted meat that killed four and sickened 600 in 1993. The organism was



transmitted in undercooked hamburgers produced by the Jack in the Box Company." (Springen, 1998, p.14). In New Zealand in 1994, environmental health officers traced an outbreak of Hepatitis A in Wellington to a delicatessen/café where a staff member was found to be a carrier. "The delicatessen closed voluntarily after news of the infection became public and its two owners retreated to the hills, their livelihood in tatters" (Kominik, 1996).

Scott et al (2000) reports there are an estimated 119320 episodes of foodborne infectious disease per year in New Zealand (3241 per 100000 population). The total cost of these cases was \$55.1 million (\$462 per case) made up of direct medical costs of \$2.1 million, direct non-medical costs of \$0.2 million, indirect cost of lost productivity of \$48.1 million, and intangible cost of loss of life of \$4.7 million. Campylobacteriosis generated most of the costs. Lost productivity was the major cost component for all diseases. The total cost of potentially foodborne infectious disease was estimated to be \$88.8 million. Broad estimates of additional costs due to cases of infectious intestinal diseases caused by non-foodborne pathogens or for which no pathogen is identified could raise the cost to \$215.7 million. (P. 1)

The cost of food poisoning in New Zealand is, just like in other countries in the developed world, increasing which illustrates the need to control this unnecessary burden on society. Whilst there are many estimates regarding the true cost of food poisoning, these are often conflicting.

In a report prepared for NZFSA (now MPI) Gadiel (2010) lists five main components to the cost of the main (six) pathogens in New Zealand

- Costs of regulation and surveillance incurred by the Government

- Costs borne by businesses, including the costs of compliance and the consequential costs of food incidents and disease outbreaks
- Costs of treatment—incurred mainly by the government by way of subsidies towards the cost of GP services, other community care and payments for inpatient hospital care
- Costs associated with loss of output because of worker absenteeism caused by foodborne disease
- Personal and lifestyle costs incurred by households and individuals in connection with private disbursements (where no recourse to government subsidy exists) and pain, suffering and disruption, including the possibility of premature death (p. v)

In 2010 the then Minister of Food Safety (Wilkinson, 2012) estimated food-borne illness caused a \$162 million loss to the New Zealand economy.

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## Chapter 4

### A Sample of Pathogens

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#### Pathogenic Bacteria in brief

The number of pathogenic bacteria types is considerable. Following is a brief description of the most common types at present causing the majority of food-borne illness. The material was provided by the Australian Institute of Food Science and Technology Incorporated, N.S.W. Branch, Food Microbiology Group (2003).

- Salmonella
- Escherichia coli
- Campylobacters
- Pathogenic Vibrio
- Staphylococcus aureus and Staphylococcal Enterotoxins
- Bacillus cereus and other Bacillus species.
- Clostridium perfringens
- Clostridium botulinum <sup>1</sup>
- Shigella
- Yersinia enterocolitica

#### Salmonella

The primary reservoir of bacteria belonging to the genus Salmonella is the intestinal tract of vertebrates, and the members of this genus are widely distributed in nature. The Approved Lists of Bacterial Names recognises the type species of the genus as Salmonella choleraesuis, first isolated by Salmon and Smith in 1885 from swine affected with clinical hog cholera. Salmonellosis is one of the most important public and animal health disease problems, causing worldwide morbidity and mortality of humans and animals. Salmonellosis is a communicable disease readily transmissible from animals to man, either directly or through contaminated products of plant or animal origin.



Fig. 4.1: Pathogen: Salmonella

Salmonellae are recognised by serovar (serotype) names that are the names used to differentiate different Salmonella types. Although all salmonellae are considered potentially pathogenic, serovars differ in the pathological syndromes they produce and in their host adaptations. Some serovars are host adapted, e.g. Salmonella serovar Typhi is host specific for humans and does not infect any other species. The most common

syndrome associated with Salmonella in humans and animals is the asymptomatic carrier state. For many years, microbiologists have applied themselves to developing a diverse range of methods to detect salmonellae in foods.

#### Enteropathogenic Escherichia coli

Strains of Escherichia coli have been considered pathogenic by veterinarians since the early 1900s when E. coli was

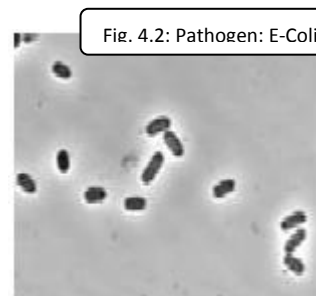


Fig. 4.2: Pathogen: E-Coli

associated with white scours in calves. In the 1920s and 1930s it was suggested that a number of strains could cause diarrhoea in infants, but it was not until the 1940s that the concept of *E. coli* as a cause of human diarrhoea was accepted when outbreaks of infantile diarrhoea were caused by enteropathogenic *E. coli* (EPEC). In Europe and North America in the 1960s, several outbreaks of gastroenteritis occurred in adults and were linked to the presence of enteropathogenic *E. coli* of serotypes O26, O111 and O128 in the water supply. In the 1940s, a different group of strains, enteroinvasive *E. coli* (EIEC), were associated with diarrhoea in Europe, and, in an outbreak in the USA in 1971, at least 387 people suffered gastroenteritis caused by an EIEC strain, serotype O124, from imported soft cheese.

About the same time, a third group of *E. coli*, the enterotoxigenic group (ETEC), were recognised as a cause of travellers' diarrhoea. In 1975, a waterborne outbreak caused by the ETEC strain O6:K15:H16 affected over 2000 people in the USA. In 1982, after two food-associated outbreaks, food-borne enterohaemorrhagic strains of *E. coli* (EHEC) including *E. coli* O157:H7, were recognised as a fourth group. This group caused haemorrhagic colitis (HC) and haemolytic uraemic syndrome (HUS). Further groups have been described that cause diarrhoea — entero-aggregative *E. coli* (EAEC), diffusely adherent *E. coli* (DAEC), necrotoxicogenic *E. coli* (NTEC) and *E. coli* producing cytolethal-distending toxin (CDT).

## Campylobacters

Since early this century, vibroid-shaped organisms have been well known in veterinary microbiology. They were reported as causing abortion in sheep as early as 1913 and, in 1919, a vibrio isolated from foetal fluids of aborted cattle was named *Vibrio fetus*. In 1931, *Vibrio jejuni* was isolated from cattle with winter scours. Taxonomic studies revealed that the latter organism had a G+C content of 33–35 mol% while that of other *Vibrio* spp. was 47 mol%. The genus name *Campylobacter* was proposed in 1963 and *Campylobacter fetus* was designated as the type culture.



Fig. 4.3: Pathogen:

It was not until the 1970s that campylobacters were recognised as a significant cause of human gastroenteritis. Since then, surveillance has shown these organisms to be a common cause of acute human enteritis and, in a survey of hospital laboratories that cultured for *Campylobacter* species, *Campylobacter* infections were found to be more common than *Salmonella* infections. In the USA, *Campylobacter jejuni* accounts for 99% of the reported *Campylobacter* spp. from human disease with *Campylobacter coli* making up the majority of the remainder and *C. fetus*, *C. lari*, *C. upsaliensis* and *C. hyointestinalis* being occasionally isolated.

## Pathogenic Vibrio



Fig. 4.4: Pathogenic Vibrio

The genus *Vibrio* includes several food-borne pathogens that cause a spectrum of clinical conditions including cholera and milder forms of gastroenteritis, and occasional systemic infections that are often fatal. *Vibrio cholerae* is the etiological agent of human cholera and was first described by Robert Koch in 1883. Disease similar to cholera is described in early Sanskrit writings dating back about 2500 years, yet in spite of numerous medical and public health advances since then, this disease remains a major public health problem, particularly in developing countries. The history of cholera since the early 1800s includes a series of up to seven pandemics. Most recently cholera has undergone an upsurge and new epidemic strains have emerged. Ironically, *V. cholerae* is included in the list of so-called 'emerging pathogens' of the 1990s.

The number of species included within the genus *Vibrio* has increased progressively and some species are known to be food-borne. In 1950, ninety-six years after the isolation of *V. cholerae*, *Vibrio parahaemolyticus*, was isolated from patients following an outbreak of foodborne disease in Japan. Since then other new *Vibrio* species that have been shown conclusively to be transmitted to man via foods include *Vibrio mimicus* and *Vibrio vulnificus*.

Food-borne *Vibrio* species pathogens vary significantly in their phenotype and physiology, their ecology and epidemiology. The species most commonly associated with foodborne transmission include *V. cholerae*, *V. parahaemolyticus* and *V. vulnificus*. Other species, *V. mimicus*, *Vibrio fluvialis*, *Vibrio furnissii* and *Vibrio hollisae*, are autochthonous species in similar aquatic habitats and thus are found on fish and seafood harvested from these areas. However, they have been associated with foodborne illness less frequently or there is less conclusive evidence of food being a means of transmission and they will not be presented in detail.

### **Listeria monocytogenes**

The increase in knowledge of *Listeria monocytogenes* has been significant for the food industry. Perhaps the greatest increase in knowledge has been gained from the continuing improvements in typing methods and thus the epidemiology of the organism. This has allowed sampling plans and control programs to be refined and to better target the organism in food processing facilities.

The question of 'zero tolerance' still with different countries' food and agencies adopting a wide range of tolerance level. The question of *monocytogenes* strains is also still being investigated.



Fig. 4.5: Pathogen: *Listeria* (m)

remains highly contentious, public health regulatory limits from zero to quantifiable variability in pathogenicity of *L.*

There has been a noticeable increase in the number of product isolations and product recalls, both within Australia and internationally. This is due mainly to further improvements in analytical methods, better targeted sampling plans and greater general awareness of the organism. Contrasting this, trends for food-borne outbreaks caused by this organism do not appear to have increased concomitantly, with some countries reporting up to a 50% reduction in cases of listeriosis.

Over the past five years, the scientific community and food industry have added to our knowledge and control mechanisms for this organism, an organism that is now rightly recognised as a major food-borne pathogen, but one where control programs appear capable of reducing its risk to human health.

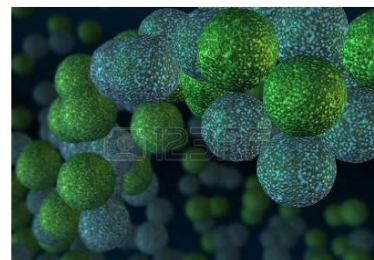


Fig. 4.6: Pathogen: Coccal(shape)Bacteria

### **Staphylococcus aureus and Staphylococcal Enterotoxins**

*Staphylococcus aureus* has been of great interest to bacteriologists since the days of Pasteur and Koch. It was first demonstrated to be pathogenic to humans by Ogston, and was isolated and grown in pure culture by Rosenbach in 1884. The microorganisms were named "staphylococcus" in 1882 for the Greek words staphyle meaning bunch of grapes and coccus meaning grain or berry. Originally, two types of *Staphylococcus*, differentiated by the pigments formed when grown on plates, were described. Those forming white colonies were named *S. pyogenes albus* and those forming yellow colonies were named *S. pyogenes aureus*. In 1908, Winslow and Winslow proposed a second species of staphylococci; *S. epidermis*. *S. aureus* and *S. epidermis* were differentiated based on their ability to produce coagulase and they were the

only two species recognized until 1972. In 1974, a third species was added to the *Staphylococcus* genus from the *Micrococcus* genus, *saprophyticus*. By 1984, 20 species were identified. All of the newly identified species produced coagulase, except *intermedius* and *hyicus*, which can be either coagulase positive or negative.



Fig. 4.7: Pathogen: Staphylococcus

Vaughan and Sternberg were the first to report on a foodborne illness outbreak in 1884 in which *Staphylococcus* was implicated. In 1914, Barber identified staphylococci as the causative agent of illness after consumption of milk from a mastitic cow. Dack and his associates were the first to demonstrate that staphylococcal foodborne poisoning (SFP) was not caused by ingestion of the microorganism itself, but rather illness was caused by a filterable toxin. Since then, it has been shown

that *S. aureus* is a common and widespread food poisoning microorganism.



Fig. 4.8: Pathogen: Pathogen: S. Aureus Infection

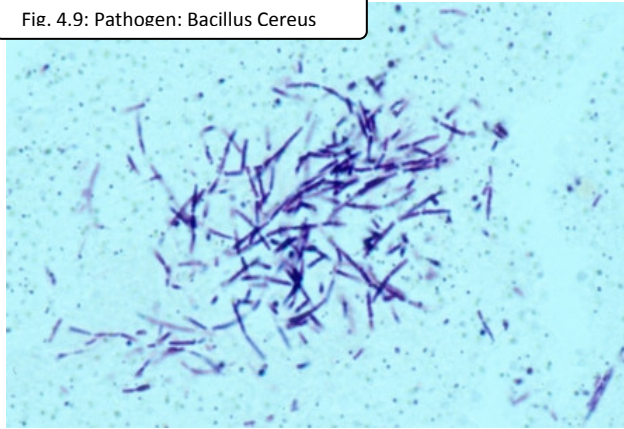
SFP occurs when enterotoxigenic staphylococci are introduced into a food in which it can multiply, and the food is subsequently held under conditions that allow the microorganism to grow and produce significant quantities of staphylococcal enterotoxin. Large numbers of *S. aureus* are necessary to produce sufficient enterotoxin to cause illness, therefore small numbers in food are not a direct hazard to health. Neither the absence of *S. aureus* nor the presence of small numbers is a guarantee of food safety so a direct measurement of toxin presence is therefore essential. It should also be noted that some strains of several other species of *Staphylococcus* are able to produce enterotoxins, although the overwhelming majority of outbreaks of SFP have been caused by *S. aureus*. It remains one of the most frequently reported causative agents of foodborne illness.

### **Bacillus cereus and other Bacillus species.**

*Bacillus cereus* and related organisms have been noted in foods associated with illness since early in the 20th century, but it was not until the 1950s that the role of *B. cereus* was firmly established. The organism is well known and may be found in a wide variety of foods, usually without causing concern. It was therefore difficult to prove that this organism was responsible for food-borne illness. In fact, it is responsible for two distinct syndromes: an emetic illness and one characterised by diarrhoea. The diarrhoeal illness was the first to be recognised and the emetic illness was not noted until the 1970s.

Bacillus species are frequently considered to be harmless saprophytic organisms, but there are a few species such as *Bacillus anthracis* that are well known pathogens of humans and animals, and *Bacillus thuringiensis* and *Bacillus sphaericus* that are pathogens of certain

Fig. 4.9: Pathogen: Bacillus Cereus



insects. *B. cereus* has been recognised more frequently since the 1960s in human infections of wounds, eyes, respiratory tract and central nervous systems as well as bacteraemia and endocarditis.

In recent years, incidents of food-borne illness have been reported in which *Bacillus* species other than *B. cereus* have been implicated. In particular, *Bacillus subtilis*, *Bacillus licheniformis* and *Bacillus pumilus* have been linked to these cases. *B.*

*subtilis* and *B. pumilus* have also been reported in human clinical infections. Other members of the *B. cereus* group, such as *B. thuringiensis* and *Bacillus weihenstephanensis* may also be responsible for foodborne illness.

### **Clostridium perfringens**

*Clostridium perfringens* causes enteritis. Despite many advances in food hygiene and preparation in the last century, food poisoning caused by *Clostridium perfringens* continues to be an important cause of morbidity in the community, and large outbreaks are still common, with Australia being no exception. This points to a continuous and ongoing need for education of food handlers and consumers alike in the safe handling of food, particularly proteinaceous foods.

*Clostridium perfringens* is an important, though often under-reported, cause of food poisoning in Australia. Because of the relatively short duration of the symptoms produced by *C. perfringens* food poisoning, many outbreaks go unreported. As a result, it is difficult to accurately gauge the extent of food poisoning caused by this organism in Australia. These

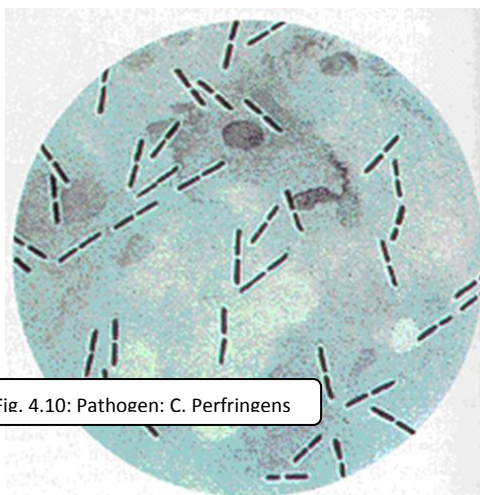


Fig. 4.10: Pathogen: C. Perfringens

outbreaks may manifest themselves in only a few cases, e.g. in a home-prepared meat pie, or in a large number of cases, such as a wedding or similar gathering. *C. perfringens* (or *Clostridium welchii*, as it was formerly known) has been well known to clinical microbiologists since 1892. For the last 90 years, *C. perfringens* has been associated most closely with gas gangrene. The ravages of two world wars over this time have no doubt contributed to this organism's prominence. A strict anaerobic spore-forming bacillus, it causes a variety of clinical syndromes in man and animals, such as gas gangrene, gastroenteritis, enteritis with necrosis and mild diarrhoea in humans (pig-bel), dysentery in lambs and enterotoxaemia in sheep and calves. Although the first reference to *C. perfringens* being a cause of mild human diarrhoea was made at the end of the 19th Century (1899), it was not until the early 1940s that Knox and MacDonal in England in 1943 and McClung in the U.S.A.

made a firm association with food poisoning. However, it was the subsequent work of Hobbs and associates in 1953 that led to renewed interest in this organism.

### **Clostridium botulinum**

*Clostridium botulinum* is a microorganism of contrasting capacity. From the food safety view, it remains one of the most important of the pathogenic food-borne bacteria characterised by its anaerobic growth, heat resistant spores, growth across a broad temperature range (some strains can grow at temperatures of refrigeration), and production of the most potent group of biological neurotoxins known. The neurotoxins cause the syndrome botulism characterised by flaccid muscular paralysis, which in its severest form leads to death. Since the mid-1980s, these same neurotoxins have emerged as one of the most important therapies for the management of disorders typified by excessive muscle movement.

*C. botulinum* was first isolated from home-cured ham implicated in a botulism outbreak at the end of the 19th century. The toxin producing bacterium was originally named *Bacillus Botulinus*. Outbreaks of botulism—such as the ‘*sausage poisoning*’ of the late 18<sup>th</sup> century—were always found to be anaerobic spore formers. As *Bacilli* were aerobic, the difference between organisms was recognised by renaming the anaerobic strains *Clostridium*. (Jay 1992)

The genus *Clostridium* encompasses a group of organisms with diverse metabolic activity. Organisms belonging to the species *C. botulinum* are straight, anaerobic, Gram-positive rods that form oval, subterminal endospores, which usually distend the cell. Since 1953, *C. botulinum* has been the species designation for all organisms that produce botulinum neurotoxins (types A—G). Little consideration was given to the physiological properties of the organism itself. This has resulted in the species encompassing a range of metabolically diverse organisms. Substantial phenotypic and genotypic evidence exists demonstrating heterogeneity within the species. Such evidence has led to the reclassification of *C. botulinum* type G strains to a new species, *Clostridium argentinense*. From a taxonomic view, it is possible to justify further change in the nomenclature of the species. In view of the utility of the current nomenclature to medical science, there has been an understandable reluctance to initiate further change.

### **Shigella**

Shigellosis or bacillary dysentery is an acute, febrile, intestinal disease characterised by watery diarrhoea associated with abdominal cramps, often with vomiting. Convulsions are common in children. Dysentery, the definitive clinical manifestation of shigellosis, is defined as frequent passage of bloody stools with mucus and abdominal pain. In severe cases, the stools may contain blood, mucus and pus. The severity of *Shigella* infections depends on

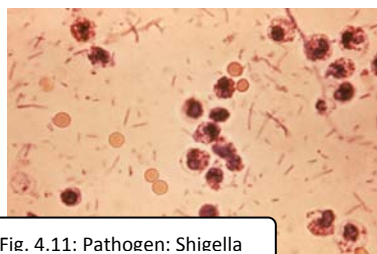


Fig. 4.11: Pathogen: *Shigella*

many factors such as previous exposure, infective dose, age and general health of the patient and the type of the bacterium causing the infection. *Shigella dysenteriae* 1 (Shiga's bacillus), the prototypic member of the genus *Shigella*, identified by Kyoshi Shiga during an epidemic of severe dysentery in Japan in 1896, causes a more severe diarrhoea than that caused by other *Shigella* species.

The infectious dose is low: 10–100 organisms. Although the incubation period may vary between seven hours and seven days, foodborne outbreaks commonly are characterized by shorter incubation periods of up to 36 hours. Shigellosis is self-limiting with illness lasting from 3 days up to 14 days. Occasionally a carrier state may develop which can persist for several months. Although rare, bacteraemia, haemolytic uraemic syndrome, Reiter's syndrome,

development of disseminated vascular complications and reactive arthritis may occur as a result of *Shigella* infection.

Human-to-human transmission is by the faecal-oral route. Most cases of shigellosis result from the ingestion of faecally contaminated food or water, and with foods, the major contribution to contamination is poor personal hygiene of food handlers.

Epidemiological observations suggest that both *Shigella* infections and environmental exposure may elicit serotype-specific immune protection. However, the occurrence of epidemics of *S. dysenteriae* 1 in areas endemic to other *Shigella* serotypes suggests that the immunity induced by environmental exposure can be circumvented by the introduction of a serologically heterologous strain. Owing to the lack of efficacy of killed bacterial vaccines, contemporary *Shigella* vaccine research has concentrated on several strategies. These are, the use of living attenuated strains that will elicit the protective immune response of a *Shigella* infection without the symptomatology of shigellosis, vaccines that induce cell mediated immunity, ribosomal vaccines, and purified O-specific side chains of *Shigella* lipopoly saccharide (LPS) conjugated to carrier proteins to elicit IgG antibodies. To date, none of these strategies has produced a safe, affordable and effective vaccine.

### **Yersinia enterocolitica**

In 1997, *Yersinia enterocolitica* had all the hallmarks of an emerging pathogen. However, in Australia at least, it seems that this organism is now of declining significance as a food-borne pathogen.

*Y. enterocolitica* was first described in 1939 and included in the Genus *Yersinia* by Frederiksen in 1964. Bottone has reviewed the early history of this organism. Over the last 40 years, *Y. enterocolitica* has been described as an important cause of food-borne disease from many countries, particularly those with a temperate climate. It would seem to be a particular problem in northern Europe and Scandinavia, parts of North America, Japan and New Zealand. Most cases are sporadic but some outbreaks have been reported. Many foods have been incriminated as a vehicle or source of infection but it is now clear that pigs directly or indirectly are the main primary source of human infections.

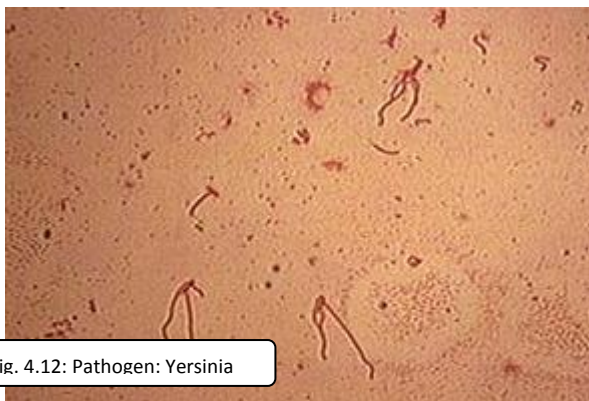


Fig. 4.12: Pathogen: *Yersinia*

Human infections are mainly caused by a small number of pathogenic bio-serotypes that carry a plasmid encoding a number of virulence factors. The current predominant pathogenic strain belongs to biotype 4 and serotype O:3. Newer molecular techniques provide the opportunity for direct detection and differentiation of pathogenic strains in clinical samples and foods.

*Y. enterocolitica* is a heterogeneous group of organisms in a genus that includes two other species pathogenic to man — *Yersinia pestis* and *Yersinia pseudotuberculosis*. These three pathogens have many characteristics in common. There exist further species of *Yersinia* that share habitats with the pathogenic species, but are not themselves primarily pathogenic.

The above list is not exhaustive. There are many more pathogens and those quoted above are only the most common examples.

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## Chapter 5

### Preventative Measures

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Doyle (1993) presents the view that programs most likely to have the greatest impact on the microbiological safety of food are those that focus on reducing, controlling, and (where possible) eliminating pathogens in foods of animal origin. The approaches presented by the US Department of Agriculture's Food Safety and Inspection Service in its "War on Pathogens" are well founded and, if properly executed, should lead to major reductions in foodborne illness.

Doyle continues (p. 246) to express that special emphasis should be placed on the following four areas:

1. Risk analysis, management, and communications. Regulatory agencies are not likely to be able to regulate pathogens out of all foods; an alternative is to regulate on the basis of risk. Many foods, especially those of animal origin, carry with them an inherent risk because of the occurrence of microbial pathogens. Some pathogens, such as *Listeria monocytogenes*, are frequently consumed, but only cause illness in a very small segment of the population. It is not reasonable to mandate a zero tolerance for *L. monocytogenes* in all foods because of the widespread occurrence of the organism and the infrequency of the illness it causes.

A risk assessment approach is needed to address this issue. Information is needed to identify the foods most frequently associated with illnesses, to identify the minimum infectious dose of harmful microorganisms, to determine the survival and growth characteristics of pathogens in foods, and ultimately to determine what levels of pathogens may or may not be tolerable in different foods.

2. Development of innovative approaches to produce pathogen free foods from animals. Animals often carry microbial pathogens within their intestinal tract and on hide, skin, feathers, and feet. With the frequent occurrence of internal and external contamination by harmful microorganisms, present-day slaughter and primary, processing procedures cannot reliably produce pathogen-free raw foods. Innovative, practical approaches, such as the use of probiotics or competitive exclusion, are needed to reduce the conveyance of pathogens by animals.

3. Research to support the implementation of effective HACCP Programs. The HACCP approach to producing and preparing safer foods is conceptually well based and scientifically sound. However, two important needs reduce the potential of HACCP for controlling or eliminating foodborne pathogens in many food processes. These needs include:

- Real-time procedures for detecting and isolating pathogens in the environment of food-processing facilities. The present one - two four-day procedures for isolating pathogens takes too long. Tests that can be completed within minutes or hours would enable processors to take quick corrective action when pathogens are detected.
- Definitive kill steps that can be applied at critical control points to insure that pathogens are destroyed. Innovative, practical methods that can be effectively used in food-processing facilities are sorely needed.

4. Develop innovative approaches to educate consumers and food preparers in proper food-handling practices. The incidence of salmonellosis, which is principally transmitted by

foods, has increased dramatically during the past three decades. Several approaches have been taken to educate food handlers and consumers about proper food-handling practices, yet the occurrence of foodborne illness continues unabated. Reducing the incidence of foodborne disease is a challenge for the future, with a principal problem being the improper handling of foods by consumers and those involved in commercial food preparation. Innovative approaches to educating consumers and food preparers about proper food preparation techniques are needed. In addition, consumers must be made aware of the risks of foodborne illness from eating raw or undercooked foods of animal origin.

With limited funding available for food-safety research and education, we need to focus our efforts on issues likely to have the greatest impact on reducing foodborne disease. Although Doyle is not alone in the above areas of food safety risk control, what is of real interest is why has so little changed since 1993? Much of the same appears to be republished every year and on the surface there appears to be very little improvement. Despite massive evidence to the contrary, there seems to be a too-common perception that the American food supply is increasingly hazardous and often deadly (Cliver, 2000). Another term for this increasingly prevalent view is "risk aversion." It seems that, as life expectancies increase, the public is even more unwilling to accept the fact that they are going to die of something, eventually. The result is that any perceived threat is viewed as huge.

“Meanwhile, a phenomenon of recent years is the advent of organizations that seem to make a fairly comfortable living by decrying the safety of U.S. food, and soliciting contributions from the public to do something about it. They have shown that, in the absence of scientific knowledge, stridency carries the day. Their insistence on absolute safety regardless of cost has earned them the title of "The Marie Antoinette School of Nutrition." (Doyle 1993 p. 47)

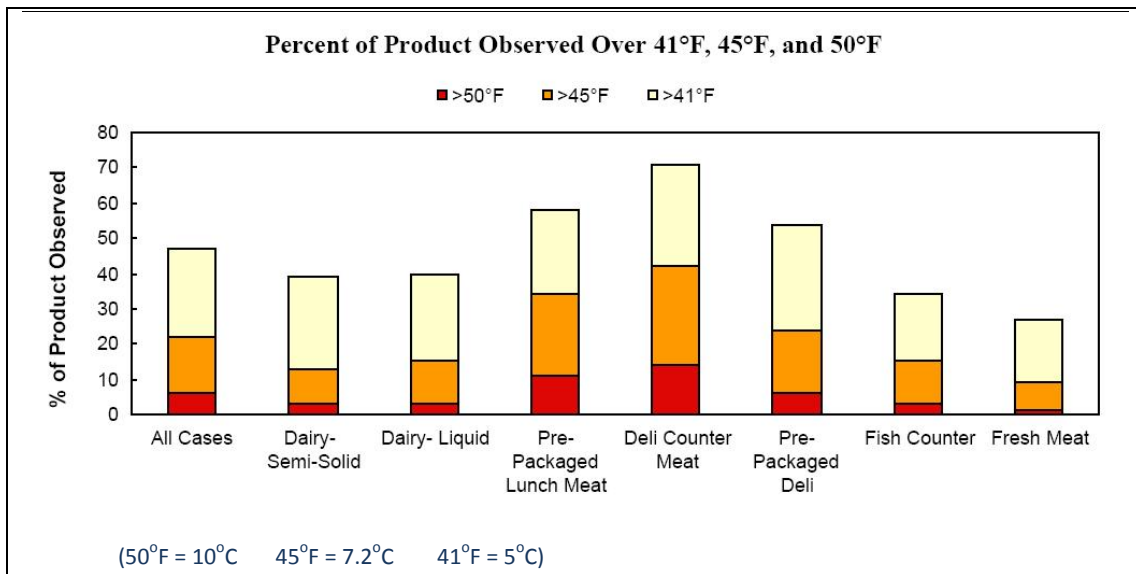
A subset of every population is exceptionally vulnerable to foodborne illness. They include infants, the elderly, pregnant women, and people whose immunity is impaired (e.g., those receiving cancer therapy, those immune-suppressed after a transplant, those infected with HIV, etc.). Although the existence of this "at risk" category is well known, opinions differ as to whether all foods should be safe even for them, or whether the most vulnerable should take some special precautions on their own.

Those who want all foods risk-free for even the most vulnerable consumers are imposing much higher food prices on the majority, who have little to gain by extreme safety measures. In fact, at a time when foods that have been thermally processed in their hermetically sealed containers (usually cans) are increasingly perceived as nutritionally and gastronomically inferior, these are the products that offer the margin of safety needed by those with impaired immunity. People who insist on eating raw fruits and vegetables must realise that these can never be made 100% safe. Many organisms from the air and soil can cause illness if the food is improperly handled or if the consumer is exceptionally vulnerable.

Hoornstra and Notermans (2001) report their findings associated with food processing/manufacturing. This processing is different from food preparation in a number of ways:

- Takes place on a large scale
- One product manufactured at the time
- Often takes place under fully controlled environment
- Staff specifically trained for each specific production
- Production is processes driven

Their article further illustrates the differences between the manufacture and preparation driven food safety production issues. (See Fig. 5.1)



**Figure 5.1 Differences between manufacture and preparation driven food safety production issues**

Once food safety objectives have been defined, food companies have to translate these objectives into criteria, etc. that apply to their processes and or products. To achieve compliance, food companies can take a simple approach, by estimating the probability of occurrence of contaminants in end products, which gives an assessment of the food companies risks, e.g. of exceeding the criteria set by governments, clients or the company itself. This approach, focussing on assessing the occurrence of contaminants in end products, does not involve hazard characterisation dose-response, or consider the amount of product that might be consumed.

These two factors are very complicated, and cannot be effectively assessed by food companies. On the other hand, they are very important for governments in relation to setting food safety objectives. When a food company carries out a risk assessment, the factors contributing to a certain risk will be prioritised and critical limits will be set in order to meet the criteria and specifications. Cost-benefit analysis can also be carried out, to assess the economic impact of possible improvements. This approach is in some ways similar to the hazard analysis element of the HACCP plan. However, the systematic method of risk assessment is much more extensive and quantitative in nature.

While the process focuses on food safety, i.e. the prevention or control of pathogens, food spoilage also poses important challenges to food companies, e.g. leading to claims, recalls, etc. A systematic risk assessment can include non-pathogenic spoilage micro-organisms, underpinning the prediction and extension of product shelf life, within an overall process to food safety and food spoilage problems.

The identification of risk factors is an important and early step in risk assessment procedures. Risk factors contribute to the risk of occurrence of a foodborne hazard. It may contribute to the introduction, increase or decrease of the hazardous agent. Risk factors are influenced by the quality of raw materials, steps within the process environment, as well as the composition, packaging and storage conditions of the final product. When such a method of collecting and analysing information on the characteristics of contaminants, and

conditions leading to the food safety risks had been applied, control measures necessary to reduce a risk to acceptable levels can be determined. The impact or the effect of a risk factor can be quantitatively determined using worst-case or statistical approaches.

The worst-case approach considers a succession of extreme situations in the process, under which an improbable series of unfavourable events could occur simultaneously, leading to loss of adequate levels of product safety. If the results from such worst-case analysis still show the product quality to be within the specifications, the product can be considered as safe. In other cases, the results should be subjected to further analysis as the worst-case analysis is by definition always an overestimate of the likely risk.

Hoque (2003) presents a different slant on the preventive task of hand washing in Bangladesh. He states that:

“Worldwide, hand washing is one of the few practices that has been universally promoted by people of various religions and cultures throughout the ages. However, it still remains an important challenge in the prevention of disease. This paper describes the practices and challenges of hand washing in Bangladesh. Hand washing as a practice has been shaped by culturally learned patterns. Longstanding religious and secular patterns are involved in the ideas and behaviours of people with respect to cleanliness and hand washing techniques. Cleanliness for prayer is a particularly important concept among Muslims who must perform *ozu* by washing both their hands, arms up to the elbow, face and legs up to the knees – all of this three times – using clean water before every prayer session. The prayers are mandatory five times a day and there is a need to be ‘clean’ both in body and mind to perform them. Most South Asian groups share strong traditional concepts concerning the separation of the left hand from the right hand – each hand is used for specific purposes. One reason for this separation is that the left hand is used for cleaning post-defecation. Under these circumstances it may be surprising that Muslim people do rub their hands together in *ozu*. This suggests that hand washing behaviours on the Indian subcontinent are affected both by religious and secular ideas.”

Hand washing is also influenced by the availability of soap or another agent. Use of soap or ash is not common on the subcontinent because most of the population are very poor and cannot afford to buy soap (Nath 1993).

However, it is recognised by a large number of researchers and authors that hand washing, or rather, the lack of hand washing is a major contributor to food borne illness outbreaks.

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## Chapter 6

### Hazard Analysis Critical Control Point (HACCP)

HACCP is a systematic approach in identifying, evaluating and controlling food safety hazards. (U.S. Department of Health and Human Services, Public Health Service, Food and Drug Administration, 2001). Food safety hazards are biological, chemical or physical agents that are reasonably likely to cause illness or injury in the absence of their control. A HACCP system is a preventive system of hazard control rather than a reactive one. HACCP systems are designed to prevent the occurrence of potential food safety problems. This is achieved by assessing the inherent hazards attributable to a product or a process, determining the necessary steps that will control the identified hazards, and implementing active managerial control practices to ensure that the hazards are eliminated or minimized.

According to the European Commission there is a widespread belief the food industry should accept full responsibility for controlling any adverse, and Raaska health effects that may be present in the foods they produce (Tuominen et al., 2003). The food supply system forms a continuum from farm to fork, and sources of food-borne disease may be found at any step of the food chain. (See Table 6.1 for example.)

Estimate of Juice-Associated Cases Covered per Year	
Hazard	Case
<i>B. cereus</i>	3,420
<i>C. parvum</i>	3,210
<i>E. coli</i> O 157:H7	200
<i>Salmonella</i> (non-typhi)	2,430

- Laboratory Studies
  - 4.4% of juice samples positive for *E. coli*
  - even juice from “tree picked” fruit and manufactured under CGMPs may contain pathogens
  - O157:H7 survives in juice-strength acid and survives refrigeration

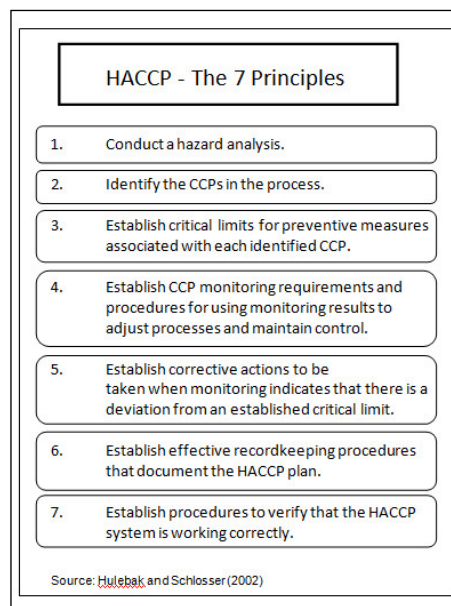
**Table 6.1 Organisms responsible for food poisoning from juice**

Food suppliers are required to apply the principles of HACCP to ensure the safety of their products. The HACCP principles have been internationally accepted and approved, and details of the approach have been published by the Codex Alimentarius Commission (Codex, 1997a). In the United States, the Pathogen Reduction/Hazard Analysis and Critical Control Point System Rule concerning meat and poultry production, was regulated in 1996 as a result of the need to remove responsibilities from inspectors to the establishment. In Europe, the current hygiene directive (EC 93/43/EEC, 1993) in the EU states that the HACCP principles should form the rationale behind risk management decisions; however, no formal HACCP plan is required.

Although the HACCP philosophy has been used as a tool in food safety management for years (Tuominen et al., 2003), there is also open acknowledgement that companies have had problems with its practical application. Implementation can be hindered by lack of time,

expertise, training, motivation, commitment and/or funding, particularly in small and medium-sized enterprises (SMEs). In order to obtain the best benefit from HACCP, the prerequisite programmes supporting HACCP should function properly. Furthermore, food safety and quality should be tackled separately, with emphasis primarily on food safety. Written documentation behind the development of specific HACCP plans, which would ease validation and re-assessment, has also been difficult to procure, particularly in SMEs or where no previous quality management system exists and thus record keeping is not part of the company culture (Mortimore, 2001; Panisello & Quantick, 2001). In HACCP development, extensive effort is made in producing a reliable hazard analysis to begin with.

The principles of HACCP (Table 6.2) are practised in a large variety of businesses, growers, manufacturers, and food selling establishments and a number of methods are used in order to collect valuable data.



**Table 6-2 HACCP – The Principles**

Angelillo, Viggiani, Greco, and Rito, (2001) state that questionnaire studies examining the knowledge, attitudes and self-reported practices of food handlers may provide general indications of the food safety practices undertaken by commercial food handlers (Angelillo et al., 2001; Walker et al., 2002). However, food handlers' knowledge of food safety is not always translated into good hygiene practices in reality, and it has been shown that food handlers tend to overestimate the frequency with which they carry out food safety practices.

Cliver (2000) conducted a study in the effectiveness of testing food for hazards. Statistical analysis was used as the basis of his rejection of that process which he termed as ineffective. The HACCP approach (Table 6.3), where appropriate, does a better job of achieving food safety than methods previously in place, and had made a fair start toward implementing the system voluntarily before it was mandated by regulators. Now federal regulators seem to be urging that HACCP be adapted to all segments of the food system, whether legitimate critical control points can be identified or not. This might work if the entire farm-to-table sequence were regarded as one continuum that, collectively, required at least one critical control point. Such an approach has worked with pasteurising milk. Despite many other precautions, beginning at the farm and ending at the retail outlet, the only critical control point is pasteurisation, and the safety results have been salutary.

1	HACCP Team Formation
2	Product description
3	Identify Use for Product
4	Construct Flow Diagram
5	Confirm Practicality of Flow Chart (On Site)
6	Prepare List of Both HA and CCPs (Observation)
7	Determine Practicality of all Hazards and CCPs
8	Establish All Critical Issues for Both HA and CCP
9	Prepare a Monitoring System
10	Establish Correction Procedures
11	Construct a Verification Process for Points 4-10
12	Construct Documentation and Record Keeping Process

Source: Cliver (2000), modified by J. Kramer

**Table 6.3 HACCP - The Process**

A Food Safety Programme is based on the seven principles of HACCP. Grigg (1998) lists these principles as:

1. Identify potential hazards associated with food production at all stages. Assess the likelihood of occurrence of the hazard and identify preventive measures for their control
2. Identify points/procedures/operational steps that can be controlled to eliminate the hazard(s) or minimise the likelihood of its occurrence (critical control point (CCP))
3. Establish target values and critical limits which must be met to ensure the CCP is under control
4. Establish a system to monitor control of the CCP by scheduled testing or observations
5. Establish the corrective action to be taken when monitoring indicates that a particular CCP is:
  - a. out of control
  - b. moving out of control
6. Establish procedures for verification to confirm that the HACCP system is working effectively
7. Establish documentation concerning all procedures and records appropriate to these principles and their application

In addition to the above there is a FDA listing of eight procedural steps in its guide of HACCP principles for operators of food establishments at the retail level (FDA Annex IV, 1998). Steps 3 to 8:

- 3 Identify CCPs and Critical Limits
- 4 Monitor Critical Control Points
- 5 Develop Corrective Actions
- 6 Conduct On-Going Verification
- 7 Keep Records

## 8 Conduct Long-Term Verification

Steps 3 and 4 are the real procedural steps.

The last step, long-term verification, leads to crosschecking each of the principles and the methods.

Lee & Hathaway (2000) express the opinion that the verification of HACCP involves more than just completion and implementation of the seven HACCP principles. The components that the processor and the regulator must agree on are covered by the following key outcomes of a HACCP plan audit process:

- Determination as to whether all required elements are present in the HACCP plan and that they are addressed adequately;
- Determination as to whether the procedures are effective with respect to achieving acceptable Food Safety Objectives (FSOs) for the product/process on an on-going basis;
- Determination as to whether actual events comply with the documented procedures that have been validated by industry or an approved third party.

It is very likely that as HACCP progresses in the years to come, other steps will be added to the present principles.

Auditors also review HACCP documents to ensure there is a preventive system in place to safely produce food. Lee & Hathaway (2000) continue:

"Evaluators will spend as much time inspecting documents and records as they will studying a facility's cleanliness," says Bill Schwartz, vice president, processor food safety programs, for NSF Cook & Thurber, an Ann Arbor, MI-based not-for-profit auditing firm. "Maintaining up-to-date distribution records also is very important in case there is a recall. Documents must show where every product was shipped and the ingredients used in those products."

A successful food policy demands the traceability of feed and food and their ingredients. Adequate procedures to facilitate such traceability must be introduced. These include the obligation for feed and food businesses to ensure that adequate procedures are in place to withdraw feed and food from the market where a risk to the health of the consumer is posed. Operators should also keep adequate records of suppliers of raw materials and ingredients so that the source of a problem can be identified. It must be emphasised however that unambiguous tracing of feed and food and their ingredients is a complex issue and must take into account the specificity of different sectors and commodities. (Commission of the European Communities, White Paper on Food Safety, 2000)

The monitoring of plant cleanliness, structural conditions, and worker practices, however, also remain key audit objectives. Inspectors spend ample time studying factors that can lead to contaminated meat and poultry. Such elements may include determining if a facility uses sanitizing solutions that are inadequate for killing all surface bacteria, and if plant equipment, cleaning accessories, and food-processing equipment are potential trouble spots. Undetected crevices on machines, for instance, can grab a dirty bristle or fibre from a cleaning brush, resulting in bacteria build-up. Condensation forming on ceiling heating, air conditioning, or ventilation units, meanwhile, can drip on and taint meat, poultry, and processing machinery.

A more streamlined set of seven HACCP principles has since been developed and Sperber (2005) published the following:

1. Conduct hazard analysis
2. Determine critical control points
3. Establish critical limits
4. Establish monitoring procedures
5. Establish corrective actions
6. Establish verification procedures
7. Establish record keeping procedures

It is generally recognized that 1,2 and 4 were developed prior to 1972 and all seven were published in one form or another in 1997.

## **Principles of HACCP**

Baker (2002) presents a case study whereby a local health department inspected one outlet of a large, multinational catering company. A temperature measurement of roast beef being served from a carving station was at 58°C. The health department cited the caterer for not serving the roast beef at 60°C according to hot holding regulations. The caterer removed the product from their menu, as heat lamps could not consistently assure a 60°C product temperature. The caterer could not raise the holding temperature as higher initial roast beef temperatures would over cook the product and negatively affect quality.

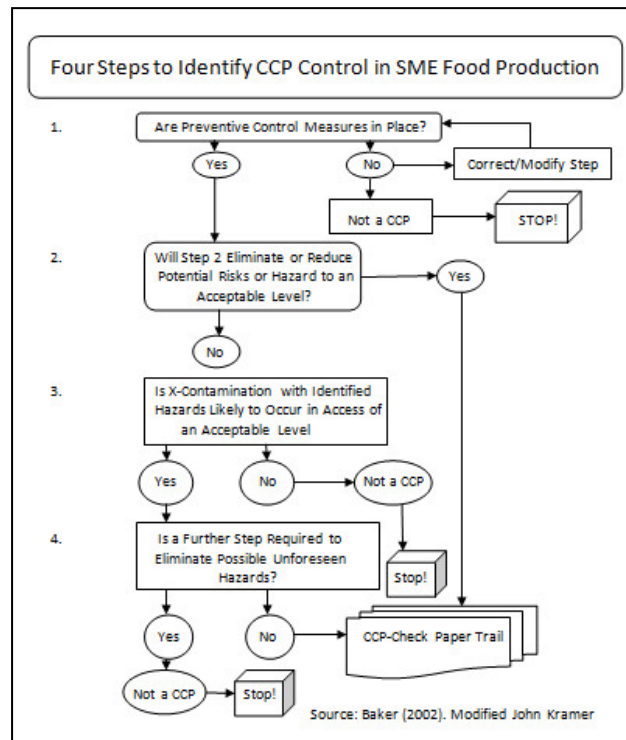
A risk assessment was performed to understand the complete process of the preparation and service of rare roast beef. The working instructions for each step of this process were validated for their effect and integrated with a specific HACCP plan. The outcome was a risk management strategy that clearly and scientifically demonstrated a safe process for the service of high quality, rare roast beef. The HACCP plan ensures food safety objectives are consistently achieved. Defining food safety objectives for the service of rare roast beef enabled the caterer to communicate how much risk reduction was achieved and how food safety management demonstrated compliance with the intentions of food safety regulations.

This risk management strategy incorporated all the food handling criteria specified by the specific health department concerned and recommended food handling guidelines in general. A HACCP based food safety system that was integrated with restaurant policies, operations, documentation and communication strategies could have avoided the costly exercise of removing a highly profitable menu item, the associated loss of market momentum, heightened regulatory scrutiny and the potential to raise questions of consumer confidence.

With the introduction of cooking systems like low temperature cooking (Alto-Shaam) and on-the-premises sous-vide cooking the boundaries are being stretched. If executed correctly by trained staff these create little risk. However, lack of understanding the cookery time principles is just a food safety incident waiting to happen.

Sterilising technique under extreme high pressures works a treat, however, the likelihood that staff become complacent is very real. Working under pressure leads to the first bad habit in a chef's repertoire: *The "Shortcut"* which leads to unforeseen issues.

Of interest is that Baker (2002) demonstrated that it is possible to still adhere to HACCP procedures when undergoing a change in methods. Far too often food workers and food management complain that the implementation of HACCP is too difficult and does not suit their establishment. With a fresh approach to most food safety problems there is ample room for HACCP to be introduced. (See Figure 6.1)



**Figure 6.1 Example of (HA)CCP decision tree**

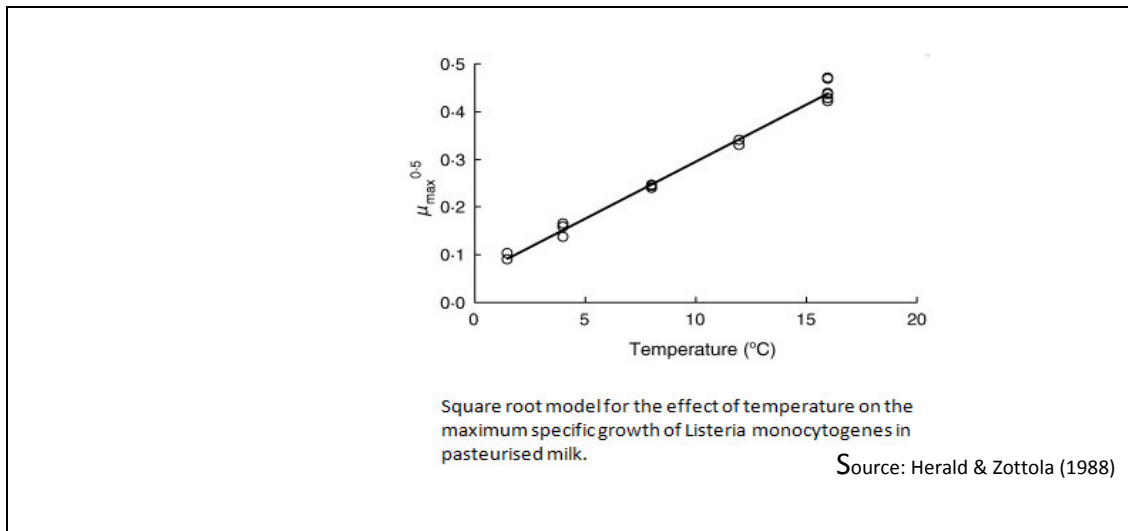
Clayton and Griffith (2004) observed that worldwide epidemiological research has identified major risk factors contributing to food-borne disease outbreaks.

Typically these factors include:

- Inadequate heat treatment,
- Inappropriate storage of foods,
- Infected food handlers and cross-contamination

“Data on these contributory factors are of great importance for assessing risks. They offer a starting point for training interventions and have been used for the identification of critical control points within HACCP. However, this approach often amalgamates a large number of malpractices and process failures into general categories, which may be difficult to relate to specific operations carried out in food service establishments. There is also a lack of consistency in how these risk factors are categorised and reported so it is difficult to make comparisons across studies. Furthermore, risk factors are generated from investigations of food-borne illness outbreaks, which tend to be reliant on the recall of events.” (ibid p.212)

This could lead to errors in the identification of the causes of food-borne illness and it has been argued that cross-contamination events may be under-represented in these statistics.



**Figure 6.2 Effect of Temperature on Listeria**

Fallows (1994) highlights three major features:

1. There is a requirement that proprietors of food businesses must ensure that food handlers are adequately supervised and instructed and/or trained in food hygiene matters. The extent of training should be "commensurate with their work activity". This is a useful step forward, but does not go as far as many had hoped at the time of the introduction of the Food Safety Act in 1990 (UK). It remains to be seen how the phrase "commensurate with their work activity" will be interpreted by the courts. However the document on the preparation of industry foods does expand on the training requirements.
2. Food businesses will have a duty to identify and control potential food hazards. This is the utilisation of HACCP principles and provides the basis of future enforcement that will be determined largely by assessments of probable risk. A revised Code of Practice on Food Hygiene Inspections is to be introduced to coincide with the regulations, and risk assessment is a central theme.
3. Industry is to be encouraged to develop Guides to Good Hygiene Practice. Businesses within a particular industry sector will be encouraged to contribute to the drafting of the Guides and will be expected to use them in their day-to-day activity. It is not clear how this is to be achieved, except for those sectors of the food industry for which there is a clearly recognised trade association that may take the lead. Inevitably, the driving force will be the larger companies, with the guides subsequently "imposed" on smaller, less influential businesses.

Eleven years later has seen some progress but serious questions should be asked why the dream of 'safe food' behaves almost as if out of focus.

Herald and Zottola (1988) portray the influence of temperature on *Listeria* on pasteurised milk. (See Figure 6.2)

## Further History and Future of HACCP

A key provision of the World Trade Organization's Sanitary and Phytosanitary (SPS) Agreement is the requirement for countries to take the necessary SPS measures to assure the safety of foods in international trade. Governments have the right to reject imported food that could jeopardise the health of their consumers, i.e. food that would not meet a specified Appropriate Level of Protection (ALOP). Codex standards, guidelines and codes of practice serve as guides for appropriate national standards. WTO member states are obliged to harmonise with these standards wherever possible. Codex standards are based on risk assessments. In the absence of Codex standards, risk assessments should be used to settle an issue when disputes in international trade in food arise. This agreement prompted the development of microbiological risk assessments that could be used proactively to quantify risks to health posed by microbiological hazards in food, and whether the risks faced by consumers exposed to the imported product would be greater than equivalent products from the domestic industry.

Recognising the difficulty of using public health goals such as an ALOP to establish control measures to avoid conflicts, the concept of Food Safety Objectives (FSO) has been introduced. An FSO converts the ALOP into parameters that can be controlled by food producers and monitored by government agencies. The ALOP is an expression of a public health risk, while an FSO expresses the level of a hazard in relation to this risk.

The basic hygiene texts in the Codex Alimentarius (Codex Alimentarius, 2001) outlines procedures to make the safe food concept levels more concrete. It is difficult to imagine a world without the Codex Alimentarius. It has been said that if Codex did not exist, somebody would have to invent it. Consumer demand, recognition by WTO, the growing attendance at Codex meetings and the greater involvement of developing countries, all point to a long and active life for the Commission.

However, Codex activities of the future will differ considerably from what they have been until now. Scientific developments in fields relating to food, changing attitudes of consumers, new approaches to food control, changing perceptions of government and food industry responsibilities and changing food quality and safety concepts will present the Commission with new challenges and, conceivably, the need for new standards.

When designing and controlling food processing systems it is necessary to consider microbiological contamination, destruction, survival, growth, and possible recontamination (FAO, 2001). Consideration should also be given to subsequent conditions to which the food is likely to be exposed, including further processing and potential abuse (time, temperature, and cross-contamination) during storage, distribution and preparation for use. The ability of those in control of foods at each stage in the food chain to prevent, eliminate or reduce food-borne hazards varies with the type of food and the effectiveness of available technology.

When a FSO has been established to express the level of a hazard at the time of consumption, another term is needed to describe required levels of hazard control at other points of the food chain. Performance criteria can be used to fulfil this role. For the purposes of this document, a performance criterion is defined as "the required outcome of a step or a combination of steps that contribute to assuring that a FSO is met."

The establishment of a performance criterion can be a competent authority and/or an industry activity. In both cases it is the industry's responsibility to meet the criterion.

Whenever a competent authority changes a criterion, this should be communicated to all relevant parties.

When establishing performance criteria, consideration should be given to the initial level of a hazard and changes occurring during production, distribution, storage, preparation and use of the food. (The availability of an MRA that includes modelling of the hazard exposure pathway will be of particular assistance here).

A HACCP system that really works in practice will depend on the competency of both the people who developed, and those who operate it, and the prerequisite programmes, which support it (Mortimore, 2001). If it is to be truly successful then there must be an overriding internal belief in the HACCP approach and what it can do for the business once properly implemented. The critical success factors will thus be:

- Proper preparation and planning
- Trained and educated people
- Belief in the approach by all personnel
- A shared commitment to food safety

It will be successful only if it has been put together by people with sufficient technical ability, implemented with enthusiasm and driven by forces within the organisation.

Ehiri, Morris and McEwen (1995) report that food organisations have not embraced the HACCP strategy with the enthusiasm originally anticipated. Difficulties, the authors claim, are due to the voluntary status of the approach, coupled with a limited understanding of the strategy itself among operators. This applies particularly, as Kirby (2002) states, to small- and medium-sized enterprises (those with less than 500 employees), where there may also be insufficient technical resources. To whatever extent this is the case with HACCP, it is likely to be equally if not more true with regard to the understanding and application of SPC techniques. The model of a fully operational HACCP system coupled with SPC on the CCPs therefore represents something of a holy grail.

Sperber (2005) wrote that the processes by which the current global food safety system and HACCP system evolved were contemporaneous and entirely transparent. The current global food safety system, under the auspices of the United Nations, began in 1945 with the organization of the Food and Agriculture Organization. As far back as 1947 the General Agreement on Tariffs and Trade (GATT), recommendations included provisions for countries to apply measures necessary to protect human, animal, or plant life or health.

Several GATT stipulations were that measures adopted by an individual country must not unjustifiably discriminate between countries where similar conditions prevail, and must not act as disguised restrictions on international trade. These provisions proved far reaching. The formation of the FAO/WHO Codex Alimentarius Commission (CAC) followed in 1963. The aims were twofold, the first to protect the health of consumers, and secondly to ensure fair practices in world trade. The next step was the formation of the 1994 Sanitary and Phytosanitary Agreement (SPS), 'transparency' being most important underlying concept. The formation of the World Trade Organization (WTO) was an equally important step forward shortly after after the SPS formation.

At the 24th Session of the Codex Alimentarius Commission held in July 2001, it was decided that the Task Force expand its work in starting the work on drafting a Proposed Draft Guideline for the Conduct of Food Safety Assessment of Modified Microorganisms in Food and established a new Working Group to prepare a draft document on this. The FAO and

WHO at that time announced that they would jointly convene a third joint Consultation to consider the scientific aspects of the safety assessment of genetically modified microorganisms in foods in support of this new work.

The FAO and WHO convened this Consultation to evaluate the build-on-experience gained since the previous two FAO/WHO Consultations and to assess whether currently available approaches for assessing the safety of foods and food ingredients derived from genetically modified plants, could be applied to GMMs. The Consultation examines unique aspects to be considered in the safety assessment of foods produced with the aid of GMMs.

The safety and risk assessment of foods, including genetically modified foods, are generally considered within a framework of risk analysis. Within this framework, reference can be made to the use of precaution in risk management and risk assessment. Ongoing discussions within the Codex system will help guide these considerations further.

Johnston (2000) highlights a section of HACCP that is more and more identified as being equally important in the production of safe food.

“Whenever food production and processing is mentioned in relation to food safety the use of the HACCP system is suggested. HACCP enables decisions on whether control, absolute or in part, can be applied to limit the hazards, and determines the methods for monitoring and controlling the process. The use of HACCP has become rather ‘all things to all in the food industry’, and perhaps even to different Governments but there is good reason for using HACCP principles behind the farm gate. In livestock production, there are a number of points where controls can be applied”. (Johnston 2000 p.52)

Disease in animals is inevitable on farms, no matter how good the husbandry. In terms of food safety, one option for control would be to eradicate specific agents if they are identified on the farm (ibid). This, however, depends first on being able to identify the agent in the herd or flock. In addition to there being an accurate ‘test’ available, there is the need to decide if eradication is really necessary, for animal health and human health reasons, or for both.

That HACCP implementation into SME in New Zealand may prove more difficult than envisaged does not necessarily mean that the principles of HACCP should be abandoned. With the proposed Food Act being a step in the right direction it should be realised the legislation cannot be introduced with the stroke of the ministerial pen. HACCP being manufacturing based where a group of persons produces a single item for resale in the space of a day is the very opposite from SME where on average a single person may produce anywhere from 12 to 36 items during their business hours in a single day. Threats to ‘conform or get out’ have not worked previously and will not work in the future except under extreme and justifiable circumstances. The very nature of these small establishments gives their proprietors a chance to make a living in an extremely competitive industry. The reasons for the competitiveness is beyond the scope of this study. What is required are robust rules of compliance whereby it is possible to improve our record on food safety over a period of time.

The long overdue changes have shown a lack of political will to address the food safety issues for a long time. For this reason can we now expect the SMEs to comply? As explained earlier in this thesis the cost of food borne illness is very high and will continue to rise each year as part of an international trend. Only by having a workable Food Act in place can the rise in costs be expected to halt or diminish.

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# Chapter 7

## Observations

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### **Safe Food, a Healthy Thought**

The following is a window through which to view how “food safety” in small to medium New Zealand hospitality businesses will progress in the near future. The view is not from a microbiological perspective but rather from a management view.

#### **Scenario:**

Eating house customers in New Zealand do not only have to contend with high prices and indifferent service but statistics have us believe that there is a higher proportion of customers suffering from food-borne illnesses than those in comparable countries.

#### **Hype, truth, rumour mongering or media distortion?**

This section starts by looking at the present situation followed by questions and a discussion on how to improve the situation.

What message is the above scenario trying to tell us?

An article in the ‘Dominion Post’ (Monday, 26 February 2007, p. A6) paints a picture of a person having eaten right throughout the world to arrive home and fall victim to campylobacter food poisoning, and stating that this (the food-borne illness) had only happened once throughout her travels while in Egypt.

Statistics indeed have us believe that our rates of food-borne illness are much higher compared to other ‘developed countries.’ It may be wise to change the wording to ‘reported food-borne illness’, which puts a different slant on who reports what in which country. It would be very trusting to accept the reported rates in New Zealand and, being comparable to the tip of an iceberg, the actual figures are likely to be much higher. That campylobacter, with at least another ten pathogens lurking in the background, is just one of the many organisms affecting our health brings home to us that all is not well. Having been active in the food industry for approximately 50 years, this researcher has never had his health compromised by a case of food-borne illness, but this is more likely due to luck rather than wisdom as he eats almost any foods in any combination imaginable.

In the home, occurring outbreaks are very unlikely to be any different from commercial enterprises, yet are the figures available correspondingly high?

The chance that a person trained in food safety principles is causing food-borne illness must be ranked much lower than with an untrained person. If there is an anomaly in this area, the authorities should perhaps look at legislating toward a much more comprehensive training scheme than the present food safety training requirements.

In the home, common sense food safety awareness has been extensively promoted for some considerable length of time by the New Zealand Food Safety Authority under the guise of numerous campaigns. To an experienced person these campaigns make sense, but is there evidence that they actually work? Today’s ‘bullet proof’ generation needs to be better educated on issues threatening not only their health but also the wellbeing of their immediate family and relatives.

It would be very interesting to research if a person, developing a food borne illness as a result of eating food cooked in their own home, would be as quick to report this incident as

they would be when the incident had occurred as the result of eating food in commercial premises.

The foresight of previous generations to make it compulsory for incidents of food-borne illness to be recorded is commendable. The system provides for good statistical evidence from which scientists, academics, and politicians, as well as the layperson, can draw conclusions. Cynically speaking there is always the season to draw attention to these statistics, which feeds the media machine. A report that one academic actually advocated that chickens should only be sold in supermarkets made excellent reading for a number of days.

However, having said all of this, there is an urgent need to address the recorded results, as these levels are not acceptable in today's society.

Of interest is that society measures outcomes by costs involved to achieve the objectives, which in this case is the prevention of food-borne illness. What are the real costs of food-borne illness to society? Many researchers have come up with a colossal sum; enough to frighten society out of its apathy to address the situation. Yet, what has been done to date? If foods were made safer to consume, what additional cost would the customer be charged?

Does society need to re-address the way we prepare food? Technically, we are capable of producing pathogen-free '*safe*' food, at a cost. However, the problem is that the minute human beings come close to foods these lose their safety aspect. It is encouraging to see the range of pre-prepared foods available to the public at large, and in the near future we shall start to see foods prepared from ground up as stand-alone products rather than a traditional '*roast meal in a bag*' to be reheated. Cost will continue to play an important part when purchasing these food types and in their acceptance by society. With an aging population having a financially hard time, this situation is not likely to improve. Purchasing such pre-prepared foods at a single meal price, which could feed the same person for two full days, makes little sense at present. This would leave a huge gap in the prevention of food-borne illness, or better expressed, the opportunity of providing safe food. Older people (as well as the very young and the sick) are more susceptible to food-borne illnesses than young adults, and generally the pensioners are not able to afford these high costs.

It is not only that there are many who can ill afford to buy costly and/or higher quality products, but also a human trait to buy as cheaply—or perhaps economically—as possible. A trend observed over the last five to ten years is that the cost of a number of staple foods has risen out of all proportion. As an example, at present supermarkets sell bananas for \$3.89 per kilo, whereas at the popular weekend markets these can be bought for \$1.99. Of interest is that the proportion of senior citizens is not out of balance. Young people form perhaps the majority of the buying public at these markets. One should understand that to supply supermarkets very rigorous quality and safety protocols have to be followed and consequently, in order to sell produce at a considerably cheaper price, corners are cut; protocols are less stringent. Small growers have difficulty to comply and be economic at the same time. In addition to this there exists a considerable difference in product range. Large growers can produce a small number of products at economic rates but the small growers have to grow many different products that then fit into a niche market. To be able to effectively do this, it is suspected that shortcuts are taking place, which may not be in the end consumers' interest.

Is the severity of food-borne illness on the increase or are the pathogens different to those traditionally encountered? There has been a shift in the traditional food production and animal husbandry from a leisurely pace to highly intensive husbandry techniques. Whereas in the 1950 and 1960s there was little evidence of salmonella or campylobacter infestation in the poultry population; today, trying to eat medium-rare chicken livers would be to invite

a nearly certain absence from society for at least a couple of days. Recent incidences starting to emerge worldwide on the problems with salad vegetables like mesclun, tomatoes and spinach will amplify the need for action to ensure our safe and pleasant lifestyles. One alarmist view—that there is a greatly increased stress on ourselves, and the produce we eat—is perhaps not so strange after all, but this would be rather difficult to research. What is important is that society should closely look at the how, when, where and by who our purchases should be made.

As the present-day thinking does not produce the required outcomes, our ways of food production need to be reassessed, just like in the Jewish and Muslim tradition (which took place between 1500 and 2000 years ago), and the present behavioural and hygiene laws adjusted to prevent food-borne illness on a worldwide scale. Horror stories about Chinese and Indian food production principles are not the only incidents taking place. However, it must be understood that there is a difference between incidental and deliberate tainting of foods for consumption. Food wholesale and retail businesses both internationally and nationally stand accused of squeezing the primary producers to such an extent that extreme hardship is not unheard of. This situation is conducive to shortcuts that often can only be detected by an expensive testing regime. New Zealand food manufacturers are starting to demand Product Information Forms (PIF). These are part of an international drive to extract credibility from suppliers. Cynically speaking we can also say that this is part of ‘*backside covering*.’ Of interest is the following anecdote:

A Chinese student returning from a trip home was asked which food her mother cooked for her. Her answer was that she had roast chicken only cooked until nearly done. When asked if she was not afraid of food poisoning caused by the lightly cooked poultry, her answer was most surprising. “Oh no, mum only buys from a reputable supplier!”

This brings us back to the opening statement that it is management, rather than science that would be likely to have the greater impact in reducing food-borne illness in New Zealand. It is not the intention to belittle the role of microbiologists. These people should be the driving force to influence the thinking of not only hospitality management but also all management of those establishments licensed to produce, transport and sell foods and beverages. This, combined with a credible training regime for all staff of the above-named types of businesses, would alleviate a large percentage of food safety problems. That all staff should be trained in elementary food safety should be given greater consideration as, from experience, it has been observed that a great number of serving staff often perform tasks without any thought regarding the well-being of their customers. One cannot help but be critical of the present training regime that, in many cases only consists of two leisurely training days, which includes time set aside for an examination.

There remain a large number of questions to be answered regarding SME staff training, which could translate into a lifetime of research. These questions are general in nature but a number are pointed towards the small and medium businesses of the hospitality industry. Previously stated in chapter 1, smaller establishments are the areas where discrepancies are most likely taking place. Larger organisations, especially caterers and hotels have more robust systems in place. However, it can’t be stressed enough that SMEs are not all bad, as a number of better class establishments have been observed to have systems in place which are unequalled. Being able to hire the best staff in small places begins an upward economic cycle, but many of these organisations can ill afford that crucial first step. Being able to hire sufficient trained staff is often difficult and those businesses are often owner-operated, and it is not unusual to have two partners as owners of an eating-house. The numbers of staff being trained, and to which level they are being trained are interesting topics. Training establishments produce numerous graduating students year after year. As far back as the

late '60s there was a shortage of chefs and there is still a shortage to date and, save for a massive economic downturn, there will continue to be a shortage of chefs.

Whilst working for a number of years in a well-established training institute, one has long felt tempted to conduct an in-depth survey on how many students would still be in this industry after five years. The number of trained waiting staff is not very likely to be different from that of chefs, which makes it all the simpler to engage untrained staff to be thrown in at the deep end. It is not unusual to have the loveliest, smiling and polite waiting-person going through the motions to describe perfectly the evening's specials, but in many establishments, this seems to be the only training received. The purely political move to do away with the London City and Guilds approved apprentice scheme in the latter part of the nineties saw one structure replaced with an even poorer one. The lengths of time students attend various hospitality training schemes vary from the very short (enough to survive the first fortnight on the job) to extensive training. The number of these establishments producing excellent results does not alleviate the shortages. It is bemusing to hear comments from Chefs (head, or in-charge) that students, having completed a basic course, now become qualified and are demanding high wages without having the basic skills. It would be safe to assume that those establishments lucky enough to attract good, well trained, staff are less likely to suffer food safety issues.

What does the future hold?

The prevention of food-borne illness not only lies with protecting the dining public frequenting the small and medium eating houses in New Zealand, but the problem should be seen as applicable to all food consumed.

Since the completion of Chapter 2 '*A History of Food Safety*' there have been some significant changes in New Zealand. Three changes stand out and will influence further progress on the path to the production and consumption of safe food:

1. The amalgamation of the Ministry of Agriculture and Forestry (MAF) and the New Zealand Food Safety Authority (NZFSA) in 2012 into the now Ministry of Primary Industries (MPI)
2. The introduction of the "Food Bill 2012"
3. The introduction of the "Food Plan"

These changes will have a major impact in how food safety will be implemented in the years to come.

The amalgamation of MAF and NZFSA—introduced under the umbrella of cost cutting by the National Party-led government—requires little discussion, as its merits can only be judged by long-term outcomes, which have yet to be seen. Its history goes back as far as 1998 when the then Minister, Dr Lockwood Smith announced a proposal for a single Food Safety Agency (previously MAF and Ministry of Health). This was established by mid-1999. The then Labour Government launched the Food Safety Authority in 2002.

Controlling the outcomes of a plausible food safety regime administered by this organisation should be foremost in mind by the management and staff of not only hospitality outlets but also those capable of growing and distributing foodstuffs. Determining that produce is fit for consumption may well be beyond the present-day capabilities of MPI. It is the opinion of the researcher that the size of this organisation may well be its downfall, especially when we look at past performance. Initial irregularities are to be expected, but we would do well to remember that the public's health is at stake

Self-governance by SME Hospitality Industry management of the food bill may sound good in principle but at which level of incidence will the local council EHOs be stepping in, and more

important how will MPI see its role? Talk like "*We will close them down*" does very little from an educational point of view, as this will shift the persons affected by closure from one place of work to the next - not unlike the well documented American '*Salmonella Mary*' case from the 1930s. Television programmes such as '*Border Patrol*' may well provide the viewing public with a new form of entertainment, '*Food Patrol*.' An interesting case is one establishment in Wellington that, after introduction to the food plan, has not seen an EHO inspect the state of their food plan compliance for 17 months. Is this likely to be an isolated case, or is this the tip of the proverbial iceberg?

The second change, a step in the right direction, is the Food Bill that is at present going through the motions in parliament. At present the last minute politicking to prevent undesirable passages to be included is gaining momentum. Although the researcher has signed a petition to delay the passage of this piece of legislation, this is only to ensure further submissions can be made before the bill is put through its second reading. Whether the persons objecting are correct in their opposition to the said bill remains to be seen. There is an element of emotion rather than expert opinion that has taken the forefront and forced the minister to reply.

The 'Food Act' is now 30 years old and needs updating. The Bill, its name still uncertain at this stage, was introduced out of necessity due to the dating of its predecessor. A vibrant, regenerative piece of legislation, void from political interference would be able to keep ahead with amendments introduced at various stages. However, this has not taken place insofar as this '*dating/aging*' has been allowed to take place. (See Figure 7.1)

In December 1998, then Cabinet Minister, John Luxton, announced the formation of a single food agency. By mid 1999, the agency was to be based within MAF. Both Ministries (MAF and Ministry of Health) said the single agency was part of a package of structural, legislative and administrative changes designed to enhance food safety. Over time, it was also intended to align major legislation regulating food, possibly in one Act. Currently there are barriers for industry groups to implement effective food safety programmes because of overly complex legislative requirements.

This alignment did not happen until 1 July 2002 when the Food Safety Minister Annette King launched the New Zealand Food Safety Authority. "This Government takes food issues, food information and food safety very seriously and I am confident New Zealand, through the Food Safety Authority, will boast a world leading food regulatory programme."

In March 2003 the same minister at the first New Zealand Food Safety Authority Conference summed up:

"Maybe the Authority has not quite got an "A" yet for having achieved everything, and maybe there's still a long way to go to get to where we want to be, but the Authority definitely deserves an "A" for the ambitions it has for food safety in New Zealand."

In November 2006, the Government approved a package of recommendations designed to update and streamline food regulation in New Zealand.

During the three year Domestic Food Review of New Zealand's entire decades-old food regulatory programme, the New Zealand Food Safety Authority (NZFSA) identified inequities in the way the food industry was regulated across the country, a lack of clarity in the roles of the regulators (NZFSA, Public Health Units and Local Authorities) and a continued rise in the number of reported food-borne illnesses. Ms King said the Cabinet agreed that the Food Act should be amended/replaced to modernise the food regulatory system with the aim of ensuring "our vital food

sector is positioned to deal with the significant growth expected over the next 20 years.”

“A key will be to make food operators responsible for providing safe and suitable food. It is also intended that government interventions and compliance costs are minimised.”

**TIMELINE FOODSAFETY GOVERNMENT**

<b>Government Proposes Single Food Safety Agency</b> Dr Lockwood Smith	11-Aug-98
<b>Single Food Agency By Mid 1999</b> John Luxton	21-Dec-98
<b>Capitalising on Food Safety</b> John Luxton (Sp)	1-Jul-99
<b>Launch of New Zealand Food Safety Authority</b> Annette King	1-Jul-02
<b>New Zealand Food Safety Authority briefing to Minister</b> Annette King	30-Aug-02
<b>Address to the New Zealand Food Safety Authority Conference</b> Annette King	25-Mar-03
<b>Cabinet approves development of new food laws</b> Annette King	1-Nov-06
<b>NZ Food Safety Authority set to meet challenges</b> Annette King	2-Jul-07
<b>Food Control Plans – ready for serving up now</b> Lianne Dalziel	21-Jul-08
<b>NZFSA mandate confirms consumer safety comes first</b> Lianne Dalziel	18-Sep-08
<b>Minister receives food safety briefing</b> Kate Wilkinson	10-Dec-08
<b>Outdated Food Act to be replaced</b> Kate Wilkinson	22-Sep-09
<b>Wilkinson go-slow costs charities money for jam</b> Ashraf Choudhary	6-Oct-09
<b>Businesses consulted on Food Bill roll out</b> Kate Wilkinson	17-Dec-09
<b>MAF and NZFSA to be merged</b> David Carter, Kate Wilkinson	25-Mar-10
<b>Food Bill passes first reading</b> Kate Wilkinson	22-Jul-10
<b>New Food Bill introduced to Parliament</b> Kate Wilkinson	26-May-10
<b>Greens wrong on Food Bill</b> Kate Wilkinson	11-Oct-11
<b>Food Bill to make food safer – not restrict small traders</b> Kate Wilkinson	7-Jan-12

**Table 7.1 Timeline for food safety over successive NZ governments**

Ms King, speaking at a function for NZFSA industry and consumer stakeholders in on 2<sup>nd</sup> July 2007 said:

"When it was first set up back in 2002, NZFSA was a semi-autonomous body attached to the Ministry of Agriculture and Forestry (MAF). Its functions and powers were invested in the Director-General of MAF, and then comprehensively delegated to NZFSA. It was a compromise arrangement for a government agency, but at that time it was accepted that MAF was New Zealand's only credible brand in international trade.

"However, NZFSA has grown and evolved in the past five years. The NZFSA brand is well recognised and can now confidently take its place on the world stage as a highly reputable and credible agency among consumers of New Zealand food, producers, importers and exporters. It is clear that it no longer needs to be attached to MAF to maintain that credibility," she said.

Of concern is the Food Safety Plan. The previous government's minister of Food Safety, Lianne Dalziel, in an interview on 30 June 2008 with the researcher stated that:

"SMEs in the hospitality area never had to worry about anything other than getting to the end of the week. Unfortunately the food industry has attracted a lot of people to it who have not necessarily had a history in business and who kind of pick up business skills as they go, relying more on their expertise at the 'stovetop' and they have never understood why it is so important to have HACCP in place".

During an interview with Professor Ray Winger of Massey University on 17 September 2008 the food safety plan was discussed

"Yes, and it's... it's a higher level than HACCP. HACCP is a subset of food safety plans. So I think the move has come from a relatively close-focused HACCP, with a recognition that for most companies, they actually can't implement the HACCP plan. So the food safety plan is trying to get above that, to say "Right there are general principles that if you run your business with these sorts of principles, then you're going to cover a lot of the HACCP hazards. So, it goes into things like generally temperatures of your chill storage and freezing storage and cleanliness of surfaces and all these sorts of things which is generic."

On 21 July 2008, the then Food Safety Minister Lianne Dalziel launched the off-the-peg Food Control Plan to provide an easy-to-follow food safety system for food service and catering businesses.

The Food Control Plan had been designed as one of a suite of tools under the proposed Food Bill. The Plan's early release is designed to maintain the momentum built up after four years of consultation and preparation for the updated domestic food regulatory programme pending the Bill's introduction to Parliament.

The release of the Plan is being carried out in collaboration between the New Zealand Food Safety Authority and 44 local councils from around New Zealand. So far, another 10 councils have indicated interest in joining the programme later this year.

"The high number of councils that have voluntarily signed up to take part together with an indication from several others that they're keen to join later in the year gives me confidence that we're heading in the right direction," Lianne Dalziel said.

The Plan provides operators of cafés, restaurants, clubs, bars and catering businesses with a practical food safety management system for their business.

- It's made up of a series of information sheets covering each step in the food production/handling process.
- It provides instruction for keeping food safe at each of those steps and lets operators know their obligations under the rules.

- There's also a diary where key actions can be recorded, as well as for documenting when things have gone wrong and how they were fixed.
- The proposed system is a major shift from the current practice, which relies on inspection to find breaches of the expected standards, to a culture of encouraging operators to take responsibility for the safety of their food product.

Over the next couple of months:

- Environmental Health Officers from participating councils will be inviting business operators to register a Food Control Plan.
- Operators who join the programme receive their own Food Control Plan as well as a range of supporting resources designed to reinforce key food safety messages.
- The off-the-peg Plan will be made available free of charge to food operators, saving them the expense of developing their own plan to show they are complying with the rules.

Lianne Dalziel advises consumers to look out for businesses displaying a window sticker or certificate showing they have a Food Control Plan.

"Consumers can have confidence that a business with a Food Control Plan has a proactive approach to producing safe food and has the right measures in place to address the risks that need to be managed."

"In turn, we expect this to reduce the risk of foodborne illnesses which will of course be good for consumers and good for business." Lianne Dalziel

Under the new government on 22 July 2010. the Food Bill passed its first reading and will head to select committee with unanimous support, says current Minister for Food Safety Kate Wilkinson as reported by Schreck (2010).

"I'm confident that when the Food Bill emerges from the scrutiny of the select committee we will be able to implement a regulatory system that offers greater clarity to businesses and more confidence to consumers."

The new Food Bill has been developed over the past three years and is aligned with the New Zealand Standard platform, which provides the basis for our food exports.

This bill includes Schedules that set out what risk-based measure will apply to each food sector, and increase the number of sectors required to operate under National Programmes.

"Ultimately this Bill will make it easier for food businesses to understand how safe food needs to be produced and ensure they take primary responsibility for everything they sell. Organisers of community-based fundraising activities like cake stalls and sausage sizzles won't need to jump through hoops."

"Food handler guidance will be made available to these people to help them keep food safe and local councils will have more certainty around their role in regulating food premises." (ibid)

Little opposition to the Food Bill has taken place as the select committee consisted of an across-the-board group of people. A last minute opposition group started a petition which in a short time collected approximately 30,000 signatures. The details presented to the public were somewhat sensational and not very accurate. For example the details contained the following words:

"And what is different about this legislation is it comes under an international rule called 'Codex' or 'Codex Alimentarius'. If we go along

with Codex, New Zealand then CAN'T CHANGE the legislation in future. This is what is really appalling about this. It is not Common Law, it is Napoleonic Code. It hasn't happened before with food and is a quiet part of Codex that most people don't realise. We would actually have to get out of the WHO to change this legislation if we didn't like it - which is just not a thing governments do."

However, under extreme conditions these details could have a ring of truth in them.

A further five points were part of the petition blurb:

1. Home and small growers who grow small amounts of food and sell locally NEED to be exempt - they are not.
2. Seeds for cultivation and food seedlings NEED TO BE NOT within the definition 'food' under the Bill. (This is huge – imagine you not being able to produce seed and give away!!). This sounds crazy but seeds will be 'explicitly controlled substances' (like drugs) – seriously. Why? Not sci-fi – in time whoever controls the food chain protects their own interests. (This is so unbelievable that I believe this is why we are not acting.)
3. Under the Food Bill, Police acting as Food Safety Officers can raid premises without a warrant, using all equipment they deem necessary – including guns (Clause 265 –1) (What is the precedent for this? Why is this necessary?)
4. Members of the private sector can also be Food Safety Officers, as at Clause 243. E.g. Monsanto employees can raid premises – including marae – backed up by armed police. (This has never happened before or needed to happen).
5. AND Food Safety Officers have immunity from criminal and civil prosecution. What is the precedent for this?

The Minister replied:

"Unfortunately a small minority have decided the Bill is some sort of global corporate conspiracy designed to take control of the food chain and will lead to armed police storming the homes of private gardeners. Obviously this is rubbish and the Green Party, having earlier worked with the Government and supported the Bill through select committee, is now irresponsibly encouraging these views by spreading misinformation for political means." (Wilkinson, 2011)

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## Chapter 8

### Rationale and Methodology

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As mentioned above: Cooking and the safe preparation of food has been my controlling interest for more than 50 years. On leaving school in Holland, I spent 5 years in the 'Horeca Trade School', which included a two year practical apprenticeship in cooking. We, the students, learned about bacteria that were likely to cause problems but, other than that, very little about how to keep dining customers safe from food borne illness. Basic food safety teaching, as we know it today, would have been very welcome. It has been with more luck than wisdom that in my entire career as a chef, I have not been responsible for a food borne illness incident, although in the early days the pathogenic bacteria never seemed as potent as varieties plaguing today's society. Much has changed from my early cooking days. On the plus side, the staff at the various training institutions, at present, have a far greater food safety knowledge than those in the 1990s. The downside is that with the increase in small and medium enterprises worldwide, the staff turnover issues in the hospitality industry have resulted in a large part of the staff having little, other than basic food safety training. That the media has picked up on the increase of food borne illness can very well be a case of better reporting practices combined with an increase in people eating out, and a public awareness that if the food is not satisfactory a complaint should be made.

During the last 30 years, the problems in controlling food-borne illnesses have changed. HACCP, Food Control Programmes and Food Safety Programmes have contributed greatly to a reduction in food related incidents, but the importation of exotic foods, not only into New Zealand but worldwide, has seen dramatic changes and has introduced a whole new set of problems. The food processing chain, which once was contained in a single factory, may now involve several organisations and multiple countries. For example: A recognised leading chef in the Netherlands informed me that in October 2012, an outbreak of Salmonella was traced back to smoked salmon which was sourced from Norway, then sent to Greece to be processed, then sent on to Egypt to be packaged, and finally exported to the Netherlands - the owners of the product [Private communication from Peter Borr, The Netherlands]. The true number of those falling ill was difficult to establish as the product was also exported to at least another six countries including the USA. The number of illnesses related to this incident was estimated to be in the thousands. This case in point has not yet been published in an academic journal, but has come from a most reliable source and has been widely reported in the media. With ever-changing products, processes, food handling practices, societal habits and pathogens, emerging food-borne diseases will continue to be an important public health issue (Meng and Doyle 1997).

#### **The New Zealand Scene**

Training, not only in food safety subjects but also chefs (cooks) training has a short history in New Zealand. Little time was spent on learning food safety, or 'food hygiene' as the topic was then called. It was not until the mid 1970s that Christchurch Polytechnic ran its first food safety course outside the very limited food safety component of the London City and Guilds hospitality courses. During that time cookery apprentices were trained on the job. These apprentices received a further 28 weeks theory and practical training at recognised training institutions, i.e. Polytechnics. Having trained many cookery students while employed as a tutor, lecturer and senior lecturer I always endeavoured to make the topic understandable to my students at the same time realising that there were components on the topic which were not touched. The learning of which specific bacteria at which time induced vomiting or caused diarrhoea seemed somehow wrong. Providing circumstances which prevented the growth and spread of these pathogens made a lot more sense. It was only when the then trade certificate TC169 food safety unit was taught that students started to show

more understanding of the topic. The unit involved the students designing their own 'inspection', and conducting agar tests as well as being given the opportunity to express what they had learned. It was only then that the real learning took place.

In the days before council EHOs conducted inspections, hygiene inspectors came unannounced twice yearly to 'give the place a good doing over'. These days have thankfully disappeared. The changes of approach as to how and why it is important to have the compliance checks, have evolved towards the establishments taking responsibility of their own food safety requirements. As with all levels of management and society there will always be those who take the responsibility seriously and have systems in place over and above the requirements deemed necessary to avoid food borne illness. At the other end of the scale are the operators who either don't care about the welfare of their customers or don't know how to implement their food safety requirements.

One good example of being ahead of the time is the then Executive Chef of Ballamy's Catering complex at the parliamentary complex, Wellington. Anita Sargensen, the Executive Chef, worked hard to implement a HACCP based system in the catering complex. Her system included a great deal of staff training. It was sad to observe she received little encouragement from the then management.

It is not unusual for proprietors to start a new business, or, purchase an existing hospitality business without any prior food safety knowledge, and then to engage staff also without this knowledge. The Wellington City Council Local Public Health Bylaw (2008, 2.3.1) states that the Council will not issue a certificate of registration unless:

*there is working on the premises*

*a) staff member that has been trained in food safety to NZQA level or equivalent or such other training approved by the Council and has been issued with an appropriate food safety training certificate, and/or;*

*b) a manager or staff member who is responsible for training others has been trained to NZQA level or equivalent or such other training approved by the Council and has been issued with an appropriate food safety training certificate; and/or;*

*c) a manager or staff member who has undergone trade training or other training which has a food safety component equivalent to NZQA level or other suitable training approved by the Council*

This section does not take into account two important points:

- 1) The new owner may have bought a business with an existing/current certificate of registration, but have no one with food safety experience.
- 2) What happens if the only person with the required level of NZQA level training, decides to seek employment elsewhere?

This is creating an unacceptable risk. Proprietors without prior food safety knowledge run the risk when hiring catering (or more specifically, cooking staff with food safety qualifications) of being back to square one when qualified staff move on. Until the time when the proportion of qualified staff increases through improved training opportunities, all management of food production and food sales should, in the interest of food safety, have at least an elementary recognised certificate.

## Rationale

Many of the leading chefs in New Zealand have attended my polytechnic and university courses, and I have maintained communication with many of them through my involvement with the New Zealand Chef's Association, with whom I am a "Life Member". It is thus with inside knowledge and long experience in the food industry, that I have undertaken the research reported in this thesis, and this reflexivity of course has a bearing on how the study was conducted and how the data obtained was analysed. Robson (2002) states simply that reflexivity is an awareness of the ways in which the researcher as an individual, with a particular social identity and background, has an impact on the research process. McGhee, Marland and Atkinson (2008) believe "Whilst the researcher's own creativity is an integral part in the emergence of categories, these categories must be inductively derived from the data in the field and not forced into the shape of preconceived notions held by the researcher."

The study has involved the examination of many published works, academic reviews, journal articles, government reports, media items and communications with acknowledged experts in the field – many of them known personally. A relatively small sample of the many publications examined for this study, but not cited in the text, is given in the Bibliography (Appendix A). This may be of use in further studies.

From the start of this research I was influenced by earlier research in the food safety sector (Kramer and Scott, (2004): Kramer, Frost and Cameron (2002)) and it was clear that qualitative research methods (Babbie, 1975: Cooper and Emory, 1995: Denscombe, 1998) should be used. As the research progressed an additional limited quantitative survey was conducted to cross check and clarify points of uncertainty. Using open ended questions would give greater detail, and so whenever possible open ended questions were used in the interviews.

In order to pinpoint, examine and record patterns from such data, research often uses thematic analysis which is one of the most common qualitative research forms (Alam and Alam, 2013) The flexibility of thematic analysis allows patterning across language and presents the possibility of adhering to theory i.e. language and experiences and or practice (Clarke and Braun, 2013). With thematic data analysis it must be understood that the better the questionnaire preparation, the better will be the actual analysis of the data.

Czaja and Blair (1996) as well as Remenji, Williams, Money and Swartz (1998) stress that the starting point of questionnaire design is to accurately define the purposes and objectives of such design. Zikmund (1994) states that "a survey is only as good as the questions it asks" (p. 378). Bordens and Abbott (1991) warn to avoid the temptation to do too much in a single questionnaire.

The decision to use both structured and unstructured approaches to personal interviews was influenced by Bordens and Abbott (1991) who state that "a questionnaire is more than a collection of questions" (p. 210)

In addition to demographics and predictor variables, there should also be questions designed to assess the behaviour of interest. Such items, or a combination of several items, would constitute the 'criterion variable' (Bordens & Abbott, 1991, p.184).

The questions formulation process is perhaps best expressed in the Zikmund (1994, p. 378) list of decisions

1. *What should be asked?*
2. *How should each question be phrased?*

3. *In what sequence should the questions be arranged?*
4. *What questionnaire layout will best serve the research objectives?*
5. *How should the questionnaire be pretested? Does the questionnaire need to be revised?*

## Methodology

Firstly, in the beginning of the research project the purpose was established and from this, questions were formulated as to how and what would bring about the richest details from the interviewee. The decision to have the questions semi-structured was based on Denscombe (1999,) who states that:

*“with the semi-structured interview the interviewer is prepared to be flexible in terms of the order in which the topics are considered, and, perhaps more significantly, to let the interviewee develop ideas and speak more widely on the issues raised by the researcher.”*  
(p. 113)

Secondly, burdensome and poorly formulated questions are a recipe for the researcher to lose rapport with the interviewee. Depending on the knowledge of your interviewees, the level of replies will automatically let them divulge a great deal of information. This was borne out from the replies received during each of the participant interviews.

Thirdly, order bias was avoided by not seeking answers already dealt with in previous questions. Nesting questions did take place but only when detail about a specific topic point would give greater detail enriching the data in question. For example:

*Are there specific issues that deter most businesses from implementing a type of Food Safety Plan?*

Followed by:

*Do you foresee any problems with a Food Safety Plan once you have installed such a process?*

The second part of the example succeeded in getting good responses from most chefs in their group.

Fourthly, each of the interviewees had the questions presented to them at least four days prior to the interview. This took the form of mailing the list combined with other informative details. This was followed up by a telephone call to confirm them receiving the questions and a confirmation of the proposed interview time.

Lastly, pre-testing took the form of two Wellington Small and Medium Enterprise chefs, and two people who had no connection with the food industry, answering the questions. Fowler (1993) writes that *“the purpose of such pre-tests is to find out how the data collection protocols and the survey instruments work under realistic conditions.”* It is of interest that all four persons were able to answer the questions, not taking into account their actual trade based knowledge. The two people who had no connection with the food industry were able to answer the questions without any difficulty. Small adjustments were made, the order in which the questions were asked (Sekaran, 1992) being the area of most changes when compared with the actual question detail.

In addition, how the in-depth interview questions were portrayed was not seen to be an inconvenience. The order of the questions was found to be well thought out. Those pre-testing the questionnaire made no comments on the difficulties in the layout. No further changes were made after presenting the pre-testers with the small adjustments made.

In order to get a balanced view (Sekaran, 1992) from within the interviewees, I initially decided to use groups into which the interviewees would be placed according to their particular area of expertise. The groups were:

Leaders	Those having knowledge which made them experts in their specific fields
Managers	Those ultimately in charge of an operations
Chefs	Those administrating the day to day running of kitchens
Maître D's	Those in charge of the front-of-house section in a food service situation
Suppliers	Those who distributed the produce to the respective SME types
EHOs	Those overseeing, administrating and auditing food for sale establishments

Initially having six groups proved to be a mistake. It was found that most of the "Maître D" group had little or no practical food safety knowledge. Most often, those who did have the knowledge quickly moved into the management area. For this reason this group was removed.

Interviewee selection, the next step, proved, due to my industry standing, a relatively straight forward exercise calling on the hospitality industry leaders for suggestions of suitable candidates. With my question outlines in place this task was simplified as each participant was recommended to me by, for example the Restaurant Association of NZ (RANZ) and the New Zealand Chefs' Association (NZCA) because of their topic knowledge. In the leader group, those first approached, the selection was based on the snowballing method as some of these participants were part of the above two associations. Snowball sampling may simply be defined as: A technique for finding research subjects. One subject gives the researcher the name of another subject, who in turn provides the name of a third, and so on (Vogt, 1999).

The possibility that potential participants may not reply was avoided by contacting each person (by telephone) and asking them for support and the most suitable times for an interview. It must be understood that through the nature of their industry, managers, chefs and in some cases EHOs, all were busy, working long hours and having few, if any, days off. That 97% agreed to partake is remarkable which may be due to my standing in the industry as well as the support received from the RANZ and the NZCA. Those having agreed to partake were sent an explanation of the research details, their specific group's questions and proposed interview time and date. This course of action made my response rates very high (97%). Only one person did not respond to my request, via her secretary, for an interview. This was due to my standing in the Hospitality Industry in New Zealand. The person was a director of policy in an important government organisation. Equally so, I could have avoided this one rejection by personally contacting the potential participant rather than her secretary.

The number of interviewees in each group was based on my understanding as to the importance of each of the five groups. The number of interviews in each of the five groups is shown in Table 8.1

With each person having a story of importance to tell, and each of the five groups having a varied number of interviewees, the result of the interviews provided a rich, balanced amount of data. EHOs, the future auditors of the Food Safety Plan provided 9 interviews

To illustrate the expertise of the 30 participant of the in-depth interviews only two had fewer than 10 years of experience in their area of know-how (6.7%).

Group Name	Numbers	%
Leaders	6	20
Managers	5	17
Chefs	6	20
Suppliers	4	13
EHO	9	30
Total Numbers Interviewed	30	100

Table 8.1 Group numbers of interviewees and percentages

The managers' group included a number of chef/owners and those not having cooking knowledge (Ratio: 3-2). This resulted in 5 interviews. Combining this with the chefs group a total of 11 interviews were conducted as those most likely to influence the correct implementation of the Food Safety Plan. I feel justified in the balance between the three groups – Environmental Health Officers, Chefs and Managers.

The six Leaders provided an insight of six highly skilled motivators and administrators of both those in the hospitality industry and the health professionals responsible to initialising and maintaining a standard of food safety concepts.

There is a reason for concentrating on just one particular section of the hospitality industry, the small to medium sized enterprises (Robbins and Barnwell, 1998; Scott, 1961; Franken and Braganza, 2006; Gray, Densten and Sarros, 2003; Bernard, 1974; Cavana, Delahaye and Sekaran, 2001). This is perhaps best illustrated by the imbalance of large and small businesses. More than 75% of studies using organisational size define it as the total number of employees (Kimberly, 1976).” Tebbutt's (1992) study found that the level of food safety knowledge is greater in a larger establishment than in the smaller ones. The resources and the costs of larger establishments, in providing a food safe environment, are proportionately lower than those of the very small husband and wife team with either 2 or 3 other employees. Training, administration, and the hours worked when supplying their customers at low prices (to stay competitive) are not taken into account by those responsible in requiring compliance in an across-the-board Food Safety Plan.

The interview process consisted of a reminder phone call a day prior to the interview to check if it was still convenient to conduct the interview (all confirmed positively). It must be understood that those participants engaged in the business situation had the interview momentarily halted due to phone calls and urgent business requirement. Interruptions were never longer than 2 to 3 minutes and none interfered with the actual data collection. Notes were taken during the interview and all were audio recorded.

Only one incident occurred during the interviews. One person in the EHO group felt that the supervisor of the EHO section needed to check the answers to the previously submitted questions. Although the interview took place, and only a sanitised version was received, I am still of the opinion that the content contributed to the data. The reason to only use the names of the participants in the Leaders group was based on that EHO also objecting to the use of her name. It must also be noted that no other participants objected to the use of their name. I feel that this decision did not give the very high calibre participants the opportunity to have their name published.

Starting with an open mind does not mean that I did not have a well thought out topic for this thesis. As Glaser and Strauss (1967) explain:

*“Rather than basing an investigation upon whether certain theories do or do not work, the researcher embarks on a voyage of discovery.”* (p. 33)

It was all very well that I was of the opinion that there are significant shortcoming in the proposed legislation, it was the expertise of my participants that provided the richness of data

From my copious reading it appeared at first that using Thematic Analysis of the data would be the way to proceed.

Thematic analysis and grounded theory are methodologically similar analytic frameworks. Themes can best be described as an important point in data which relates to the research question. The size of a theme may not be as important as the number of responses and their meaning or a level of patterned response which provide a richness to the research. Aronson (1994) leads us to believe that when gathering sub-themes to obtain a comprehensive view of the information, it is easy to see a pattern emerging.

Thematic Analysis is, in a number of cases, an approach to dealing with data that involves the creation and application of ‘codes’ to data. The ‘data’ being analysed, interview transcripts, required the creation of categories in relation to data; the grouping together of different instances of datum under an umbrella term that can enable them to be regarded as ‘of the same type’. In spite of what some radical grounded theorists might say, decisions about what counts as a category come from all kinds of ‘places’ – theory, literature, research experience, the data itself. Rather than using ‘open coding’ the researcher decided to use relational coding i.e. to the *relating* of those categories to each other.

Grounded theory, according to Glaser and Strauss (1967), is a set of both inductive and iterative techniques designed to identify categories and concepts within text. Boeije (2010) feels that the main feature of an interview is to facilitate the interviewees to share their perspectives, stories and experience regarding a particular social phenomena being observed by the interviewer. In reflecting on formulating both the interviewing groups and categories it gave me great satisfaction to observe that the grouping decisions, including the removal of the Maître D’ group, were correct and subsequently the question categories were equally so appropriate.

Some proponents of the grounded theory method appear to treat interview and participant observation data as though they mirror informants’ realities (Hall and Callery 2001). Others claim that grounded theory incorporates reflexivity. Hall and Callery (ibid) claim that the principal texts on grounded theory do not attend to the effects of interactions between researchers and participants in interview and participant observation contexts. Descriptions of the effects of interactions on interview data and attention to relationships between interviewers and interviewees are necessary for attending to the rigor of grounded theory findings. Therefore, it is argued that reflexivity and relationality, which are defined as attending to the effects of researcher-participant interactions on the construction of data and to power and trust relationships between researchers and participants, should be incorporated into grounded theory.

After much consideration, I came to the opinion that to categorise the interviewee data would make the thesis miss out on a lot of data which described the interviewees own words and specific detail. Thematic analysis (Braun and Clark, 2006) is restrictive in portraying great detail but tries, to some extent, to quantify the qualitative aspect of my research. I see this as an injustice to the views of these experts in their respective fields. The greatest difficulty was to decide whether to follow the Thematic Analysis path or to describe/report the participants’ interview details. In the end, the latter

path was chosen and the answers prioritised according to importance given them by the interviewees, all of whom were experts in the field of Food Safety. Given the recognition of my and the interviewees' background knowledge and experience in our respective study areas, I believe I have avoided the potential for this adversely to influence the inductive requirement by the process of reflexivity, which is perceived as integral to the constant comparison method. I have stayed true to the constant comparison method, having faith that this will eliminate any bias stemming from pre-knowledge (Robson 2002).

At the NZCA bi-annual conference (2008) the opportunity was taken to conduct a small survey consisting of closed questions for quantitative interpretation and each of the participants were chefs or chef-owners. All these respondents were members of the NZCA which has strict entry criteria in place.

When the questions were tested, the language (Sekaran, 1992) was deemed appropriate. Equally so biased wording of the questions was avoided. Turner (1988, as cited in Easterby-Smith, Thorpe and Lowe, 1991, p. 16) compares the researcher to an expert cook, who finds it difficult to explain what he does but claims that the end result is evidence of his proficiency.

The data collected with the in-depth interview section of the surveys made it clear that the grouping and categorising of the data (Clark and Braun, 2013), an essential part of the "*thematic experience*", gave the interviewee the opportunity to provide additional information which happened in a number of instances. The success of the thesis will be judged on how well the information provided contributed to providing answers to the research question:

*Are there inadequacies in the management of food safety in New Zealand and are there solutions?*

In a culture which prides itself on innovation and entrepreneurship there is an equal, if not greater, problem arising with a society having to live under a cloud of shortcuts. Food safety is one area where there is a need for change, but, the proposed food safety legislation is being addressed without paying the right amount of attention to make this last for the next ten years. Prior to this timespan we are then faced with further changes which can easily become a '*cyclic period of changes*' to be repeated over and over again.

My interviewees, the experts in the practical side of the hospitality industry, not only SME but all sections of their industry, provided a richness of data which should be read as an indication that it is not only food safety that requires changes, but also the culture. When both items are addressed real progress can be measured.

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## Chapter 9

### The Survey Questions

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#### The questions and their evolution

The interview question formulation section of this research was based on earlier research (Scott, Kramer 2004). Over time the initial questions asked became dated and so were subjected to continual change. In hindsight, these perhaps should also be analysed to see if they really did bring out the correct answers.

The participants were only the same in that they worked in the hospitality industry or their line of work was involved with the hospitality industry (suppliers and EHOs).

Since the start of the interview period, the push by the Minister of Food Safety and the then New Zealand Food Safety Authority (now MPI as from 30 April 2012) to rush the proposed legislation through Parliament has resulted in little apparent progress to date. The push by the Wellington City Council, Porirua City Council and Hutt City Council to have SMEHI establishments take the Food Safety Plan on board has been successful insofar as numbers of establishments on the plan has increased significantly. As at 1<sup>st</sup> October 2012 there were a total of 512 establishments voluntarily on the plan within the three councils.

In the previous chapter, “Rationale” (Chapter 8) the five groups of participants were discussed in detail and an explanation was given as to why it was decided not to continue with the ‘Maître D’ group. However, the questions intended for the Maître D’ group are included in this chapter.

#### Question Content Analysis

Following is an analysis of the question content directed at the management section of the interviews conducted. The questions directed at Chefs, Suppliers and the Leaders were very similar, and were used as a method to reinforce the management’s views expressed in the interviews.

#### Questions

Each group was asked different questions which consisted of both open and closed questions.

#### Managers

The main emphasis on the interviews with the participants for the research was management-oriented.

Question topic:

- Their knowledge (qualifications, experience in the industry)

- Their staff’s food safety knowledge

- HACCP knowledge

- Implementation of HACCP

- Maintaining a HACCP system

- Awareness of other food safety systems
- Experiences with food safety problems
- Staff retention and associated problems
- Their view of the role of Management in Food Safety

There is little difference between the questions directed at management and the following set of questions directed at Chefs (Head and Executive).

### **Chefs (Head & Executive Chefs)**

These questions are directed at the head chef and executive chef level. These two groups are used to indicate that although the word chef is used, this has now become a generic name for a person involved in cooking. Traditionally the word chef, derived from 'chef de cuisine', was for those in charge of a kitchen.

Question topic:

- Their knowledge (qualifications, experience in the industry)
- Their kitchen staff's food safety knowledge
- HACCP knowledge
- Implementation of HACCP
- Maintaining a HACCP system
- Awareness of other food safety systems
- Experiences with food safety problems
- Kitchen staff retention and associated problems
- Their view of the role of Management in Food Safety

### **Maîtres D'**

As stated previously, the Maître D' section was discontinued after it became clear that few had any food safety qualifications, and this was coupled with the trend that they often moved into the management area.

Question topic:

- Their knowledge (qualifications, experience in the industry)
- Their staff's knowledge and training
- Their view of the role of Management in Food Safety
- Their view on being able to promote a greater level of food safety in their area
- Experiences with food safety problems
- Their view of the role of Management in Food Safety

## **Suppliers**

The question topics described were not always followed, but the interviews were based on the general topics discussed, which, in the opinion of the researcher, provided greater detail.

Question topic:

- Their knowledge (experience in the industry, qualifications)
- Their view of the present legislation on food safety
- Their staff's knowledge (and training details)
- Their role in food safety as a supplier
- Their view on the food safety legislation

## **Environmental Health Officers and Health Protection Officers**

The question topics described were not always followed, but the interviews were based on the general topics discussed, which in the opinion of the researcher provided greater detail.

Question topic:

- Their knowledge (qualifications, experience in the industry)
- Their view of the present legislation on food safety
- Their view on the present food safety training
- Their view of the role of Management in Food Safety
- Experiences with food safety problems
- Their perception of an ideal system

## **Manager & Chefs**

Small differences were made to differentiate between the two groups. The questions directed at the manager participants, although very similar to the chef questions, were expected to produce answers expressing their role to manage the overall state of their establishment. The questions directed at the "Chefs" (Head and Executive Chefs) section were modified as the interviews progressed and the final Chef participant was presented with the following 11 questions:

1. What length of time have you been active in the Hospitality industry and has this always been associated with the preparation of food?
2. What are your qualifications, and give me an indication of your experience in this industry?
3. Are you satisfied with your staff's experience in this industry, especially regarding food safety issues?
4. Could you describe your experience with the HACCP process?
5. Are there specific issues that deter most businesses from implementing a type of Food Safety Plan?

6. Do you foresee any problems with a Food Safety Plan once you have installed such a process?
7. Who would be the main instigator in ensuring your implementation of HACCP or Food Safety Plan in your organisation?
8. What is your opinion on the role of management in food safety?
9. If there were to be a change in food safety training, how would you like to see this progress?
10. Does staff retention play a role in your control of food safety?
11. Have you been consulted on your input to the proposed Food Safety Plan?

## Suppliers

It was intended that five suppliers would be interviewed. It was realised that they needed to be very carefully approached. Other than from a funding perspective, the interviews would ideally take place throughout New Zealand. Cost-wise this was not possible, so it was decided to only interview those in the Wellington area. The choice of food types supplied would be directed to poultry, seafood and dairy products when possible (other than sealed packaging). This turned out slightly differently, with the suppliers specialising in the following areas: seafood, a fresh perishable product, delicatessen items and manufacturing food lines. Dairy and meat products are generally supplied by large organisations, all of which have stringent HACCP-based rules in place which is mainly due to these businesses being export-oriented. Poultry, seafood, smallgoods and imported cheese products are generally supplied by smaller local suppliers each of which, due to the nature of their product, have procedures in place to ensure quality and continuity of product supply. The small, informal suppliers without HACCP-based principles have no place in supplying hospitality establishments that are serious about controlling food safety.

The questions formulated for the suppliers:

1. What length of time have you been active in this industry and has this always been your preferred industry?
2. Do you have any qualifications, either trade-related or academic?
3. Have you received any specific training in food safety?
4. What is your role in the industry, i.e. 'are you an independent operator', 'do you have staff in your business', 'do you distribute foods other than perishable foods'?
5. Are you aware of the HACCP process or a Food Safety Plan and to what extent have you implemented such process or, alternatively, a similar programme?
6. Do you monitor your food safety process?
7. If you have staff (other than administration staff) in your organisation, how do they receive their training in food safety related issues? Do you play a role in this?
8. How would you rate the practicality of implementing a food safety programme in your organisation?

9. How would you rate your organisation's role in providing safe food to the hospitality industry?
10. Have you been asked for your input in the proposed food safety plan?

### **Environmental Health Officers**

The questions directed at the EHO section were modified as the interviews progressed and the final EHO participant was presented with the following 11 questions:

1. What length of time have you been employed in the 'Safe Food' sector and has this always been your profession?
2. Can you give an indication of your qualifications, and if you had the opportunity, which qualification would you like to add to this?
3. Can you briefly explain the Food Control Plan process and what benefits would this process bring to the public?
4. In your opinion, what were the reasons for the very slow, or rather non-implementation of HACCP into the small to medium hospitality enterprises in New Zealand?
5. With the failure of one system, how different is the 'Food Control Plan' system and in which areas have improvements been made?
6. What role should the management of the SME play in the implementation and maintaining a Food Control Plan and to what extent has management control over such plan?
7. Staff training of food safety control in the hospitality sector could best be described as?
8. Would legislative changes to the control of food safety ultimately see the demise of EHOs or alternatively see a change in their present role?
9. From a health officer's perspective and the phenomenally high turnover rates of staff in SME (hospitality) would these changes be realistic?
10. What difficulties do you foresee with SME management maintaining a control system in these enterprises?
11. What was your personal input into the new proposed legislation regarding the food control plan approach of the new food act?

### **Additional Questions**

The following supplementary questions were asked where appropriate, as a means to gather a greater depth of information, otherwise too large a question list would very likely put the participant into a negative frame of mind. Only one participant was uncomfortable with this approach and formulated a set of answers which were checked by the person's supervisor. This was then forwarded to me and as the information was very relevant, the researcher decided to include these details.

### **Question 1**

Are you aware that the numbers of SME businesses in New Zealand that have implemented a HACCP system is very low?

- Do you have an opinion as to why this is so? (1A)
- Are these numbers acceptable? (1B)
- Is there, in your opinion, sufficient awareness among New Zealand food enterprises regarding HACCP? (1C)
- Do you feel the industry, that is the SMEs, has a positive view of HACCP? (1D)

Perhaps too great an emphasis is placed on HACCP. Perhaps a covering note needs to be included as to why the term HACCP has been used, when technically there is no true HACCP compliance evident due to the principles being manufacturing based. "We" tend to apply the principles of the concept loosely. The term 'loosely' is scaled to establishment size. Large organizations generally have better control systems in place, whereas small businesses do not have the capacity and resources to maintain such a system and be economically sound. The NZFSA has greatly helped to overcome the '*HACCP Barrier*' by introducing their Food Control Plan.

### **Question 2**

Is food safety training in New Zealand sufficient to meet HACCP standards?

- Could you add a number of points or ideas to further improve such training?

At present, only limited food safety training is required for food workers

### **Question 3**

How do you see the role of management (other than the head chef) in the implementation of a food safety system?

- Is management trained in this role?
- Would you like to see greater management involvement in food safety training?
- Should all staff involved in food preparation and serving hold a reputable food safety certificate?
- When employing new staff, would you give preference to staff holding a reputable Food Safety Certificate even if their skill level is not as great as that of a non-certified potential employee?

### **Question 4**

Are you aware of other countries similar to New Zealand having implementation problems?

### **Question 5**

Is it practical to implement HACCP into SME enterprises in New Zealand?

- In your opinion what is the greatest inhibiting factor to the introduction of HACCP?

- What advice would you give food safety authorities to promote the introduction of HACCP or a similar system?

### **Question 6**

Are you aware that premises, which have embraced HACCP, compare favourably with premises not using the HACCP process?

### **Question 7**

Are you aware of alternative systems comparable to HACCP?

- Would such a system require a greater emphasis on training?
- How would you rate its chance of successful implementation?

### **Question 8**

Should management of establishments that have a HACCP system in place be in control of the monitoring of the process?

- Should a staff member be the holder of the business's food safety registration?
- Should management and staff be re-certified after a set period of time?
- Do you foresee a problem with the above two points which could inhibit the organisation's ability to operate?
- Should, in your opinion, the checkers be checked?

### **Question 9, 10, 11**

These questions asked the participants, mainly managers and chefs, on their views on a change in food safety training, staff retention playing a role in their control of food safety and if they had been consulted on their input to the proposed Food Safety Plan.

These questions were only asked when it was appropriate to get further information .

The anticipated interview time of 20 minutes proved insufficient in most cases. One interview had the answers supplied in written form and the Minister for Food Safety's interview took exactly 20 minutes. The remaining 28 interviews took far longer with a number passing the 90 minutes time span. This may have been caused by the relaxed manner in which the interviews were conducted, and at times allowing deviations from the topic as each subject had a fascinating amount of detail to contribute

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## Chapter 10

### Findings

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The 30 interviews associated with my research were carried out a number of years ago and the participants may no longer be in the position they held during the interviews. This chapter is reporting the views of the five groups.

The Leaders group, six industry experts, with their permission, have their names included whereas the other four groups' participants are coded as follows:

Leaders	Names and not coded	(6)	Page 91
Managers	M and participant code A to E	(5)	Page 103
Chefs	C and participant code A to E	(5)	Page 108
Suppliers	S and participant code A to E	(5)	Page 115
EHO	E and participant code A to H	(8)	Page 118

#### Leaders Group

The answers provided by this group were, due to the diversity of the group, varied but of great interest. The 'Leaders' group is portrayed per each individual's answers. Their positions in the industry, if stated, was their position at the time of the interviews.

#### **Lianne Dalziel, Minister of Food Safety and previous Minister of Small to Medium Enterprises in the New Zealand Parliament.**

The Minister reported we now export 80% of our food and for this the producers have to compete to international standards. Anybody handling food will have to have a basic qualification. Some of the providers, that is some of the restaurants, have been a little bit niggly about this, but if you actually think of the upper class restaurants as part of the tourism industry, they know they can't afford to poison tourists as this would put people off, not just the tourists. However, the training is far less than it should be and that is partly because this industry has relied on being able to casualise so they can call people as required. When it is busy you keep more staff and when it's quiet you don't have that same commitment and the downside of that is that you have a high turnover of staff. This industry has a high turnover, and it always has had, and probably always will. The restaurants who see themselves as part of the tourism industry will have to start thinking about professionalizing those core functions.

The answer lies in the training of food safety so that from the outset people understand that food safety is of great importance. Also in handling the different forms of food, one must be careful in not going from just one to the other, like from the preparation of chicken to the chopping up of the salads on the same board, and without washing your hands in between. Reiterating: The answer lies in the training and making sure that people right from the outset understand how important that is.

Unfortunately the food industry has attracted a lot of people to it, people who have not necessarily had a history in business and who kind of pickup business skills as they go, relying more on their expertise at the 'stovetop', and they have never understood why it is so important to have HACCP in place. The Food Control Plan approach of the new Food Act when it comes into effect will be bolstered by two things, the first is the '*of the peg control plan*' that will be developed for particularly those sort of sectors where the SMEs dominate,

namely the restaurants and cafés. The second item is the implementation of the Voluntary Implementation Program which is happening right now or will happen very soon.

The Minister emphasised the need to impress children with basic hygiene requirements. The Government has a focus on the 20/20/20 rule. When schools are visited, the children actually know about this. Young kids know about the importance of washing hands, so the message is getting through. We have got “Food Safe Freddy” and “Food Safe Feliti” and we see them everywhere with little signs and notices in the bathrooms and rest rooms and the message is getting through. It is a kind of community responsibility, it is not just around the food industry. However, we need to hammer home to the food industry that things have to improve.

The way that the Minister looks at it, is that you have to find a way of communicating to the public whether we are satisfied with the quality of what is being presented. But if we are not, then we also ought to be making sure that people are followed up, rigorously brought up to scratch, or else closed down.

The Minister felt that the Food Control Plan that the Government is proposing in this area, with the “off the peg” templates, will give the people the framework for what they have to do. It is seen that that is the solution to the problem, and does achieve what should be achieved. It is HACCP at an appropriate level. So what the Government is doing here is the HACCP equivalent for these establishments. What the Minister believes happens, is that a lot of people go into business. Some of these start in business as first time self-employed. Generally they go into business without knowing how to run their business, understanding the ups and downs and what to do. They know little about employment relations and they employ people and start finding out the hard way that they may have employed the wrong people.

### **Mike Egan, President of the New Zealand Restaurant Association, Wellington restaurateur**

#### *Low level of implementation*

Mike Egan believes there is not enough awareness. The SMEs don't have a positive view, indeed it is doubted the majority has any view because they don't even know what it is about. Mike Egan knows about it because of his role and by having a chef-partner who has worked with it. So really, it is just an awareness issue and there has to be a groundswell of awareness. It would be beneficial for a huge number in the industry to adopt such a system before it becomes compulsory. It would be great if 90% of the food operators already had it in place by 2013.

#### *Food Safety training being sufficient*

Mike Egan's restaurant tags all that is in the fridge, so with training they just have to be more aware. He thinks it needs the carrot and the stick approach. The carrot is having an excellent rating and a whole lot of things like that, with the stick being the closing you down which is a good incentive to make you comply. He reported his staff scrub the rubbish bins at the back of his restaurant every second day, whereas a short distance away, there is the back of an ethnic restaurant which is horrifying and makes one want to retch when walking past.

He feels that food safety training in New Zealand is insufficient. The beauty of HACCP is that it's written for us, it is already there, it is not as if we have to reinvent the wheel. So if we look at their model and our model, then we have the process. It could not be any easier.

#### *The role of management in food safety*

Everything starts at the top. There is no point of having the chef trying to implement food safety and the management not willing to spend the money and put the people into training. The management definitely needs a greater role and all managers should be trained in it. Mike was, and would not have any problem doing it, but if the owner doesn't care then you have a problem with staff not caring either. There are inhibiting factors. The industry is terrible at reading and adopting new rules. Most businesses are very low profit restaurants so they are certainly in survival mode. There is a huge amount of them, and when they are presented with another set of regulations they will simply shake their head and back away. Survival of the fittest.

#### *The advice I would give the authorities*

They need a timeline plan of implementation and awareness, targeting maybe some market leading places first, and if we have the staff organised at this end, other places are likely to follow. So we need some kind of incentive to have the high profile restaurants getting in early and getting some assistance to be test venues. Rather than implementing it in 2014 they should start now. We should be getting restaurants in Auckland and Wellington to upscale themselves to smart casual restaurants, and say these are the ones and use them as guinea pigs, getting them to work out what is good and what is bad. All will have different levels of needs and when these are certified, we can work on another section of restaurants.

#### *Who does the monitoring*

Management should be in control of the monitoring of the process. Mike Egan feels that we should use providers to monitor the process. It is a bit like the fire and safety thing where we have an independent to see if the safety is up to standard. We could do it ourselves but, could we or should we? It is another expense which some restaurants cannot afford but then again could not afford not to.

#### *Who should hold the Food Safety registration*

Staff come and go, so the management should hold the food safety certificate. Management and staff need to be recertified within a certain period as the message gets blurred with some, but then it is food safety and there should not be any shortcuts. With the many different nationalities in the industry it is easy enough to translate that it is "Food Safety"! When you are in business you should be aware of our rules. If you can't understand English and learn or understand our rules, you should not be in this business but in another, where people's health and safety are not at risk.

#### *A finishing Note*

The hardest part of training in the industry is that you can't train staff for every eventuality. A newspaper reported last year that a waitress poured some wine and in the conversation drank some of the wine from the customer's glass. You don't put in the training "You don't drink from customer's glasses." You would think that that is common sense. One can feel sorry for the restaurant because they got slammed by the media, and knowing the operator we know there would be no way that that is part of the normal operation. The waitress was just dumb. Following on from the discussion the question came up regarding how many people in the industry actually know how to wash their hands. This provided a fitting answer - well, absolutely none!

## **Mark Collins, Regional Manager Compass Group**

As regional manager of a multi-national company, Mark Collins has a wealth of practical and managerial experience in the catering and hospitality industry. He was trained as a chef in New Zealand and worked overseas for a number of years. Having been the owner of a number of establishments, from fine dining restaurants, sous-vide production to food art photography, made him an ideal candidate for this section of the research.

### *On food safety training*

Mark felt that the two most important parts in a New Zealand food safety training are firstly personal hygiene, the most important, and secondly system control.

### *On personal Hygiene*

These days you have dispensers, sanitizers, and a solution for this and that, and people go through the motion. You have to have the desire to have incredibly clean hands to have a high standard. I don't think we have the will to have high standards. Everything about society is questionable, cheap mediocrity and it is all made for a price and what this means is that there is no high quality. No one seems prepared to pay for it, or values it. We actually are seeing new staff entering the industry without any training, that is absolutely zero training, but what also is missing is practical common sense. In addition to the above two points, albeit somewhat fragmented, are the environment and perhaps technology. At different times technology may have exceeded its ability to maintain itself. Technology is somehow out of sync with these people's ability to manage and maintain it, due to insufficiently trained staff.

### *Implementing a food safety system*

On the role of management in the implementation of a food safety system, Mark felt that management has to lead. He explained that you have to drive the culture as the culture maintains the system. You can put the system into place but until you have the culture you really don't have food safety. In his company they strive for that, but if one looks over time, only in the last few years have they committed to a risk manager and a food safety manager, and only now are they really making the headway needed to make themselves get everything right. Incidentally most companies don't have that.

### *Having a process on board*

When a business has taken the HACCP process on board, they are more disciplined and have a greater desire for control. They are more proactive, their food is fresher and their expectation of standards are clearer. We get more professionalism in the other areas of the business as a consequence of being clear about food safety processes.

### *Alternatives to HACCP*

When asked if he was aware of any alternatives instead of HACCP, the reply was that HACCP is just an idea and there are a great number of variations on HACCP that contribute to peoples' food safety and these may not be full blown HACCP processes. His interest would be how to make it better. He didn't think legislation drove things very well, but legislation, or something like this, has a role to play.

### *Change*

Change should be in sequential steps, a partial change, a partial adjustment time, because what is seen too often is a poorly thought through timeline. People deny the time that it takes.

### *Implementation of a Food Safety Plan*

Having a lead time of say 10 years, does not mean we do nothing for 10 years. We should get real with it right from the outset. A lead time of 10 years with no trigger points, presents the likelihood that it will never come in. It will be lobbied at the end and then be deferred because a lot of people are going to go broke. There should have been an incremental move towards compliance in a 10 year period, and a penalty, not for non-compliance but for not purchasing the base of a food safety plan. So the first thing will be the food safety plan purchase and its installation. Following this they have a number of months to embrace it otherwise they close down. So then the process starts to gain its own momentum and people start realising that this softer, more manageable target is not going to go away. And yes, they will do this if they want to stay in the industry.

### *In sync with market place*

If it is out of sync with the marketplace you get a massive adjustment. This leads to a vacuum afterwards with the consequences of the inability to make further changes and the whole thing falling flat on its face. Following that is a 20 year gap before someone is prepared to endorse anything else, and this is the process of constant change that has been talked about. It is evident that the constant change that you get there, is not from a boom-and-bust mentality because you get another set of people coming along in the void of non-compliance. Call it subsistence farming for restaurateurs: They can't get a job anywhere else so they buy a job - they buy a business to buy a job, and they work night and day but are not committed to the industry or the minimum industry standard. As a consequence the food safety people cannot talk to them. The food safety people become frustrated as they need 5 or 10 visits a day to deliver the requirements of the job. These health officials do not have the time to come for a training session or an argument process. And what a run around they get! So the leverage ability to make that person comply is just like a child programming the parents to get what they want - the child wears the parent down.

### *On staff retention*

The difficulties with staff retention (an international reality) has a significant effect on food safety. With a high staff turnover you can have an audited food safety programme in, say, August, but by December you may have had a turnover of staff, and in January have a whole new kitchen brigade. So the process starts all over again.

### *A final comment*

His final comments were: Culture is far more important than a food safety system or a food safety plan, but one needs to support the other.

## **Anita Sarginson**

Anita Sarginson is Executive Chef of Bellamy's Catering complex, President of the New Zealand Chef's Association, and a certified Occupational Safety and Health assessor. In the latter role she is fairly active too, working with some of the major restaurants in town.

### *On implementation of the Food Safety Plan*

Her group has not implemented the new Food Safety plan, because not only are they stuck between that and a full HACCP, but have in place more robust systems than are required in the New Zealand Food Safety Plan. Most of the food safety processes have been organised in-house to fit the specific needs of their restaurants. They have also accreditation in City and Guilds 167 and 168, to deliver their own unit standards on site. That means that just about their entire complement of staff in the kitchen, bar staff and front of house staff also,

are trained to 167 standard, and their manager trains all eight in the kitchen to 168 standard as well. So they are doing a reasonably good job, over and above where they really need to be.

#### *Food Safety experience*

Anita Sarginson is satisfied with her company's experience in the industry regarding food safety issues, she thinks that's one of those things that's done perhaps at the beginning of people's courses rather than being a pro-active approach the entire way through. It is also something they can focus on, in their culinary and cooking competitions. There are marks awarded in all of those food competitions for food hygiene and food safety. In some of the international competitions there are even food hygiene specialists appointed just to give marks for that. It is seen as quite a good way of revisiting the subject. Some of our tertiary institutes include food hygiene at the very start of their cooking courses, but often that's the last we talk about it.

#### *On HACCP*

HACCP from their experience is found a little cumbersome. It seems to be designed very much towards larger operations, where there is someone that can do the administration or management. The Food Safety Plan is exactly the same thing. It seems the people that write these are straight from academia, and they don't have a realisation of the ability to go out and actually make that happen on the floor, when you've got day-to-day pressures of delivering a product to people. The food safety processes in her company are certainly integrated into their day-to-day work - they've been planned and designed by a chef, so that they can actually take place as part of the cooking process. They have food safety tips on the bottom of all their recipes, so that there's food safety information right throughout all of their processes. They've taken the more inclusive approach.

You must be careful the food safety plan does not just sit on a shelf. It needs to be not an academic manual that sits on a shelf, but a knowledge given to staff, training given to staff, education, the impetus as to why and what would happen if we didn't have this, and how can we manage it so that it's not screeds and screeds of paper, because kitchens are not designed to have screeds and screeds of paper.

#### *How we do the plan*

Dare it be said, chefs sometimes are not particularly literate people: They are very, very focused and driven towards time deadlines, getting the product out to a time deadline. People don't wait, in our industry, and you can't finish off what you wanted to do tomorrow. So therefore it's got to be an integration process. When her staff cook something they temperature probe it, write it down, and then it goes into the cooling process. The kitchen hand might write it down for the refrigeration. Those things are available to them, but it's at the far end of the cooking process they undertake it. It is not something they have to go and sit in the office afterwards, and do retrospectively. It has to be able to be managed in the place, at the time.

#### *Specific issues.*

One problem is the long-windedness of some of this documentation, stuff that to be really fair is not rocket science. They're always presented with a great glossy bound manual and that to some people is a daunting thing, whereas in their company they have a variety of sets of sheets of paper. The staff get used to it, and that seems to work for them, as opposed to documentation on file. Anita Sarginson thinks that perhaps the best way to deliver a Food Safety Plan would be in bite-sized chunks - break it down, because people

cannot concentrate on too much at a time, and integrate it into your establishment slowly so that it's not a massive change. If you gave someone the document and said "Here, right, go with this tomorrow", she can see it sitting on the shelf. It's just never going to work. These are our controls, and we need to use them to protect our small businesses, fighting to stay open in this economic climate. They should not be able to ignore it either, even though, for a lot of them it's just not a priority.

Then on the other hand there are people turning around and saying "we want to be business mentors", well maybe that's something we need to do through the Chef's Association or through some of their related networks and say, you know, the business doesn't always have to be about profit. Maybe the business does need some business mentor out there writing the food safety plan or some of those other things. And there are definitely discussions that have been had with some of the environmental health units when they've come through to do the monthly or yearly inspection. There is a lack of guidance on where the company stands and what it should be doing. There is a certain amount of frustration too.

#### *The role of management*

Anita Sarginson's company takes a really good view on training. They allow her to run the courses, and in fact, after the interview, she was about to go to Christchurch to run courses there. Not all businesses see the focus in that direction. It would seem they really don't recognise that deep down, they are responsible as managers and supervisors. It's a pity the proposed Food Safety Plan does not make that clear.

#### *About changes to the plan*

Definitely it needs to be in the bite-sized chunks, it's not something you can deliver on a one-day course. It's something that you would need to do two hours this week, go away and put it in place in the restaurant, come back, and maybe in a month you'd get all of those things in that plan in place. And yes, people would respond, but one just can't see how you could make people deliver that as a one day course and expect them to go on site and practice their learning.

So for those people that were trained a while ago and perhaps have let things slide a little, they also need to be refreshed, putting food safety foremost in their mind again. So Anita Sarginson thinks the reality of that is, from the discussions that she has had with the Ministry of Health, one would have to start immediately, concentrating on the basics, get those into place, and then it doesn't look like such a daunting task. With a follow up the next week, it would be a two hour commitment from the owner or the management, and they would consequently feel a lot better about getting that information out.

#### *Being consulted about the Food Safety Plan?*

There was no consultation until well after the fact. The first time Anita Sarginson heard about the new Food Safety Plan was when the launch was in Wellington and the New Zealand Chef's Association was invited by the Environmental Health Unit as a VIP to go along and have a look. Although there was involvement from the Restaurant's Association (RANZ) and the Hospitality Association (HANZ), there was no collaboration at all with the New Zealand Chef's Association. Both HANZ and RANZ have a very much employer-based focus, whereas the Chef's Association is an employee based association, which means generally it's dealing with technicians, and with the hands-on people who are working in kitchens. She finds it absolutely extraordinary that Food Safety New Zealand had not contacted the Chef's Association or made them any part of the process.

It is possible those writing the Plan believed that representation through HANZ and RANZ would be enough to also represent the New Zealand Chefs' Association, but it doesn't and the Chef's Association actually reaches a lot more people than that. The Chef's Association's magazine is very widely read, and also picked up off the net and downloaded into lots of kitchens. Each of its 600 members may be interacting with 20 or 30 people within their workplace. This makes it even more extraordinary that the Chef's Association was not consulted. It is also extraordinary that people like Ruth Pretty, a fantastic cook of international repute, are held up on getting HACCP recognition simply because they are not on town water supply.

### **Dr Ray Winger, Professor of Food Technology Massey University, Albany**

#### *HACCP or Food Safety Plan*

There's actually quite a bit of difference. HACCP tends to be looking at processes, and trying to identify where there is something critical. Where you have a hazardous product, is there a part of your process where you can do serious damage to micro-organisms and if so can you control that system? Having identified that, then you put a lot of resource on that particular step to make sure that you don't make a mistake at that stage. That's HACCP.

The Food Safety Plan is looking much wider than that. It's a higher level than HACCP. HACCP is a subset of food safety plans. So it is thought the move has come from a relatively close focussed HACCP, with a recognition that for most companies, they actually can't implement the HACCP plan. So the food safety plan is trying to get above that, to say "Right there are general principles that if you run your business with these sorts of principles, then you're going to cover a lot of the HACCP hazards."

There's different aspects on this one, and some challenges. You can't afford to have people getting food poisoning in institutional trade, hospitality whatever, because people simply aren't doing the right things. You are going to have issues around training, you are going to have issues around making people aware of what's going on, and that's really a pretty major exercise. So, one has less sympathy with the industry having to train people than anything else because if one looks at the industrial sector, it is the training of staff that actually makes the difference between a successful operation and a not successful operation. So, the problem that we face constantly with micro-organisms, is you can't see them and people don't think they exist. So why bother. Yet in restaurants, if you watch all of these programs that go on television, they cook something and then use their hands to manipulate it on the plate, so it looks good on the plate. There isn't a problem with that provided that they do clean their hands, and provided they're not a salmonella carrier and all the other bits and pieces going in there. And if there is a big turnover of staff, one wonders if they ever check.

#### *Improving*

From a technical point of view, HACCP was quite specifically about designing things in a process. So, you know, if you cooked a piece of steak in a restaurant, that was one process. If you cook potatoes that's another process. You have a HACCP thing for every process, which is a little ridiculous. There are certain principles in food safety that you have to adhere to, and it doesn't matter if you're cooking a steak, potatoes or whatever else. That makes a lot of difference. If there are generic things that people have pumped into them; temperatures of chillers, handling of leftovers, cleaning of desks, cleaning of benches, cleaning of hands, utensils, plates, these sorts of things, (and there's a whole raft of simpler things that can be done) and if that's pushed into people, and that's trained properly through the teaching establishments, there will be a tremendous improvement on present conditions.

*Are other countries, similar to New Zealand, having food safety systems implementation problems?*

Pretty much everybody does, the systems are the same everywhere. There's nobody that's doing it better or worse than others. There are countries, like the United States, that think they are leading in terms of food safety, but they're no better or worse than anybody else. They're good and they certainly do some things very well. For example: It is very rare that you will see, in the United States, somebody handling food and then going and handling meat for example.

*Is it because of fear of the legal process?*

Absolutely. They get sued and that creates big issues for them. It doesn't matter which country you look at, and it could happen in New Zealand as well. Australia's had it, the United States have it, Europe's got it. Companies with a court action on a food safety issue have a serious impediment on their business, if not being out of business very very quickly. And there are examples all over the world on that sort of thing. Even very big industry can suffer, and the smaller ones have potentially an even bigger risk.

*The direction Food Safety awareness should take*

There has to be training, that's the only way of making people aware of it, and it has to be training that is suitable for the industry, and if there is rapid turnover that has to be covered as well.

*On SME in the hospitality industry*

There needs to be a change in how these places are actually established. So somebody may have to look quite seriously at putting licences on them or something of that nature that, unless they get a satisfactory certificate they're not going to be allowed to even open. That's part of what may need to be done to control people, to get people up to speed on maintaining adequate food safety in these particular organisations. If one has new people coming in, and they're setting up restaurants and other food outlets that are atrocious, then that has to be stopped. It's not only the newcomers, this should apply to everyone.

With SME's, in food safety there are some generic things that they should be implementing. Environmental health officers shouldn't just be going around looking at the state of the buildings and issuing a certificate if the building looks all right. They should be looking at their rubbish bins and their operating systems, they should open their fridges and have a look at whether there's temperature control in there, whether they know what the temperature is, and all these sorts of things. Do they have disinfectants in there, do they have proper cleaning materials there and not just the soap powder or dishwashing liquid they get from the supermarket? They've got to have industrial based products there. Some of these things are essential for that type of business, and going to the supermarket and buying retail stuff doesn't work. If they can't afford these sorts of things, then they shouldn't be in business. There are some absolutely basic principles about food handling and food safety, which are not earth shattering, and certainly not rocket science. They're sitting with a very perishable product, indeed they're sitting with a dangerous product, and they should realise it. If they're working with such a dangerous product and can't reliably work out what the problems are, where their hazards are, and how to control them, then they shouldn't be in business.

### *On food safety authorities promoting a Food Safety Plan*

They need to work out how to get access to the people directly involved in the food industry. At the moment those in the hospitality industry probably find it difficult getting information. What are they going to listen to? What are they going to look at? Where are they going to get their information from that makes sense, and which source is the one that they think is important? The food safety authorities need to make this communication much easier and reliable.

### *Controlling the HACCP/Food Safety Plan*

If there's an approved HACCP system, or anything like it in place, then it needs to be controlled. In a small business often the manager's the right person to control that, because the manager cares. In other instances, maybe the manager isn't there very often, so the best person to control it could be a chef, or could be one of the appropriate people routinely present during the day. The situation in the industry is very different, because you've got quality control technical staff that are specifically involved in that, they understand the details, they have a remit to do that, they are usually separate from other groups so that they have no conflict of interest, and they have no management to mess things up, so to speak. Much will depend on the system in place. It is not really something that can be set in concrete. If you've got staff and a high turnover, then the only group that may be around for any length of time is the management, and you can't have somebody that changes every time an auditor or a policing officer walks into the restaurant. They could disclaim all knowledge and you get nowhere.

Whoever audits the business must have the power to actually do something on the spot if they so decide – even to closing down the business if necessary. So, there has to be an appropriate policing body of some sort. It may be an officer of NZFSA or an environmental health officer, but whoever they are they must have the power to actually do something on the spot.

The players that are doing it well are not the ones that are going to create any problems so auditing them say once a year, may be sufficient. For other businesses, the way of handling them is an unannounced audit, so that there's no pre warning, and they haven't a weekend to clean up their act and make it look all good. That keeps them on their toes.

### **James Frazer, formulator of the original food safety regulations**

Until he retired, James Fraser was Chief Scientist in the New Zealand Department of Health in charge of all food issues. He was the architect of the original Food Act 1981 and the Food Hygiene Regulations. As there was a time constraint, the questions he was asked were very similar to the list of questions presented to the health official group. He has been in the food industry since 1948 in Production, Research, Enforcement and Consultation. He has a Diploma in Dairying from Massey College and a Bachelor of Food Technology from Massey University.

### *Your comments on the Food Control Plan process and what benefits would this bring the Public?*

This process was the foundation for providing food for the Astronauts, and moving control and enforcement to industry was not only logical, it appealed to world government's policy of "user pays". In theory, safe food at less cost to the Consumer.

*What were the reasons for the very slow, or rather non implementation of HACCP into small to medium hospitality enterprises in New Zealand?*

Small to medium hospitality enterprises in all countries have for years experienced problems that are touched upon below, in particular “the phenomenally high turnover rates of staff”. In addition, staff in these enterprises are often not paid what one would expect for the work that is done and the shift hours that are involved, seven days a week, 20-24 hours per day. English is often the second or even third language of the employee. Employers were very reluctant to fund the new approach.

*With the failure of one system how different is the "Food Control Plan" system and in which areas have improvements been made?*

The Food Control Plan by introducing Critical Control Points has simplified the goal of Safe Food from farm to plate. HACCP has been more successful in large food processing plants because food production is simpler with less people ‘handling” a smaller range of ingredients and under better controlled conditions. The Hospitality industry is “handling” a food just before it is consumed when it is most susceptible to contamination. A “Food Control Plan” places the responsibility of preparing safe food firmly in the hands of the people producing and processing the food. Once again it has been easier for these Plans to be implemented in a large automated food processing plant than in the Hospitality Industry; e.g., large scale production of bread, breakfast cereals, dairy products, meat processing etc.

*What role should management of the small to medium hospitality enterprise play in the implementation and maintaining a Food Control Plan, and to what extent has the management control over such a plan?*

A dedicated management must understand HACCP and Critical Control Points and at all times maintain management control of the whole process. A company whether small, medium or large is “only as good as its worst employee”. This is often not recognized by Management and they fail to accept that this also applies to Management, as well as the employees.

*Staff training of food safety control in the hospitality sector could be best described as . . .*  
Very briefly haphazard, inconsistent, unreliable. It has improved over time.

*Would legislative changes to the control of food safety ultimately see the demise of EHOs or alternatively see a change in their present role?*

Environmental Health Officers EHOs have a role in auditing Private Auditors whose role is to ensure Food Safety Plans are fit for purpose and observed by industry. This is “checking the checkers”. I do not see a need to change their role.

*From a health officer's perspective and the phenomenally high turnover rates of staff in small to medium hospitality enterprises would these changes be realistic?*

If EHOs were completely excluded from the chain of command, who would check the checkers? My experience is that there is a definite role for someone to audit the Auditors. To exclude EHOs someone is needed to replace them and who will train them to meet the present EHOs’ level of expertise.

*What difficulties do you foresee with small to medium hospitality management maintaining a control system in these enterprises?*

Difficulties are as follows – Untrained staff; transient staff; lack of staff loyalty; language difficulties; shift hours, seven days and nights; insufficient monetary return to staff; lack of

job security and promotion possibilities in many positions; working under pressure sometimes under unpleasant conditions

*What was your personal input into the new proposed legislation regarding the food control plan approach of the new food act?*

I had retired as a Food Safety and Legislation Consultant by the time the new Food Act was being considered and having been the architect of the previous Food Act and Regulations believed I should step aside from the proposed new legislation.

## **Findings: Managers Group**

***How long have you been with this organisation?***

MA 15 years and in present position for the last six years.

MB 17 years, present position General Manager for four years.

ME Nearly two years.

***Has the hospitality industry been your only career path?***

MA The hospitality industry has been only career path

MB Hospitality has been only career path, qualified with a BA

ME In the food industry for almost eight years. Started off by going via polytech and training up for two years, going through food safety with them and everything like that. The rest of it's been experience. Spent one year off in that time as well though, just had a bit of a break from the industry. The qualifications come down to a diploma in culinary arts through Christchurch Polytechnic. Another thing found really useful for time as a head chef was a Bachelor of Commerce degree which helps in terms of organising all the structures, the computer side, and all the costing side.

***What percentage of staff holds FS certificates?***

All replied that those involved in food preparation all had Food Safety certification.

***Are you satisfied with your staff's experience in this industry, especially regarding food safety issues?***

MA Has about 15 full-time staff and a number of part-timers which brings the number up to just over 35. The percentage of staff holding food safety qualifications is low. However the seven to eight people in the kitchen all hold appropriate certificates, that is food safety certificates, and of course staff at management level all have food safety knowledge.

MC Quite satisfied because they have been training their workers to be part of their plan. Has had workers that have come in with training elsewhere, and it hasn't entirely fitted in with the plan here. When a food safety programme was first put in place, personnel from food and health standards came and spent probably three weeks giving lots of training, initially in food safety.

ME Generally, yes. Most of the senior staff had no dramas whatsoever regarding food safety issues or anything like that. Some of the kitchen hands, younger ones, needed to be pulled up on it a little, just because they hadn't had the work experience, but it was just small things that were quite easy to improve on and manipulate to get on target. Things such as washing hands: All would know the importance of it, but not necessarily do it at the start of every shift. It's still pretty good though in their kitchen. Quite fanatical about handwashing. Hate if it's not done properly. Thinks time wise, of how long physically you're washing, is pretty poor in New Zealand. People would do the good old quick rinse with a little bit of soap, and then magically they're done.

### ***On likely changes to the Food Safety Regulations***

MA Likely changes to be introduced for food safety should be that these become more compulsory and it would be very important to start with some training at secondary school in their last year before going out into the wide world. On entering the food industry some type of training in food safety should be compulsory, even if the industry has to do the training. That would be good for the industry especially if they can show some kind of a certificate at the end.

MB Would like to see the inspectors give advice on how to solve some of the problems experienced by businesses. Mention may be made of a problem and an order to fix, but no solutions ever offered by the inspector. If there was someone who was a representative who could come in from food safety to help them acquire a higher level of food safety, including the hazards etc., then people wouldn't necessarily see food safety inspectors as "the enemy". There would be a benefit to them actually working with the food safety inspectors. Thinks some people change things around just at the last minute before an inspector comes in, because they get warning. Believes there should be no warning.

ME Should increase awareness and place more accountability to it. At the moment, technically, apart from the six-monthly or three-monthly check, you're actually not accountable.

### ***Should management have greater control rather than local body control?***

MA Doesn't think there should be a greater local body control. It is the whole population which needs to have greater awareness. On the one hand we get the complaints that the government is a nanny state but on the other hand a great number of people disobey common sense rules and it would be fair to say that we cannot think for ourselves anymore. Coming back to food safety when people do not have this knowledge for whatever reason, the government needs to take control and enforcement on their behalf at least to the very bare minimum. But Government intervention or regulation should not be left to the last minute and then try to rush it through, which makes it appear as not being very well thought out.

MC Maintains staff training twice a year plus some intermediate where necessary. Clearly thinks management should have greater control than local body.

ME Each owner/operator is slightly different in how they approach food safety. The problem from a head chef point of view, is that the inspectors are not aware of the practicalities nor give advice on what to do. Nor do they ask for a summary for everything that you've worked out, and all the related data, at the end of each month. This is considered important, but if the inspectors don't care, what is the actual point in doing it.

### ***Should all staff involved in the preparation and serving of food hold reputable food safety certificates?***

MD Believes Yes. Skill level is not that important. Their ability to want to learn, their enthusiasm, their drive, their fire, and their dedication is more important than their skill level.

### ***On implementing HACCP in your organisation***

MB Has already done a trial. On the negative side, it is adding more paperwork to people who aren't necessarily paperwork oriented and who work in a highly pressured environment. On the positive side, HACCP gives a greater awareness of their responsibility to the customer in food safety and hygiene, which is very obvious in that new plan.

MC Thinks some people take it on board, and some people don't. Some people just put it in the too hard basket. The bigger companies may do it, but not certain about his.

MD Implementing this into a large operation such as a hotel, where you've got more people coming through, may be fine, but in a smaller restaurant it's costly, it's very time consuming, and very expensive. Thinks it's probably overkill for a small restaurant.

ME First impression was that it's a lot of work to implement, but can see why they're doing it, and thinks it's a really good idea. Said recently Food and Safety Officer came out and gave them the big book of things to do. It looked simple, straightforward and obvious, and when you break it down it is actually easy to do. But it costs time and money. A problem that one can foresee is that if you don't get your staff engaged and actually get them involved with the plan, it's not going to be implemented. You may push them as hard as you like, but if you don't actually get them involved in the plan, it's going to be really hard to implement it effectively and get it so it's actually correctly and accurately recorded. If your staff aren't actually motivated to do it, it's really easy to open up a book and write in the number 3.5 for the temperature, even if you haven't actually measured the temperature. To make it work they must be motivated, you need that involvement.

***Is in your opinion the standard of food safety improving or deteriorating?***

MA Sad to say they are deteriorating and this is based on the fact that if no program is in place things do not improve but become stagnant or even deteriorating. Is not fully aware of all the details of HACCP, but in reality follows most of these principles in one form or another. From a sheer financial point of view, every delivery is checked and ensured has correct storage and preparation methods. Anything not correct will be rectified. Their chef is very professional and very much a hands-on person, one of the few who still makes his own stocks. Both he and the sous chef have been there for 12 years and run it very tightly. They are aware of hygiene standards and requirements and in the words of the local health inspector. "If most businesses were as good as yours there would be fewer environmental health officers."

MD The very basics such as your heating temperatures, your cooling temperatures, your cleaning procedures, your personal hygiene procedures, those types of things and how you prepare and take care of them come first and foremost. Then would come your bacteria, the types of bacteria, how they grow, and how they're killed. There is a gap between the New Zealand Food Safety Authority and the restaurant. Maybe there needs to be more work done to bridge the gap, to convert the perfect template to the practical template. Maybe there needs to be a bit more work done to find out what's needed and what's required.

***Are you aware of negative points regarding HACCP or the Food Safety Plan?***

MA Feels there are very few negative points about HACCP as HACCP is all about people living in a healthy environment and a safe environment, of what we produce for our guests and customers and as such there can't be anything negative. It involves everything from the worker to the customer, the relation and the name of the place as well. Unfortunately, the staff in general have insufficient knowledge, the kitchen staff do, but overall there is lots of room for improvement. The industry has neglected a lot of areas which eventually will have to be addressed. It is not known if there is a better system than HACCP available, but eventually it, or at least a similar system should be made compulsory. The good thing of course, is that it can be implemented in different stages and the needs of some places are different from others.

***Are customer expectations a good reason for maintaining control of Food Safety?***

MB Absolutely, one could not have a business that had a B grade, with the current system at least, and be proud of it - especially when your customers could see it. Customers are spending good money to be fed a meal that we're meant to be experts at doing. If they could do a better job at home, then why should they pay?

MD It's strange, it seems the hospitality industry runs as a different engine to all other businesses.

***Would you like to gain further Food Safety qualifications?***

MA In principle would like to receive extra training in food safety although as not involved in actual preparation and serving feels doesn't need it. Would do it if available as, like first aid, you never know when you'll need it, and another incentive is, as you get older you realize how little you know and you should take advantage of any opportunity to learn more. Finally, on what can be improved in food safety not only for the manager but for everyone in the business is of great importance. It is a constant reminder for everybody no matter where or what level of employment they are in, that there are a lot of basic rules which are constantly being broken.

MB Would like something for the front of house teams, that's appropriate just for them, something obviously more simplified with a basic knowledge of food safety and how to pick up and serve the food.

MD Didn't answer the question but told of taking an Australian course which stressed the seriousness of working in an environment that is not sterile.

***On bad habits***

MB Leaving our stocks out in an open area, in the kitchen, if they're hot. You can't come in at 4:00 am., and start putting them in the fridge. There has to be a realistic approach, weighing up what is more dangerous: Leaving them overnight, or putting them hot in the fridge. Putting them hot in the fridge is far more dangerous. You could end up heating everything else up.

**Findings: Chefs Group**

***How long have you been in this industry?***

CA Approximately 21 years and always with food preparation. Started apprenticeship when just over 15, with a small break after apprenticeship for just under a year.

CB Coming up to twenty years, and it's always been in cooking since seventeen years old.

CC Spoke much about experience as a head chef and now chef/owner with its extra pressure and demands, but didn't answer the question.

CD Owner-Manager and has been in this organisation for 35 years.

CE Executive Chef. Has been in this industry for 30 years

CF More than 28 years.

***Has the Hospitality industry been your only career path?***

CA Yes

CB Yes

CC Yes

CD Yes

CE Yes

CF Probably also a Yes. Started in mess hall in an air force base, worked in the mess halls in the US, moved back to England, worked in a fish and chip shop, did professional training, and then worked in five star hotels and restaurants in North America, Europe, and eventually Australasia, and New Zealand for the last fifteen years. Very familiar with legislation in other countries. Set up a food safety system in Christchurch, where it was hit and miss.

***What is your highest qualification?***

CA Three year apprenticeship and trade certificate.

CB City Guilds - one of the last group of students to go through the old City and Guilds program while taking a full apprenticeship.

CC Full five year apprenticeship in London and Chef's training in Auckland University of Technology.

CD Doesn't have any

CE City and Guilds program and trade certificate plus a Food Safety Course in Otago Polytechnic.

***What is the percentage of your staff holding Food Safety qualifications?***

CA 100% kitchen staff

CB 100% kitchen staff

CC 100% kitchen staff, but 30% overall - the front of house staff don't and that's where it's so needed. They all have to have one of the managers on duty who have managers' certificates acceptable with the liquor licensing controllers.

CD About 75%

***What is your opinion of your staff's level of knowledge regarding Food Safety?***

CA Untrained maybe 50 percent. Depends on culture. Related story of Samoan friend who commented on how strange it was to see people washing their hands when leaving the toilets.

CB Has all young staff, and all have been through food safety programs in Polytech. Thinks have high standard of food safety.

CC All chefs high standard, but not front of house staff. Is sure a lot of cafes and takeaways don't have any at all.

CD All have good knowledge now, but not when they arrive. Employs very young people, so they get a quick course in it. Sometimes difficult to impress on them.

CE Didn't answer but talked about food safety not being a main priority to young people. After Polytech they believe they can jump up the ladder to a high position, without working their way up. Working for inexperienced executive chefs, or inexperienced people who believe food safety is a cost and will lose them money, is disastrous. It's the old story, if you're at home and your family's sick, check your fridge. Many think just looking clean and tidy at work is sufficient.

CF Quite satisfied with staff. Food safety in the kitchen is part of their daily life. Talked about their taking over a restaurant, how filthy it was, and how much work was needed in getting it completely clean and in working order. Also talked about lack of food safety training of prospective staff and how the restaurant owner shouldn't have to do this. Believes modern training is more a numbers and money game and there needs to be a change in education policy so the certificates presented actually mean something. There also needs to be a shift in the mindset of the owners, the operators, and the managers, that training is important.

***What is your opinion on that all food workers hold Food Safety qualifications before they enter this industry?***

CA Didn't really answer the question but thought, regardless of what is taught in industry, anyone handling food should have good personal hygiene. It's a cultural thing they need to understand.

CC Yes the kitchen should have 100%, except the dish washer, but not necessarily the rest of the staff.

CD Believes everyone should, including dining room staff as well.

***What if any Food Safety changes would like to see implemented?***

CA More focus on the younger generation, and maybe at the management level, when a different approach is needed.

CC Would like to see a 6 monthly publication on Food Safety reporting on both good and bad, with a little more praise for the ones that do actually care about what they do, so they continue to do so, and don't slack off because nobody's keeping their eyes on it.

CD Thinks it should be better than just someone coming to test your kitchen and facilities every six months, and giving warning so that one can clean up the week before. A new mindset is needed that all parts of the restaurant has to be clean at all times. Then a better relationship is needed with the regulators, one in which they come to give advice rather than the bureaucratic attitude some have taken in the past. A mutual respect is required.

CE Would like to see more seminars done about food safety for employers, and spending more money on sending staff to seminars. Would also like to see much more frequent (and unannounced) visits by the Health Department, and at times when the kitchens are in full operation. Thinks some times the authorities don't understand actually how it works.

CF Not a lot.

***Are in your opinion the problems with Food Safety improving or deteriorating?***

CC Certainly not improving and lack of proper inspection or auditing is much to blame.

CD Perhaps improving, but just not in the right direction.

***Is HACCP a reality you can implement in your organisation?***

CA It's important and needs to happen, but once again there is a cultural problem.

CB For a restaurant to take on a HACCP process, it's a minefield of information. It's something that's essential for hotels, big restaurants, casinos, catering companies, etc, where they move a lot of food around, and they move it from place to place and it's handled by multiple people. CB's restaurant lucky in that there are very few handling stages in the process of the food that they get, otherwise would be very difficult to implement HACCP.

CC Yes probably, but need more information to actually know what is needed to be done. Needs a detailed pack that runs through step by step what the authorities are going to be looking for and what they want from the restaurant.

CD Believes must be implemented and has someone who understands HACCP writing the program for them as it is too complicated for them to write themselves..

CE Yes. Has worked in places where HACCP has been introduced and has attended some HACCP courses. Understands HACCP was designed by NASA for food in space, and thinks sometimes you can go too far, and a food safety plan a little below HACCP would be just as good. Believes most people would say that's going to cost money, haven't got time to train the staff, nor enough staff, so just can't be bothered

***Does Staff retention play a role in your control of food safety?***

CE It does. If there is a high turnover of staff you've got a problem. it's very hard to put a food safety process in place if you're constantly training new staff. Some people just give up and haven't got time to do any more. If you can hold your key staff you're okay.

***What could replace HACCP?***

CD Doesn't know. It's all confusing so are implementing their own food safety plan, which is being written up by a professional in terms that everyone will understand, and know what has to be done.

## **Findings: Suppliers Group**

Each question will be individually shown with the interviewee's views on the topic. Their code will be shown at the start of their comments made.

### ***What is your position in this organisation?***

- SA Managing Director
- SB Company auditor in charge of food safety
- SC Managing Director
- SD Meats and poultry category manager

### ***How long have you been with this organisation?***

- SA Since we opened
- SC 28 years
- SD Six months

### ***Has the Hospitality industry been your only career path?***

- SA No I worked in two other industries.
- SB No. Worked for seven years in the public health division of the Department of Health after completing a food technology degree in product development. Was involved in the regulatory and consumer aspects, basically, administrating food and drug regulations, the composition and a labelling of food in New Zealand, and this involved going around the country and every food factory mainly in labelling and public health issues. From there, moved into the Fishery Industry Board as a technical officer.
- SC Yes
- SD Yes

### ***What is your highest qualification?***

- SA Honours degree in nursing, specialising in intensive care. Normal business qualifications but not in terms of food.
- SC Hospitality apprenticeship
- SD Hospitality apprenticeship

### ***Have you been consulted for input in the proposed 'Food Control Plan'?***

- SA No
- SB No. Has some reservations about the culture in some government departments. To implement a New Zealand wide food control program we need a decent length of time over several years with the opportunity to comment and make recommendations. Things have to change.
- SC Apparently not but has acted as consultant regarding the new food safety plan to a number of organisations
- SD No. Disappointed as is a member of the New Zealand Chefs Association which also was not consulted.

### ***What is the percentage of your staff holding Food Safety qualifications?***

- SA All staff have completed the normal polytechnic training, but believes the food safety component is poor. Has now developed a very extensive food safety programme in-house over a period of several years which is HACCP based. This was done in consultation with Food Safety Authority of New Zealand
- SC All those responsible for food handling and food production hold appropriate certificates, and in-house training is also given.

SD At present has no staff, but in previous position, it was compulsory for all staff to have recognised food safety qualifications.

***What is your opinion of your staff's level of knowledge regarding Food Safety?***

SA Knowledge satisfactory at their end of the chain, but in the supermarket chain they supply, it is a different matter. The chain doesn't have special staff to deal with food safety. They feel they can take a minimum wage person and put them in areas where you work with fresh food, and there are huge problems. You need people who are qualified and responsible and that's where the problem is. They do not have these people, they are not available.

SB Does the training in food safety, and has even trained the person in the shop. Have training sessions with the majority of staff whenever required from time to time, which works out at every couple of months. It is mostly '*on the floor*' training, as this is the only way it can be done due to the setup of the business. The staff here have very low academic skill levels and this method of training is particularly suitable for them. They are people who work with their hands, and they are very willing to learn and to understand, they do know what is right or wrong, and they very quickly pick up the requirements of an external auditor. Have quite a high turnover of staff in this industry, and have to remain very vigilant, but that would not be very different from most industries. It is very hard to get people from New Zealand to work in the business. Most of the workers are transient from overseas and stay, on average, only about 2 months, so training is a continual thing.

SC Have a high level of knowledge in this company, but it's probably never enough, so have on-going training and regular monthly meetings and training sessions to ensure that the knowledge stays at a high level. Hand washing of course, if not conducted properly, presents the greatest risk to food safety. What a lot of people don't understand is the risk of cross contamination, and this would be the greatest risk any organization faces today and the staff must understand that.

SD Believes staff need a continual type of training as they easily forget. Some feel they don't have the time, some are too lazy, but each person has their training.

***What is your opinion on that all food workers hold Food Safety qualifications before they enter this industry?***

SC There is a big problem here: Not enough people are being trained and few stay long enough in the industry. For example they may run a restaurant for two years and then become a taxi driver. The new people coming up all the time, start with little knowledge and this process repeats itself time after time.

SD The production staff should definitely have the right qualifications and knowledge and not only in food safety but also have knowledge of allergies. Awareness of the dangers of an allergy should not be underestimated as some customers may or may not have an allergy, but others are definitely allergic to some foods. Feels that training in this area is just as important as food safety training.

***What if any Food Safety changes would like to see implemented?***

SA A tightening up on who gets an exemption. Why should a service station serving food have an exemption and not a small restaurant?

SD It should be compulsory that a new kitchen hand entering the industry be given induction training in simple food preparation, food safety issues and also health and safety training. Today, this seldom if ever happens. With so many private providers around, the government should make it compulsory that is this type of training needs to take place.

***Are, in your opinion, the problems with Food Safety improving or deteriorating?***

SA Deteriorating. What is particularly disturbing is that most places, when the staff has a stomach upset they keep on working. In SA's establishment, they don't come back until they have a doctor's certificate saying they are fit to work. This is a good policy, but, in other places they want the staff to get back to work quickly and that is such a dangerous thing. There is also a need for each worker to be clean and tidy in appearance. Some kitchens that have been visited are absolutely disgusting.

SD Not improving. Not everybody is taking part in the new program and that should be government driven and compulsory for everyone. Not everything works under the new food safety plan mainly because of the documentation as not everyone has the time at the end of the day to sit down and complete the paperwork. To take the temperature of cooking poultry the temperature of the cooling process is not always possible. Rapidly cooling a product in a blast chiller is beyond most places, and storing the product in different refrigerators is not always possible due to the fact that most places have only one walking cooler if they are lucky. An added problem: In the smallest of the places the cooler is too close to the cooking area and then, with its door opening and closing all the time, the temperature is not always possible to keep at 3 to 4 degrees. As a supplier, taking shortcuts to deliver a cheaper product just does not work.

***Is HACCP a reality you can implement in your organisation?***

SA Has developed a food safety programme, a safety plan, over some length of time and making improvements all the time. If at the time of audit improvements still are needed, they will be done as the company continues to improve and reach a higher level.

SB A risk management plan, a site plan, what areas are covered, document control for record-keeping, external verification, corrective actions, reception of fish, storage of fish, cleaning and sanitation chemicals, maintenance inspection for parasites, packaging and labelling, storage and transport, staff training, waste management, non-compliant product like recall of product, internal compliance, business continuity plans, and these are just some parts of risk management plan. It started off as ISO, then it was HACCP and now it is called RMP and we're not sure what the next one is going to be.

SC You must of course implement this into your organization. One down side is that it can be expensive but this can be debated. It is definitely a positive step forward with nothing negative other than the costs involved. There will be a problem of applying it and this is where the challenge lies. You have the rules but do they comply to the rules. HACCP should of course not be replaced, but it can certainly be refined and improved. The practicality of HACCP must be answered as a yes, especially with our type of organization. HACCP can, and of course, should be applied at many different levels.

SD Making sure that everybody is aware of the regulations will alleviate a lot of the problems. We will also need to be aware that one plan does not suite all establishments. Hotels and takeaway places are very different indeed and the regulators will have to be flexible to ensure that these plans will work. The problem with implementing HACCP into smaller establishments lies with the administrative content. Larger establishments are able to do this much better than the very small. The food safety plan is a step in the right direction but if there is no prior knowledge or awareness, any plan will fail.

***Would you like to gain a higher level of Food Safety knowledge?***

SD It is always good to keep up-to-date with law changes and if you don't keep up with learning to changes you will fall behind. We live in a changing world and yes, would like to learn more.

## Findings: Health Professionals Group

### ***What length of time have you been employed in the 'Safe Food' sector and has this always been your profession?***

- EA Three years, first appointment after studies.
- EB Qualified in 1982, worked for two years as an Inspector of Health (Department of Health) and since then as an Environmental Health Officer.
- EC On and off, since 1976. There was a gap of about 2 or 3 years when working in health and safety, but generally always involved as a regulator in the safe food sector.
- ED Employed as an Environmental Health Officer for 14 years, which includes food safety. Before this had a number of different jobs.
- EE 30 years, but was a Occupational Hygienist with the Labour Department for 8 years.
- EF 30 years
- EG 13 years, 10 as an Environmental Health officer, 3 as a Health Protection Officer.  
Not now involved in the food sector
- EH Environmental Health Officer for 21 years. Has always been involved with food safety and this is now my specialist area.
- EI 31 years as an Environmental Health Officer. Started as a medical laboratory technician.

### ***Can you give me an indication of your qualifications and if you had the opportunity which qualification would you like to add to this?***

- EA Has a Bachelor of Environmental Planning (mid 90s) but no job as market full. Continuing from there obtained a diploma of Environmental Health which was about 3 and a half years ago. The next step: Perhaps a Masters in public health but then has not given it too much thought at this stage.
- EB Current qualifications: BSc in Ecology & Botany; Diploma of Royal Society of Public Health; Auditing introduction. Future Qualifications: No particular qualifications of interest at present.
- EC Has undertaken some of the basic food safety courses, both as a deliverer and a receiver. Training courses – how to teach. Courses on the implementation of the then new food act in 1981, the new food regulations in 1984, new food hygiene regulations, ongoing training in that area. In the early days, the Department of Health also used to run technical training in food areas as well. Environmental Health officers and Health Protection officers attended courses run through Massey University, they were really good. They improved our technical skills. Started off down the track of doing a Master of Philosophy - only research thesis still to do. Is beginning to get a really good understanding of the movement of food across borders. That's a big growth area and the transnational food industry is where we're going to have a lot of problems in the future.
- ED Has a Bachelor of Applied Science (Environmental Health), HSNO Test Certification, Lead Assessor Qualification in Environmental Management Systems, Food Auditing Qualifications, NZ Certificate in Business Management. Would like to add possibly a Diploma in Environmental Noise.
- EE Royal Society Diploma in Health Inspection, Royal Society Diploma in Air pollution, Qualified Meat Inspector, Health and Safety Diploma (Hygiene), Bachelor of Science (Psychology). Would like to do a post graduate diploma in public health.
- EF UK Health Officers diploma, EEC Poultry Meat Hygiene qualification, Food Act training. Australian Food Safety Lead Auditors Course-Class 1, Approved auditor for FCP's, Would like to take other classes if opportunity arises for further practical experience
- EG Royal Society of Health Diploma for Public Health officers. Since that time have completed MSc and PhD., but not in food.

- EH Diploma in Environmental Health Science at Wellington Polytechnic.  
EI Royal Society Diploma in the Public Health (in England)

***Can you briefly explain the Food Control Plan process and what benefits would this process bring to the public?***

EA This basically is the management of Critical Control Points in the production of food and ensuring that these CCP are really well met to ensure "Safe Food". A simple example is that in cooking a whole chicken making sure to heat the centre to 68°C, the CCP, and anything less than that is giving bacteria the chance to increase significantly. You have got the whole range, for which each has the CCP. This is just the Hazard Analysis in general.

EB HACCP (Hazard Analysis and Critical Control Points) includes the assessment of potential hazards, defines how to eliminate avoidable hazards and sets acceptable limits for those that cannot be avoided during the processing of food. It considers the potential risk from biological, chemical or physical contamination. The control measures, tests and criteria are defined in a systematic documentation of the entire life of the food - from raw materials to final consumption.

EC The food control plan is a document that shows people how to control aspects of food that they're preparing, to minimise the hazards and make sure the food is going to be safe for the public. One of the key things we're going to be looking at is the sense of ownership. When someone's preparing a food control plan, they sit down and look at the processes, they analyse the processes, and they actually have to think about what it is they're doing. That in itself can be beneficial. It's like sitting down and doing an assignment, it's not necessarily the outcome that's the important thing, it's the process of doing it that's critical. It is their responsibility to make safe food and show the inspector it is safe.

ED The FCP process places more responsibility on the operator to implement controls that address food safety hazards, and ensure that staff are well trained in all aspects of their job, with a particular focus on food safety. Rather than inspecting a food premises, audits are now carried out to assess conformance to the FCP. Instead of telling the operator how things should be done, there is an expectation that when an 'issue' is raised by the auditor, the operator will come up with the solution, having taken a more hands-on approach to food safety. The benefit to the public is potentially safer food.

EE Currently there are two Food Control Plans recognised by the Ministry of Primary Industry (Old MAF and NZ Food Safety Authority) These are a full Food Control Plan which is based on a HACCP approach where critical control points are identified and controls put in place. The process for the full plan is that the operator normally has the assistance of a private company who develop the food control plan in conjunction with the operator. The plan is then approved by the Ministry and an exemption is given for the Food Hygiene Regulations and the requirement to register their business with the Territorial Authorities. An independent auditor approved by the Ministry then audits the plan on a regular basis. These auditors in the main are third party auditors. The second system has been put in place as a temporary system awaiting the passing of the new Food Bill. This system is the Voluntary Implementation Programme (VIP) and known as an Off-the-Peg Food Control Plan. It is a simplified form of a Food Control Plan, which differs from a full plan in that the food premise operators are given a preformatted diary and work book which have been designed for specific types of food operations, for example restaurants. The operators are permitted to make minor changes to plans. The plans when completed by the operators are approved by the TAs who then carry out audits of the plans. This auditing is carried out by the EHOs.

EF Identification of hazards, standardised systems of control, for example cooking of chicken. reduction in food safety risks. improved level of awareness – making food business operators less at risk, and overall a reduction in incidents of food borne illness

EG Thinks the practicality of a food control plan is overrated. It does have some excellent points about identifying risk factors and control points critical to specific processes, rather than generic hygiene requirements, but that being said it is much easier to enforce prescriptive hygiene requirements like cleanliness, appropriate food storage, personal hygiene and pest control. Just because the plan is on paper, it doesn't mean it will be implemented and it will likely sit on the shelf and gather dust. Take the simple example: If the speed limit rules were abolished on the road and instead we were told that we had to drive safely and adjust speed according to the situation (e.g., open road, presence of children, outside a school or residential street) do you honestly think it would work? Some would argue that driving at 100kph around an urban city street is perfectly safe and okay.

EH The Food Control Plan process, involves a lot more time than a standard food hygiene inspection under the Food Hygiene regulations. It involves: Premise signed up and given FCP documents; Educational visit made to assist operator and answer any questions they may have; Sometimes a further visit is made to provide further assistance; A pre assessment is completed (form filled out) to assess if operator at stage to have FCP approved. An audit is then completed – recommendations and corrective action requests may be issued Any Corrective actions issued require follow up and sign off. A special EHO is employed on a contract basis to deal with the initial part of the process – signing up and educating premises/operators. Benefits for the public: The operators of food premises have to take “ownership” of the FCP and the requirement to record temperature checks etc. This will hopefully prove that the food being cooked and held is safe to eat. However, there is the potential for records to be falsified by operators.

EI Believes it a little over the top, as answered below

***In your opinion, what were the reasons for the very slow, or rather non-implementation of HACCP into the small to medium hospitality enterprises in New Zealand?***

EA Basically getting the legislation through is the slow process as it has been postponed and it is now due to be released by the middle of next year (2009) provided that the government in power does not change and wishes to continue with it. Once it becomes legislation it will quickly move forward, but until that is the case people don't really have a reason to implement until it becomes mandatory.

EB Many operators are operating in small but busy businesses with limited resources: staff, funds, time, language barriers, particularly where English is a second language.

EC It was overly complicated. There were a lot of people that would really love to do it, because they want to provide a product and get the return clientele. When it was first promoted, it was based on a production line process that tended to be a single simple product. You start with the live animal at one end, and steak at the other. It doesn't fit with making a chow mien in a Chinese takeaway, or a sandwich in a bakery.

ED HACCP based food safety programmes (including FCP's) were being discussed in 1994. There were delays in the passing of legislation (it still has not been passed) due to it being a low priority for Central Government, and continually being pushed back down the list by more pressing matters. There was quite a long and extensive consultation period also. Within the industry, operators have been reluctant to enter the Voluntary Implementation System due to the extra workload required, despite the fact that FCP implementation is not unduly onerous. Most people do not like change. Also, the hospitality industry is very transient, with premises changing hands and high staff turnovers, all presenting challenges for the operator.

EE The implementation of the Food Control Plans using HACCP was too complicated for medium to small business owners to complete on their own. The costs compared to

registering their premises was considerably more expensive. The new plans are based on the HACCP principle but in a simplified form.

EF Small and medium business operators are reluctant to keep records, some will not participate unless mandatory. Perceived as overly bureaucratic

EG Because there was no legal incentive to do so. Why would one agree to a new regime with much higher penalties and fees when one could stay with the licensing and inspection under the Food Hygiene regulations and only face a \$50 fine for a serious breach of the regulations?

EH The industry does not like change and operators find it easier to be told what they have to do to fix a problem, rather than taking steps to prevent issues. They also do not like to be burdened with additional tasks, such as temperature checks. Also, legislatively things have moved slowly in New Zealand and central government has taken ages to bring about any proposed changes.

EI The HACCP process was found to be very good when it first came in. People thought it was marvellous. Then with further deliberation it was thought it might be marvellous for space flight in a space shuttle but not quite the thing for the average food outlet especially the small to medium enterprises. In the end it was realised it was a bit over the top.

***With the failure of one system how different is the 'Food Control Plan' system and in which areas have improvements been made?***

EA It is hoped the implementation of HACCP (Food control plan) can be improved. It seems to be going in the right direction with the regulations, bringing in the food control plan, the thing what needs to be done is bringing in the operators, then buying them in as well saying this is the new system! You have to use the system and if you don't use it, you won't operate.

EB These operators need assistance from Council Officers (education) to change the way they run their business - from the requirements of the Food Hygiene Regulations 1974 to the Food Control Plans. The NZFSA provision of a stepwise food control plan template process, incorporating the HACCP concepts, makes the concepts more accessible and less threatening.

EC People need to see this as a great opportunity. It's a natural evolution and not the demise of Environmental Health Officers. The approach to food safety is essentially refocused. It is now a holistic approach. The skill of the Environmental Health profession is looking at relationships and this will not change. There are always going to be issues, and the motivated EHO will become a consultant, either privately or under the auspices of their own local authority, and this is already being seen in some major cities. Certainly there are areas that are being improved. It has been simplified, no doubt about that. The purist HACCP models are being taken out of it, but it still follows the seven golden rules, the seven principles of HACCP. You can't get away from them.

ED The Food Hygiene Regulations could have been amended to include greater controls of potential food safety hazards. Improvements of FCP's over the FHR's include procedures for various controls over food safety, from delivery of goods to consumption. Also they could have included the monitoring of hot and cold holding units, cooking temperatures and procedures for cooling, reheating and specialist food controls such as those for Sushi, Chinese Duck and Doner Kebabs.

EE Currently in New Zealand there are three systems operating: The two Food Control Plan systems and registration of premises utilising the Food Hygiene Regulations. The two Food Control Plan systems are actually based on the HACCP system and the new Food bill proposes the demise of the Food Hygiene Regulations so that conceivably it could be said that there will be one system with variations. The main advantage of the Food Control Plan system that is being promoted by the new Food Bill supporters, is that food operators will

need to ensure that they operate their premises in line with the food control plan and thus they are deemed to take the responsibility of food safety.

EF Need for commitment of management-record keeping. Some have reported that it provides structure to their day to day business and reduction in risk

EG The failure of one system was the lack of updating the Food Hygiene Regulations to incorporate incentives for operators to clean up their act. All premises should be universally graded according to one standard (not something different for every council) and a certificate prominently displayed. If they are found in breach of that (i.e., hiding an E grade certificate) then they should be prosecuted for in effect misleading the public. Furthermore many councils just refuse to take prosecutions (because it costs too much) and expect their officers to walk around on bended knee and plead with them.

EH The FCP system requires operators to document processes and how they do things, along with the requirement for record keeping with regards to temperature control, cleaning, maintenance and staff training. This is a positive step and where the most area for improvement will be.

EI One can understand it working for a large place with lots of resources, but for small enterprises like small takeaway bars with owners with limited English, one cannot see it working. There is going to be the same problem with the food control plan, which is a cut down version of HACCP. The full HACCP was too involved, but coming back to small businesses: The buying-in is the factor and if they can't buy into it and have the feeling that they are in control of what's going on, it is not going to work.

***What role should the management of the SME play in the implementation and maintaining a Food Control Plan and to what extent has management control over such plan?***

EA They should have better communication. The role of food safety authority is to be working with the SMEs and getting the issues resolved. Getting the buy-in from management is the main thing because without that, it is not going to work. That is the key, working with them, you have got to be working with them. Staff training of food safety control in the hospitality sector could best be described as variable. It is getting better with more premises getting staff trained in food safety. Those on a lower grade will get more money but the staff turnover is a difficult one as you may get someone trained and then they leave, which results in some places not training because the employee leaves so soon, and that causes a problem. There definitely has to be some sort of timeframe, and at the moment there isn't one.

EB Management needs to get buy-in from the staff to implement a HACCP process. The format used needs clear action steps.

EC It is a very difficult transition for school leavers, who have been taught they can't fail, to go into a high pressure environment and realise they don't know everything. Staff training in food safety control in hospitality could best be described as inadequate. The training of the professionals, the people that are going to become chefs and managers, is probably quite adequate, but there are real concerns about the remaining 75% of the people that work in the industry. A real challenge is the lack of responsibility in the community now. For the last twenty years people have been brought up to believe they don't have to have any community responsibility. One of the difficulties with implementing this model is in fact changing that sort of mental attitude.

ED The operators need to take a hands on approach and 'own' the FCP. They need to impress upon their staff just how important it is to adhere to the FCP and ensure that all staff understand how their role impacts on the safe preparation of food. Management must have ultimate control over the plan for it to be effective. A half-hearted approach will not suffice.

EE As stated previously the new off-the-peg food control plans have been designed to support small to medium operators in putting into place their own Food Control Plans. Management will be responsible to ensure that all aspects of the plan are followed. Thus Management will need to ensure that systems are in place to ensure that the Control Plan is followed and all records are kept for audit purposes.

EF Must be totally involved in order to provide continuity in the event of staff changes

EG SMEs should be fully involved in the preparation and approval of that plan and then implement it. As was found in the Pike River disaster where comprehensive plans and manuals were in place, the lack of effective enforcement saw utter disregard for the most fundamental breaches of good practice and legal requirements. There must be effective enforcement if HACCP or a Food safety Plan is to work..

EH Management needs to take ownership and provide guidance and training to staff, however if they are not present at the premises on a regular basis (hands off approach), then responsibility needs to be delegated to a staff member who is responsible for the implementation of the FCP and training of staff.

EI The fundamental rule - if the managers don't take the lead, the staff will not follow. If the owners and management do not get their heads around it, and take responsibility, it is not going to happen.

***Staff training of food safety control in the hospitality sector could best be described as?***

ED At present it is more focussed on the mechanics of preparing food rather than food safety.

EE Variable, some hospitality operators have very high standards of training and reasonably stable staff retention, whereas others are very poor and place very little emphasis on training staff.

EF Inconsistent, lack of commitment unless required by TA -bylaws

EG Haphazard and hit and miss

EH People have often done the training, but then do not implement what they have learnt, or pick up bad habits from working in kitchens where things are done incorrectly. Others that have been in the industry for a while could do with refresher training.

EI In the hospitality industry this is best described as piecemeal but then again if you follow NZSI with their training sessions by attending a full food safety course, this may not be necessary for a lot of people. As long as they find it is useful in what they are doing in their particular occupation, or part of that particular process, then that is fine. So would be an on-the-job risk management style approach, which is what they seem wanting to bring in. At the moment we have a Polytechnic course operating where they do some specific food hygiene training. The management of some of the higher calibre places, and also some of the chains like Coffee Culture, are very keen to keep training on track.

***Would legislative changes to the control of food safety ultimately see the demise of EHOs or alternatively see a change in their present role?***

EA There is also room for third parties

EB The proposed Food Bill appears to be introducing the HACCP concepts in a more manageable format.

EC Changes in the food legislation will not see the demise of EHOs, as a group. Although their profession is being torn apart, and has been torn apart for many years, with parts being assigned to different functions, it's all part of specialisation. Their role will simply change from the do-as-I-say type approach to a more advisory one.

ED FCP auditing is more time consuming than inspections carried out under the FHR's, and so has brought about a change in the role of EHOs. There will always be a need for EHO's to be employed for enforcing provisions of the Health Act 1956 and subsequent

regulations. Should FCP auditing be thrown open to private industry, we may see some EHO's becoming solely food auditors in order to compete.

EE Currently EHOs have been trained to audit the Off-the-Peg Food Control Plans, and as long as the legislation does not discourage TAs from undertaking this work, the EHO role in food safety will continue. The EHO role has continually changed since the role commenced, and there is no reason to believe that this will stop.

EF Change to an auditing role rather than inspectorial style is foreseen. There is a need for EHOs to remain with in depth knowledge of environmental health. A review of future training needs is required for those replacing experienced staff leaving the profession though retirement etc.

EG If the government believes the rubbish that they don't need enforcement because all operators are responsible and would police themselves, then yes there would be a demise. But if a rigorous environment regime is introduced (and the officer role maintained where prosecution or some other effective penalty was imposed) then their role should not diminish. One can foresee problems with private auditors, as was seen with the disastrous Building Act 1991 regime, and lessons should have been learnt from that i.e., that officers and enforcement must be carried out by government agencies and a strict independence from outside influences maintained.

EH There would always be the requirement for EHOs under the Health Act, however with FCPs you could just have a food safety auditing background.

EI Would like to have seen local body inspectors having the ability to close places without having to go through hoops to achieve this.

***From a health officer's perspective and the phenomenally high turnover rates of staff in SME (hospitality) would these changes be realistic?***

EB Training within the industry is currently triggered by the operators' initiative to learn about and apply the principles of food safety. Greater training will be required to implement the principle of HACCP. One should at least require a minimum of one person trained per business, and an encouragement to achieve up to 50% of food handling staff with basic food safety training.

EC There's two aspects of why people go and do a job in the food industry. You've got the students, who are doing it because they can work those late hours, it doesn't clash with their studies, and they're always going to be available to fill in, and then there are those few that go into the career because they have an affinity for what it is. Maybe one of the things that needs to be looked at is the whole progression through the food industry from being the humble dishwasher to the CEO of a large corporation. Here in New Zealand we've got basic food safety courses and chef courses, and then you've got the B.Tech., your food engineering. There's a huge gap in between. The high turnover of hospitality staff presents a challenge to the operators, which in turn the auditor must address. The changes are realistic, but challenging for operators.

ED The high turnover of hospitality staff presents a challenge to the operators, which in turn the auditor must address. I think the changes are realistic, but challenging for operators.

EE If we want to have safe food, then it is important that all food handlers have the knowledge to achieve this. If small to medium hospitality enterprises are unable to train their staff, or have insufficient knowledge of food safety, then it probably will not be a great loss if they disappear. However if Food Control Plans are well structured, so they can be understood and manageable, then there is no reason why they can't be followed and add value to these businesses.

EF Hopefully core knowledge of FCP operations will remain as numbers increase.

EG It would be a problem but is it any different to those who are employed as drivers – they have to have the necessary licence and staff turnover there is equally as high. This is not a good reason not to have properly licensed and trained staff

EH With regards to FCPs, premises with high staff turnover have had difficulty maintaining the new system and it all grinds to a halt. This seems to be worse with some of the major franchise operations that have tried adopting the FCP system.

EI Would like to have seen local body inspectors have the ability to close places without having to go through hoops to achieve this.

***What difficulties do you foresee with SME management maintaining a control system in these enterprises?***

EA There is another problem: That of the validity of training staff say they have had. It's often hard to check records, especially from overseas. It is understood that there have been cases of people faking training records as well - you can make them up on your computer.

EB Many of the operators will need guidance to implement the new templates. They will also need encouragement to venture into an area which initially may make them apprehensive.

EC One of the things the government is trying to develop is a relationship between the auditors and the Health Protection Officers. At the moment there is not a very good relationship. The auditors think they are doing one thing and the EHOs another, whereas they are all part of the same interface. There are a number of premises around the country where the auditor goes in and sees some problems, which they say has to be fixed. Twelve months later and the problems are still there because there is no compulsion to rectify them. The government is trying to develop a methodology where the auditor and EHO act in tandem on a short timeframe, and where non-compliance by a business is not an option if they want to remain trading.

ED Time constraints and a shift in the paradigm, placing more responsibility on the operator to adhere to the plan. Some operators involved in the current voluntary programme have pulled out stating that it is too onerous, and with high staff turnover, too difficult.

EE If they do not have a good understanding of their business and food safety they will struggle to pick up the concepts of Food Control Plans. This is no different to the current situation where poor operators struggle to meet their obligations under the Food Hygiene Regulations. However these problems will be exacerbated if the management have poor language or literacy skills.

EF Lack of commitment, ethnic problems due to lack of understanding

EG No different to a courier company employing appropriately licensed drivers or a bus company or Transrail for that matter ensuring that all drivers are certified.

EH As above – staff turnover is the biggest issue that the operators face.

***What was your personal input into the new proposed legislation regarding the food control plan approach of the new food act?***

EB Has assisted with submissions and took part in the initial trial of the template food control plans.

EC Was very much involved. Was on the team that spent months writing the food bill, that's currently sitting with the Minister.

ED Their office made submissions to Local Government regarding the bill. They felt that the FHR's could have been amended to include greater controls based on HACCP.

EE Was part of Council Officers submission on the bill. In general favours the concept of Food Control Plans however does have concerns on how the plans will be enforced and how willingly the food industry will take them up.

EF Member authority for VIP, participated in domestic food review, member of local cluster group

EG No direct inputs but became involved in the discussion at the last EHO conference

EH As the Senior EHO for Food Safety and a vocal participant of a Regional Cluster Group, has had a lot of involvement with expressing the views of fellow colleagues with regard to the FCP system. Regularly provides feedback to MPI on recommendations for proposed changes to the FCP Document and Diary, and continues to do this.

EI Had some input in the drafting of the regulations following round table discussions and making submissions. Believes the New Zealand Food Safety Authority have tried and done it reasonably well by listening to the consultation, but they have had their set aspects they did not want to change too much - rightly or wrongly. On the whole, thinks they have done it quite well although wonders about the implementation stage as progress has been so slow.

**Outcome**

The interviews have provided a wealth of information about Food Safety not only in small and medium size enterprises but right throughout the industry. A first order analysis is given in the following figure (Figure 10.1) and discussed in the next chapter.



## Analysis of the Supplementary Survey

In answer to:

1. *Food Safety can be controlled by a range of options. From a very simple food safety plan to a high calibre HACCP system. Do you have any type of plan in your operation? (Y/N)*

26 participants gave a “Yes” answer (83.9%) and 5 gave a “No” answer (16.1%).

2. *With the newly proposed Food Safety Plan about to be introduced to Parliament are you aware what this will mean to you as a chef/chef-manager/chef-owner? (Y/N)*

21 participants gave a “Yes” answer (67.7%) and 10 gave a “No” answer (32.3%).

3. *Could you give an estimate of the amount of time you would have to set aside to complete the daily tasks such a plan requires? (in minutes) (Figure 10.2)*

The average minutes indicated by the participants was 60 minutes.

Lowest minutes recorded: 10 (2)

Highest minutes recorded: 120 (6)

### Question 3

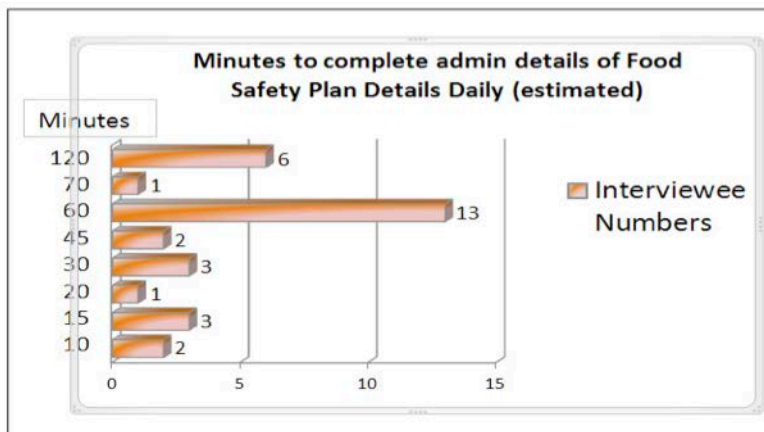


Figure 10.2 Minutes set aside for daily tasks

4. *On a scale of 1 to 7 how would you rate food safety training in New Zealand? (7 = Best)*

Average scale number 4.55.

Lowest number 2 (2 participants). Highest number 7 (2 participants) (Figure 10.3)



**Figure 10.3 Responses to question 4**

5. Do you feel the New Zealand Chefs Association could assist you to achieve better levels of food safety training for your staff? (Y/N)

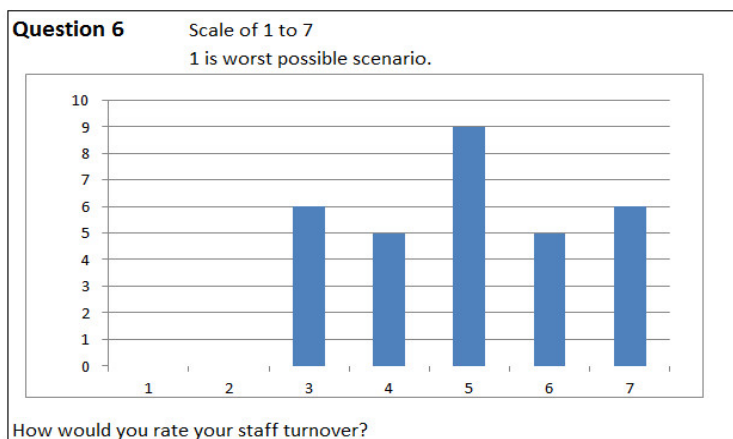
26 participants answered "Yes" (83.9%) and 5 gave a "No" answer (16.1%).

6. How would you rate your staff turnover (1-7) and, if this is reasonably high (25% or more)...will this affect your staff training? (7 = Best) (Figure 10.4)

Average scale number 4.74.

Lowest number 2 (2 participants).

Highest number 7 (4 participants)



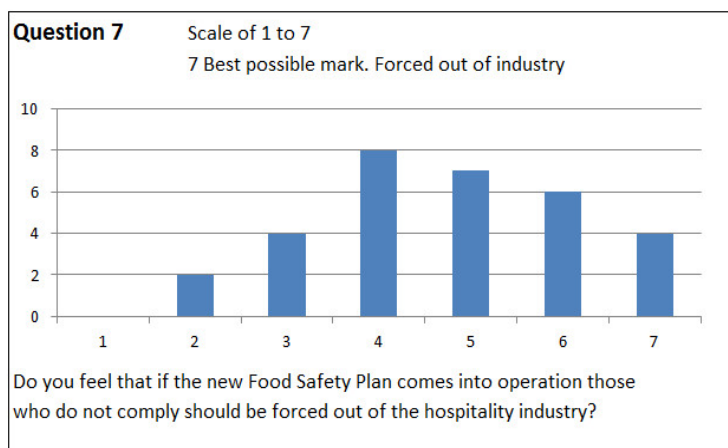
**Figure 10-4 Responses to question 6**

7. What chance would you give the newly proposed Food Safety Plan? (1-7). (7 = Best) (Figure 10.5)

Average scale number 5.00.

Lowest number 3 (6 participants).

Highest number 7 (6 participants)



**Figure 10-5 Responses to question 7**

8. Do you feel that if the new Food Safety Plan comes into operation those 'who do not comply' should be forced out of the hospitality industry? Yes/No

30 participants answered "Yes" (96.8%) and 1 gave a "No" answer (3.2%).

### Discussion - Supplementary Survey

The questions asked in the survey were designed to gather knowledge of chefs and chef-managers who are members of the New Zealand Chefs Association, the professional body representing chefs in New Zealand. This section does not compare answers with the 'chefs' group of interviewees in the main section of the research but, rather, provides further detail to either compare or verify the results of the 'chefs' interviews. These details will be discussed in the discussion chapter.

The first question asked if the participants already were using a Food Safety Plan. The number of chefs and chef managers working in SMEs using an New Zealand Food Safety Authority Food Safety Plan is very small, most are already having some type of Food Safety Plan in operation and lastly the survey did not take into account whether they at present worked in a SME. Most chefs do, during their career, work in both SMEs and larger establishments.

Of the 31 participants 26 (84%) had a Food Safety Plan in place (FSP-YES) and the remaining 5 participants (16%) (FSP-NO) did not. The question did not ask if their Food Safety Plan was the New Zealand Food Safety Authority plan. (See Figure 10.6)

That 67.7% were aware of the implications/requirements of the proposed Food Safety Plan introduced to Parliament and 10 of the 31 participant answered 'No' is perhaps an indication that the plan could be much better publicised at this point of time.

To display the estimated times to complete the administrative requirements of the Food Safety Plan the researcher indicated one hour as 10 and the minutes scaled accordingly. There was little difference between the two groups (5 minutes) with the FSP-NO group being lower. The average score was 10 (60 minutes)

Rating food safety training in New Zealand saw those in the FSP-YES score a full point higher on a scale of 1 to 7 with 7 being best (4.8 the high mark and 3.8 the low mark)

That the FSP-YES group also gave the to be introduced regulation a higher chance of success (5.1) than the FSP-NO group (4) is interesting. The score was based on a scale of 1 to 7 (7 being best)

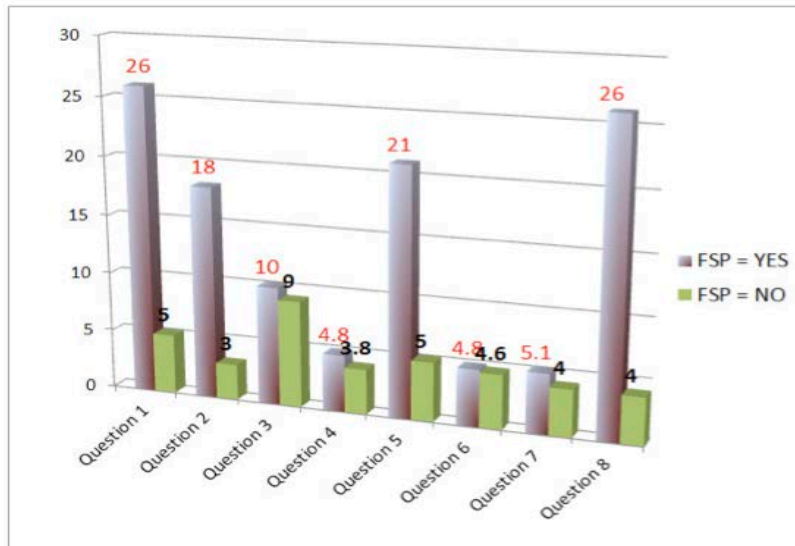


Figure 10-6 Summary of question responses

Both the small sample size, and the fact that all the participants have a great deal of industrial knowledge, should be taken into account. A larger survey may well produce different results if a cross section of managers and chefs active in SMEs right across New Zealand, participated.

# Chapter 11

## Discussion

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This study set out to identify inadequacies in the management of food safety in small and medium size restaurants and cafes, and to investigate the role of management in preventing food borne illness. The Food Hygiene Regulations (1974) and the Food Act (1981) related to a country far different from that of today. It was, perhaps, sufficient for the Country's culture at that time, but things have changed radically since then. Starting in the 1960s immigration by chefs to New Zealand saw a change from the usual fish and chip shops, milk bars and tearooms towards a better style of dining in small and medium enterprise eating-houses. Few Mexican, Malay and other ethnic restaurants, other than Chinese, existed and "better" dining occurred in hotels. From the mid 1960s to 1980s a change was taking place. French cuisine became the basis of today's modern cuisine. In the 1980s not only the cooking styles changed, with increasingly more complex methods, but a much greater range of local and imported foodstuffs made the risk factor of food borne illness much greater. Today New Zealand has many thousands of small restaurants and cafes. Many of these have Asian origins and exotic menus, and are small family run businesses working on a very limited budget.

The food eaten in the restaurant may have been grown in a far away country, transported by road, rail or air to another country for packing, transported again to another place for sorting and distribution, then again transported to a Port in New Zealand, where once more it is sorted and transported to a distribution centre where the national supplier in New Zealand picks it up and transports it to a local base from where it is delivered to the restaurant. Even the vegetables, long regarded as fresh from the local market and the very best picked by the head chef, may now come from far overseas with again many people handling them before they get to the chef. The Food Hygiene Regulations and the Food Act are long out of date and in urgent need of amendment. The Food Bill due for enactment in 2013 or 2014 is long overdue, and there are concerns that it may not be practicable for small and medium size business enterprises.

For a long time the "Them or Us" mentality between health officials and hospitality management did not work in the interests of achieving safe food for the public of New Zealand. Changes in legislation, either proposed or implemented, need to address and remedy any such situation. From an environmental health officer perspective, the number of proprietors in the hospitality Industry, especially the Small and Medium Enterprise establishments, having no training or qualifications in that specific industry, is too large to ignore. The reasons for allowing unqualified, underfinanced, unprepared and unsuitable owners to operate in the industry, indicate that from the very start there has not been the political will to state "We cannot continue as we are." Previously, in the days of very few people eating out, the risk factor was not alarming and nothing was done about it. Today, the situation has changed dramatically and for the last twenty years or so, the need to have better controls has amplified. Health officers' workloads have dramatically increased, and to continue to be an effective group of inspectors, they too have had to economize and perhaps ignore unforeseen circumstances. This could be to the detriment of the safe food concept. The Small and Medium Enterprise proprietors of the hospitality industry face similar circumstances and have problems surviving economically. In order to survive, cuts have had to be made in a variety of areas. These cuts are generally based on food quality,

staff quality, smaller portions, and reducing the quality of service. They are not in the interests of producing safe food. This surely has been, and is, a recipe for disaster.

The prevention of food borne illness lies with protecting the dining public frequenting small and medium size eating-houses in New Zealand, irrespective of where the business has chosen to source it. Prior to its first reading in the New Zealand Parliament, lobbyists attacked the Food Bill from various angles. Of interest was the opposition to sections requiring home-made produce to be covered by a food safety plan. Pickles and jams manufactured for country fairs, as well as those products being produced for fund raising, were debated in the media. The familiar weekend sausage sizzle fundraiser sees a number of persons all wearing plastic gloves dishing out food to the public. It is only a matter of time before an incident of food poisoning will happen, and it is in the opinion of the researcher that this could be avoided by instilling a limited amount of pertinent knowledge into the operators. It is likely that it was never intended for the home producers to have a fully-fledged food safety plan forced on them. However, ensuring that these people have a level of awareness about food safety is essential. The practicality of producing a simple poster with vital information specific to its target market, is not beyond the organisation that produced the Australian Food Standards Code.

### **Deductions from the literature**

An extensive library of more than a thousand books, manuscripts, journals and papers was critically examined in the research. A bibliography of some of the most important works examined, but not cited in the text, is given in Appendix A. From this examination it was clear that although Food Safety as such was of great importance, there was little information on how it could be related to and handled by small and medium size restaurants and cafes.

Safety is a quality attribute of foods, along with taste, nutritional value, odour and presentation. Antle (1997) explored the conditions under which the market will provide a degree of quality that consumers would want to purchase. The literature on product markets with imperfect information shows that the properties of market equilibrium depend on the characteristics of the product, on the cost of communicating information among customers, and on the ability of consumers to use information (Siglitz, 1998). When information about product quality before purchase is imperfect, consumers are put in the position of buying a product whose quality is uncertain.

Concern about technological risks was associated with a lack of information from the government, potentially implying a need to increase transparency regarding risk management practices associated with technological food hazards, as well as developing effective communication practices about technological risks. Lifestyle hazards were associated with the need for improved communication in a crisis. (Miles et al 2004)

Among the 17 USA state food codes that clearly mandate certification, regulations vary wildly, but generally they cover 10 areas or issues:

- who must be certified (managers or food handlers
- whether the certified individual must be on site at all times,
- recertification,
- approved examinations,
- training requirements
- exemptions
- allowing times for coming into compliance for new establishments and for turnover.

- fees
- instructor requirements, and
- the way the certification is checked. (Almanza and Nesmith 2004)

Fielding et al (2005) undertook an evaluation of the implementation of HACCP in small and medium enterprises in food manufacturing. The results they presented demonstrate that small and medium sized enterprises and micro-sized food manufacturing industry face problems when undertaking hazard analysis. Micro businesses consistently performed less well on audit, and businesses from all sectors were unsure about specific hazards that should be controlled. The self-reporting from the majority of companies regarding hazard analysis implementation was clearly inaccurate and the people responsible for food safety within these businesses must be made aware that their current practices do not constitute hazard analysis and that they require training in the principles and practice of HACCP. There is a discrepancy, therefore, between the need for small businesses to have a full HACCP-based approach to food safety management (within three years in the United Kingdom) and the fact that many small businesses did not yet appear to comply with current legislation. They suggested the use of benchmarking as an audit tool would allow companies to target their resources at the areas requiring improvement and so improve food safety management.

Quality labelling is a fuzzy category that covers many different things. Quality labels can be awarded by manufacturers, groups of manufacturers, retailers, government bodies, and independent organisations, for example, consumer associations. The criteria for awarding the labels can be very strict or almost non-existent. Some labels refer to very specific qualities, such as the labels indicating organic production, whereas others are intended as general quality labels. Some of the better known examples are the French 'label rouge', the German CMA 'Gutesiegel', and the Norwegian 'Godt Norsk'. Although there appears to be no general overview quantifying the overall effect of such labels, it seems likely that many food quality labels probably do not function as quality cues at all, meaning that consumers ignore the information because they do not feel that the labels are predictive of any quality dimensions they are interested in. (Grunert 2005)

Changes in food and water quality, designed to reduce our exposure to pathogens, are likely to have altered our exposure to commensal and environmental strains as well as pathogens; removal of pathogens in modern water treatment inevitably also removes most benign microbial bacterial contamination, such as environmental mycobacteria. However, there is no direct temporal relationship with the rapid rise in atopy – a predisposition toward developing certain allergic hypersensitivity reactions such as eczema, hay fever, asthma, and a tendency to have food allergies (Bloomfield et al 2004). Similarly changes in food preferences are likely to have altered the microbial content of our diet. Since foods are only controlled for pathogens, there are no available data to indicate what trends might have occurred in the broad microbial content of our diet during the period critical for the rise in atopy. (ibid)

*Listeria monocytogenes* is ubiquitous in nature. It is commonly found in the intestines of animals and humans without causing illness. It has been isolated from a variety of products, including raw milk, cheese made from unpasteurized milk, soft cheese, meat, poultry and cabbage. *L. monocytogenes* can also survive the predation of amoebae which may serve as reservoir of *L. monocytogenes* in the harsh environments (Ly & Muller, 1990). *L. monocytogenes* can also survive adverse conditions on smooth surfaces. However it cannot resist high temperature as the culture is killed within 5 minutes by moist heat at 60°C. As delicatessen foods in supermarkets are normally processed at 100°C in China, *L. monocytogenes* in those foods are often considered cross

contamination from environments when they were sold at open or half-open environments. On the other hand, delicatessen foods are ready-to-eat food products, so it is important to find out measures to control contaminations and reduce the contamination level in order to ensure food safety for consumers. (Guoxiang 2006)

A study by Duff et al (2003) in North America and the United Kingdom, examining approaches for preventing food borne illnesses in the household setting, demonstrated that cleaning with soap and water was insufficient to reduce surface cross-contamination and that the use of an antimicrobial agent might be necessary. However, it would appear that a systematic analysis of the costs and benefits of alternative measures for preventing food borne illnesses, has yet to be conducted. Nevertheless, properly conducted hand washing remains one of the most important measures in preventing food borne illness.

### **Deductions from the Interviews**

All the participants in the interviews had considerable knowledge on the subject of food safety. It must be understood that not everyone in the hospitality industry has a similar level of knowledge. The comments made by the health officials indicate that all is not well. This was reinforced in consultation with the respective environmental health officers in the Wellington area. In this area only 329 out of well over a thousand establishments have signed up for the voluntary food safety plan. This result is abysmal considering that, although the plan is voluntary, it has been in operation for several years.

The interviews indicated that HACCP, or in a modified form the Food safety Plan, is a necessary tool to reduce the incidence of food borne illness not only in small to medium size enterprises in the Hospitality Industry but also at industrial level, both in production and in sales, where a broader view needs to be adopted to reduce the majority of food borne illness. Large establishments have a better record of food safety control. What is of importance is that the smaller the business, the greater are its difficulties in staying economically viable, and therefore the more likely it will take shortcuts in its food preparation.

Hospitality businesses, large or small, cannot stay afloat by selling only 1 to 5 products – their potential clientele prefers a larger range from which to choose. It is not unusual to find little difference in menu size between large and small establishments. Added to this, with most of the ingredients used, wastage becomes increasingly greater the smaller the establishment is. Both items are likely to increase the risk factor which will ultimately result in food borne illness. Introducing a nation-wide ‘off the peg’ food plan adds an additional work load, which is either absorbed in even greater working hours, or by fudging the figures, both of which increase the risk factors.

The Chefs group of interviewees all indicated that no consultation took place with the Ministry for Primary Industries to assist in the formulation of the Food Safety Plan. All participant groups need to have an input in controlling food safety. Perfection will ultimately see an industry without any food safety issues, but this situation is still only a dream. In the management of risks, especially those in small to medium size enterprises, food safety needs a greater level of commitment for which a type of Food Safety Plan with a higher level of achievement needs to be formulated.

The implementation of the Food Safety plan, as it stands, requires no training, the proprietor of the business simply being handed a large daunting folder containing a diary and journal with an explanatory compact disc. When asking the proprietors of two establishments in

Wellington City about their experience with the Food Safety Plan and how it was being audited, both reported that nobody had been to see them in well over a year to discuss progress on their individual plan and how it was being implemented.

### **Deductions from the Chef's Conference questionnaire**

The formula of Size + Product + Viability is very much an indicator that the smaller the business is (in terms of either seating, staff numbers, and/or building size), combined with a large product range to produce and sell each day, the more risk it runs of becoming uneconomic. Ideally a business would produce and sell one product only, but with a small population base in New Zealand, the customers tend to shun such places. Working 12 to 14 hours daily leaves little room to add another layer of complexity. The chefs estimated that on average the administration of the Food Safety Plan would take up to an hour of extra administration duties each day - this in addition to administration for the Inland Revenue Department, the Accident Compensation Corporation, bill payments and other administration duties. Larger hospitality businesses are often better able to absorb the cost involved. This is the present scenario that Small to Medium size Enterprises are facing.

### **From the Maori Perspective**

Although this thesis is biased towards SMEs in the Hospitality Industry. it is of equal national importance that the views of others are taken, and especially that of the Maori, our indigenous population. Other cultural groups living in New Zealand no doubt have similar concerns.

### **The Food Bill (160-2) 2010**

In July 2012 the 400 page Food Bill went through its first reading, was returned to a select committee and is currently awaiting its second reading in Parliament. This is now expected to be sometime after the national election.

The Food Bill (160-2) 2010, will replace the Food Act 1981, and is nearly four times as long. In it, there are several sections and clauses that are of concern:

#### **Powers given to Central Government**

Under the 1981 Act, local authorities had more responsibility for food safety in their area, with different areas of New Zealand having different by-laws.

*The new Bill attempts to create one law for the whole country, giving Central Government greater responsibility for making and enforcing all food safety regulations.*

The concerns here are for all whanau, hapu, iwi and Marae across New Zealand. Creating one law or statute for everyone will not work because of the dynamics and layout of the land, the different types of soil, the greatly differing fauna and flora across the Country, and the right for Maori to practice Traditional Maori Food Culture. Alternative Medicinal Remedies Culture and Tikanga to Maori Food Religious Practices, do not belong to any Food Act.

Maori consider it bad enough that they have to fight for the little access to govern the future of Traditional Maori Food, Medicines and Health remedies under the banner of Tikanga, to protect and maintain the integrity of the Maori Cultural heritage.

### **Excessive power given to the Ministry for Primary Industries and the Food Safety Minister**

*Just about everything in the Bill, once passed into law, can be amended by way of regulation by the MPI or the Minister for Food Safety.*

Because of the stakes Maori has in the Food Bill, representation for Maori should be in every sector of MPI and the Food Safety Minister's Office to ensure the integrity and rights of indigenous peoples and their culture is recognised and properly enforced in the food bill.

*Although home gardening is not included in the Schedules of the Bill it is difficult to confirm, without clear statements of exclusion, what is not able to be changed.*

A clear statement to determine that a home garden is not to be used for commercial purposes could be a way forward to clarify what determines a home garden. The Maori believe a Marae should be exempt because Maraes are specifically used for non profit purposes.

*The MPI and the Food Safety Minister will also have the power to waive the Bill altogether or to give regulatory authority to a third person.*

The new bill does not state that this person or authority be resident in New Zealand. This could well mean that a foreign, body or organization could be allowed the right to regulate the bill for the government if the government so desires.

The New Zealand Bill of Rights protects against unreasonable search or seizure.

The Food Bill appears to contradict this. Section 322 for example states "Unlike the police and the rest of the New Zealand people, food safety officers would have immunity from civil and criminal liability". This is a huge statement to reconsider because this could place the act above the law if the food safety officers apply unreasonable search and seizure methods. One could make a false report, or a false claim against an opposition or opposing rival in a business or family feud, purely out of jealousy or greed, with no redress possible.

*The present section 275 states: "A food safety officer may enter a place described in subsection (2) without a search warrant and may use any force that is reasonable for the purposes of entry and search"*

It is understood that for the whanau, hapu, iwi and Marae, this action the Maori believe would devastate their people, and not only Maori but for everyone who gets caught up in the politics of this bill, the stigma would have life long ramifications.

*The present section 243 states: "Food safety officers do not need to be New Zealand State employees".*

In fact they could be employees of a large business with its own business agenda and profits in mind. Here the Food Bill needs to state exactly what its intentions are, and how any conflicts of interest will be avoided. The Maori would, of course, like to have Maori Food Safety Officers in place to handle any issues about food in their culture.

*The present section 265: Apparently allows the potential use of guns*

We have a potentially strong Police Armed Defenders Force in New Zealand whose role in the society is impeccable with strong public support. One wonders why the writers of the Bill believe food safety officers could or should be armed.

*The present section 272 (3): Allows an officer to exclude a particular person from all or part of a place*

This could be interpreted as including being excluded not only from their Marae but also from their own home if their home business is deemed in breach of any aspect of the Bill. I am sure this was not how this sub-section was meant to be interpreted since in Section 7 of the Bill "Interpretation" (page 30) neither a Marae nor a dwelling house is listed in the definition of a "place", although "a building" is. How the law could exclude a person from a Marae or especially from their own home kitchen is unrealistic even if they use the kitchen for the purpose of selling food to raise money for the family. If there is a public health issue it would be much better to place a ban on their selling food, until such time as they comply with the, then current, food safety regulations.

The Food Act 1981 exempted private homes from being searched but the Food Bill would allow this.

## **Other considerations**

(1) Food safety regulations now refer to a regulated plan versus a premises based plan. Under the 1981 Act, many food safety regulations relate to the premises from which food sellers operate. These premises are generally required to be licensed. The new bill shifts emphasis from ensuring food businesses operate from premises that are licensed as safe, to ensuring their entire operation runs according to a regulated plan. It's about what they do in its entirety rather than where they are.

(2) There is a potential loss of food sovereignty. The current draft of the Food Bill requires that the Minister must take into account the aim for consistency with international standards and the need to give effect to New Zealand's obligations under any relevant international treaty, agreement, convention or protocol.

The Trans Pacific Partnership Agreement, currently being negotiated, is one example of how international trade agreements will impact our food sovereignty. Genetic Engineering (GE) is another. In the most recent draft of the Bill, in a list of things that need food safety

consideration, genetic engineering has been deleted. With GE excluded it is then left to the trans Tasman body Food Standards Australia New Zealand (FSANZ) to decide what GE food lines are safe. To date FSANZ has approved all of the over 70 GE food line applications in New Zealand's food chain.

The ability for the Minister to pass regulatory authority of the Bill to a third party is an extreme concern as well as the Minister's ability to nominate Food Safety Officers (who may not reside in New Zealand) and the powers given them.

(3) Registration and exemptions: Except for those selling horticultural produce direct, most small-scale producers will need to apply for an exemption in order to avoid food safety and registration costs which will be at the discretion of the Food Safety Minister. No indication is given of what these costs might be, nor of what the costs might be for. These new costs could well be to generate money for a new body within the council to generate new sources of income created out of the Act to support corporate activities rather than those of the simple home person who only desires to generate a small income but is not allowed to do so because it could mean less money for a corporation or a government department.

(4) Under the Bill, charitable groups can run sausage sizzles etc., under food handler guidance (a best practise food safety pamphlet and no safety checking) as long as the activity does not happen more than twenty times a year. One must wonder how this has come about, since in New Zealand there never has been a limit on how many sausage sizzles one may have in a year, to raise funds for clubs, schools and charities. And what is the significance of 20 times a year. No reason is given, no data nor any statistical analysis to justify this particular number, and the difficulties of policing compliance would be enormous. Home gardeners and home-grown food sharers are not covered by the Bill as it stands at the moment. So cooking, selling and bartering with each other will not be impacted by the Bill.

(5) The Trans Pacific Partnership Agreement: New Zealand and the United States are currently negotiating a new free trade agreement, the Trans Pacific Partnership Agreement (TPPA), with eleven other countries in the Asia-Pacific region – Australia, Brunei, Chile, Malaysia, Vietnam, Peru, Korea, Singapore, Canada and Mexico. In December 2012 all met for the 15th round of negotiations at Sky City, Auckland. The TPPA would link countries together in a free trade zone, but the agreement is bigger than trade. Its 29 chapters will set binding rules on everything from service sector regulation, investment, patents and copyrights, government procurement, financial regulation, labour and environmental standards to industrial goods and agriculture. Negotiations started in 2007 and whilst the draft text can be cited by the 600 corporate lobbyists involved, the public cannot cite it despite calls for transparency.

The main concern with the TPPA is that a democratic system gives way to the rights of foreign investors to trump laws passed by legislative bodies and seek compensation for lost profitability. The Biotech Industry Organisation have said they want Genetically Modified (GM) Food labelling restricted under the TPPA. At the moment, in New Zealand any food with more than 1% GM content has to be labelled. Supermarkets don't typically stock known GM products because they know consumers don't like them, but we won't have that choice and neither will they if labelling laws are revoked. Consequently this agreement undermines the power of our government to maintain consumer, environmental and labour laws and protect public assets.

## **Overall**

The Ministry for Primary Industries in formulating a standard Food safety Plan, did leave one unforeseen problem: “Bridging the gap between desires and practicality.” It is difficult to understand comments heard that if the Small to Medium Size Enterprises do not comply in their adopting and maintaining a Food Safety Plan, they should not be in business. Such talk can only be attributed to those with little knowledge of the complexity of this industry. The responsible authority has to understand the predicament that the Small to Medium Enterprises are likely to have, and have an understanding of practicality in applying rules and regulations. Progress in food safety management as against disregard of the basic principles, if properly recorded, will sort out the rogue operators. Reducing an establishment’s food safety rating from a B to a D would be sufficiently good reason for the public to shun such an establishment. The Media’s negative reporting style where only bad cases are reported rather than publishing the A grades, doesn’t help. Establishments could proudly add their grades into their advertising, and equally so their professional association could endorse this – not unlike the Master Builders Federation of New Zealand Inc.

Initially a simplified form of a Food Safety Plan, overseen by health officers or auditors, for the owners of Small to Medium Enterprises, will have to be put in place. Such a plan needs to have a learning curve incorporated in it, and only after a considerable lead-in time, could Small to Medium Enterprises fulfill a realistic food safety programme. This does not take into account that at the same time a considerable amount of staff training will have to be put in place. Staff, prior to entering this industry, need to have an elementary level of knowledge. A change of mind set will not occur in a two hour lesson. Basic personal hygiene and food handling training will have to start within the school system prior to pupils reaching the workforce. Hand washing being “sissy” among young male students in the secondary school system is very likely to present future problems while these young males are employed in both the food and beverage industry. Such training for both management and staff needs to include the basics such as hand-washing, covering food, date marking and temperature recording, as well as cleaning schedule maintenance. This would essentially mean a much greater emphasis on training, which could very well mean a rewrite of the present training requirements.

## **Conclusions from the above**

A considerable amount of discomfort in the hospitality industry has been created as a result of inconsistencies in how the rules are applied by health officials (environmental health officers). It would be difficult to enforce a set of regulations fairly across the board in New Zealand as regulations are invariably open to interpretation. It is not only the specific sectors where environmental health offices operate, but also individual officials who have been shown to apply different interpretations to the regulations. This in itself is perhaps not a bad thing as undoubtedly each health official has the best intentions possible, regarding food safety. We should also keep in mind that with a large variety of establishments in New Zealand, consistency in applying the regulation is well nigh impossible to achieve. However, it is problematic to see one establishment continue under the worse possible conditions, while another establishment is prevented from opening until it attains an unrealistic standard, which may or may not be fitting for its situation. It would be interesting to allow that once an organisation is open, it can then revert back to less stringent standards. Consistency across the spectrum of new to old establishments has to be achieved for any food safety plan in order for it to succeed.

Management of Small to Medium Enterprises in the Hospitality Industry must take ownership of their food safety plan. If they are large enough to have a chef, this person is most likely to be a more suitable person to control food safety in their establishment. In the past, when the chef left the establishment the new chef could very well be untrained and lack knowledge to oversee food safety in the establishment - which led to many unforeseen problems. The responsibility of controlling and maintaining any food safety plan rests with the owner/manager, and it is up to them to engage a chef with sufficient food safety knowledge.

A health officials and auditor controlled system to grade establishments on their standard of food safety, is seen to have the potential of giving owners of food outlets an incentive to excel. The slogan "Who wants a C or D grade?" will very likely produce such an incentive. However, such a control system has to be fair and right across the board in all locations in New Zealand. Situations could arise, and may well have done so in the past, where the standard of a business to be opened is very different from an already established business. Inspections and audits need to be uniform and standardized throughout New Zealand.

It would not be difficult to imagine the situation of good environmental health officers dealing with poor hospitality management, and good hospitality management dealing with poor environmental health officers. Time is running out, as each year the situation becomes more difficult to control. The possibility of devising a workable solution to alleviate the problem is within our grasp. It is the researcher's opinion that the environmental health officers are best placed to lead the initiative. Hospitality management often has too many problems scraping out a living in their businesses through bad choices, the lack of understanding or the lack of will to succeed. Not all management falls into this category as there are many smart operators, who very well understand the requirements. However, a successful partnership between the health officials and hospitality management can only be achieved through mutual respect. In the interviews, both management and chefs indicated the lack of consultation as a source of friction.

The importance of identifying allergies as a potential source of a food-borne illness should be addressed. Twenty five years ago there was hardly, if ever, an issue with allergies. It is enormously difficult for the owner or manager of an establishment to ascertain how great this risk is. Certainly they would not be willing to take it, but without the knowledge of the subject are they not already taking a risk? Equally so, the public has to take certain responsibilities if they have a known food allergy, to avoid the foods to which they are sensitive. Diabetics generally have a knowledge of which products contain sugar or starches, and should be avoided. In defence of small establishments, the variety of products they produce makes it almost impossible to guarantee that product contamination does not occur. The grouping of diabetes and allergies may not be fair, as a diabetic is not likely to die from ingesting unsuitable foods in small quantities. The solution for food sensitivities may be too difficult to include in any type of food safety plan, but proprietors and staff made aware through training, will be able to minimize the risks.

There should not be any moves to close down non-compliant establishments before policy writers have revised the existing food safety plans to a more workable form. The responsible operators in the hospitality industry, managers, suppliers and chefs must be brought in from the very start, to contribute their views. Even without taking into account the considerable sum of money spent on food safety plan-based regulations before Parliament, one needs to

ask the question “How did this all come about?”. The ‘we know best’ attitudes may well have been a contributing factor to our present situation.

The food safety training of management, and of food preparation and service staff, has not been given sufficient attention. The cost of such training outweighs the consequences of food borne illness caused by poorly trained staff and management alike. As advocated earlier on in this thesis, it is management’s role to take responsibility or rather ownership of the Food Safety Plan. Employing trained staff will go a long way towards having a trouble free establishment. This would release Government’s commitment to provide training and, with the more forward thinking small and medium enterprises already ensuring the training of their staff is taking place, fairly puts the cost of training on all establishments. Initially, this would see a disproportionate number of staff having to be trained, but, once the Food Safety Plan system has been established, the number would reduce dramatically. In schools, at both primary and secondary level, there is a need for basic personal hygiene food safety training. It is doubted this type of training is taking place in many homes.

The food bill appears to consist of exemptions which give it the appearance of little being done about producing safe food, when it should have been producing a forward thinking, robust legislation in which lobbying has no place.

“The state exercises vast and elastic powers in the regulation of public health and education. Why does the state make no attempt to search out the cause of the diseases with which it deals? Why does the state not warn the people against the hidden enemy that attacks them? Let me again repeat: The politicians, the food industries and the newspapers will not permit it.” McCann (1918)

Such was written nearly a century ago. Little seems to have changed. The Food Act 1981 is far from perfect but, seeing it will take nearly 30 years for its successor to be put in place, are we not already replacing a much needed upgrade with something which will not last a further 20 years?

## **Suggested strategies for a successful Food Safety Plan**

Areas of responsibility must be clearly defined. It seems as if society is being drawn into a black hole, with fewer and fewer of the new legislators applying a combination of common sense and business sense to the tasks in hand. Taking responsibility for the end product (not only by small to medium enterprises in the hospitality industry, but by all units providing food and beverages to the public) can only come about if suppliers deliver good produce to establishments. Manufacturers and primary producers need to provide to suppliers, products which comply with all regulations from a food safety perspective. It is only then that management is ready to accept responsibility. The quality of staff, and the set up of equipment in the premises, should no longer be any excuse for an owner of a food business to take unnecessary risks.

The existence of many different hygiene grading systems in use throughout New Zealand has the potential to cause confusion; obviously some are superior to others. The Auckland City Council grading of premises is a good and fair example. The Auckland system has merits that recommend it for possible adoption nation wide. Several interviewees indicated that it is not only the bad grades that should be published, but also the top grades. A prominent place for

displaying these certificates ought to be decided on a national basis. At present it is too easy to hide or obstruct the view of the certificate. The main reason behind displaying the certificates is to bring awareness to the public as to which premises are good and which should be avoided. This may seem a harsh solution but ultimately if the proprietor feels they have been dealt with too harshly, they will make sure to attain better grades in future. Equally so, establishments with a low grade will not stay in business very long. The reason why this paragraph's contents are of importance is that food safety is a serious concern and the policy writers will have to be serious and practical when formulating regulations. If an establishment has been evaluated and given a poor mark, it should have the right of a second audit within a two month period. The regulations will have to be written in such a way that the results of an audit are binding and not able to be overturned on a point of law.

These new requirements can be implemented in steps with both the fees and grading as the controlling points. If the proprietor has no food safety qualifications, there cannot be an A or B grade certificate for the business.

Ideally, having a provisional grade for a one to three month period only, would ensure better standards without unduly punishing the new owner. However, ultimately the penalty for non-compliance needs to be closure. This would mean that if the owner does not rectify a potential risk, the environmental health officer can recommend closure, but they would not have to undergo the complicated process which at present has created situations where they walk away from confrontation as their workload gets out of control and the cost to the responsible authority becomes prohibitive.

Staff is the owner's most valuable asset and without staff commitment to assist its management in implementing good food safety practices, it will be difficult for food safety to be effectively implemented. A one to two hour seminar, or even a video on buy-in, lessens the risk. Up-skilling the knowledge of owners and managers in business principles, creates benefits for the industry and its customers. The well-known principle of human resource management still applies: "In the good times it's a wonderful idea and in the poor times it cannot work." It requires good management skills to motivate staff to embrace the requirements to reduce food borne illness. It is also a well known principle that the more skilled the staff become, the better the business performs.

The implementation as a series of steps to achieve better food safety control, should be considered. As part of the legislation, for Food Safety Plans to succeed in reducing food borne illness in New Zealand, a sensible stepped time plan is essential. To leave the completion date to be set at (say) 2018 and have no progress made until then, will negate this opportunity of implementing a sensible stepped time plan. As has happened in the past, deadlines pass and those most vocal will achieve one thing only - further deadlines. In the meantime, bacteria are more likely to follow the rule of evolution and become much harder to control.

Inspections either carried out by council employed health officers or independent auditors, will have to pass the scrutiny of their clientele. Encouragement and advice will win out and produce results rather than a punitive regime hunting for mistakes, which in the past has proven to be very counterproductive.

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## Chapter 12

### Conclusion and Recommendations

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The Food Act 1981 has been in operation for more than 30 years and is due for revision. Changes to Small to Medium sized Hospitality businesses and the way people work, eat, drink and spend their leisure time has been dramatic. The proposed legislation is long overdue. Not only the Small to Medium size Enterprises, but all food outlets in New Zealand will have to embrace the Food Safety Plan with the imminent passing of the Food Act in Parliament in 2014. However the method of implementation needs to be very carefully examined to ensure the greatest benefits are achieved.

If food outlets, of which the Small to Medium Business owners are very much a part, are to become responsible for what they sell to the public, it would not be difficult to foresee the situation whereby these operators, with their limited funding, would have no way of challenging the restrictions imposed by the proposed Food Act. They might be forced out of business, even if their produce was bought in good faith but was tainted for a variety of reasons beyond their control. Paying above average prices for produce is no guarantee that the produce is fresh and untainted throughout the cycle of 'farm to fork'.

There are three main faults with the Food Bill as it stands:

- 1 There is an over-simplicity of the complexity of the Bill. You cannot have a large organisation running on the same legislation as a small one. It becomes too complex for the small to medium businesses to handle.
- 2 There is apparent a lack of realization, by those writing the legislation, that there is a practical issue: The small businesses must be able to cope with the legislation. If they are not able to cope, there is the prospect of numerous court cases. With the 30,000 or more establishments in New Zealand that have to be dealt with, there could well be 250 court cases a month and we can't have that - it just won't work. So the Food Bill will need to be more targeted towards the locality, size, and purpose of the enterprise, and that is lacking.
- 3 The training component in the bill is very basic. It more or less describes training that needs to be done - but includes nothing to guarantee that it is done. It is insufficient and particularly so for anything above medium size enterprises with say another 2 to 3 people working there together with the proprietor and his partner. To complicate matters, the big restaurants may also be divided into categories and classed as small, medium and large. For these, there has to be a higher level of complexity in the training to be able to cope with the different food types, and then we start going from the steak and kidney pie, that is produced all over the world from local produce, to the use of imported ingredients and their special storing and

cooking needs to preserve food safety. At the moment there is a lack of awareness of this.

In the implementation of the proposed Food Plan there needs to be a closer relationship between those auditing the premises and the management of the small to medium size enterprises. The auditors (environmental health officers and their counterparts) cannot go in like a steamroller, as some have in the past, and run up a plan in 20 minutes saying if the operations of the enterprise are not corrected in a fortnight, "We will close you down." That state of affairs should never have been allowed to happen in the first place, and would not have done so if there had been a closer relationship between the auditor and the enterprise. It's lack of understanding how the small business operates. The auditors have a responsibility to ensure the regulations are followed. At the moment, the way some go about doing this is questionable.

One can understand the two roots of the problem: Firstly, in their training the officers are not taught how to communicate socially, and this should be a requisite of the university courses they have to undergo. Secondly almost all councils do not have sufficient funds allocated to food safety, and certainly not for any prosecution for non-compliance with the regulations. If a business, on being threatened with closure, elects to go to court, more often than not the local responsible authority cannot afford a court case, as the defendant often is well aware, and so the prosecution is dropped. The legislation must include a means to overcome this if food safety is to be preserved. It would appear those writing the legislation have no idea of running a business and no idea of how to deal with staff

There must also be a change in the New Zealand business culture. People with no idea of hygiene, and no idea of food safety, are being allowed to set up food outlets. Such entrepreneurial undertaking is encouraged as part of our culture but may be a hazard to public health. Some City Councils have stepped out of line demanding more than is contained within the Regulations and have instituted requirements for all new food businesses. If we are to preserve food safety nation-wide, then this needs to be implemented nation-wide so that all councils handle the problem in exactly the same way. The application of the legislation in New Zealand has to be across the board and not left to local councils.

The reason the Food Bill has not yet been implemented is because it has not been written properly. Of course, this is not only restricted to food safety, many other pieces of legislation have the same problem - the most economical way is taken, rather than the best way. Public health is given a lower order of priority.

The legislation should demand there be something to guarantee that the owner or prospective owner of any food business has an awareness of food safety and either has a certificate in food safety or has staff that are qualified in food safety and will obey the Regulations.

## **Recommendations**

The greatest issue in implementing the proposed food safety legislation is seen to be that there are management and staff who have received little or no training on the subject. All SME food workers need to have received training to ensure that food for sale is safe for consumption. Food producers, transporters, and suppliers should also receive an appropriate level of training. To have only voluntary food safety training is not the answer to solving New Zealand's costly lack of an up-to-date legislation. Training and qualification procedures need to be written into the proposed legislation, ensuring that all staff engaged in the production and service of food, receive an adequate level of training in their perceived area of expertise. Indeed food safety and personal hygiene should be made a compulsory component in the curriculum of all secondary schools, ensuring a basic knowledge when school leavers enter the workforce. Only with a political determination to change, can this important hurdle to the proposed food safety legislation be overcome.

The researcher would have liked to complete a single city based survey on Small to Medium Enterprises' staff numbers, product range, and both hours worked by its owner/manager and administrative hours worked. Unfortunately, because of severe time restraints this had to be abandoned after only two persons had been interviewed. Nevertheless, their responses bear out the problems seen in staff being inadequately trained, or not trained at all in good food safety practice, and the perceived problem of balancing regulations with practicality. It is believed the results of such a survey would be of great benefit to legislators and administrators alike.

No legislation is complete without checking its implementation progress over a number of years. Additional research observing the Food Safety Plan's progress over a period of the first five years in operation, with special attention to Small to Medium Enterprises in the Hospitality Industry, has the potential to bring to light any discrepancies in the Food Act. Such research should include: Management and staff food safety knowledge, training standards, planned implementation standards, health officer and auditing standards, food borne illness records in the Small to Medium Enterprises, and administrative costs and/or licensing costs nationally. The research would ensure that flaws in the legislation come to the attention of the policy formulators, and regular updates have the potential to occur more frequently than those in the past.

In addition, more research as to how the legislation will progress, needs to be undertaken by many more researchers throughout New Zealand. With the cost of food safety issues increasing year by year, there are many opportunities for New Zealand based researchers to gain international recognition.

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# Appendix A

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