A STUDY OF KNOWLEDGE, ATTITUDES AND BEHAVIOUR WITH REGARD TO FOOD SAFETY, IN THE WELSH HOSPITALITY AND CATERING INDUSTRY

PHILIP DENNIS COLEMAN

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SCHOOL OF HOSPITALITY, TOURISM AND LEISURE
UNIVERSITY OF WALES INSTITUTE, CARDIFF
COLCHESTER AVENUE
CARDIFF

ABSTRACT

Foodborne illnesses respresent a serious threat to health. The World Health Organisation (2000) recently passed a Resolution stating that "...foodborne illness associated with microbial pathogens, biotoxins and chemical contaminants in food present a serious threat to the health of millions of people in the world (p.1)". Overall notifications of foodborne illness and food poisoning have risen significantly and many outbreaks have been associated with the food industry. The Hospitality and Catering industry is of special concern because of it's size, diversity, individual characteristics, and direct interface with customers.

This thesis focuses upon the Hospitality and Catering industry in Wales, a largely unexplored area of research. It applies an investigate approach to issues relating to the management and implementation of food safety in the industry across a range of industry sectors to be found in the Principality. Information was gathered by utlising a range of secondary and primary sources. Data collection instruments included questionnaires, structured interviews, and audit checklists and observations. These were administered by way of three discrete but interlinked primary data collection investigations. Both quantitative and qualitative data were obtained. Participating industry personnel included proprietors, managers and food handlers.

Via a literature review, the key issues of knowledge, attitudes and behaviour related to food safety are discussed and evaluated within the contexts of the inherent characteristics of the Hospitality and Catering industry, and food safety legislation. There three investigations are presented individually and the findings are consolidated in a synoptic discussion in relation tot he Aims of the thesis.

The findings indicated that within the Welsh Hospitality and Catering industry, levels of knowledge and attitudes with regard to food safety and food safety legislation were variable and in some instances, unsatisfactory. In many instances, intentions to act in a positive manner towards the implementation of food safety precautions were not reflected in actual behaviour. It was further found that in establishments of all sizes and ownership categories, food handling practices were variable and in many cases, unsafe. Recommendations are made based upon the results obtained and discussed in this thesis.

DEDICATION

To Jack, Sheila and John. No longer with us, but never to be forgotten.

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-ABBREVIATIONS

ACMSF	Advisory Committee for the Microbiological Safety of Food
ANOVA	Analysis of Variation
ASC	Assured Safe Catering
BHA	British Hospitality Association
BS5750	British Standard 5750
CDR	Communicable Disease Report
CIEH	Chartered Institute of Environmental Health
CP	Control Point
CCP	Critical Control Point
EC	European Community
EEC	European Economic Community
EHO	Environmental Health Officer
FAO	Food and Agriculture Organisation
FT	Full-time
GHP	Good Hygiene Practices
HACCP	Hazard Analysis and Critical Control Points
HBM	Health Belief Model
HCIMA	Hotel and Catering International Management Association
IID	Infectious Intestinal Disease
ISO	International Standards Organisation
JHIC	Joint Hospitality Industry Congress
KAP	Knowledge Attitudes Practices (Model)
LACOTS	Local Authority Co-ordinating Body for Food and Trading Standards
MAFF	Ministry of Agriculture Fisheries and Food
MID	Minimum Infectious Dose
PHLS	Public Health Laboratory Service
PRP	Pre-requisite Procedure or Practice
PT	Part-time
SAFE	Systematic Assessment of the Food Environment
SME	Small to Medium Sized Establishment
SRSV	Small Round Structured Virus
SOP	Standard Operating Procedure
SWALEC	South Wales Electricity Company
UK	United Kingdom
US	United States
USA	United States of America
WAFSAB	Wales Food Safety Attitude Battery
WHO	World Health Organisation

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CHAPTER ONE

INTRODUCTION

1.1. Background:

The role of food in maintaining life is a fact that cannot be disputed. For many people however, food has become more than just a necessary sustenance. Business deals are conducted over working breakfasts, lunches and dinners, and transport organisations strive to prepare the best food in order to attract businessmen and women to use their company when travelling between meetings. Socially, our whole way of life has changed, with children's parties, leisure activities, and even shopping, having an increased focus upon food. Tourism is now the largest industry in the world (Foster, 1999, p. 2) with many countries recognising the economic wealth that it can bring to them. Increased opportunities for travel with expanding tourism markets, and cultural diversification between nations, have also contributed to the wealth of foods and dishes that are now available to many people. Technological advances have changed the way in which food is grown, produced, transported, stored, and prepared, and competition between commercial catering and retail organisations has helped to keep prices relatively low and affordable to most people. Improved transport networks including the motorway system have all provided opportunities for people to purchase a wide range of foods during their journeys. Changes in society itself also influence the supply and choice of foods available. In the United Kingdom (UK) there are smaller family units and changing attitudes to marriage, an ageing population with more free leisure opportunities, young people with "money to burn", and increasing numbers of working women. Such factors have contributed to increased levels of disposable income, resulting in a population that can not only choose from an unprecedented selection of foods at their local supermarket, but also have increased desires and opportunities to eat away from the home environment.

1.2. Catering outside of the home environment:

Expansion within the hospitality and catering industry has reflected these lifestyle changes and there has never been such a diversity of outlets ready to sell their wares. Consumers can choose between large international multi-chain organisations or family owned small independent businesses depending on their requirements at the time. Restaurants serving foods from virtually every country on the globe may be seen in most town and city centres, fast food has become a way of life, and more exclusive establishments are available to the more discerning customer. The hotel sector has equally recognised the interaction between not only business needs and the provision of food, but also the potential profits to be made from the more social aspects of life including sporting and leisure activities. At work, many employers have recognised the need to supply a wide selection of high quality foods for their employees. In total, every taste is now catered for in all aspects of our life. In the UK however, it is possible for anyone to set up and open a catering business without a licence, although they do need to register with the local authority. Whilst many caterers are diligent and endeavour to apply high standards of food safety, there has been an increased awareness of the association between Hospitality and Catering businesses and food related illnesses. Issues relating to unsafe food production practices, poor standards of training, inappropriate attitudes to food safety, and over-burdensome legislation have been the subject of much debate.

1.3. Food and illness:

These changes within society and the industry have not happened without other "influences" however. There have always been dangers associated with the consumption of food but the risks have also never been greater. Food related illnesses continue to rise (Djuretic, 1997, p. 752). The World Health Organisation (WHO) (1988) has called for "...the appropriate use and application of all available techniques to reduce food contamination and thus foodborne disease" (p. ix). In a more recent report, the WHO estimated that up to 30% of the population in industrialised countries

may be affected by foodborne illness each year (WHO, 1999, p. 1). Apart from ill health and death caused by food related illnesses, there are financial considerations. In the United States of America (USA) for example, the annual costs of foodborne illness have been estimated as being anywhere between $6.5 billion and $34.9 billion annually (Buzby and Roberts, as cited in World Health Statistics Quarterly, 1997, p. 62). Food safety legislation has been reviewed and amended significantly since 1990 (Aston, 1996, p. 14), and increasingly influenced by European Directives (Adams, 1995, p. 19), but it has been criticised as being ineffective and too weak (Willett, 1991, p. 155). Food related illnesses are not just restricted to underdeveloped countries, with reports of food poisoning and foodborne illnesses being increasingly reported in Westernised countries and a growing media attention to the problem. As more people eat away from their home, the Hospitality and Catering industry is increasingly being implicated as a source of contamination. Of particular concern is the growing association between harmful micro-organisms and illnesses caused by food. The need for better education in terms of personal hygiene and food preparation has been recognised. This is difficult to implement however, as attitudes and behavioural change are not so easily changed, especially in an industry which is so diverse, made up of large numbers of small enterprises and which employs large numbers of part-time and casual staff. With increasing reported incidences of food related illnesses, media attention surrounding such incidences has never been greater. This has resulted in increased public awareness and an increased focus upon the Hospitality and Catering industry.

1.4. Structure of the Thesis:

This thesis explores a number of issues regarding the reasons for food-related illnesses and their prevention, specifically within the Hospitality and Catering industry in Wales. It expands upon previous research undertaken in South Wales and considers the views of other researchers and authors. To facilitate this exploration, a strategy encompassing both secondary and primary data collection methods was utilised. Primary data collection instruments including questionnaires, attitude scales, structured interviews, audits and observations, were used to obtain information from industry personnel and about food preparation environments. Such a diversity of data collection

methods enabled the researcher to collect a comprehensive range of information appropriate for analysis and evaluation. Some of the instruments including a Risk Assessment checklist, an audit test, and differing recipe formats, were specifically designed by the author for this thesis. The Hospitality and Catering industry is extremely large and made up of many discrete sectors. As part of the primary data collection strategy, it was decided to conduct an exploratory survey of one sector (the hotel sector), and then expand subsequent investigations to include a range of other sectors. The rationale for this is discussed in chapter three, but in strategic terms, it allowed for an initial knowledge base to be established which could then be built upon, allowing comparisons between other sectors to be made where appropriate. The investigation of secondary sources including texts, journals, reports, theses, and Internet material provided a theoretical platform through which the results of primary data information could be compared and discussed.

Structurally, this thesis is made up of seven chapters. The subject matter of chapters three, four and five have been published as discrete articles in their own right in international journals as the thesis has progressed and these are available for scrutiny. The basic framework of subsequent chapters is as follows:

Chapter two reviews and evaluates previous research undertaken and information available regarding food-related illnesses, food safety legislation, and the relationship between food poisoning and the Hospitality and Catering industry. It endeavours to focus upon issues relevant to this study and culminates in the Aims of this thesis.

Chapter three introduces the primary data collection aspect of the thesis and provides material for use and comparison throughout the remaining chapters. It specifically focuses upon the types of meals and foods used in hotel outlets in Wales, the practices and procedures employed in the food production process, aspects of quality assurance relevant to food production, and also upon the knowledge and views of senior personnel within the sector.

Chapter four investigates the attitudes of personnel in a range of catering industry sectors towards food safety and food safety legislation. The relationship between attitudes and intended behaviour is discussed, and comparisons are made with the findings reported in chapter two.

Chapter five reports upon a series of food safety audits conducted in selected establishments and compares and discusses actual behaviour in relation to intended behaviour and knowledge, as discussed in the previous chapters. The presence of systematic approaches to food safety, supporting documentation, food preparation procedures, and aspects of personal hygiene were investigated, together with the role of recipes as a tool for helping managers to reduce food related illnesses.

Chapter six forms a synoptic discussion, integrating and consolidating the main findings from all previous chapters, and contextualising these findings within the current political climate in Wales and the UK.

Chapter seven consists of suggested recommendations formulated as a result of undertaking this thesis.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction:

This chapter evaluates a wide range of available literature and previous research as an introduction to the investigations undertaken by the researcher and culminates with the Aims of the thesis as a whole. The broader aspect of food related illnesses are introduced and discussed, and the chapter proceeds to focus upon the relationship between the Hospitality and Catering industry and food poisoning, as well as food safety legislation. Together with food safety and hygiene knowledge, reference is made to the attitudes of personnel within the industry which became apparent as an important issue during the early stages of the project. Subsequent chapters provide more detailed and focused discussions of these areas.

2.2. Food related illnesses:

Frequently referred to as food-transmitted diseases (Brownsell, Griffith and Jones, 1989, p. 206) the prominence of these types of illnesses has grown alarmingly. Improved education and standards of personal hygiene, sanitation, water, vaccination programmes together with technological advances have reduced the incidences of many diseases such as poliomyelitis, cholera, typhoid, and brucellosis in industrialised countries (Kaferstein, as cited in World Health Statistics Quarterly, 1997, pp. 3-4). The WHO (1995) has described illnesses associated with food as "...immense" (p. 62), and in an earlier report published jointly with the Food and Agriculture Organisation (FAO) (1988) as being "...perhaps the most widespread health problem in the contemporary world and an important cause of reduced economic activity" (p. 1). There are a number of reasons why the consumption of food may result in illness and traditionally these have been considered under two headings, foodborne infections and food poisoning (Brownsell et al, 1989, p. 206).

Foodborne Infections:

Some parasitic organisms such as worms (e.g. *Trichinella spiralis*), protozoa (e.g. *Giardia lamblia*), bacteria (e.g. *Campylobacter jejuni*), and viruses (e.g. Small Round Structured Viruses (SRSVs) are able to use food as a vehicle to gain access to human hosts, thereby causing infection. They may also be ingested directly as a result of contamination from animals or directly from hand to mouth for example. Characteristically, they do not increase in numbers once in the food and in some cases (*Campylobacter jejuni*) only relatively small numbers are necessary to cause illness. Examples of illnesses caused as a result of foodborne infection include - typhoid, paratyphoid, hepatitus A, brucellosis, tuberculosis and amoebic dysentery (Brownsell et al, 1989, p. 209),

Food Poisoning:

Food poisoning may occur in a number of ways:

- Contamination by micro-organisms including bacteria, moulds and viruses
- by physical contamination, either animate (e.g. from birds and animals), or inanimate (e.g. from flaking paint and screws)
- contamination by chemicals such as insecticides, cleaning agents, and some metals
- contamination by natural toxins from within food items or poisonous plants (e.g. certain fungi, the liver and intestines of some fish, and rhubarb leaves)

Unless precautions have been taken to remove them, bacteria and other micro-organisms are to be found almost everywhere in the environment including in soil, water, dust, the air, on human and animal bodies, and in food itself. They are the most frequently attributed cause of food poisoning (Maurice, 1994, p. 28) for a number of reasons. Firstly, their widespread distribution in the environment means that they are well placed to contaminate food. Secondly, once having contaminated food, some

organisms are able to reproduce at extremely rapid rates (Border and Norton, 1997, p. 4). Thirdly, there is an abundance of empirical evidence to demonstrate the involvement of micro-organisms in reported notifications of food poisoning (Evans et al. (1998 p. 166)). Bacterial food poisoning may be categorised under two headings (Brownsell et al, 1989, p. 214):

- infective bacterial food poisoning - where bacteria reproduce in the contaminated food as well as inside the person once consumed (e.g. *Salmonella typhimurium* and *Escherichia coli*)
- toxin-type bacterial food poisoning - where bacteria reproduce and produce separate chemical toxins which cause illness once consumed (e.g. *Clostridium botulinum*)

Because the term "food poisoning" had not previously been defined, confusion arose between this and the use of the term "foodborne infection", and the adverse effect it was having within the monitoring and reporting process regarding which cases should be reported (Wall, de Louvois, Gilbert and Rowe, 1996, p. 93). Consequently, a standard definition was required and the Advisory Committee on the Microbiological Safety of Food (ACMSF) defined food poisoning as "any disease of an infectious or toxic nature caused by or thought to be caused by the consumption of food or water" (Wall et al, 1996, p. 93). For the purposes of consistency, the term food poisoning will be used throughout this study when referring to food related illnesses except when referring to or quoting, other authors. It should also be noted that much of this study focuses upon food, food handling practices, and the management of food safety. Consequently, illnesses mainly transmitted through water are not discussed.

2.2.1. Trends and Implications:

Maurice (1994) states that "In some Western countries ... the incidence of foodborne disease may be second only to the common cold" (p. 28). The same author also argues that the problem is not just restricted to certain countries and is in fact a global issue, citing the death toll from diarrhoea as "... still shockingly high throughout the developing world" (p. 29), causing the death of at least six children every minute. As previously indicated, the WHO has for some time recognised the problem of food related diseases and a report published in 1984 by the FAO/WHO Expert Committee on Food Safety stated that "It is ... virtually impossible to avoid the contamination of food ..." (p. 12). Given that contaminated food supplies and life-threatening diseases are predicted to continue in the future (Powell, 1997, p. 1), the costs associated with them are not only counted in terms of ill health and death, but also in financial terms (Maurice, 1994, pp. 28-29). When analysed in more detail, the financial costs are considerable. According to the WHO (1999) "the medical costs and value of lives lost from just five foodborne infections in England and Wales were estimated in 1996 at £300-£700 million annually" (p. 1). Griffith and Coleman (1993, p. 10) state that as the industry is so important to the UK economy for the number of people it employs, its contribution to the gross domestic product, and the balance of trade, the country cannot afford to sustain such losses. More recently, the costs of infectious intestinal disease (IID) have been estimated at three quarters of a billion pounds a year (Joint Food Safety and Standards Group, Seminar Proceedings, 2000, p. 6), although this figure does of course include all cases of IID and not just those resulting from contaminated food. Such costs however, are not just confined to developed countries. Maurice (1994, p. 29) for example, makes reference to Venezuela where the increase in foodborne disease increased from thirty cases per 100,000 population in 1976 to one hundred and forty per 100, 000 population by 1991. In the UK, notifications of food poisoning have increased considerably (see table 2.1). Salmonella and *Campylobacter* have been of special concern with reported incidences of Salmonella increasing from 28 to 127.4 per 100,000 population for the period 1982-1992, and isolations of *Campylobacter* increasing from 25.8 to 75.7 per 100,000 population in the same

period (Griffith, Mathias and Price, 1994, p. 16). More recent data indicates that *Campylobacter* has become of more concern with notifications increasing significantly (Handysides, (Ed.), 2000, p. 205), whilst notifications of Salmonella have decreased 27% between 1998 and 1999 (Handysides, (Ed.), 2000). Notifications in Wales have remained relatively constant but significant in recent years (see table 2.2.

Table 2.1. Food poisoning notifications in England and Wales, 1982-1999:

Year	Formally notified	Otherwise ascertained	Total
1982	9,964	4,289	14,553
1983	12,273	5,462	17,735
1984	13,247	7,455	20,702
1985	13,143	6,099	19,242
1986	16,502	7,446	23,948
1987	20,363	8,968	29,331
1988	27,826	11,887	39,713
1989	38,086	14,471	52,557
1990	36,945	15,200	52,145
1991	35,291	17,252	52,543
1992	42,551	20,796	63,347
1993	44,271	24,316	68,587
1994	50,412	31,421	81,833
1995	50,761	31,280	82,041
1996	50,718	32,515	83,233
1997	54,233	39,668	93,901
1998	53,764	40,168	93,932
1999	48,454	37,862	86,316

Adapted from: PHLS data (2000)

Food poisoning is not a problem unique to the UK and this type of illness is of equal concern elsewhere in the world (Sharpe and Reilly, 1994, p. 25). The American government for example, has estimated that there are between 6.5 and 33 million cases of food poisoning and 9,000 deaths each year, and in 1998 allocated $43 million to the detection and prevention of foodborne outbreaks before they became too widespread

(Todd, as cited in World Health Statistics Quarterly, 1997, p. 45). The internationalisation of food poisoning also has a further dimension. According to the same author (1997) "an increasing number of illnesses are international in scope, with contamination ... occurring in one country and affecting tourists in several others" (p. 46). It should also be stated that figures for food poisoning are indicative only, as many cases of food poisoning are unreported (Border and Norton, 1997, p. 22). One recent study of IIDs undertaken in seventy general practices in England confirmed this (Wheeler, Sethi, Cowden, Wall, Tompkins, Hudson and Roderick, 1999) concluding that "only a fraction of these cases are reported to national laboratory surveillance" (p. 2). The same study reported that "...for every case detected by national laboratory surveillance, there are 136 in the community (p. 6). Whilst IIDs can arise from a number of sources of which food is only one, the findings are reflective of other surveys more specifically associated with food poisoning (Evans, Madden, Douglas, Adak, O'Brien, Djuretic, Wall and Stanwell-Smith, 1998, pp. 170-171). Equally, arguments that increases in food poisoning may be fully attributed to improved diagnosis and identification procedures have been refuted. Maurice (1994, p. 29), refers to increasing notifications in countries where reporting systems have not changed for a number of years. Sockett (1993, p. 114) supports this argument that overall rising trends are authentic, referring to the peaks and falls in reporting of single stereotypes (e.g. salmonella typhimurium) since the mid-1950s.

The effects of food poisoning may also be viewed from a social perspective. For individuals the costs may include:

- medical costs
- loss of income
- pain and suffering
- reduced or lost leisure and social activities

For industry, the costs are also extensive, including:

- loss of business or closure
- loss of income
- product and personal liability
- adverse media attention
- increased administration and time given to correcting faults

Table 2.2. Notification of food poisoning in Wales, 1996-2000:

Year	Notification
1996	1,335
1997	1,440
1998	1,344
1999	1,152
2000*	139

Adapted from: Communicable Disease Report Data (January 1996 to February 2000)

* Data available for January and February 2000

Reasons for the rise in food poisoning are many and include:

- changing patterns of food consumption and increased numbers of people dining outside of the home environment
- improper use of food preparation equipment such as microwave ovens
- a greater variety of foods now available including imported exotic foods
- changes to purchasing habits as more people work full-time, buying and preparing food well in advance of its use
- lack of storage (refrigeration) space to cope with increased amounts of food being purchased and stored
- an increase in the number of food outlets, especially within the fast food sector, together with an increase in "snacking" as time becomes more precious
- a lengthier and more complex food chain
- changing and improved technology with the potential for larger and more widespread incidents of food poisoning

Mathias, (1999 p. 23).

Together with an increasing trend in notifications of food poisoning, other pathogenic bacteria have been acknowledged as being harmful to health, with recent outbreaks of enterohaemorhagic strains of *Escherichia coli* for example, causing serious illness and even death (Sharpe and Reilly, 1994, p. 30). Such outbreaks have been highly publicised through the media (de Bertodano, 1998, p. 465) and this has contributed to raised levels of public awareness and concern. Additionally, a number of pathogens which are multi-antibiotic resistant have become significant threats to public health (e.g. *Salmonella typhimurium)* (Kaferstein, as cited in World Health Statistics Quarterly, 1997, p. 3). Equally, notifications of viral gastrointestinal illness, especially Rotavirus and SRSVs are of concern. Not only are they under-reported to national surveillance (Joint Food Safety Standards Group, Seminar Proceedings, 2000, p. 15), it is estimated that SRSVs were implicated in approximately 64% of food borne illness outbreaks in England and Wales in 1995 and 1996 (Evans et al, 1998, p. 165). Of additional concern is the fact that many foodborne infections can also lead to serious chronic illnesses affecting for example the cardiovascular, renal, respiratory or immune systems (Kaferstein, 1997, p. 3).

2.3. Epidemiology of Food Poisoning:

Notifications of food poisoning attributed to domestic sources remain significant, especially when food is prepared in the home for larger numbers of people than would normally be the case, e.g. parties and barbecues (Border and Norton, 1997, p. 37). The relationship between catering premises and outbreaks of food poisoning however, has also been well documented, with parliament further recognising the risks associated with smaller businesses (Allan, 1998, p. 5). It should be noted that for the purposes of this thesis, general outbreaks are defined as: ".. affecting members of more than one private home, or residents of an institution" (Border and Norton, 1997, p. 35). It is estimated that almost half (44%) of all general outbreaks of food poisoning occur in commercial catering premises, with most of these outbreaks also being associated with catering for large numbers of people (Border and Norton, 1997, p. 37). This

relationship between hospitality and catering, and food poisoning was also reflected in research carried out some eight years earlier by the Audit Commission for Local Authorities in England and Wales (1990, p. 1) which indicated that almost one in eight food premises carried a significant or imminent level of health risk. Whilst domestic notifications remain important (Ward, 1995, p. 13), the significance of catering establishments and specifically commercial establishments, in relation to food poisoning has become clearly recognised (see table 2.3), especially when the potential for the spread of illness is considered. Large numbers of people may be affected in one incident, including the young, the elderly and expectant mothers' groups of people who are considered to be particularly susceptible (Coleman and Griffith, 1997, p. 234). Robinson (1997) reports that "people are five times as likely to suffer from poisoning through eating out as they are from eating meat from their local butcher" (p. 5). Given that outbreaks associated with the catering industry are significant in other countries as well as the UK (van Houten, 1997, p. 31), the industry carries an enormous responsibility for providing a food environment for its customers which has a minimum or acceptable level of risk.

Table 2.3. Locations of General Outbreaks of Food Poisoning 1996-1999:

Location	1996	1997	1998	1999
Private houses	19	13	18	9
Hotels and Restaurants	57	50	63	58
Pubs and Clubs	14	8	17	12
Hospitals and Welfare	34	31	45	24
Institutions and Schools	10	8	7	6
Caterers	7	10	10	10
Retail	4	12	6	16
Armed Forces	3	3	3	5
Others	16	2	10	9

Adapted from: Communicable Diseases Report data, (January 1996 to December 1999)

2.3.1. Foods Associated with Food Poisoning:

A survey of PHLS data indicates a range of foods which are frequently associated with general outbreaks of food poisoning, examples of these may be seen in table 2.4.

Table 2.4. Suspected food vehicles in general outbreaks of food poisoning, England and Wales, week one 1996 to week fifty two 1997:

Suspected food vehicle	Number of outbreaks
Poultry/poultry dishes	15
Made up meat dishes	15
Eggs/egg dishes	11
Meats	10
Fish/fish dishes	10
Rice/rice dishes	8
Cold desserts	4
Shellfish	2
Others	9

Adapted from: Communicable Disease Reports data, (January 1996 to December 1997)

Many of these food items include those which may be eaten on an almost daily basis. Because of this and their susceptibility to supporting the multiplication of pathogenic bacteria, they are frequently referred to as "high-risk" foods and described by Sprenger (1998) as "ready to eat foods which under favourable conditions, support the multiplication of pathogenic bacteria and are intended for consumption without

treatment which would destroy such organisms (p. 8). Using Sprengers 1998 definition, based upon the inherent properties of the food combined with their likely future treatment, all the foods indicated in table 2.4 may be classed as high risk. Some however, are more frequently implicated than others in food poisoning. These include for example - poultry/poultry dishes, made up meat dishes, eggs/egg dishes, fish and rice/rice dishes, and have attracted higher risk levels (Coleman and Griffith, 1998, p. 292). Certain other foods which are not so frequently reported may also be considered to be high risk, i.e. cold desserts and fresh cream products, shellfish, soups, gravies, soft cheeses and mayonnaise (Coleman and Griffith, 1998, pp. 292-293). The variability and frequency in which these foods are eaten is dependent upon a number of factors including for example - the venue, the occasion, the time of day, and the weather. Also, some foods will undergo a series of stages in the preparation process, as well as becoming a component part of other more complex dishes. In instances such as these, the risk of contamination and illness increases because of the greater use and handling (Coleman and Griffith, 1998, p. 293). Additionally, as societies and cultures continue to integrate, and as technological changes continue to occur, modern eating habits constantly change. This in turn indicates a higher range of foods associated with food poisoning being consumed (Richmond, 1990, p. 22). The microbiological risks have also been raised by technologically advanced food processing methods such as vacuum packing (e.g. sous-vide) and minimally processed foods (Knabel, 1995, p, 120). There is a potential for bacterial spores to survive the relatively low heat treatments involved in such processes, and for the modified atmosphere of vacuum packing to enhance the growth of other micro-organisms. In such instances, there is a need for increased vigilance by food handlers, supervisors and managers with regard to appropriate storage, especially with ready-to-eat convenience foods which do not require further heat treatment prior to consumption. The association between certain foods and specific bacteria is a familiar one for many industry personnel involved in or associated with, food preparation. Not so well known however, may be the more recently identified risks between bacteria and other types of foods not normally associated with food poisoning. Outbreaks of salmonellosis associated with fresh fruits and vegetables for example, have been reported (Knabel, 1995, p. 120). Reference has previously been made in this thesis to new or emerging pathogens such as *E.coli 0157.* Also of concern is *Listeria monocytogenes,* a psychrotrophic with good environmental

survival abilities (Bell and Kyriakedes, 1998 p. 2), further increasing the need for effective temperature control measures, vigilance, and appropriate hygienic practices regarding the handling of the food itself.

2.3.2. Risk Factors Contributing to Food Poisoning:

Methods employed to prepare food will inevitably vary. In domestic environments, small guesthouses and bed and breakfast establishments, as well as many larger organisations, food preparation is normally based upon traditional cook-serve principles, and resources as well as space may be restricted. In some larger catering establishments and organisations, food preparation may fully or partly incorporate more technologically based systems such as cook-chill, cook-freeze and sous-vide, with centralised production units forming part of the overall production system. A process which necessarily involves the preparation of food in advance. Whilst catering in domestic premises is more often than not limited to family requirements, every catering business is different and has individual methods of food preparation according to their menu requirements although certain factors are common to all food handling practices. Also, foods may pass through a number of storage, preparation and production processes between purchase and service and be subject to a variety of food handling practices, some of which when not undertaken correctly, are contributing factors to an increased risk of contaminated food reaching the customer, and are associated with notifications of food poisoning (Coleman and Griffith, 1998, p. 298). Key contributory factors implicated in general outbreaks of food poisoning are shown in table 2.5. Many of these factors are avoidable by adhering to simple rules of food hygiene and good catering practices, together with continuous and effective training and supervision. Such training should emphasise the inter-action of operational practices as in reality, more than one factor is often cited in many outbreaks (Ryan, Wall, Gilbert, Griffin and Rowe, 1996, p. 181).

Of increasing concern, is the reported growing frequency of cross-contamination in outbreaks, as reported by Evans et al (1998, p. 169), who state that cross-

contamination contributed to 39% of foodborne outbreaks between 1995 and 1996. Indeed, cross-contamination has been described as one of the two main routes of infection; the second being contamination by food handlers themselves who through poor personal hygiene, may contaminate food with *Staphylococcus aureus* or other harmful organisms (Border and Norton, 1997, p. 12).

Table 2.5. Risk factors implicated in general outbreaks of food poisoning (percentage figures):

Contributory factor	USA data (Bryan)	England and Wales data (Bryan)	England and Wales data (Ryan et al)	USA data (Weingold et al)
Inappropriate storage	21.1	38.5	24.4	23.9
Preparation of food in advance	22.6	57.1	-----	9.9
Inadequate heating	15.5	15.8	23.3	20.0
Inadequate hot-holding	16.6	-----	----	17.3
Cross-contamination	5.4	6.4	22.0	8.9
Inadequate re-heating	10.6	26.4	22.0	8.5

Source: Bryan (1995), Ryan, Wall, Gilbert, Griffin and Rowe (1996) and Weingold, Guzewich and Fudela (1994).

2.3.3. Other Vehicles of Infection:

Such vehicles of indirect contamination include utensils, cutting boards, meat slicers, and other items such as dishcloths or tea towels. Brownsell et al (1989) describe this as the "route of infection" (p. 254) and it involves the process of cross-contamination where pathogenic microorganisms are transferred from a previously infected vehicle to something which was otherwise uninfected. Cross-contamination is frequently attributed to poor hygiene practices by food handlers during the preparation of food

(Evans et al, 1998, p. 171). Brownsell et al (1989, p. 255) are of the opinion that that it is the mental process of thinking itself which is to blame, arguing that it is the lack of thought by food handlers that is the main cause of food poisoning, with the brain being the most important part of the anatomy in this context.

2.4. Prevention of Food Poisoning:

Preventing food poisoning involves the application of effective good hygiene and catering practices. This includes all preventative measures to protect food from contamination, and to destroy any harmful micro-organisms present in food and prevent their reproduction (Sprenger, 1998, p. 7). For food poisoning to occur, a series of events is necessary (Sprenger, 1998), often referred to as the "food poisoning chain" (p. 16). This series of events involves:

- contamination of food with food poisoning bacteria
- multiplication (reproduction) of those bacteria
- consumption of the contaminated food

To prevent illness, this chain must be broken. Responsibility for this must be shared, involving everyone from industry to consumer, and from central to local government. (see table 2.6) Legislation exists to help protect members of the public, and for those people who do not comply with it, severe penalties face them.

Table 2.6. Responsibilities for food safety:

GOVERNMENT	INDUSTRY	CONSUMER
Food legislation and enforcement	Good practices for production and distribution	High level of expectations and demands
Advice and guidance to industry	Quality assurance strategies	Appropriate level of knowledge and positive attitudes to food safety
Consumer education and awareness	Appropriate processes and technology	Adoption of good practices
Information gathering	Adequate training of all personnel	Acceptance of shared responsibility and participation
Health service provision	Consumer education and labelling	Action within consumer groups

Source: Adapted from Griffith, (as cited in Safe Handling of Foods, Sparkes and Todd, 2000, p. 251).

Strategies for the prevention of food poisoning incorporate legislation, enforcement and education. There is a responsibility upon government and industry to ensure the safety of food produced. Equally, as many notifications of food poisoning originate in the home environment (Border and Norton, 1997, p. 37) there is also a responsibility upon the general public to prevent illness (Kaferstein, as cited in World Health Statistics Quarterly. 1997, p. 4).

2.5. The role of government:

The role of government regarding food and levels of public health can be traced back to the nineteenth century (Thompson, 1996, p. 3), and the dangers of contaminated food to public health have since been well recognised by governments and global authorities (Powell, 1997, p. 1). In the UK, government has three main strategies to combat food related illnesses:

- through the introduction of legislation
- by effecting appropriate enforcement structures
- by monitoring food related illnesses, collecting and analysing data, and by disseminating this information

2.5.1. Food safety legislation:

Increasingly through legislation, the emphasis has been toward consumer protection and the safeguard of public health. Legislation in the UK however, has been changed on many occasions and recent years have seen examples of this, including a focus on a more deregulatory approach placing more responsibility on individual businesses to consider the risks associated with their particular operation (Collings, 1993, p. 58). As a result of the historical developments of political boundaries, Scotland and Northern Ireland have greater degrees of autonomy within their borders and this is reflected in the legislation which is sometimes at variance to that in England and Wales. For example, although a specific temperature for the storage of chilled foods is determined for England and Wales (i.e. 8oC or cooler), that is not the case for Scotland (Joint Hospitality Industry Congress, (JHIC), 1997, pp. 55 65). As the focus of this research project has been the Hospitality and Catering industry in Wales, all reference to food safety legislation will be to that for England and Wales unless otherwise stated. The conservative government in power during the late 1980s was of the opinion that the legislation existing at that time (The Food Act of 1984), was comprehensive and efficient. It recognised however, that further changes and improvements were necessary citing the rapid rate of technological changes which were placing increasing demands upon the flexibility of the legislative system (Willett, 1991, p. 146). Consequently, the Food Safety Act 1990 was introduced which included substantial changes - stronger regulatory and enforcement powers, increased powers to introduce Regulations, the registration of food premises, mandatory hygiene training, the introduction of a due diligence defence, and increased penalties for non-compliance with food safety legislation (Bradgate and Howells, 1991, p. 320). According to Griffith and Coleman (1993, p. 10), however, there were a number of other

contributory factors including - increased public concern and consequently a growing awareness of safe food, the need for clear, effective, and easy to understand legislation, the need to restore public confidence in the safety of food, the need for raised hygiene standards, and legislative developments in the European Community. Whatever the stimuli for the new legislation, its introduction should also be considered within the context of the impact of illness upon industry. Recent estimates calculated by the Chartered Institute of Environmental Health (CIEH) for example claim that treatment and time off work costs the UK £1 billion annually (Allan (Ed.), 1998, p. 6). Such figures pose questions about the success and effectiveness of the current legislation. Perceptions of the Act itself are varied. Some (Hyner, 1995) consider that the government is "playing with the law" (p. 26), whilst others (Aston, 1994, p. 26) claim that the government has failed to grasp the nettle. Concern with, and confidence in, government approaches to food safety has been the subject of much debate. In 1989 the government published a White Paper entitled "Food Safety - Protecting the Consumer" which for the first time included the word "Safety" within its title. A development which according to Scott (as cited in Willett, 1991), " ... provides an effortless way to convey the impression that the government is taking serious measures to address concerns about food safety" (p. 147). The seriousness in which government takes food safety has also been questioned by others. Recommendations for formal licensing of food premises for example (Sonsino, 1991), have been perceived by government as being "an unreasonable burden" (p. 10) on restaurants and other food premises, with government arguing instead that existing penalties were a sufficient deterrent to rogue operators. The sincerity of government regarding food safety is a debate which still continues today (Pennington, 1997, p. 27), and which continues to attract a certain amount of media attention especially in the light of delays with the introduction of an independent Food Standards Agency. As catering establishments are frequently associated with outbreaks of food poisoning, delays such as these could be seen as being contradictory to putting public safety foremost.

2.5.2. Enforcement of food safety legislation:

To emphasise the importance that they placed upon the introduction of legislation, government pledged a further £30 million a year to be added to the revenue Support Grant Settlement to cover additional costs incurred by local authorities (Bradgate and Howells, 1991, p. 321), seventeen percent of which was allocated to Wales (Worthington, personal communication - 1998). Bradgate and Howells however, also make the point that local authorities considered a figure of £40 million to be more appropriate to provide adequate resources; sentiments echoed by Willett (1991, p. 151), who states that there were very few Environmental Health Officers (EHOs), in the UK engaged in the enforcement of food standards at that time, and a significant numbers of food premises had not been inspected in the previous three years. Indeed, the resourcing of environmental health services would still appear to be an issue, with Adams (1995, p. 22), questioning whether EHOs can successfully undertake their roles with the limited resources at their disposal. At least one authority has been criticised (Traylen, (Ed.), 1999) for "failing miserably" (p. 2) to keep up with their inspection targets and Parliament itself has criticised the inconsistency of local authority enforcement (Allan, (Ed.), 1998, p. 5). Enforcement of the legislation continues to be the subject of much debate in the UK and Europe (Mitchell, 1996, p. 76), (Morrison, Caffin and Wallace, 1998,p.364). EHOs are still regarded with scepticism in some industry quarters (Bartlett, 1993, p.14), even though one of the aims of the 1990 Act was to further harmonise enforcement of food safety legislation. A situation recognised by government itself (Collings, 1993), which has referred to the "claims of unfair treatment some food businesses have received as a result of the lack of uniform enforcement procedures for food safety and hygiene offences across the UK" and the need for "an even-handed enforcement of the rules" (p. 9). Such scepticism it should be noted, is not just confined to the UK, with equally strong feelings being shared across Europe (Mitchell, 1996, p. 75). Whilst many caterers enjoy constructive relationships with their local EHO, there is no shortage of critics willing to make their views public. One critic has described the misery inflicted upon caterers by EHOs (Crossley, 1996), who insist on "illogical improvements to premises and working practices", further describing these EHOs as "little Hitlers" (p. 25). Such views must

have an impact upon the way in which food safety is approached by the Hospitality and Catering industry. Co-ordination and guidance is provided for local authorities and their EHOs by the Local Authority Co-ordinating Body for Food and Trading Standards (LACOTS) and as a body, it is "striving to crush the image of EHOs as hygiene police" (Collings, 1993, p. 9). Even so, guidance from LACOTS puts the responsibility for ensuring consistency of inspections firmly in the hands of local authorities (Bartlett, 1993, p. 14). Government however, needs to ensure that resources are made available for the employment of sufficient numbers of EHOs (Adams, 1995, p. 22), and for authorities to ensure that their EHOs are appropriately qualified and sufficiently experienced (Bartlett, 1993, p. 14).

2.5.3. Monitoring and surveillance:

Allied to the other responsibilities and activities carried out by central and local government, a structured system for the monitoring and surveillance of reported notifications of food related illnesses, as well as preventative measures, exists. This system of monitoring and surveillance, as well as those of legislation and enforcement, has received much criticism from several sources not least of all from Parliament itself (Border and Norton, 1997, p. 15), with the varying regulatory arrangements which exist between different parts of the UK being described as too complicated (James, 1997, p. 14). Changes have occurred within the system. For example, the methods in which data are collected and monitored have been reviewed and improved with increased use of electronic communication between authorities. Pennington (1997), however, argues that "we are still bad at collaborating across professional boundaries in this country and there is still an apparent lack of co-ordination" (p. 5). Taking up the subject of electronic technology, he further states (p. 15), that there should be a provision for electronic reporting and collecting of data. Of particular concern to the catering industry is the poor dissemination of information (Coleman and Griffith, 1997, p. 235). Data obtained from government studies are available in a wide range of scientific and medical journals. These are not however, distributed to caterers unless they become independently aware of them and are astute enough, and conscientious enough, to obtain them, although it should be stated that hospital catering services do

have access to an advisory service provided by the King Edward V11 Hospital Fund for London (Hobbs and Roberts, 1993, p. 318). Compared with certain other countries the UK has developed a structured approach to the control, monitoring and enforcement of food safety, and has made advances in its policy towards self-regulation and training (Willett, 1991, p. 155). It has however, also received further criticism for being too secretive (Hernon, 1998, p. 3), and of having conflicting interests as a result of the dual responsibilities held by the Ministry of Agriculture, Fisheries and Food (MAFF) for example (James, 1997, p. 14). Government has responded by promising the introduction of an unbiased and independent body for handling all matters relating to food safety (Traylen (Ed.), 2000, p. 2)), this however, has been subject to delay and is yet to occur (Cooper, 1997, p. 8).

2.6. The Hospitality and Catering Industry:

The Hospitality and Catering industry is extremely large and diverse consisting of commercial sectors such as hotels, restaurants, pubs, and various contract catering outlets, and non-commercial sectors which includes hospitals, residential homes, and educational establishments (see table 2.7).

Table 2.7. Number of Hospitality and Catering outlets in the United Kingdom, 1996:

Type of Outlet	Number of Outlets	Percentage of Total
Hotels	60,949	21
Restaurants	15,954	5
Fast Food	2,221	0.5
Cafes/Take-Aways	29,270	10
Pubs	54,723	19
Travel	1,359	0.5
Leisure	48,523	16
Staff Catering	20,683	7
Health Care	25,075	9
Education	34,429	12
Services	3,355	1
Total	296,541	101

Adapted from: HCIMA (2000), p. 31.

N.B. All percentage figures rounded up/down to the nearest 1.0%

2.6.1. Characteristics of the Hospitality and Catering Industry:

The industry is of great importance to the UK because of the number of people it employs and its contribution to the economy, with the UK catering market being valued at an estimated £24.22 billion in 1995 (Key Note, 1996, p. 20), as well as its contribution to the balance of trade (Griffith and Coleman, 1993, p. 10). In terms of market share, the commercial sectors comprise the fifth largest consumer market after food, cars, insurance and clothing (Marketpower, 1997, p. 2), with over 215,000 establishments recorded in the UK in 1997, and over 5,600,000,000 meals being served in them in the same year (Hotel, Catering and International Management Association

(HCIMA), 1999, p. 33). It has been estimated that approximately 9,000 Hospitality and Catering Businesses operated in Wales in 1996 (The Welsh Office, 1999, p.3) Whilst the hotel sector has not developed as quickly, budget travel lodges, ethnic and theme restaurants, US style fast food outlets, and public house catering have all enjoyed a relatively rapid growth in popularity (Coleman and Griffith, 1997, p. 234). Whatever the sector, a number of operational strands are characteristic of the industry including accommodation (in many instances), food and beverage, and front of house services, with industry sectors having specific emphases depending on their individual nature. As social patterns, travel opportunities, and eating habits have changed, all industry sectors have changed with them and have had to adapt to cater for an increasingly diversified customer base and quality conscious consumer (Richmond, 1990, p. 22). The divide between commercial and non-commercial sectors has narrowed with hospitals and educational establishments for example, relying more and more on commercial activities including conferences and functions for extra income to support their normal daily business (Shaw, 1992, pp. 36-38). This has contributed to increased competitiveness and even more diversity within what was already a complex industry. The development of International catering styles has resulted in the growth of fast food outlets, ethnic restaurants, and food courts, as well as the development of new technologies, and is reflective of some of the changes and influences upon the industry that have occurred over the last twenty five years (Richmond, 1990 b, p. 22).

2.6.2. Human Resources Within the Hospitality and Catering Industry:

To fulfil the needs of this growth and diversification, employment within the industry has also grown, increasing fourfold between 1970 and 1990. It is now estimated that Over 1.25 million people work within the industry (Quest, (Ed.), 1999, p. 37), making it one of the largest employer groups within the United Kingdom. Recruiting and retaining qualified personnel at both craft and management levels is however, problematic, partly as a result of insufficient investment in training and staff development initiatives, and partly as a result of perceived poor working conditions and low pay, with up to six hundred staff moving to other jobs every day (Crossley, 1996, p. 25). With over 50% of employees working on a part-time or casual basis, this

adds to the already huge staff turnover problem for which the industry is well known (Richmond, 1990 b, p. 137). Consequently, many sectors in the industry are reliant on unskilled and untrained staff (Sheppard, Kipps and Thomson, 1990, p. 192), and as such, many establishments, especially smaller ones, struggle to achieve both appropriate standards and consistency of quality in their operation (Allan, (Ed.). 1998, p. 5). The provision of food and beverages is a key operational aspect of any hospitality and catering establishment and although technological changes have resulted in a more widespread utilisation of catering production systems such as cook-chill, cook-freeze and sous-vide, especially in larger organisations, the industry in general is one where food preparation and production, service, and consumption takes place within the same premises (Sheppard, et al, 1990, p. 195), although not necessarily at the same time. This characteristic has implications for food safety and will be referred to throughout this thesis. Many catering outlets, especially small and medium sized businesses therefore, still operate to what may be described as traditional cook-serve methods with menus and dishes often varying, sometimes on a daily basis, and with individual interpretations on production methods being adopted by food handlers and their managers. Whether large or small, privately or company owned, the nature of the industry is to provide a service to large or moderately large numbers of customers. In the case of commercial establishments and especially those that use a la carte menus, this is frequently undertaken "to order", although in all establishments that cater for functions much higher stock levels of prepared foods and meals are maintained.

2.6.3. Catering for large numbers of people:

As indicated earlier, the association between catering premises and outbreaks of food poisoning has been well-documented (Allan, 1998, p. 5), with 44% of outbreaks originating in hotels, restaurants and similar outlets. Function catering is common in many establishments, and in the case of hotels for example, involves catering for more customers than would normally be the case if only residential meals were being served. This type of catering has the potential to affect large numbers of people in one incident, including high risk groups such as the young, the elderly and expectant

mothers, and according to Cowden, Wall, Adak, Evans, Le Baigue and Ross (1995, p. 112), half of all outbreaks identified in 1992/93 were associated with functions. Function catering often places a heavier reliance on resources both physical and human, which could affect the control of food hazards and their associated risks, and therefore, the safety of the food. Heavy demands may be placed upon refrigeration and/or hot-holding space for example, in order to prevent microbiological growth or contamination. Also, more demands may be placed upon staff when preparing food, as well as storage and preparation space, resulting in an increased risk of cross-contamination. Many establishments also cater for more than one function at any one time, or on any one day, further increasing the demands placed upon the caterer and the risks to the customer (Coleman and Griffith, 1998, p. 299).

2.7. Managing Food Safety in the Hospitality and Catering Industry:

2.7.1. Introduction:

As lifestyles and eating patterns change, more people eat outside of their home environment on a regular basis with what has become a plethora of catering outlets becoming an integral part of daily life for many people. Whilst domestic food preparation practices give cause for concern and are reported as significantly contributing to food poisoning (Cowden et al, 1995, p. 109), consumers expect professionals to have high levels of knowledge and experience, be proactive in their approach to food safety and to prepare food in a technically competent and safe manner. The methods in which food is prepared are critical if the risks to health are to be eliminated or reduced to a safe level. It has been estimated that improper food-handling practices for example, are responsible for approximately 97% of all foodborne illnesses (Howes, McEwen, Griffiths and Harris, 1996, p. 737). If food handling is to be undertaken safely, and if hazards and their accompanying risks are to be properly managed, managers and proprietors of catering establishments must have a thorough knowledge and understanding of both food safety issues and food safety legislation, as well as a positive attitude towards compliance with the legislation and to ensuring that their food is produced to the highest standards of food safety. Their role in developing an organisational culture which is conducive to the maintenance of high standards of food preparation and service, in the development of food safety management systems, and assuring safe food and therefore customer confidence in their products, is critical.

2.7.2. Understanding Hazards and Risks:

"Hazard" - anything that may cause harm to a consumer

"Risk" - The probability of a hazard occurring

(Coleman and Griffith, 1997, pp. 236-237).

Managers, proprietors and their staff must be aware of the hazards and associated risks within their establishment, understand the principles of food safety, and understand and comply with food safety legislation. For this to occur, managers and proprietors must be sufficiently knowledgeable themselves, and have sufficient access to up to date information. Cleaning and temperature recording charts are frequently seen on kitchen walls and new refrigerators and this is to be commended. They must however, be properly understood and used as part of a food safety management programme if they are to be fully effective (Ward, 1998, p. 63). As part of a food safety management strategy, the development of an effective food safety policy is critical, it demonstrates management commitment and plays an important role in communicating this to all personnel within the organisation. Equally critical is the need for any system to be firmly underpinned by prerequisite good catering practices such as effective stock rotation, cleaning schedules, temperature monitoring, and food handling procedures (Mortlock, Peters and Griffith 1999, p. 790). Food safety policies and programmes will vary between establishments and organisations, but all must be based upon principles used in the development of HACCP, as stated in article three of the 1993 European Directive (Council Directive 93/43/EEC, 1993, p. 2), i.e.

- analyse the potential hazards in their food business operation
- identify the points in those operations where food hazards may occur
- decide which of these points identified are critical to ensuring food safety
- identify and implement effective control and monitoring procedures at those critical points
- review the analysis of food hazards, the critical control points and the control and monitoring procedures periodically and whenever the food business operations change

To achieve this, Jouve et al (1999, p. 85), refer to a number of methods and tools which may be used. These include the adoption of Good Hygiene Practices (GHPs), and the implementation of a HACCP based management system, integrated into a Total Quality Management approach, and possibly forming a part of a formal quality

system such as those based upon the ISO 9000 series. Mortlock (1999. p. 790), however, identify a lack of technical expertise in applying food safety management systems, especially among small caterers. Similarly, Morrison et al (1998, p. 367) refer to evidence which suggests that most managers in the food industry have a limited knowledge and understanding of the HACCP philosophy. It should also be noted that full HACCP systems are not suitable for use or indeed appropriate in most catering establishments, even though many caterers and a number of EHOs are under the impression that the hazard analysis requirements contained within the legislation mean that they should implement HACCP (Ward. 1998, p. 63). HACCP is ideal for use in the food manufacturing industry where food products are produced in bulk using standardised recipes and a production-line process which changes infrequently. The catering industry however, is dynamic with menu and recipe changes occurring almost on a daily basis, particularly where a la carte menus are in use. The unsuitability of full HACCP systems for use in the catering industry has been previously recognised (Adams, 1995, pp. 21-22), and systems more applicable to the industry have been developed, i.e. Assured Safe Catering (ASC), (Department of Health, 1993), and The Systematic Assessment of Food Environments (SAFE), (BHA, 1991). Both ASC and SAFE are invaluable tools with which caterers can apply the principles of hazard analysis, thereby ensuring safe food and complying with legislation.

2.7.3. Monitoring and Reviewing Food Safety:

Once a food safety management system has been adopted, it is important that it is regularly reviewed and monitored. The aim being to expose weaknesses in either the control system itself or at operational level (Oakley, 1994, p. 3). Immediate remedial action can then be taken. This review and monitoring process may be undertaken in the form of an audit which is an effective method of identifying hazards and accompanying risks, and is effected in a planned and structured manner with a view to focusing on root causes of problems and long term solutions to them. Put simply, "are you doing what you say you do and is it appropriate?" (Dillon and Griffith, 1997, p. 14).

An audit culture is much less well established in the Hospitality and Catering industry than in other industries such as food manufacturing. It is however, a powerful tool in improving quality and food safety, and may provide evidence towards a due diligence defence if the need should arise.

2.7.4. Training:

It is critical therefore that staff, supervisors and managers involved in the food preparation and production process are adequately trained and that this training is regularly updated (Coleman, Griffith and Botterill, 2000, p. 147) within a supportive organisational culture. When conducted effectively, food hygiene training can have a significant effect on lowering the risks to health associated with individual catering establishments (The Audit Commission for Local Authorities in England and Wales, 1990, p. 7). A lack of knowledge and management of food safety issues including training, does however, appear to be a common aspect of many prosecutions under the Food Safety Act 1990, with at least one South Wales restaurant owner being ordered to attend a food hygiene course (Roff, 1999, p. 3). Previous research has shown that the training provided in many establishments is variable, insufficient and inappropriate (Rennie, 1994, p. 24). This reflects the findings of an earlier research project carried out in South East Wales (Coleman, 1992, p. 73). Rennie (1994), continues to conclude that such approaches to training do not necessarily consider the attitudes of personnel or the association between perceived knowledge and behaviour. As she states, "knowledge alone does not lead to changes in food handling practices" (p. 24). Sentiments supported and expanded upon by Taylor (1994), who found that "since the investment in wholesale training ... there is little evidence that that there has been any behavioural change in the workplace" (p. 14). This certainly gives cause for concern as hygiene awareness of both management and staff has been stated as being one of the most common high-risk factors associated with food poisoning (Tanner, as cited in Willett, 1991, p. 148).

2.7.5. Appreciating risks:

For the hazards and risks associated with catering establishments to be adequately controlled, they must be fully appreciated and understood by everyone involved in and responsible for, food handling, including managers. Mortlock et al (1999) identified perceptions of risk, as well as negative attitudes, as areas of concern, stating that "48% of catering managers thought their business represented a low risk to food safety" (p. 788). It has also been suggested (Crossley (Ed.), 1997) that some caterers do not believe that "such problems could afflict them" (p. 51). Konopka (1997) also discovered a number of managers who stated that they don't employ staff who "make fundamental mistakes" (p. 4). Trade journals as well as other sources of information however, frequently cite instances where fines and/or imprisonment have been imposed upon those people responsible within food businesses, for breaches of the legislation. Such perceptions and views held by industry personnel have implications for the enthusiasm in which food safety in general, and food safety management systems in particular, are approached, understood, and adopted by them as well as by their staff. These views may also be implied from the findings of the Audit Commission for Local Authorities in England and Wales (1990, p. 4) which identified management attitudes to hygiene and staff awareness of hygiene as high-risk elements in food production. It is not uncommon within the industry for external consultants to be employed both to advise on, and assist in the implementation of, food safety management systems, especially within larger establishments and chains. This is to be commended in principle. Mortlock et al (1999, p. 790) however, suggest that understanding, commitment and effectiveness will only be achieved once a sense of ownership has been developed by the managers themselves. By delegating food safety control to external experts, managers may also be absolving some of their own responsibility. A false sense of security, negative attitudes, and insufficient knowledge, together with complacency, and a lack of awareness, are therefore, contributing barriers to an underestimation of the risks involved and therefore, to implementing effective measures to control hazards and risks associated with food production, and should also be considered in relation to the barriers discussed earlier.

2.8. Risk Assessment:

New food safety legislation requires caterers to manage risks associated with food served in their establishments (JHIC, 1997, p.5), and Risk Assessment is a pre-requisite of Risk Management. Risk Assessment itself is not new to the hospitality industry and may be interpreted in different ways (Coleman and Griffith, 1997 p. 238.). Originally introduced via the Health and Safety at Work Act, Risk Assessment is the estimation of the likelihood (probability) of the occurrence of a hazard, and may include an indication of the severity (magnitude) of harm resulting from exposure to the hazard. Every catering establishment is different and approaches to Risk Assessment and its' principles will vary, and be specific to each individual establishment (JHIC, 1997, p. 8). Risk Assessment can be qualitative or quantitative, although both approaches require data (Griffith and Coleman, 1997, p. 36). A structured approach to the assessment of hazards and associated risks has previously been recommended (Pennington, 1997, p.12). Jouve et al (1999, p.85-89) recommend an integrated approach, incorporating food safety approaches such as Risk Assessment, into an organisations overall quality assurance programme. Environmental Health inspections reflect legislative requirements and the authorities have developed their own model for risk based inspections for use EHOs, (MAFF, Department of Health, Scottish Office and Welsh Office, 1995, pp. 20 - 24). This standardised model enables officers to assess the level of risk that may apply in any establishment as well as assessing compliance with food safety legislation. It also provides EHOs with a means of prioritising, as well as giving a structure to inspections nationally. It further requires EHOs to determine the effectiveness of the businesses' own assessment of their systems together with control measures in place, as well as any contravention's of the Food Safety Act 1990. The types of food handled, the methods by which they are processed and the type of customer patronising the establishment are all considered, together with the management quality assurance system in place. The findings are used to determine the

nature and frequency of future inspections and any action that may need to be taken. The advantages of such a numerically based scheme mean that a more standardised and objective approach is possible when carrying out inspections. The more structured format also enables EHOs to allocate scores, and individually rate establishments according to risk.

The use of similar numerically-based diagnostic assessment tools which may be self-administered within the hospitality and catering industry will assist caterers in the identification and assessment of processes, prior to undertaking more rigorous procedures. A practice endorsed by Dillon and Griffith (1997), who state:

> The value of this type of quantitative approach to self-audit is that the caterer is required to think analytically about the potential for food risk and it encourages a reflective attitude towards food preparation. This type of approach helps the establishment to prepare for an external audit or inspection.

Such a self-inspection tool was devised as part of this thesis and will be discussed in more detail in the next chapter.

2.9. Large and small businesses:

According to the Kaferstein, as cited in World Health Statistics Quarterly, 1997, p. 4), the food industry often fails to prioritise food safety issues. Larger companies are frequently aware of their responsibility and committed to producing safe food. Many smaller businesses however, remain unaware of both their responsibilities and the best approaches to ensuring the safety of their products. Within the Hospitality and Catering industry larger organisations are frequently better equipped to deal with the management of food safety and often have internally designed programmes to ensure the production and service of safe food (Coleman and Griffith, 1997, p. 235). Smaller

establishments (often family owned) however, make up the bulk of the industry (Key Note, 1996, p. 106), and are not so well resourced. This is particularly true of South Wales for example, where small businesses are especially important to the economy (Coleman, 1992, p. 58). They are less likely to receive information from external sources and do not have the luxury of centralised head offices providing financial, technical and physical expertise and support. Larger organisations for example, frequently develop formalised guidelines with documentary support for applying food hygiene principles and complying with food safety legislative requirements (Page, 1994, pp. 19-24). Smaller establishments also often have less experience or knowledge to handle the apparent barrage of legislation with which they have to comply (Coleman and Griffith, 1997, p. 235). Previous surveys have shown that smaller hotels for example, displayed considerably more ignorance of food safety legislation than their larger counterparts (Griffith and Coleman, 1993, p. 12). Fears have been expressed that there may be a two-track system of conformity, with large hotels in the fast track and smaller ones with tighter budgets and less expertise displaying considerably more ignorance of the legislation (Griffith and Coleman, 1993, p. 12). According to Morrison et al (1998) small food establishments "also appear to represent one of the highest risks to consumers" (p. 364). A sentiment shared by David Stratham, Chairman of the Chartered Institute of Environmental Health Food Committee (as cited in Allan (Ed.), 1998, p. 5).

2.10. Summary and Aims of this Thesis:

The importance of food in relation to illness has never been greater. Notifications of food poisoning and foodborne illness have shown an upward trend, and are considered to be just the tip of the iceberg. Previously unknown harmful organisms are increasingly being recognised as causing severe illness and death, especially in the young and the elderly. Public awareness has increased dramatically, largely through expanded media coverage, and expectations of professionals who have responsibility for the production of food within the food industry have similarly increased. The association between outbreaks of food poisoning and the Hospitality and Catering industry has been well documented, both by government and independent agencies.

The industry itself is one of great diversity, with industrial establishments frequently catering for very large numbers of people on a daily basis, producing large varieties of food products through a number of different processes and procedures. It also has an employment pattern with inherent problems, and which also suggests variable success rates in achieving appropriate standards of quality. Increasingly, legislation requires caterers and other food businesses, to be able to identify, monitor and control the hazards and associated risks within their operations. Systems based upon the principles of HACCP, ASC and SAFE have all entered the food business arena. They do however, need to be understood by caterers before they can be effectively implemented. Previous research in Wales and in the UK generally (Maryon, 1998, p.131) (Griffith and Coleman, 1993, p. 13) indicates that caterers do not always understand food safety legislation with many of them, especially small businesses, having little experience of or exposure to, this relatively new facet of the requirements, as well as suffering from some of the worst practices and standards (Allan, (Ed), 1998, p. 5). Inadequate training (Powell, Attwell and Massey, 1997, p.329), low perceptions of risk (Frewer, Shepherd and Sparkes, 1994, p.19), and inappropriate management strategies (West and Hancock, 1994, pp. 12-13), especially with regard to understanding and implementing food safety systems, do little to encourage appropriate levels of food safety or consumer confidence. Many caterers, have limited knowledge and/or experience of hazard analysis or risk analysis, and are similarly restricted with regard to food safety legislation. The role of managers and proprietors must be clear and unambiguous, they have ultimate responsibility for ensuring safe food is produced and served. There is also, a critical requirement for the effective co-ordination and dissemination of information from both central government and local authorities. For this to achieved, the structure and workings of government agencies must be effective and unbiased, and local authorities must work in unison and be consistent in approaches to enforcement and advise provided to industry. As a result of this review, it would seem clear that much more needs to be known about the knowledge, attitudes and behaviour of caterers and the potential to influence food safety. This thesis therefore, aims to:

- Evaluate the knowledge and understanding of Welsh hospitality and catering personnel with regard to food safety legislation and safe food production practices.
- Evaluate operational and management practices and procedures undertaken in Welsh hospitality and catering establishments in the production of food.
- Determine attitudes of Welsh hospitality and catering personnel towards food safety, food safety legislation and food production practices.
- Develop and apply diagnostic instruments designed to assist caterers in identifying and evaluating and monitoring the practices and risks associated with the production of food in their establishments, and to better comply with food safety legislation.
- Evaluate the provision of resource and facilities designed to support the production of safe food in Welsh hotel and catering establishments.
- Evaluate food preparation practices in Welsh hotel and catering establishments.
- Make recommendations which may better enable hospitality and catering personnel to comply with food safety legislation and ensure the production of safe food.

CHAPTER THREE

WELSH HOTELS: AN EXPLORATORY STUDY.

3.1. Introduction:

Personnel in the Hospitality and Catering industry must come to terms with the legislative requirements, understand the terminology used, and be able to interpret the requirements according to their individual situations. This does not mean that they have to become microbiologists or lawyers, but they do need to apply the legislation in a conscientious manner and to the best of their ability (Coleman and Griffith, 1998, p. 300). The previous chapter referred to a number of industry characteristics and associated issues, as well as the recognised association between hospitality and catering establishments and the risk of food poisoning. This chapter brings the attention of the reader to research undertaken in Wales which builds upon a previous smaller study (Coleman, 1992, pp. 1-89) carried out by the author in the hotel sector in and around the Cardiff area. Much of the focus of this chapter is centred around the extension of some of the issues raised in the earlier study, as well as other areas which have become of interest and concern as a result of the introduction of new food safety regulations in 1990/91. Primary, secondary and tertiary data collection methods were utilised to investigate the knowledge and understanding of hotel and catering personnel regarding aspects of food safety legislation, the types of foods and meals served in their establishments, especially when catering for large numbers of people (i.e. for functions), and operational practices and procedures undertaken as a part of the food production process. Additionally, views were sought regarding more general approaches to quality assurance which may influence the safety of food produced in an establishment. The assessment of risk is an important factor when undertaking effective management strategies to control food safety, and the use of diagnostic self-assessment tools were referred to in the previous chapter. A Risk Assessment model was designed and applied to the premises used in this survey. A review of previous research and literature relevant to the subject matter of this chapter is followed by a detailed explanation of the primary research methods employed to obtain information from

industry personnel. Data are discussed within the context of the literature, previous research, and this thesis.

3.1.1. Previous research:

Results obtained from previous research (Griffith and Coleman, 1993, pp. 11-13) identified a number of areas of concern meriting further investigation including:

- A lack of awareness and understanding of some aspects of food safety legislation (e.g. the Due Diligence defence).
- A lack of information regarding food safety legislation (e.g. from central and local government).
- A lack of attention to quality assurance measures "behind the scenes", especially in SMEs (e.g. ad-hoc approaches to monitoring the quality of delivered foodstuffs).
- confusion regarding specific aspects of food safety legislation (e.g. temperature control requirements).

These areas of concern have been further investigated and incorporated into this element of the thesis.

A thorough understanding of the legislation is helpful to the successful application of preventative measures against food poisoning. Many independent businesses however, confessed to misunderstanding the regulations (Konopka, 1997, p. 4). Of particular concern in the earlier survey, especially in small establishments, was a poor understanding of the concept of Due Diligence, enforcement procedures, and the potential penalties that may be incurred if in breach of the legislation. Some of these issues have been referred to in chapter two and have also been recognised in other works. Mortlock et al (1999, p. 790) for example, note the need for more effective communication regarding aspects of legislative requirements, and the harmful effect that this lack of communication is having upon an appropriate understanding by caterers of the processes required to ensure safe food production. This is particularly so in relation to systems based upon the principles of HACCP. Ehiri, Morris and

McEwen (1997, p. 15) expressed similar concerns after analysing the results of research carried out in Glasgow, stating that only 27% of the respondents in their survey claimed to have received literature on HACCP. Regarding the application of food safety measures, Morrison, Caffin and Wallace (1998, p. 368) refer to managers in small establishments who focus their efforts and resources into the control of costs and customer satisfaction as opposed to preventative actions in the first place, with many not being proactive and taking the initiative in contacting the regularity bodies themselves. Examples such as this lead to questions being posed regarding the relationship between business operators and the authorities, and perceptions of food safety legislation which is largely prescriptive in nature or which conversely has a deregulatory focus, placing much more responsibility upon industry and personnel working in it. Many operators consider themselves to be low-risk in terms of food safety (Mortlock et al, 1999, p. 788). Wade (1998, p. 86) found that managers themselves felt confident of their own abilities when managing hygiene standards. Of critical concern therefore, is the role held by managers and proprietors, their knowledge and understanding of how the production of safe food may be compromised, of hazard and risk based approaches to food safety, of food safety legislation, and the manner in which they communicate with, and train their staff. Managers are central to the development of an organisational culture which encourages high and consistently applied food safety practices (Sheppard et al, 1990, p. 203). Such a cultural approach should permeate throughout the organisation and should be cultivated and re-enforced consistently. Equally, for this to be successful, there is a dependence upon and interrelationship with, the implementation and management of Good Hygienic Practices (GHPs) or Standardised Operating Procedures (SOPs). It is also important to recognise however, the influence that negative attitudes have on effecting appropriate food safety measures and compliance with legislation. Allen (1991), refers to negative management attitudes which are endemic within the industry and of managers who relate every aspect of their business to the "bottom-line" (p. 12). He cites one manager as stating "good hygiene standards and functions such as training and food safety, are excellent in theory, but unnecessary in practice" (p. 12). Views such as this do nothing to elevate food safety to the level of importance which it deserves, and attitudes of catering managers, personnel and proprietors, to food safety will be examined in detail in the following chapter. The

Audit Commission for Local Authorities and the National Health Service in England and Wales (1990, p. 11), compared levels of risk to levels of training within the food industry. The findings revealed high relationships between poor training and high levels of risk in terms of food safety in commercial sectors of the hospitality and catering industry. In an industry in which large quantities of a diverse range of foods are prepared and served in a variety of styles, often to large numbers of people at the same time, such issues must be successfully addressed, and any barriers to the production of safe food, overcome.

3.1.2. Foods prepared and served:

The previous chapter identified a number of foods considered to be high risk and which are frequently reported as contributing to food poisoning. Food safety legislation, does not specifically define high-risk foods. It does however, refer to "food which is likely to support the growth of pathogenic micro-organisms or the formation of toxins..." (MAFF, Department of Health, Welsh Office, Scottish Office, 1995, p. 3). Characteristically, the Hospitality and Catering industry consists of large numbers of diverse operations where a wide range of foods are prepared and served, and where raw and cooked foods are frequently prepared in close proximity. Many of these foods will be of a high-risk nature. Equally, certain foods are necessary ingredients of a large number of dishes and are used in much greater quantities and more frequently (e.g. eggs, milk, cream, meat and poultry, stocks and sauces). Many establishments utilise a variety of service styles and menus including those that necessitate the need for food to be produced some considerable time before consumption, and/or for the food to be presented buffet style where the customers can serve themselves or be assisted to do so. As indicated in chapter two, there is a potential for cross-contamination or contamination by other means in such instances. The level of risk attached to such service methods are potentially greater therefore, than if the food was totally under the control of qualified food handlers in a controlled food production environment, or from a central production unit. The nature of the catering industry is such that because of the variability of use of these foods, menus and service styles will differ in each establishment, and in the same establishment over time. Also, menus change,

sometimes daily, according to business strategies based upon consumer eating patterns and demand. This is similarly the case when establishments cater for functions, the pattern of which will differ not just according to customer type, but also to seasonal variations in demand. The levels of risk associated with the foods produced in any one establishment should be considered therefore not only on the variability of the food type itself, but also in relation to the frequency in which it is used.

3.1.3. Catering Practices and Procedures:

Food preparation and production practices and procedures involved in individual businesses vary. Traditional cook-serve methods of food production are however, employed on a large scale and are characteristic of many sectors of the industry, especially in smaller establishments. Such methods involve certain practices which are commonly undertaken throughout the industry regardless of individual menus, operations or size, and a number of them have been recognised as contributing to food poisoning (see table 2.5). Data for the period 1992-94 (Border and Norton, 1997, p. 40) also refers to the following as key contributory risk factors implicated in general outbreaks - inappropriate storage and temperature control, inadequate cooking or reheating, cross-contamination, and infected food handlers. Richmond (1990 a), however, reported on the significance of preparing food too far in advance, stating that this practice was "the single most important factor contributing to food safety problems" (p. 128); a factor also referred to by Bryan (1995, p. 66) in his earlier research. The preparation of food in advance is a practice perceived to be frequently undertaken in the industry, especially when preparing for large functions. Reports and articles by various authors vary in their perceptions of what is the most prominent factor contributing to food poisoning, but of increasing concern is the reported growing frequency of cross-contamination in outbreaks of food poisoning. Evans et al (1998, p. 169) reported that cross-contamination contributed to 39% of all general foodborne outbreaks between 1995 and 1996. It has since been described as one of the two main routes of infection, the second being contamination by food handlers themselves who through poor personal hygiene may contaminate food with *Staphylococcus aureus* or other harmful organisms (Border and Norton, 1997, p. 12).

3.1.4. Quality approaches:

In all catering environments there are also a number of other practices or procedures which contribute to the production of safe food. These would be beneficial to an effective quality assurance system within any establishment working to good catering practices, as well as contributing to compliance with food safety legislation. Amalgamated into a well thought out management programme, they should contribute to elevating a commitment to food safety to the highest level, and endorse the fact that senior management have the ultimate responsibility for ensuring the highest standards in food production and handling. Any approach to quality management should be considered with an integrated set of systems and practices. Food safety programmes are dependant upon and interrelated with GHPs or Pre-requisite Procedures (PRPs) and the implementation of a structured system such as one based upon the principles of HACCP (Jouve et al, 1999, p. 85). Indeed, GHPs form the basis of all food safety measures and describe the minimum criteria to which all personnel should be working. The maintenance of documentation to support management systems is one example of a practice which would contribute to the raising of awareness and standards, as is the checking of deliveries by standardised formal procedures, and visits to suppliers to monitor their quality and hygiene procedures. The importance of training is critical, and the employment of an individual responsible for training would also be indicative of a positive approach to ensuring all managers and staff are regularly trained and/or updated (Coleman and Griffith, 1998, p. 298). Combined with appropriate documented records and a continuous training programme, this again would contribute to ensuring the highest standards and a quality approach.

3.1.5. Aims:

Current legislation places a high degree of responsibility upon caterers for ensuring the production of safe food and compliance with food safety legislation. For this to be fully effective however, the legislation must be clear, easy to understand, and effectively

communicated to food businesses. Equally, caterers must be fully cogniscent of the legislation, have a thorough understanding of food safety issues, and be committed to ensuring that safe food is being produced within their areas of responsibility. The evidence however, would suggest that this is not the case in many instances, with gaps in understanding and communication, and an underestimation of the hazards and risks associated with the foods produced and the practices involved in food preparation (Mortlock et al, 1999, p. 790). In an industry which characteristically caters for large numbers of people on a regular basis, in which a range of foods including those deemed as being high-risk are prepared and served, and which frequently suffers from a high turnover of part-time and casual staff who are often untrained (Conway, 1996, p. 7), the above issues are fundamental to ensuring safe food. As such, the Aims of this chapter are to:

- investigate and evaluate levels of knowledge and understanding of Welsh hotel proprietors and managers with regard to specific aspects of the food safety legislation.
- investigate and evaluate related quality assurance procedures undertaken in Welsh hotels, which contribute to the production of safe food.
- Investigate and evaluate specific foods and types of meals prepared, together with food production practices, in Welsh hotels.
- allocate a risk score to individual hotels and analyse any significant differences between groups according to their size or ownership categories.

3.2. Methods:

3.2.1. Introduction

The hotel sector forms a major part of the Hospitality and Catering industry and demonstrates many of the best and worst features of it. The sector comprises of large,

medium and small establishments, ranging from those which are independently owned to those which form part of large, national or international chains (Odgers, 1988, p. 15). As well as providing a service for residents, food is normally provided for non-residents in the hotel restaurant or by way of various types of functions which cater for a wide-ranging clientele of all ages. Many hotels adopt traditional methods of food production, i.e. food is prepared, cooked and served in the same establishment (cook-serve), and the management of food and beverage operations is compatible with that in other commercial and non-commercial sectors of the industry. Many of the practices and procedures utilised in food preparation areas are the same. For example, food may be prepared in advance and in large quantities, and food is prepared, cooked, chilled, stored, and where necessary, re-heated using similar methods. It is difficult to ascertain the precise number of hotels in Wales because of the varying criteria employed by data collection agencies and tourism organisations. Figures range from 1,038 (The Welsh Office, 1996), to 1,397 (BHA, 1998). Calculating the precise numbers of hotels (as defined by the Hotel Proprietor's Act 1956), by using local authority sources is also difficult. The Food Premises (Registration) Regulations 1991 require all food businesses to be registered within their authority. There is however, uncertainty surrounding the actual registrations that have occurred. For the purposes of this phase of the thesis, tourism and hotel guides were seen as being more informative and eight Welsh and UK guides were referred to, when identifying the target population. Using these marketing publications, 340 hotels in Wales were identified. The previous chapter alluded to the pressures that may be associated with catering for large numbers of people and the implications for food safety, especially where resources may be limited. For this reason, hotels which had the capability to cater for functions were selected for inclusion in the data collection process. This approach, and use of these sources of information reflected a non-probability (non-random), approach to sampling, specifically, the purposive method (Saunders, Lewis and Thornhill, 1997, pp. 142-146). Further to this, the sample group was identified as being homogenous in that all the hotels had the common element of providing functions. As a result of the selection and sampling process, it was also anticipated that heterogeneous sub-groups could be identified, for example, by size and ownership. From the hotels listed, 220 hotels were identified as the sample group. It is possible that hotels not selected for the survey also provided functions. This however, was not always stated in the publicity

material, and any assumptions to this effect were not made. The information obtained indicated that the sample group was representative of hotels in Wales and in the UK generally. That is, they were of varying sizes and ownership, provided food, beverages, and accommodation, and were geographically distributed across rural and urban areas.

3.2.2. Data Collection Methods:

To obtain information from this number of hotels distributed over a large geographical area, a self-administered postal questionnaire was considered to be the most appropriate form of data collection instrument, and one was devised which required respondents to enter both quantitative and qualitative responses. This allowed for a set of responses that could meaningfully be analysed and evaluated, and for personal views to be expressed without being influenced by the researcher. A representative 5% sub-sample of hotels within South Glamorgan was identified and an initial questionnaire was administered as a pilot exercise. As a result, a number of modifications were made and the final survey instrument consisting of thirty-eight fixed and open-ended questions (see appendix 1) in four sections was distributed to the full sample group during April / May 1994.

Quantitative questions were designed so that largely nominal data would be obtained, as factual information was required for this and other phases of the thesis, although data for use in the Risk Assessment model was at ratio level. The sample chosen represented all establishments with function capabilities listed in the tourism and hotel guides. Size, as a selection criteria for inclusion in the survey was not specifically considered as this may have biased the findings and unnecessarily excluded establishments. Size was however, ascertained for analysis purposes, based upon the following criteria (Odgers, 1988, p. 15):

- small hotels 10 rooms or less
- medium hotels 11-50 rooms
- large hotels 51 or more rooms

Pre-paid return envelopes were attached together with a letter of introduction and explanation which also clearly stated that confidentiality would be ensured.

For any data collection instrument to be meaningful and effective, it must be valid in terms of what is has been designed to measure, and where appropriate, reliable in terms of the consistency of results obtained each time it is administered (Coolican 1992, p. 112). For the purposes of this survey, the methods used to test validity were:

- Face Validity - by matching the questions asked with the Aims of the survey.
- Content Validity - by conducting a pilot exercise with academic researchers and industry personnel.

The validity of any results obtained must also be considered when initially developing a data collection strategy, and it is for this reason that care was taken to ensure that the sample group was as representative as possible (Saunders et al, 1997, p. 84) (also see 3.2.3. - research limitations).

With respect to reliability, Coolican (1992, pp. 108-110) refers to this in two contexts:

- Internal Reliability - which seeks to determine if the data collection instrument is consistent within itself by checking that respondents answer each question in the same way that they answer all the others.
- External Reliability - which seeks to determine if the data collection instrument would produce similar results on more than one occasion, if administered to the same respondents.

Whilst it is desirable to know that if administered on more than one occasion, the results would be consistent, this was not the aim of this survey and therefore, external reliability was not tested. Regarding internal reliability; as this questionnaire was constructed of questions seeking largely factual information and therefore, nominal

data, it was not appropriate to conduct item analysis. For the purposes of this survey, reliability was ensured as much as possible by:

- Careful construction of the questions so that as many as possible were objective in nature.
- Construction of the questions in a manner to avoid individual interpretations and misunderstandings, except where qualitative responses were required.
- The piloting process itself, which identified any ambiguities within the questionnaire.

Additionally, it was anticipated that some information obtained from the responses could be used to ascertain a risk score for each establishment based upon a quantitative rating list. This information would further enlighten the results and contribute to later phases of this thesis. A Risk Assessment model was developed and details of it together with the findings are provided in section 3.4. of this chapter. For data analysis purposes, Minitab was used as a tool for analysing quantitative data. Qualitative data was analysed manually. Results of the Risk Assessment list were analysed using the ANOVA formula, and comparisons made between the three sections of the list.

3.2.3. Research limitations:

There are undoubtedly more hotels in Wales that are able to cater for functions than those listed in the tourism guides used, and inclusion of those within the survey would have added strength to the sample group and provided a greater breadth of information to be analysed. A larger sample group would also have contributed to the validity and reliability of the data. For the reasons discussed earlier however, it was not possible to obtain a definitive list of hotels from any other source, and it was not deemed appropriate to make assumptions regarding the type of business conducted in individual establishments. There are also more general limitations to the use of questionnaires. These include:

- low responses rates
- ensuring that the most appropriate person has actually completed the questionnaire

- lengthy postal and response times
- a possible tendency for respondents to provide answers which they consider the researcher may want
- the use of questions which are largely closed in nature and which must be easily and consistently interpreted by all respondents

(Saunders et al, 1997, p. 247).

For this survey, respondents were asked to input their job title at the end of the questionnaire and this verified that all respondents were either managers or proprietors who were in a position of influence regarding the production of food in their establishment. The use of secondary data as included in the introduction to this chapter provided a framework to which the primary data could be compared and discussed. It is not possible to test for sampling error or sampling bias when undertaking a non-probability approach to sampling. It is inevitable therefore, that some degree of error and bias exists, and the results should be considered with this in mind. The representative nature of the hotels selected and the number of replies however, was recognised as being a positive factor in reducing sampling bias.

3.3. Results:

3.3.1. Introduction

A random telephone poll was conducted on ten percent of non-respondents after the initial deadline had expired resulting in a total of ninety completed questionnaires being returned. Six of the final questionnaires returned were not appropriate for analysis because of incomplete or incorrect responses or spoilage, resulting in a final response rate of thirty eight percent (eighty four correctly completed questionnaires). This response rate although lower than ideal, was not entirely unexpected for a postal survey of the industry given the sensitive nature of food safety as a subject for investigation (Mortlock et al, 1999, p. 786). It is also generally reflective of response rates experienced nationally when gathering data by this means (Owen and Jones, as cited in Saunders et al, 1997, p. 131), especially when considering food safety (Mortlock et al, 1999, p. 786).. Response and non-response rates for the different sized hotels varied and may be seen in tables 3.1 and 3.2. Of the useable responses, 37 (44%), were medium sized establishments and these formed the largest responding group. Twenty eight (33%), were from large hotels, and these formed the second largest group. The smallest response group were small hotels where 19 (23%), were represented. The reasons for this are not apparent although in the experience of the author, managers and proprietors in small establishments frequently have little time to spare, and do not always perceive themselves to be part of the industry and subject to the same legislation (personal communications, 1995).

It has been recognised that the proportion of responses from each size group were uneven, and this has been taken into account when discussing the findings. For analysis purposes, the questions were grouped into four sections reflecting introductory questions, functions and conferences, food safety and legislation, and quality assurance. It should be noted that percentage figures in all tables are displayed in parentheses and have been adjusted so as not to include decimal points. Analysis of

quantitative data was carried out using a pre-coded structure in Minitab. Qualitative responses were examined manually.

Table 3.1. Questionnaire responses by hotel size:

Hotel size	No. Of hotels Surveyed (N)	(%)	Useable responses (N) responses)	(% of total survey)	(% of useable
Large	40	(18)	28	(13)	(33)
Medium	114	(52)	37	(17)	(44)
Small	66	(30)	19	(9)	(23)
Total	220	(100)	83	(38)	(100)

Table 3.2. Questionnaire non-responses by hotel size:

Hotel size	No. Of hotels Surveyed (N)	(%)	Non-responses (N)	(% of total survey)
Large	40	(18)	12	(6)
Medium	114	(52)	77	(35)
Small	66	(30)	47	(21)
Total	220	(100)	136	(62)

3.3.2. Introductory questions:

Questions in this section sought to obtain general hotel information relating to ownership, number of meals served, staff involved in food preparation, and number of guests served. Of the 84 hotels represented by the responses, 51 (62%), were privately owned, 13 (16%), were part of a privately/independently owned company, and 19 (23%), were part of a major chain. Four hotels (5%), indicated that they did not fall into any of these categories. These hotels were either in the process of changing

ownership, or in receivership. A breakdown of hotel category by size is shown in table 3.3. The maximum number of guests that could be accommodated ranged from under 10 in the smaller hotels, to more than 150 in the larger ones. The most frequently stated group size of guests was 21-50 (34% of hotels), although in 45 hotels (55%), more than 50 guests could be accommodated. The number of meals normally served in the hotels also varied according to size, ranging from an average of under 10 to between 61-100. Forty nine replies (58%), from medium sized and large hotels, indicated that over one hundred meals could be served each day.

Table 3.3. Hotel categories as indicated by size:

Hotel category	All hotels (N) (%)	Large hotels (N) (%)	Medium sized hotels (N) (%)	Small hotels (N) (%)
Privately owned	50 (60)	15 (54)	27 (73)	8 (42)
Part of a private company	12 (14)	6 (21)	1 (3)	5 (26)
Part of a major chain	18 (21)	6 (21)	6 (16)	6 (32)
Others	4 (5)	1 (4)	3 (8)	------
Totals	84 (100)	28 (100)	37 (100)	19 (100)

Fifty (60%), of all hotels were privately owned and these formed the largest group. Of these, 27 (73%), were medium sized hotels and the largest group of privately owned hotels represented in the survey. Interestingly, hotels forming part of a major chain were represented by equal numbers from each size group, i.e. 6. Thirteen (68%), of small hotels were privately owned or part of a privately owned company, and is somewhat reflective of national trends within the hospitality industry.

Numbers of staff, both full-time and part-time (FT and PT), involved in the preparation of food varied from 2 to between 31-50, and are summarised in table 3.4.

Table 3.4. Summary of numbers of staff (FT and PT) involved in food preparation:

Number of staff	All hotels (N) (%)	Large hotels (N) (%)	Medium sized hotels (N) (%)	Small hotels (N) (%)
< 10	70 (83)	20 (71)	33 (89)	17 (89)
11-20	11 (13)	6 (21)	3(8)	2 (11)
21-30	1 (1)	------	1 (3)	------
31-50	1 (1)	1 (4)	------	------
51-100	------	------	------	------
>100	1 (1)	1 (4)	------	------
Totals	84 (99)	28 (100)	37 (100)	19 (100)

In the majority of hotels (83%), under ten staff were involved in food preparation, and this figure represents little variance in the responses from each hotel size category. One response indicating more than 100 food handlers would appear to be unusually large when compared to the sizes of the hotels responding. This may indicate a misinterpretation of the question, or that particularly large functions are catered for in this establishment.

3.3.3 Functions and Conferences.

A number of different types and sizes of functions and conferences were normally catered for by many of the responding hotels, a summary of which may be seen in table 3.5.

Table 3.5. Summary of types and sizes of functions and conferences normally catered for. All hotels groups:

Function Type	Not catered For		<20 persons		21-50 persons		51-100 persons		>100 persons	
	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)
Conferences	7	(8)	24	(29)	32	(38)	12	(14)	4	(5)
Weddings	7	(8)	5	(6)	12	(14)	39	(46)	19	(23)
Banquets	17	(20)	3	(4)	10	(12)	20	(24)	28	(33)
Cocktail Parties	24	(29)	4	(5)	16	(19)	17	(20)	11	(13)
Office Parties	15	(18)	7	(8)	31	(37)	18	(21)	9	(11)
Children's Parties	30	(36)	23	(27)	12	(14)	4	(5)	4	(5)

A more detailed breakdown of functions and conferences for the various sized hotels may be seen in table 3.6:

Table 3.6. Detailed summary of types and sizes of functions normally catered for. All hotel groups:

Numbers of customers served	Hotel size	Conferences		Weddings		Banquets		Cocktail parties		Office/retirement parties		Children's parties	
		(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)
Not done	Large	3	(12)	1	(4)	3	(12)	7	(32)	6	(23)	11	(50)
	Medium	2	(6)	3	(8)	9	(27)	10	(29)	3	(8)	11	(33)
	Small	2	(11)	3	(16)	5	(26)	7	(44)	6	(33)	8	(44)
<20	Large	8	(32)	5	(19)	2	(8)	2	(9)	4	(15)	6	(27)
	Medium	10	(29)	-----		——		1	(3)	3	(8)	12	(38)
	Small	6	(32)	——		1	(5)	1	(6)	——		5	(28)
21-50	Large	9	(36)	4	(15)	4	(15)	5	(23)	9	(35)	1	(5)
	Medium	15	(43)	5	(14)	5	(15)	8	(24)	17	(47)	8	(24)
	Small	8	(42)	3	(16)	1	(5)	3	(19)	5	(28)	3	(17)
51 –100	Large	3	(12)	11	(41)	7	(27)	3	(14)	2	(8)	1	(5)
	Medium	6	(17)	18	(50)	9	(27)	9	(26)	10	(28)	1	(3)
	Small	3	(16)	10	(53)	4	(21)	5	(31)	6	(33)	2	(11)
>100	Large	2	(8)	6	(22)	10	(38)	5	(23)	5	(19)	3	(14)
	Medium	2	(6)	10	(28)	10	(30)	6	(18)	3	(8)	1	(3)
	Small	-----		3	(16)	8	(42)	——		1	(6)	-----	

The information contained in these tables indicated that hotels of all sizes were involved in conference and function catering to some extent, with conferences and weddings forming most of the business. Customers in the 21-50 range were the largest group for conferences, and 51-100 for weddings. Small hotels were more limited when catering for large numbers, although many of them were able to cater for over 100 people, i.e. for banquets, and to a lesser extent, for weddings and office/retirement parties. Twenty percent of hotels did not cater for banquets, although where they were undertaken, catering for over 100 was the largest group (33%). It was also noticeable that for many of the types of functions, including conferences, most of the business for all customer groups was conducted in medium sized hotels. Ten hotels also indicated that various other types of functions were catered for. These included anniversaries, sports events, funeral events, and coach parties, although the latter are not normally classed as functions. Respondents were also asked to indicate whether there was a notable difference between the pattern of functions and conferences served in Summer and Winter. Any differences were marginal and where applicable, slightly fewer weddings and conferences were conducted in the Summer. As well as the type and frequency of functions undertaken in the hotels, the percentage of business compared to meals provided for residents was also investigated and the results can be seen in table 3.7.

Table 3.7. Percentage of conference and function meals compared to meals for residents:

Percentage of business	Hotel size	Conferences		Weddings		Banquets		Residents		Office/retirement parties		Children's parties	
		(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)
10% or less	All sizes	47	(62)	45	(59)	34	(46)	9	(12)	53	(74)	37	(53)
	Large	14	(56)	16	(64)	10	(43)	2	(8)	16	(67)	10	(43)
	medium	25	(69)	20	(57)	18	(51)	7	(19)	28	(80)	19	(56)
	Small	8	(53)	9	(56)	6	(38)	----		9	(69)	8	(62)
10-25%	All sizes	14	(18)	11	(14)	14	(19)	14	(18)	5	(7)	1	(1)
	Large	5	(20)	4	(16)	4	(17)	4	(15)	2	(8)	----	
	Medium	5	(14)	4	(11)	5	(14)	8	(22)	3	(9)	1	(3)
	Small	4	(27)	3	(19)	5	(31)	2	(13)	----		----	
26-50%	All sizes	7	(9)	12	(16)	9	(12)	17	(22)	1	(1)	----	
	Large	2	(8)	3	(12)	4	(17)	6	(23)	1	(1)	----	
	Medium	3	(8)	8	(23)	4	(11)	7	(19)	----		----	
	Small	2	(13)	1	(6)	1	(6)	4	(25)	----		----	
51-100%	All sizes	2	(3)	2	(3)	3	(4)	36	(46)	----		----	
	Large	1	(4)	1	(4)	1	(4)	13	(50)	----		----	
	Medium	1	(3)	1	(3)	1	(3)	13	(36)	----		----	
	Small	----		----		1	(6)	10	(63)	----		----	

The higher percentage of meals served to residents reflects the nature of a hotel's business. As previously indicated however, conferences, weddings and banquets provided for large amounts of the food and beverage business in these hotels, with significant proportions of business (between 10-50%), being allocated to conferences and functions in all sizes of hotel. In 27% of small hotels, between 10-25% of their meal business was for conferences, and in 13%, conferences comprised of between 26-50% of the business. Banquets also featured significantly in this size of hotel, with 31% of small hotels having their meal business allocated to between 10-25% of their total meal output. Office/retirement parties and children's parties formed a small part of the overall meal provision with most respondents stating that they formed under 10% of the meals provided.

The types of meals provided for these functions and conferences also varied and a breakdown of them can be seen in table 3.8.

Table 3.8. Types of meals provided for functions and conferences:

Type of meal	Catered for - yes/no	All hotels (N) (%)	Large hotels (N) (%)	Medium sized hotels (N) (%)	Small hotels (N) (%)
Finger buffet	yes	60 (74)	25 (89)	30 (83)	5 (29)
	no	21 (26)	3 (11)	6 (17)	12 (71)
Fork buffet	yes	54 (67)	19 (68)	27 (75)	8 (47)
	no	27 (33)	9 (32)	9 (25)	9 (53)
Hot and cold buffet	yes	58 (72)	23 (82)	26 (72)	9 (53)
	no	23 (28)	5 (18)	10 (28)	8 (47)
Sit-down-hot-meal	yes	77 (95)	28 (100)	34 (94)	15 (88)
	no	4 (5)	------	2 (6)	2 (12)
Other	yes	2 (100)	------	------	2 (100)
	no	------	------	------	------

It was noted that "sit-down" hot meals were the most frequently provided type of meal (95%) for all hotel sizes. Finger buffets were especially prominent in large and medium sized hotels (89% and 83% respectively). All hotel groups however, cater for all function types to a large extent. Four hotels also indicated that other types of function meals were served, including bar meals, breakfasts and barbecues.

Respondents were also asked to indicate specific foods used in the preparation of functions and conferences, together with their frequency of use. A summary of the responses is shown in table 3.9.

Table 3.9. Specific types of foods used in the preparation of functions and conferences, and their frequency of use:

Frequency of use	Hotel size	Soft cheeses		Fresh eggs		Commercial egg products *		Fresh cream/products#		Reheated meats or poultry		Cooked cold meats/poultry		Rice	
		(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)
Every day	All sizes	6	(9)	30	(42)	8	(12)	38	(51)	18	(26)	29	(41)	19	(27)
	Large	4	(17)	11	(44)	2	(9)	13	(52)	6	(26)	11	(46)	8	(35)
	Medium	1	(4)	11	(35)	4	(14)	14	(42)	7	(23)	9	(27)	7	(21)
	Small	1	(6)	8	(50)	2	(14)	11	(69)	5	(31)	9	(64)	4	(27)
Once a week	All sizes	15	(23)	18	(25)	4	(6)	19	(26)	15	(21)	19	(27)	20	(28)
	Large	3	(13)	3	(12)	1	(5)	5	(20)	3	(13)	3	(13)	3	(13)
	medium	8	(31)	11	(35)	1	(3)	10	(30)	7	(23)	12	(36)	11	(33)
	Small	4	(25)	4	(25)	2	(14)	4	(25)	5	(31)	4	(29)	6	(40)
Once a month	All sizes	7	(11)	4	(6)	4	(6)	6	(8)	2	(3)	9	(13)	11	(15)
	large	4	(17)	4	(16)	2	(9)	4	(16)	1	(4)	5	(21)	4	(17)
	Medium	3	(12)	------		1	(3)	2	(6)	1	(3)	4	(12)	4	(12)
	Small	5	(31)	------		1	(7)	------		1	(6)	------		3	(20)
< once a month	All sizes	17	(26)	10	(14)	12	(18)	8	(11)	5	(7)	9	(13)	14	(20)
	large	6	(26)	4	(16)	3	(14)	3	(12)	13	(57)	4	(17)	7	(30)
	Medium	6	(23)	4	(13)	5	(17)	4	(12)	4	(13)	4	(12)	6	(18)
	Small	6	(38)	2	(13)	4	(29)	1	(6)	------		1	(7)	1	(7)
Never used	All sizes	20	(31)	10	(14)	37	(57)	3	(4)	30	(43)	5 (7)		7	(10)
	Large	6	(26)	3	(12)	14	(64)	------		------		1 (4)		1	(4)
	Medium	8	(31)	5	(16)	18	(62)	3	(9)	12	(39)	4 (12)		5	(15)
	Small	------		2	(13)	5	(36)	------		5	(31)	------		1	(7)

* Includes pasteurised egg products

\# Includes fresh cream products

Table 3.9 (continued) Specific types of foods used in the preparation of functions and conferences, and their frequency of use:

Frequency of use	Hotel size	Scotch eggs		Mayonnaise		Shellfish		Stewed meat items*		Soups		Gravies		Trifles		Custards	
		(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)
Every day	All sizes	2	(3)	34	(47)	21	(30)	18	(25)	36	(49)	33	(46)	14	(19)	15	(21)
	Large	2	(9)	12	(48)	7	(30)	7	(29)	13	(52)	11	(48)	5	(20)	5	(21)
	Medium	3	(9)	13	(39)	7	(21)	8	(24)	12	(36)	10	(30)	6	(18)	7	(21)
	Small	------		9	(64)	7	(47)	3	(20)	11	(73)	12	(80)	3	(20)	3	(20)
Once a week	All sizes	6	(9)	15	(21)	12	(17)	16	(22)	16	(22)	17	(24)	19	(26)	19	(26)
	Large	1	(4)	5	(20)	2	(9)	4	(17)	4	(16)	5	(22)	8	(32)	8	(33)
	Medium	------		7	(21)	7	(21)	5	(17)	10	(30)	10	(30)	7	(21)	6	(18)
	Small	2	(13)	3	(21)	3	(20)	7	(47)	2	(13)	2	(13)	4	(27)	5	(33)
Once a month	All sizes	5	(7)	8	(11)	14	(20)	8	(11)	9	(12)	9	(13)	11	(15)	8	(11)
	Large	1	(4)	4	(16)	5	(22)	2	(8)	5	(20)	4	(17)	4	(16)	4	(17)
	Medium	3	(9)	4	(12)	8	(24)	4	(12)	2	(6)	4	(12)	5	(15)	3	(9)
	Small	1	(7)	------		1	(7)	2	(13)	2	(13)	1	(7)	2	(13)	1	(7)
< once a month	All sizes	10	(14)	10	(14)	15	(21)	18	(25)	9	(12)	9	(13)	16	(22)	17	(24)
	Large	5	(22)	4	(16)	4	(17)	8	(33)	3	(12)	3	(13)	4	(16)	4	(17)
	Medium	4	(13)	6	(18)	8	(24)	8	(24)	6	(18)	6	(18)	10	(30)	9	(27)
	Small	1	(7)	------		3	(20)	2	(13)	------		------		2	(13)	4	(27)
Never used	All sizes	47	(64)	5	(7)	4	(13)	12	(17)	3	(4)	3	(4)	13	(18)	13	(18)
	Large	14	(61)	------		5	(22)	3	(13)	------		------		4	(16)	3	(13)
	Medium	22	(69)	3	(9)	3	(9)	8	(24)	3	(9)	3	(4)	5	(15)	8	(24)
	Small	11	(73)	2	(14)	1	(7)	1	(7)	------		------		4	(27)	2	(13)

* Includes curries, fricassees, goulash, etc.

To complete this section, two questions were asked relating to whether foods were prepared in advance and if so, what timescale was involved. The responses are shown in tables 3.10 and 3.11.

Table 3.10. Frequency of foods prepared in advance:

Frequency	All hotels (N) (%)	Large hotels (N) (%)	Medium sized hotels (N) (%)	Small hotels (N) (%)
Frequently	20 (25)	10 (36)	6 (17)	4 (25)
Sometimes	23 (29)	6 (23)	12 (33)	5 (31)
Rarely	19 (24)	7 (27)	8 (22)	4 (25)
Never	16 (21)	4 (15)	9 (25)	3 (19)
Totals	78 (99)	27 (101)	35 (97)	16 (100)

Table 3.11. Timescale involved when preparing foods in advance:

Timescale	All hotels (N) (%)	Large hotels (N) (%)	Medium sized hotels (N) (%)	Small hotels (N) (%)
< 2 hours	13 (18)	3 (12)	4 (12)	6 (43)
2-6 hours	43 (60)	17 (68)	23 (70)	3 (21)
6-10 hours	9 (13)	2 (8)	3 (9)	4 (29)
10-12 hours	5 (7)	2 (8)	2 (6)	1 (7)
> 12 hours	2 (3)	1 (4)	1 (3)	------
Totals	72 (101)	25 (100)	33 (100)	14 (100)

Data in table 3.10 indicates a varied set of responses regarding the frequency in which foods were prepared in advance for functions. Twenty one percent of respondents overall stated that they never prepared food in advance, with those in the medium sized hotels forming the largest percentage group (25%). Twenty nine percent overall stated that food was only sometimes prepared in advance. Of those that did prepare food in advance, 25% of respondents overall stated that food was frequently prepared in

advance. The largest responding group size of these were those in large hotels (36%), although this also applied to 25% of small hotels. The most frequently stated time for preparing food in advance was 2-6 hours, although this mainly applied to large and medium sized hotels (68% and 70% respectively). Forty three percent of respondents from small hotels indicated that food was prepared less than two hours before needed, although a significant number (29%), stated that between 6-10 hours also applied. Only four respondents indicated that food was prepared more than ten hours in advance.

3.3.4. Food safety legislation:

A number of questions were asked regarding food safety legislation, including accessibility to information, their knowledge and understanding of the legislation, and the amount of legislation. Two introductory questions sought to ascertain whether component parts of the legislation itself were kept within the establishment and whether respondents had read them. The replies may be seen in tables 3.12 and 3.13.

Table 3.12. Items of food safety legislation kept on the premises:

Item of legislation	Kept on premises - yes/no	All hotels (N) (%)	Large hotels (N) (%)	Medium sized hotels (N) (%)	Small hotels (N) (%)
Food Safety Act 1990	yes	73 (89)	26 (96)	31 (84)	16 (89)
	no	9 (11)	1 (4)	6 (16)	2 (11)
1999/91 Regulations *	yes	71 (89)	23 (92)	32 (86)	16 (89)
	no	9 (11)	2 (8)	5 (14)	2 (11)
EC Directive #	yes	40 (53)	15 (60)	14 (44)	11 (61)
	no	35 (47)	10 (40)	18 (56)	7 (39)

* The Food Hygiene (Amendment) Regulations 1990/91

The EC Directive on the Hygiene of Foodstuffs (93/43/EEC)

Table 3.13. Number of respondents having read the food safety legislation:

Item of legislation	Read the legislation - yes/no	All hotels (N) (%)	Large hotels (N) (%)	Medium sized hotels (N) (%)	Small hotels (N) (%)
Food Safety Act 1990	yes	74 (90)	25 (93)	33 (84)	16 (89)
	no	8 (10)	2 (7)	4 (11)	2 (11)
1999/91 Regulations *	yes	73 (91)	24 (96)	33 (89)	16 (89)
	no	7 (9)	1 (6)	3 (11)	2 (11)
EC Directive #	yes	44 (59)	15 (65)	18 (55)	11)61)
	no	30 (41)	8 (35)	15 (45)	7 (39)

* The Food Hygiene (Amendment) Regulations 1990/91

The EC Directive on the Hygiene of Foodstuffs (93/43/EEC)

Replies showed that in a large majority of the hotels, both the Food Safety Act 1990 and the Food Hygiene (Amendment) Regulations 1990/91were kept on the premises and had been read by the respondents. A lesser, but significant number of respondents indicated the same for the EC Directive on the Hygiene of Foodstuffs, especially in the medium sized hotels. It is of note that in small hotels, a relatively high percentage (61%), of respondents stated that the EC Directive was both kept on the premises and had been read.

Regarding the amount of food safety legislation, respondents were asked to state whether they felt it was excessive, about right, or insufficient. Replies can be seen in table 3.14.

Table 3.14. Respondents views regarding the amount of food safety legislation:

Amount of legislation	All hotels (N) (%)	Large hotels (N) (%)	Medium sized hotels (N) (%)	Small hotels (N) (%)
Excessive	38 (46)	11 (37)	18 (49)	9 (50)
About right	44 (53)	17 (61)	19 (51)	8 (44)
Insufficient	1 (1)	------	-------	1 (6)
Totals	83 (100)	28 (100)	37 (100)	17 (100)

Most respondents from the large and medium sized hotels (61% and 51% respectively), and 44% from small hotels, stated that the amount of food safety legislation was about right. Significant numbers from the large and medium sized hotels however, (37% and 49% respectively), and 50% from small hotels, indicated that the amount of legislation was excessive. Only one respondent stated that it was insufficient.

Respondents were also asked to state their level of knowledge and understanding of food safety legislation, and specifically, whether they felt confident enough to explain the principles of Due Diligence to their staff. The replies are shown in tables 3.15 and 3.16.

Table 3.15. Levels of knowledge and understanding of food safety legislation:

Level of knowledge and understanding	All hotels (N) (%)	Large hotels (N) (%)	Medium sized hotels (N) (%)	Small hotels (N) (%)
More than adequate	18 (22)	7 (25)	8 (22)	3 (17)
Adequate	61 (73)	20 (71)	27 (73)	14 (78)
Inadequate	4 (5)	1 (4)	2 (5)	1 (6)
Totals	83 (100)	28 (100)	37 (100)	18 (101)

Table 3.16. Whether respondents felt confident enough to explain the principles of Due Diligence to their staff:

Confident – yes/no	All hotels (N) (%)	Large hotels (N) (%)	Medium sized hotels (N) (%)	Small hotels (N) (%)
Yes	72 (88)	24 (89)	34 (92)	14 (78)
No	10 (12)	3 (11)	3 (8)	4 (22)
Totals	82 (100)	27 (100)	37 (100)	18 (100)

Most respondents from all size groups stated that their level of knowledge and understanding of food safety legislation was at least adequate (73% overall). Significant numbers also responding that it was more than adequate (22% overall), although a slightly lower proportion were from small hotels (17%). Only four respondents overall, stated that their level of knowledge and understanding was inadequate. A large number of respondents from all hotels (88%), but especially from medium sized establishments (92%), stated that they felt confident enough to explain the principles of Due Diligence to their staff. Twelve percent overall, and 22% from small hotels in particular, felt that they were not confident. When asked to describe the principles of Due Diligence however, only a small number of respondents (under 12%), were able to provide descriptions which were anywhere near acceptable. Some of the more inaccurate descriptions included for example:

"to ensure the best service" (manager of a small hotel)

"good standard of food hygiene" (proprietor of a medium sized hotel)

"the importance of doing the job in question" (Food and Beverage manager in a large hotel).

The following statements are typical of those given by those respondents who were able to provide (somewhat) reasonable descriptions:

"taking all reasonable precautions to prevent contamination of foods" (manager of a medium sized hotel)

"everyone in the food chain taking reasonable care to ensure hygienic practices and safe food" (Food and Beverage manager in a large hotel)

In relation to levels of knowledge and understanding, it was also felt appropriate to identify how easy to read and understand (or not), respondents felt the legislation was. Replies can be seen in table 3.17.

Table 3.17. Understanding of food safety legislation:

Level of ease or difficulty	All hotels (N) (%)	Large hotels (N) (%)	Medium sized hotels (N) (%)	Small hotels (N) (%)
Generally easy to read and understand	32 (40)	13 (46)	14 (40)	5 (28)
Easy to read and understand in parts only	15 (19)	5 (18)	5 (14)	5 (28)
Confusing in one or two areas	25 (31)	8 (29)	11 (31)	6 (33)
Generally hard to read and understand	9 (11)	2 (7)	5 (14)	2 (11)
Totals	81 (101)	28 (100)	35 (99)	18 (100)

Many respondents found the legislation generally easy to read and understand (40% overall), this only applied to 28% of those in small hotels. Equally, large numbers of replies (31% overall), show that there was some confusion attached to parts of the legislation. A lesser number (11% overall), found the legislation generally hard to read and understand.

Respondents were also asked to comment on how easy it was to obtain information on food safety legislation. Replies can be seen in table 3.18.

Table 3.18. Obtaining information on food safety legislation:

Level of ease or difficulty in obtaining information	All hotels (N) (%)	Large hotels (N) (%)	Medium sized hotels (N) (%)	Small hotels (N) (%)
Very easy to obtain	28 (35)	11 (41)	14 (39)	3 (17)
Fairly easy to obtain	38 (47)	9 (33)	17 (47)	12 (67)
Not so easy to obtain	8 (10)	5 (19)	2 (6)	1 (6)
Fairly difficult to obtain	6 (7)	2 (7)	2 (6)	2 (11)
Very difficult to obtain	1 (1)	------	1 (3)	------
Information not available	------	------	------	------
Totals	81 (100)	27 (100)	36 (101)	18 (101)

Most respondents (82% overall), stated that it was very easy or fairly easy to obtain information regarding food safety legislation, although a lower number of respondents from small hotels (17%), stated that it was very easy to obtain information. Eleven percent from small hotels also stated that it was fairly difficult to obtain information about the legislation. Only two respondents indicated that it was very difficult to obtain information. Environmental Health departments were stated as being the most useful sources of information (29% overall), with company head offices (17%), and trade associations (13%), also being the most frequently stated. Three questions were asked which related to EHO visits or inspections, and the procedures that may be taken by the authorities if varying risks to health are determined to be the case. The replies regarding procedures are shown in table 3.19.

Table 3.19. Knowledge and understanding of procedures that may be implemented by enforcement officers or local/national authorities:

Level of knowledge and understanding	Hotel size	Improvement Notice (N) (%)	Prohibition Order (N) (%)	Emergency Prohibition Order (N) (%)	Emergency Prohibition Notice (N) (%)
Very good	All hotels	24 (30)	23 (29)	19 (24)	19 (24)
	Large	6 (21)	7 (25)	5 (19)	5 (19)
	Medium	12 (36)	10 (30)	8 (24)	8 (24)
	Small	6 (33)	6 (33)	6 (33)	6 (33)
Good	All hotels	32 (41)	32 (41)	29 (37)	27 (35)
	Large	14 (50)	12 (43)	10 (37)	8 (30)
	Medium	11 (33)	13 (39)	13 (39)	13 (39)
	Small	7 (39)	7 (39)	6 (33)	6 (33)
Moderately good	All hotels	16 (20)	15 (19)	13 (17)	14 (18)
	Large	6 (21)	7 (25)	5 (19)	6 (22)
	Medium	7 (21)	6 (18)	5 (15)	5 (15)
	Small	3 (17)	2 (11)	3 (17)	3 (17)
Not good	All hotels	6 (8)	7 (9)	13 (17)	13 (17)
	Large	1 (4)	1 (4)	4 (15)	4 (15)
	Medium	3 (9)	4 (12)	7 (21)	7 (21)
	Small	2 (11)	2 (11)	2 (11)	2 (11)
No knowledge or understanding	All hotels	1 (1)	2 (3)	4 (5)	5 (6)
	Large	1 (1)	1 (4)	3 (11)	4 (15)
	Medium	------	------	------	------
	Small	------	1 (6)	1 (6)	1 (6)

Overall, many respondents indicated that their knowledge and understanding of Improvement Notices and Prohibition Orders were better than for the Emergency Notices and Orders, especially if the range moderately good to very good is considered. Responses also indicated that a very good knowledge in all four Notices/Orders was maintained in the small hotels (33%), when compared to responses in the other two groups and the overall figures.

Respondents were asked to comment on the frequency of visits made to their establishment by EHOs. Responses may be seen in tables 3.20 and 3.21.

Table 3.20. Frequency of visits to establishments made by EHOs:

Frequency of visit	All hotels (N) (%)	Large hotels (N) (%)	Medium sized hotels (N) (%)	Small hotels (N) (%)
< once every two years	13 (16)	6 (22)	5 (14)	2 (11)
Once every two years	7 (9)	3 (11)	3 (8)	1 (6)
Once a year	36 (44)	8 (30)	19 (53)	9 (50)
Once every six months	23 (28)	10 (37)	8 (22)	5 (28)
> once every six months	2 (2)	------	1 (3)	1 (6)
Totals	81 (99)	27 (100)	36 (100)	18 (101)

Table 2.21. Respondents views on number of EHO visits:

Views on number of visits	All hotels (N) (%)	Large hotels (N) (%)	Medium sized hotels (N) (%)	Small hotels (N) (%)
Excessive	5 (6)	3 (11)	------	2 (11)
About right	69 (85)	21 (78)	34 (94)	14 (78)
Insufficient	7 (9)	3 (11)	2 (6)	2 (11)
Totals	81 (100)	27 (100)	36 (100)	18 (100)

Most respondents in all hotel size groups indicated that visits by EHOs occurred once a year (44% overall), although higher percentages of medium sized and small hotels received annual visits (53% and 50% respectively), than large hotels (30%). significant numbers of respondents also stated that they received visits every six months, again in all size groups (28% overall). It was also noticeable that a number of hotels were visited less than once every two years (16% overall), but especially in large hotels (22%). Most respondents stated that the frequency of visits to their establishments was about right (85% overall), although a small number indicated that they were either excessive or insufficient.

3.3.5. Quality Control and Quality Assurance:

Questions in this section related to knowledge, practices and procedures regarding food safety in the context of quality approaches to food and beverage operations within the hotels. Respondents were asked to state their level of knowledge and understanding of nine terms/titles related to food safety legislation and quality, as well as their views regarding the level of importance that they would attach to each of them. Responses are indicated in tables 3.22 and 3.23. As with earlier questions of this nature, most responses indicated levels of knowledge and understanding between moderately good and very good. Assured Safe Catering however, attracted fewer responses in the very good range (10% overall). Responses for individual terms were variable, with BS5750 (ISO 9000), Total Quality Management and Assured Safe Catering attracting the most responses in the not good or no knowledge categories. Knowledge and understanding of Due Diligence showed relatively higher response rates, especially from small hotels, and responses also showed high levels of importance attached to it (85% overall), from all size groups. Nine respondents (12% overall), also stated that their establishments were BS5750 (ISO 9000) accredited. These responses were from three hotels in each size group.

Table 3.22. Levels of knowledge and understanding of terminology associated with food safety legislation:

Level of knowledge and understanding	Hotel size	BS5750/ ISO 9000		Quality Assurance		Quality Control		Good Catering Practice		HACCP		Due Diligence		Total Quality Management		Assured Safe Catering	
		(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)
Very good	All sizes	9	(12)	17	(21)	21	(26)	18	(22)	11	(14)	31	(37)	14	(17)	8	(10)
	Large	4	(15)	8	(31)	8	(31)	6	(22)	4	(14)	7	(25)	7	(27)	4	(15)
	Medium	3	(9)	4	(11)	8	(22)	7	(19)	4	(11)	14	(38)	4	(11)	3	(8)
	Small	2	(13)	5	(28)	5	(28)	5	(28)	3	(17)	10	(56)	3	(17)	1	(6)
Good	All sizes	22	(28)	28	(35)	34	(42)	31	(28)	27	(33)	28	(34)	25	(31)	25	(32)
	Large	7	(26)	8	(31)	11	(42)	12	(44)	9	(32)	11	(39)	6	(23)	9	(35)
	Medium	13	(37)	16	(43)	17	(46)	13	(36)	14	(40)	16	(43)	13	(35)	12	(33)
	Small	2	(13)	4	(22)	6	(33)	6	(33)	4	(22)	1	(6)	6	(33)	4	(24)
Moderately good	All sizes	23	(29)	28	(35)	23	(28)	21	(26)	29	(36)	19	(23)	25	(31)	22	(28)
	Large	7	(26)	7	(27)	7	(27)	6	(22)	11	(39)	9	(32)	7	(27)	7	(27)
	Medium	6	(17)	13	(35)	10	(27)	13	(36)	14	(40)	5	(14)	13	(35)	11	(31)
	Small	10	(63)	8	(44)	6	(33)	2	(11)	4	(22)	5	(28)	5	(28)	4	(24)
Not good	All sizes	16	(21)	6	(7)	2	(2)	8	(10)	8	(10)	4	(5)	13	(16)	17	(22)
	Large	5	(19)	2	(8)	-----		2	(7)	2	(7)	1	(4)	4	(15)	4	(15)
	Medium	11	(31)	4	(11)	2	(5)	3	(8)	2	(6)	2	(6)	7	(19)	8	(22)
	Small	2	(13)	1	(6)	1	(6)	3	(17)	4	(22)	1	(6)	2	(11)	5	(29)
No knowledge	All sizes	8	(10)	2	(2)	1	(1)	3	(4)	6	(7)	1	(1)	4	(5)	7	(9)
	Large	4	(15)	1	(4)	-----		1	(4)	2	(7)	-----		2	(8)	2	(8)
	Medium	2	(6)	-----		-----		-----		1	(3)	-----		-----		2	(6)
	Small	-----		-----		-----		2	(11)	3	(17)	1	(6)	2	(11)	3	(18)

Table 3.23. Level of importance attached to food safety legislation and quality terms:

Level of importance	Hotel size	BS5750/ ISO 9000		Quality Assurance		Quality Control		Good Catering Practice		HACCP		Due Diligence		Total Quality Management		Assured Safe Catering	
		(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)
Very important	All sizes	10	(16)	41	(66)	54	(78)	46	(67)	35	(54)	62	(85)	28	(41)	33	(50)
	Large	1	(5)	16	(70)	22	(85)	20	(80)	15	(63)	22	(79)	10	(42)	14	(61)
	Medium	7	(26)	19	(61)	21	(68)	19	(59)	15	(50)	28	(88)	13	(41)	15	(47)
	Small	2	(15)	9	(69)	11	(92)	7	(58)	5	(45)	12	(92)	5	(42)	4	(36)
Fairly important	All sizes	18	(30)	17	(25)	12	(17)	15	(22)	23	(35)	8	(11)	31	(46)	22	(33)
	Large	8	(38)	4	(17)	3	(12)	4	(16)	7	(29)	5	(18)	10	(42)	5	(22)
	Medium	5	(19)	9	(29)	8	(26)	7	(22)	11	(37)	3	(9)	15	(47)	11	(34)
	Small	5	(38)	4	(31)	1	(8)	4	(33)	5	(45)	——		6	(50)	6	(55)
Not important	All sizes	33	(54)	6	(9)	3	(4)	8	(12)	7	(11)	3	(4)	9	(13)	11	(17)
	Large	12	(57)	3	(12)	1	(4)	1	(4)	2	(8)	1	(4)	4	(17)	4	(17)
	Medium	15	(56)	3	(10)	2	(6)	6	(19)	4	(13)	1	(3)	4	(13)	6	(19)
	Small	6	(46)	——		——		1	(8)	1	(9)	1	(8)	1	(8)	1	(9)

Fifty seven respondents (56%), stated that various measures were taken to improve the quality of food production. In size groups, these were in - 16 (62%), large hotels, 17 (55%), medium sized hotels, and 14 (93%), small hotels. A range of measures were described although responses which were common in nature included the following examples:

"rotas for cleaning and correct storage of food" (proprietor in a small hotel)

"menu descriptions and management reviews" (proprietor in a small hotel)

"standardised menus and maximum amount of fresh food used" (manager in a large hotel)

"good chef!" (proprietor of a medium sized hotel)

Five questions were asked regarding specific practices or procedures relating to food safety, food safety legislation and quality. The first question required respondents to indicate the frequency in which suppliers were visited and the results can be seen in table 3.24.

Table 3.24. Frequency in which suppliers are visited:

Frequency of visits	All sizes		Large hotels		Medium sized hotels		Small hotels	
	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)
All suppliers visited regularly	8	(22)	4	(31)	1	(7)	3	(38)
All suppliers visited sometimes	14	(39)	5	(39)	7	(47)	2	(25)
Suppliers never visited	14	(39)	4	(31)	7	(47)	3	(38)

Many suppliers were never visited (39% overall), especially by personnel from medium sized hotels (47%), or only visited sometimes, again especially within the medium hotel size group (47%). Fewer visits were made on a regular basis (22% overall), with the highest response rate being in small hotels (38%).

Respondents were also asked to state whether their food deliveries were checked against a pre-determined system. Responses are shown in table 3.25.

Table 3.25. Deliveries checked against a pre-determined system:

Number of deliveries checked	All hotels		Large hotels		Medium sized hotels		Small hotels	
	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)
All of them	51	(63)	19	(70)	20	(54)	12	(71)
Some of them	18	(63)	3	(11)	11	(30)	4	(24)
None of them	12	(15)	5	(19)	6	(16)	1	(6)
Totals	81	(100)	27	(100)	37	(100)	17	(101)

The majority of hotels had a pre-determined system in place for checking-in all or some of their deliveries (63% in both instances), with responses from all size groups indicating that all deliveries were checked in this way. A significant number however, (15% overall), did not check deliveries according to a pre-determined system, especially in large and medium sized hotels (19% and 16% respectively).

One question was asked regarding the monitoring and recording of refrigerator temperatures. The results can be seen in table 3.26.

Table 3.26. Frequency of monitoring and recording refrigerator temperatures:

Frequency	Monitored/recorded	All hotels		Large hotels		Medium sized hotels		Small hotels	
		(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)
< once a day	monitored	4	(36)	2	(67)	1	(17)	1	(50)
	recorded	7	(64)	1	(33)	5	(83)	1	(50)
Once a day	monitored	15	(54)	5	(50)	8	(57)	2	(50)
	recorded	13	(46)	5	(50)	6	(43)	2	(50)
Twice a day	monitored	6	(17)	2	(15)	3	(25)	1	(10)
	recorded	29	(83)	11	(85)	9	(75)	9	(90)
> twice a day	monitored	14	(61)	4	(80)	8	(62)	2	(40)
	recorded	9	(39)	1	(20)	5	(38)	3	(60)

A variety of responses from all hotels regarding the frequency in which temperatures were monitored and/or recorded were noted. In many of the hotels, temperatures were monitored and recorded at least once a day, and this applied to all size groups. There were however, significant numbers of hotels where these actions were undertaken less than once a day. The recording process here was particularly higher in the medium sized hotel group (83%), and to some extent also in small hotels (50%). The results also show differences in the frequencies of the monitoring and recording processes. In all hotels for example, the recording process was applied far more frequently on a twice a day basis (83% overall), and in most hotels, this appeared to be the maximum times a day that this was carried out (61% overall). Temperatures were frequently monitored more than twice

a day however, (61% overall), although in the small hotel group, 60% of respondents stated that the recording process was also undertaken more than twice a day.

Regarding the sampling of food for microbiological analysis, responses can be seen in table 3.27.

Table 3.27. Frequency in which food samples are taken:

Frequency	All hotels		Large hotels		Medium sized hotels		Small hotels	
	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)
Never	69	(85)	24	(86)	32	(86)	13	(81)
Once/twice a month	10	(12)	4	(14)	5	(14)	1	(6)
Three/four times a month	------		------		------		------	
> four times a month	2	(3)	------		------		2	(13)
Totals	81	(100)	28	(100)	37	(100)	16	(100)

It is clear that in most hotels of all sizes, food samples were not taken (85% overall). Where samples were taken, this occurred once or twice a month (12% overall), although this was apparent in only 6% of the small hotels. In two hotels (13%), food samples were taken more than four times a month.

Seventy three percent of respondents overall, stated that a nominated member of staff or management was responsible for food hygiene/safety training, although this figure was less in small hotels (59%). In both large and medium sized hotels, approximately a quarter of respondents indicated that nobody was nominated with this responsibility (25% and 225 respectively). In small hotels, a higher figure of 41% was reflected here. These figures can be seen in table 3.28 below.

Table 3.28. Member of staff or management responsible for food hygiene/safety training:

Someone responsible - yes/no	All hotels		Large hotels		Medium sized hotels		Small hotels	
	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)
Yes	60	(73)	21	(75)	29	(78)	10	(59)
No	22	(27)	7	(25)	8	(22)	7	(41)
Totals	82	(100)	28	(100)	37	(100)	17	(100)

The final question in this section related to the maintenance of quality assurance documentation. A summary of responses can be seen in table 3.29 below.

Table 3.29. Maintenance of Quality Assurance documentation:

Hotel size	Documentation kept - yes/no	Purchasing procedures		Storage procedures		Refrigeration and temperature control		Cleaning procedures		Food sampling		Staff/management training		Customer comments or complaints		EHO visits	
		(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)
All sizes	Yes	32	(52)	36	(58)	40	(65)	47	(76)	13	(21)	40	(65)	40	(65)	41	66)
	No	30	(48)	26	(42)	22	(35)	15	(24)	49	(79)	22	(35)	22	(35)	21	34)
Large	Yes	10	(48)	11	(52)	19	(90)	16	(76)	3	(14)	15	(71)	13	(62)	13	62)
	No	11	(52)	10	(48)	2	(10)	5	(24)	18	(86)	6	(29)	8	(38)	8	38)
Medium	Yes	14	(52)	15	(56)	23	(85)	21	(78)	6	(22)	18	(67)	19	(70)	19	70)
	No	13	(48)	12	(44)	4	(15)	6	(22)	21	(78)	9	(33)	8	(30)	8	30)
Small	Yes	8	(57)	10	(71)	12	(80)	10	(71)	4	(29)	7	(50)	9	(64)	9	64)
	No	6	(43)	4	(29)	3	(29)	4	(29)	10	(71)	7	(50)	5	(36)	5	36)

The majority of respondents replied that documentation was maintained for a range of purposes, and in all size groups, although far fewer (21% overall) positive replies were recorded for documenting the sampling of food for microbiological analysis. The data also indicates that in large numbers of hotels, documentation was not kept. In fifty two percent of large hotels for example, documentation was not kept for purchasing. This also applied to 48% in medium sized hotels, and 43% of small hotels. Similar results can be seen for purchasing procedures, whereas for other procedures the results were higher.

Where the maintenance of other documentation was indicated, examples included were for independent audits and pest control.

3.4. The Risk Assessment Model:

This section describes and discusses a diagnostic Risk Assessment model based upon a numerical scoring system, which has the potential to be self-administered within the Hospitality and Catering industry. The model was developed by the author for two reasons:

- so that the hotels in this survey could be allocated a score indicating the level of risk attached to the premises.
- for potential use in the Hospitality and Catering industry as a tool for evaluating the level of risk attached to to individual premises.

The application of this model to appropriate data from each set of responses enabled the researcher to ascertain a risk score for each establishment. and examine any possible relationships between the groups of hotels involved in this exercise.

The model is made up of three component parts as follows:

*	The food prepared and handled	(Section A)
*	The frequency of use of the foods	(Section B)
*	The practices involved	(Section C)

3.4.1. Foods prepared and handled

Foods frequently associated with outbreaks of food poisoning were discussed in chapter two. Some however, are more frequently implicated than others in food poisoning. Therefore, a differential classification of these foods based upon their frequency of association with outbreaks of food poisoning was constructed. In the model, those foods more frequently reported - eggs, made-up meat dishes, meats, poultry, fish and rice have been allocated a **higher** rating or score.

Foods not so frequently reported have been allocated a **medium** rating or score. These include - soft cheeses, mayonnaise, shellfish, soups, gravies, fresh cream/products, trifles, custards and Scotch eggs.

One food does not inherently carry the same degree of risk as the others because of its' prior heat treatment before being received by the caterer - "pasteurised/commercial egg or egg products". It does however, still require careful storage and handling if contamination is not to occur, and warrants a place within the scoring system. For this reason, it has been allocated a **lower** rating or score than the other food items. A breakdown of the scores for the foods handled is shown in table 3.30.

Table 3.30. Score allocation for risk categories of foods:

Risk category	High	Medium	Low
Score	10	5	2
Foods	Fresh Eggs	Soft Cheeses	Pasteurised/Commercial Egg or Egg Products
	Fish / fish dishes	Scotch Eggs	
	Made-up meat dishes	Mayonnaise	
	Meat (including cooked cold meats)	Shellfish	
	Poultry (including cooked cold poultry)	Soups	
	Rice	Fresh cream / products	
		Gravies	
		Trifles	
		Custards	

3.4.2. The frequency of use

The variability and frequency of use of foods differs in each establishment, and in each establishment over time. Foods may be used discretely in their own right or as part of more complex dishes. In instances such as this, the risk to the consumer becomes higher because of their greater use and handling. As a result, frequency of use was considered as part of the model and **higher** scores were allocated to those foods which are more frequently handled. Experience from piloting shows that the addition of scores, for food type and frequency of use, produces a more realistic risk score, especially when the food factor is used in conjunction with operational practices. A breakdown of the scores for the frequency of use is shown in table 3.31. Scores for the foods used and their frequency

of use are added together to give a total score for sections A and B out of a maximum of 187.

Table 3.31. Score allocation based upon frequency of use:

Frequency	**Score**
Every Day	5
Once A Week	3
Once A Month	2
Less Than Once A Month	1
Never Used	0

3.4.3. The practices involved

Risk factors frequently associated with outbreaks of food poisoning were incorporated into the model and allocated **higher** scores. Other general hygiene practices which contribute to the production of safe food and which would be typical of an appropriate quality assurance system, were also considered in this section of the model. These include - the checking of deliveries, the maintenance of quality assurance procedures and the provision of a training manager. As their association with outbreaks of food poisoning is less clearly defined, they have been allocated **lower** scores. A breakdown of the scores allocated is shown in table 3.32 and is out of a maximum of 71.

Table 3.32. Score allocation for implementation of food safety practices:

Practice	Description	Score
Food deliveries checked according to a pre-set system	None of them Some of them All of them	5 3 0
Foods prepared in advance	Frequently Sometimes Rarely Never	10 5 2 0
Stages in food preparation	1 - 4 5 - 8 >8	2 4 8
Timescale involved when preparing foods in advance	> 12 hours 10-12 hours 6-10 hours 2-6 hours < 2 hours	10 8 6 2 1
Monitoring and recording of refrigerator temperatures	< once a day once a day twice a day > twice a day	8 4 2 0
Maintenance of quality assurance documentation	For all appropriate procedures For some procedures Documentation not kept	0 3 5
Monitoring and recording of cooking/re-heating temperatures	Yes No	0 10
Monitoring and recording of food service temperatures	Yes No	0 10
Member of staff/management responsible for food safety training	Yes No	0 5

3.4.4. The Risk Assessment Rating Test

The three components of the model were assembled together and the self-assessment rating test was compiled (see appendix 2). Scores in each section of the model were totalled to give an overall score for individual establishments out of a maximum of 258, with higher scores reflecting a higher risk factor. The data obtained was analysed both in terms of size of establishment, and ownership, and mean scores for each group were calculated and converted into percentage figures. The results are displayed in tables 3.33 and 3.34.

Table 3.33. Mean percentage risk scores by ownership:

Serial	Section of rating list	Privately owned hotels (%)	Large chain hotels (%)	Privately owned company hotels (%)
1	A and B	67	65	68
2	C	40	36	43
3	Total score (A,B and C)	61	59	63

Table 3.34. Mean percentage risk scores by size of hotel:

Serial	Section of rating list	Small hotels (%)	Medium sized hotels (%)	Large hotels (%)
1	A and B	62	68	65
2	C	39	39	39
3	Total score (A,B and C)	57	62	60

Whilst there were noticeable differences between individual establishments in all groups, the data in both tables shows very small differences in mean scores, indicating

that ownership and size were not significantly contributing factors to risk in this sample group. It can be seen that the largest difference was 6%. This applied to scores in section C (by ownership) between large chain hotels and privately owned company hotels, and sections A and B (by size) between small hotels and medium sized hotels. As confirmation of these findings, an analysis of variance (ANOVA) was conducted for sections A and B, C, and for the total scores, for both ownership and size. As seen in tables 3.35 and 3.36 no statistically significant differences were detected.

Table 3.35. Results of analysis of variance by ownership:

Section of rating list	Results of ANOVA
A and B	f = 0.12; p = 0.888
C	f = 0.59; p = 0.558
Total score (A, B and C)	f = 0.33; p = 0.723

Table 3.36. Results of analysis of variance by size:

Section of rating list	Results of ANOVA
A and B	f = 0.68; p = 0.509
C	f = 0.00; p = 0.999
Total score (A, B and C)	f = 0.66; p = 0.518

3.5. Discussion:

3.5.1. The establishments

Wales has a large diversity of commercial catering premises, estimated at just under eight thousand for the year 1993 (The Welsh Office, 1999). Within this figure, the number of hotels has increased in recent years, especially in and around the city of Cardiff and the South East Glamorgan area and it is envisaged that hotels in Wales would be typical of others within the UK. The overall response rate of 38% is

reflective of an earlier survey carried out in the Cardiff and Vale of Glamorgan area (Coleman, 1992), but was higher than in some conducted by other researchers (Mortlock et al, 1999, p. 787), (Ehiri et al, 1997, p. 13). It is not possible to compare reasons for not responding although the sensitive nature of food safety has been commented upon earlier in this chapter. Such sensitivity was an influencing factor in the earlier survey where a fear of displaying ignorance of food safety legislation was apparent. The largest percentage of non-responses were from hotels in the medium sized group (52%), although this particular group had the most questionnaires sent (114). Equally, the same group had the highest percentage of useable responses (44%), as well as comprising the highest number of privately owned establishments (73%). Whilst the unequal proportion of responses from each size group is noticeable, any possible distortion of results should be tempered against the fact that in many hotels (of all sizes), food storage and production procedures, the types of foods used, and staffing structures, have a tendency to be traditional in nature and are based upon principles common to all food and beverage operations.

In the majority of hotels, (83%), under ten full-time or part-time staff were involved in the preparation of food. A finding similar to that reported by Mortlock et al (1999, p. 788). Of particular interest, was the fact that this applied in 71% of large hotels and was also the case in 89% of medium sized establishments. This indicated that hotels in these groups employed similar numbers of staff to the smaller hotels. The implications of this were that either smaller hotels had high staff/customer ratios, or that hotels in the medium and large groups employed fewer numbers of staff in relation to their business demands. This may imply a more effective use of staff resources, or it may be that greater demands were placed upon staff than in smaller establishments. If this was the case, it may have had implications regarding the levels of risk attached to the establishment, especially when the numbers of meals served were considerable.

3.5.2. Functions and types of meals

In all of the hotels surveyed, various functions were undertaken depending upon their size, especially conferences and weddings. In many smaller hotels, functions for over 100 people were provided. Function and conference catering has particular implications for both human and physical resources (Cowden et al, 1995, p. 112). The comparatively low numbers of staff employed in food preparation implies extra pressure is upon them as they would undoubtedly be catering for residents also, possibly from more than one service kitchen. Such pressures may also be extended to storage and refrigeration space, preparation areas, and service and wash-up points, and may have had implications for cross-contamination (Coleman and Griffith, 1998, pp. 299-300). It is understandable that residents made up a large percentage of the meals served in the hotels. The significant proportion of conference and function meals catered for however, were an indication of the diversity of business that hoteliers find themselves in, and further emphasise the extent to which large numbers of people are catered for at any one time. Within these customer groups, it would be expected that people from high-risk groups formed a part, including the elderly, expectant mothers and young children. The accompanying risks were therefore potentially increased (Miles, Braxton and Frewer, 1999, p. 753). The types of meals served were also varied and typical of what may be expected for this type of catering. Two main points should be considered here. Firstly, the large percentage of sit-down-hot-meals served (95% overall) where the need for food to be correctly stored, prepared and cooked (or reheated) is critical to ensuring that safe food is served to the customer (Gillespie, Little and Mitchell, 2000, p. 472). Appropriate preparation and storage space can be particularly problematic where large quantities of food are being prepared, frequently when the demand for space exceeds that available (Richmond, 1990, p. 132). Secondly, the service of buffets is also problematic. Not only may the food be displayed at room temperature for extended periods of time, it is also open to contamination from the customers themselves as they deliberate over their selection in close proximity to the foods displayed. Whilst only four responses indicated that barbecues were catered for, experience would show that many hotels do in fact offer them, especially in the Summer months.

3.5.3. Foods and preparation procedures

The range of foods served at conferences and functions, whilst not surprising, again indicated the potential risks to the customer. The risks associated with fresh eggs for example, have been well documented (Border and Norton, 1997, p. 12), as have those associated with many of the other foods listed in tables 3.39 (Ehiri et al, 1997, p. 144). From the table, it can be seen that all of the foods listed were used on a regular basis (apart from Scotch Eggs) in hotels of all sizes. Certain foods were however, used more frequently on a daily basis. For example - fresh eggs, fresh cream or cream based products, cooked and reheated meats and poultry, mayonnaise, shellfish, soups and gravies. Results of the Risk Assessment exercise indicated high levels of risk across a range of hotels, although analysis by variance ascertained that there were no statistically significant differences between the mean scores for size groups in sections A and B. Indeed, data obtained from the ANOVA test indicated more variation within groups than between them. Some aspects of the findings regarding the preparation of food in advance were encouraging, with many respondents stating that they rarely or never prepare food in advance. Equally, in the 78% (overall), of hotels where food is prepared in advance, the timescale involved was under six hours. This should however, be tempered against those hotels where food was frequently prepared in advance (25% overall), and that in 23% (overall) of them, this extended to over six hours before service. This may be of particular concern in smaller hotels where space, equipment, and possibly experience, may be more limited than in their larger counterparts, although the analysis of results for section C in the Risk Assessment model discovered almost identical scores for all three size groups, and again, suggested that there were more differences within groups as opposed to between them.

3.5.4. Storage and temperature control

The correct storage of food before it is used and during it's preparation, is an important factor when considering food safety and forms an integral component of previous and existing food safety legislation (Gillespie et al, 2000, pp. 472-473). The diversity of responses to this question reflected differing approaches to the monitoring and recording of refrigerator temperatures. It is encouraging to note that in a number of establishments, these were undertaken more than twice a day, and that in the majority of hotels, recording took place at least twice a day. In a number of hotels however, temperatures were recorded or monitored only once a day or less. Whilst a clearly specified requirement was not evident in the Regulations in existence at the time of this survey (MAFF, Department of Health, Scottish Office, Welsh Office, 1991), a minimum twice daily procedure would demonstrate one aspect of Good Hygienic Practice, enable the manager/proprietor to ensure that the refrigerator(s) were operating efficiently, and help to ensure that foods were being stored at appropriate temperatures. Similarly, whilst documented evidence of procedures is not a formal requirement of food safety legislation, written records evidencing the frequency that refrigerators have been inspected again demonstrate Good Hygienic Practice and could contribute to a Due Diligence defence if required. The difference between recording and monitoring is not always understood and practised, and it is encouraging to note from the data that in the main, a recording procedure was undertaken albeit in a variable manner.

3.5.5. Legislation

The findings of this survey showed that in most of the hotels (89% overall), both the Food Safety Act 1990 and the Food Hygiene (Amendment) Regulations 1990/91 were not only kept on the premises, but had been read by at least 90% of the respondents. It is also encouraging to note that these figures were reflected in the smaller hotel group, which is frequently subjected to criticism (Allan, (Ed.) 1998, p. 5). In the experience of the author however, many proprietors of small establishments are not familiar with the details of food safety legislation, and it is possible that responses may represent

over-exaggerated claims. It is perhaps understandable that the EC Directive attracted less attention, for two reasons. Firstly, industry personnel may have been focusing more upon the more direct influence of the UK legislation itself, especially the introduction of the Food Safety Act 1990. Secondly, the European Directive was still a relatively new influence upon food safety legislation at the time that this survey was conducted and possibly not fully appreciated by caterers. Many respondents however, felt that the amount of legislation was excessive (46% overall) reflecting comments made elsewhere (Collings, 1993, p. 9). The majority of replies indicated that information regarding the legislation was at least fairly easy to obtain, although Mortlock et al (1999, p. 790) noted that more effective communication is still an issue for concern which affects the ability of caterers to fully understand the legislative requirements. Replies also indicated that the documents had been read, and that their level of knowledge and understanding was at least adequate. Their ability to describe Due Diligence however, was poor, and reflects the findings of the earlier survey (Coleman, 1992, p. 11) as well as those of Konopka (1997, p. 4), especially in terms of privately owned businesses. Out of the 84 replies, not one fully accurate description was stated even though the vast majority of respondents attached a high level of importance to it. Unfortunately, this ignorance over Due Diligence, a key feature of the 1990 legislation, is not confined to the hotel sector (Anon, 1992, p. 9). This important component of the food safety legislation was also of particular concern considering that over 80% of respondents stated that it was at least fairly easy to obtain information about food safety legislation. The subject of food safety and EHOs often instils a feeling of unease amongst caterers (Mitchell, 1996, p. 75). Most of the respondents however, felt that the number of visits received from EHOs was about right (85% overall). Environmental health departments were also most frequently cited as the most useful sources of information. This indicates that the role of the departments and their EHOs as sources of advice and guidance, and not just as enforcement authorities was a growing perception, and contradictory to the findings of Ehiri et al (1997, p. 16). Responses also indicated that enforcement procedures that may be implemented by EHOs were understood in the majority of hotels.

3.5.6. The management of food safety

It has been stated that there is widespread confusion regarding Risk Assessment based approaches to the management of food safety, and their application within the Hospitality and Catering industry (Ehiri and Morris, 1996, p. 302). This may explain the diverse levels of knowledge and understanding stated regarding HACCP, ASC and Due Diligence. To some extent, some unawareness of HACCP and ASC may be explained by the fact that the Department of Health explanatory booklet on ASC was not published until 1993, and the EC Directive "introducing" some of the principles of HACCP was also not published until 1993. Due Diligence however, is an integral component of the Food Safety Act 1990 introduced in January 1991, and as discussed elsewhere in this chapter, a higher level of understanding would have been expected. The results obtained from application of the Risk Assessment model indicated that in terms of Risk Assessment, there were no statistically significant differences ($p > 0.05$) between hotel groups, whether by size or ownership. The combination of p and f values did indicate however, possible differences within each of the groups. This indicated that levels of risk were affected by factors specific to each individual establishment. Such factors may have included individual management styles and attitudes to food safety, access to information, knowledge and understanding of the legislation, inadequate training and supervision, or a combination of these.

3.5.7. Supporting practices

In terms of other supporting practices and procedures, visits to suppliers were not undertaken by a significant proportion of hotels (39% overall), even though it is one possible aspect of demonstrating Due Diligence if the need should arise. A more positive set of responses was demonstrated with regard to the checking of deliveries, even though in 15% (overall), of hotels, this was not carried out to a pre-determined system. In the experience of the author, taking samples of foods for microbiological testing if required, has never been seriously undertaken in hotels and many other sectors of the industry. This is reflected in the results shown in table 3.27, particularly

with regard to small establishments. Similar findings were obtained by Ehiri et al (1997, p. 5) in their 1995 study. Communications with colleagues in industry would suggest however, that this practice has taken on a higher level of importance in recent years, at least in larger hotels, and this is a positive development. The maintenance of written documentary evidence has been referred to earlier in this chapter and elsewhere in this thesis, particularly with regard to it's contribution to food safety monitoring and to a Due Diligence defence. Whilst many responses indicated that documentation was kept for a range of purposes, it is clear that in many hotels this was not practised. The reasons may be many and variable. A lack of time because of over-burdensome work schedules, poor management control and training procedures, or apathy, are just a few possible reasons.

3.5.8. Training

As previously discussed in this thesis, food hygiene training is extremely important if safe levels of food production are to be maintained (Ehiri et al, 1997, p. 14), although the methods used to train, and their effectiveness is subject to some debate (Rennie, 1994, pp. 20-24), (Taylor, 1994, p. 14). The results of this survey showed that in approximately a quarter of medium and large hotels nobody was directly responsible for food hygiene training, although experience shows that in practice this is delegated to the Personnel and Training manager and forms an integral part of any induction process. In smaller hotels however, management structures are less clearly defined and fewer managers are employed, with the responsibility for all training falling upon one or two individuals or the proprietor him/herself. Whilst in itself, the findings shown in table 3.28 were not indicative of negative approaches or attitudes to training, they do give cause for concern and possibly reflect some of the more critical comments made about the sector by other authors (Allen, 1991, p. 12), (Morrison et al, 1998, p. 368).

3.6. Conclusions:

When the findings discussed in this chapter are compared with the results of the earlier (1992) survey, several similarities may be seen. The majority of replies indicated that it was at least fairly easy to obtain food safety legislation information, especially from EHO's and the local authority, and that they had read the information once received. A large proportion of respondents (31%) however, still found the legislation confusing in parts and 11% stated that it was hard to read and understand. This was particularly reflected in the inability of all respondents to clearly define or describe Due Diligence, but also may be recognised by the variable and inconsistent approaches to quality assurance measures and SOPs designed to support adequate food safety standards. The maintenance of documentation was ad-hoc and variable for example, as were other supportive procedures such as visiting suppliers, food sampling, and the recording of refrigerator temperatures. Combined with the lack of food hygiene training managers in many hotels, it may be argued that unstructured approaches to food safety were evident in many of the hotels surveyed.

At the time of this survey, the management of food safety by utilising formal management systems based upon some of the principles of HACCP was a relatively new concept within the legislation. This may to some extent explain the uncertainty surrounding the respondents levels of knowledge in these areas. Whilst the responsibility for ensuring safe food has always been that of the caterer, it may also explain the variable and inconsistent approaches apparent in the areas discussed above. It is disconcerting however, to note that subsequent studies have resulted in similar findings (Ehiri et al, 1997, p. 8), (Mortlock et al, 1999, p. 787), indicating that central government and local authority initiatives have had a limited effect on elevating the status of food safety or improving safe food production practices.

The reliance upon small numbers of staff to prepare food can be confirmed by the experience of the author, even in larger establishments. When staff days off and holidays are taken into account, the numbers are reduced even further. Combined with function bookings which often involves more than one on any one day, the pressures upon food handlers and managers are considerable, and can contribute to "short-cuts"

leading to an increased level of risk to the customer. The diversity and amount of catering responsibilities frequently for large numbers of customers, demonstrated in the results of this survey, increases these pressures upon human resources as well as impacting upon those factors which have been found to contribute to food poisoning outbreaks. For example, the reheating of previously cooked foods, and the frequent use of high-risk foods, contribute to increased levels of risk. Catering establishments are frequently criticised for poor standards, especially smaller businesses, and this has been discussed in both this chapter as well as in chapter two. Application of the Risk Assessment rating list however, showed little or no difference in risk between hotel groups by ownership or size. Deficiencies in knowledge, understanding or application of good practices were found in all groups and were therefore common to all hotels in this survey irrespective of size or ownership. Other studies (Ehiri et al, 1997, p. 8), (Mortlock et al, 1999, p. 787), established higher levels of concern regarding small and medium sized establishments, but these studies included other sectors of the Hospitality and Catering industry, and larger sample groups. Whilst further investigation would need to be undertaken in Wales, to ascertain whether any findings would be comparable or not, the following chapter reports on attitudes of caterers to food safety legislation and food production practices, and provides a broader reflection of views across all industry sectors.

CHAPTER FOUR

WELSH CATERERS: ATTITUDES AND APPROACHES TO FOOD SAFETY.

4.1 Introduction:

The findings reported upon in chapter three made reference to a range of issues relating to food safety and the management of them, including:

- the difficulties associated with catering for large numbers
- The inherent pressures associated with the catering industry
- the frequent use of high-risk foods
- food preparation procedures associated with food poisoning, e.g. preparing foods too far in advance
- a lack of understanding of food safety legislation
- approaches to related procedures, e.g. maintenance of documentation and temperature monitoring
- the lack of nominated personnel responsible for food hygiene training

This chapter extends and further explores some of these issues and others, by examining attitudes of personnel within the Hospitality and Catering industry. Primary and secondary methods of data collection were utilised to obtain information regarding various food preparation procedures, food safety legislation, risk assessment, training, and the management of food safety.

Coleman and Griffith (1997, p. 244) referred to the need for customers to be assured of receiving food prepared and cooked in a safe and hygienic manner. With eating out now a national pastime involving most of the population, commercial catering establishments are very much in the public eye and have both legal and moral obligations. Current food safety legislation requires that all food businesses must identify all hazards and assess any risks associated with their operation and ensure that

food is safe for the consumer (JHIC, 1997, p 4). Caterers, like other food businesses must be aware of the legislative requirements and make every effort to comply with them. Even though methods of data collection have changed (Cowden et al, 1995, p. 109), evaluation of the impact which the food safety legislation has had upon reducing the number of reported incidents of food poisoning suggests that it has had limited success (Coleman and Griffith, 1997, p. 233). The current EC Directive on the Hygiene of Foodstuffs and the UK Food Safety (General Food Hygiene) Regulations 1995, require that caterers adopt a proactive and systematic approach to ensuring safe food, with the implementation of a suitable management control system which concentrates on the identification, monitoring, control, and review, of hazards and risks within their establishment. The governments' strategy then, is to place much of the responsibility for food safety firmly into the hands of industry personnel, in an attempt to make them more proactive, and concerned about the level of food safety knowledge held by managers and staff. This clearly reflects more of a quality assurance based approach and is to be commended in principle. Ehiri et al (1997, p. 20) state however, that most food business operators have a limited understanding of such systems and strategies. There are then, it would seem, factors which influence the degree of knowledge and understanding, and the success to which food safety will be managed. Attitudes of personnel involved in food preparation and it's management have been recognised as one such influencing factor (Mortlock et al, 1999, p. 790). It is important therefore, to acknowledge the influence that negative attitudes to food safety have on effecting appropriate preventative measures and compliance with legislation. Allen (1991) refers to negative management attitudes which are endemic within the Hospitality and Catering industry, and of managers who relate every aspect of their business to the "bottom-line" (p.12). He also cites one manager as stating "good hygiene standards and functions such as training and food safety, are excellent in theory, but unnecessary in practice" (p. 12). Views such as this do nothing to elevate food safety to the level of importance which it deserves, or inspire confidence in senior personnel within the industry.

Konopka (1997, pp. 4-5) suggests that larger organisations are more proactive and experienced in developing and implementing effective food safety procedures, whilst small establishments have limited experience of such approaches. A number of barriers

however, have been identified which may suggest why levels of knowledge and understanding, and therefore, the appropriate implementation of good hygiene practices and food safety systems, is problematic. These include - a lack of time, a lack of resources and personnel especially in small businesses (Mortlock et al, 1999, p. 790), inappropriate training which frequently suffers from a lack of funding (Conway, 1996, p. 7), and a lack of government leadership (Smith, 1994, p. 45). Barriers such as these must be overcome if consistent levels of safe food are to be produced and served to the customer.

4.2. Food hygiene training:

Staff, especially those who handle high risk foods, should be adequately and continuously trained, as should senior supervisors and managers who are directly involved with the catering operations (JHIC, 1997, p 11). The importance of education and training for food handlers and managers is clearly critical to food safety. This is true with regard to the principles of food hygiene and good hygiene practices, and also for the successful management of food safety procedures (Griffiths, 1998, p. 32). With the introduction of the Food Safety (General Food Hygiene) Regulations 1995, the government, under the assumption that food safety would be improved through increased training included a requirement stating that:

> "the proprietor of a food business shall ensure that food handlers engaged in the food business are supervised and instructed and/or trained in food hygiene matters commensurate with their work activities".
>
> Food Safety (General Food Hygiene) Regulations 1995

Such an approach has traditionally been concerned with increasing knowledge of food safety practices, and the success and effectiveness of training on behaviour has yet to be fully evaluated. The Catering Industry Guide to Good Hygiene Practice (1997, pp. 9-15) does however, attempt to interpret the legal requirements and provides detailed guidance and suggestions for supervision, instruction, and training. Equally, a number

of Codes of Practice have been published and may be purchased by anyone who wishes to do so.

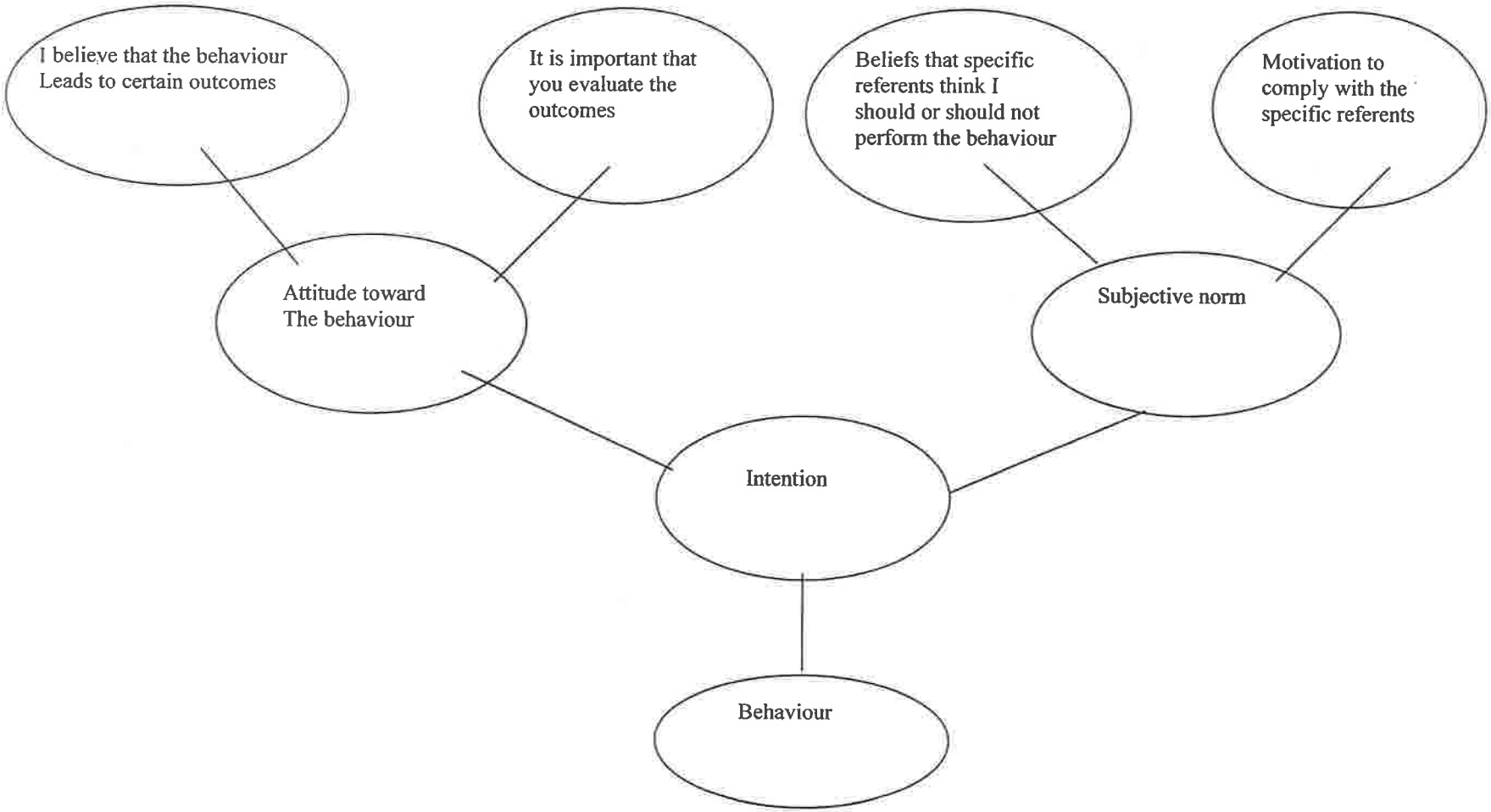
There are however, uncertainties regarding the effectiveness of training which is based solely upon the accumulation of knowledge, and its success as an indicator of actual behaviour (Coleman, Griffith and Botterill, 2000, p. 146), (Tebbut, 1992, p. 136). Ehiri and Morris (1996, p. 243) also concluded that knowledge based training with an emphasis upon certification was on its own, insufficient to assure safer food handling practices. They argued that education and training programmes would only be of benefit if they were part of an overall infrastructure for food safety control which takes account of the attitudes of individuals. This approach has an implied assumption about the ability of training on its own, to change food hygiene practices. As the literature demonstrates however, the relationship between knowledge, attitudes and behaviour is problematic, and this makes it difficult to determine how appropriate and cost-effective training really is. Ackerley (1994, pp. 69-73) utilised the Health Belief Model (HBM) when investigating public perceptions of food hygiene and food poisoning. One conclusion arrived at was that knowledge alone does not indicate that a change of behaviour will occur. This conclusion is shared by others including Williamson, Gravani and Lawless (1992, p. 97), and Rennie (1994, p. 24) whose research centred around personnel within the Hospitality and Catering industry. The KAP (Knowledge, Attitudes, Practice) model of training relies on the provision of information coupled with the assumption that people will then act on the information and behave rationally. It has, however, had only limited success (Griffith, 2000) as it "relies on the provision of information coupled with the assumption that people will act on the information and behave rationally (p. 251). Rennie (1994) further suggests that despite the abundance of information and guidance, good hygiene is not being practised, citing the poor training standards found in a large number of food premises. As she states - "knowledge alone does not lead to changes in food handling practices" (p. 24). Similarly, Clayton, Griffith, Peters and Price (2000, p. 63 - 64) refer to the fact that improper food handling practices contribute to approximately 97% of food poisoning incidents in catering establishments. It would seem therefore, that more emphasis needs to be placed upon the attitudes of personnel involved in food handling and the effect that they have upon behaviour, which in itself may be deeply rooted and difficult

to change (Rennie, 1995, p. 77). A recommendation also made by Mortlock et al (1999, p. 790) who established the importance of attitudes towards food safety, and the effects that they can have upon behaviour and the implementation of food safety practices and systems.

4.3. Attitudes:

Attitudes represent the combination of knowledge and feelings that individuals have about an object (Mowen, 1993, p. 259). Not being always tangible, they cannot be directly observed and therefore need to be inferred from what is spoken and/or from observed behaviour. Various definitions exist to describe attitudes. Schiffman and Kanuk (1991) for example, refer to attitudes as being "an expression of inner feelings that reflect whether a person is favourably or unfavourable predisposed to some object" (p. 226). The "object" itself should be considered within a broad context and may include specific products, persons, actions, practices, or behaviour. In the context of this thesis, the object may be regarded as food safety legislation, the reheating of food, or the application of risk based management systems for example. The same authors also refer to attitudes as being considered within a consumer behaviour context, then being described as "a learned predisposition to behave in a consistently favourable or unfavourable way with respect to a given object" (p. 227). Whatever the definition, a number of models exist which endeavour to categorise attitudes and their component parts (Schiffman and Kanuk, 1991, pp. 230, 232-233). Each of these models provides a different perspective in terms of their inter-relationships. Ajzen and Fishbein (as cited in Schiffman and Kanuk, 1991, p. 236) for example, have developed models including the Theory of Reasoned Action which focus upon a comprehensive integration of attitude components to better predict and explain behaviour. One of the key principles of the Theory of Reasoned Action is the relationship between behaviour and the intention to act, by an individual, as shown below (See figure 4.1)

Figure 4.1: The Theory of Reasoned Action



Adapted from: Ajzen and Fishbeins (as cited in Schiffman and Kanuk , 1991, p. 236).

In this model, Ajzen and Fishbein establish a series of inter-related attitude components which when combined together result in an intention to act and the ultimate behaviour of the individual. The authors emphasise the importance of the intention to act component of the attitude as this they state, is a better predictor of actual behaviour than other, simpler models.

4.4. Aims:

Caterers must be aware of the legislative requirements and make every effort to comply with them. Proprietors, managers and food handlers must ensure that good hygienic practices are implemented during their daily operations. Compliant behaviour is however, predicated on a range of variables other that simple awareness or knowledge of the legislation (Rennie, 1994, p. 22), and various studies have attempted to discuss these variables and their inter-relationships (Griffith, 2000, p. 251). Negative attitudes among catering managers have been referred to as being endemic within the industry (Allen, 1991, p. 12) and barriers to effective food safety standards including inappropriate training, have been described. It would seem clear that much more needs to be known about the attitudes of caterers towards food safety issues and food safety legislation, and the potential to influence behaviour. By investigating the beliefs of caterers and attitudinal components such as "intention to act", it is possible to expand upon existing knowledge and discuss the behavioural patterns that are likely to occur. The Aims of this chapter therefore are to:

- design and develop a data collection instrument for ascertaining the attitudes of caterers towards aspects relating to food safety, food safety legislation, and food production practices.
- analyse and discuss the results obtained from an attitude scale administered to a range of personnel across various Hospitality and Catering industry sectors.
- evaluate and compare the findings with those of the previous survey conducted as part of this thesis, and with other surveys conducted in the UK.
- determine levels of consistency of attitude dimensions across various sectors of the Hospitality and Catering industry.

4.5. Methods:

4.5.1. Introduction:

The Hospitality and Catering industry is comprised of a number of sectors (see chapter two.) Individual establishments and organisations within these sectors may operate on a commercial basis or be largely non-profit orientated. Many of the fundamental characteristics relating to the provision of food however, remain similar, whether it applies to large or small scale catering, and traditional methods of food production and the management of food and beverage operations retain a common basis. The survey reported upon in chapter three focused upon the hotel sector in Wales and investigated aspects of the provision of food including for conferences and functions, knowledge and understanding of caterers with regard to aspects of food safety legislation, and certain procedures associated with food safety. For the purposes of this survey, it was decided that a range of sector establishments of various sizes be included. This would enable the researcher to build upon the findings obtained in the hotel survey by exploring and comparing the attitudes of caterers from different industry sectors. Whilst it had originally been planned to conduct a postal survey throughout the whole of Wales, it was decided to administer the attitude questionnaires during a series of food safety conferences which had been planned by the South Wales Food Hygiene Club. The club founded by the author, in conjunction with the South Wales Electricity Company (SWALEC) and the local branch of the HCIMA consisted of caterers from all sectors and was established to promote food safety throughout the industry in the South and Mid-Wales areas. Three conferences were to be held in Cardiff, Swansea and Cwmbran and an audience of approximately 300 caterers was anticipated. By utilising the conferences, it would enable the researcher to ensure a sample group which included personnel from a range of industry sectors both commercial and non-profit making, albeit from South and Mid-Wales only. It was anticipated that such a course of action would also enable a large number of responses to be obtained from a variety of industry personnel including food handlers, supervisors, managers, and proprietors. It was further anticipated that as delegates attending the conferences had an interest in food safety, a higher response rate would result as opposed to one conducted by post.

4.5.2. Data Collection methods:

To obtain the required information, a self-administered attitude scale was considered to be the most appropriate form of data collection instrument and one was devised which allowed for quantitative responses to be given to both positive and negative (to the attitude object) statements. Use of the food safety conferences represented a non-probability convenience based sampling method (Saunders, Lewis and Thornhill, 1997) and a sample population of 279 catering proprietors, managers, and staff from a range of industry sectors in South and Mid-Wales were identified as the sample group. A data collection instrument based on a Likert scale was devised and distributed to a 5% representative sub-sample as a pilot exercise prior to the conferences. As a result, a number of statements were reviewed and amended. The final survey instrument, the Wales Food Safety Attitude Battery (WAFSAB) consisting of 35 statements designed to obtain data regarding attitudes towards food safety legislation and enforcement, management and staff responsibilities, and operational practices was constructed (see appendix 3). It was distributed to the full sample group over the three day period of the conferences. Statements used in the survey instrument were designed to investigate beliefs, attitudes and intentions of caterers across a range of areas related to food safety legislation, personnel responsibilities, and food preparation. Statistical analysis was carried out using SPSS for Windows.

4.5.3. Validity and Reliability:

Reference was made in the previous chapter to the need for validity and reliability to be considered when designing and constructing data collection instruments. For the purposes of this survey, validity was ensured as much as possible by testing for face validity by matching the attitude statements with the Aims of the survey, and for content validity by conducting a pilot exercise with other academic researchers and industry personnel. The representative spectrum of caterers from a range of industrial sectors also contributed to the validity of the results obtained. Regarding reliability. As with the previous survey, whilst it would be desirable to know that if the attitude scale

was administered on more than one occasion, the results would be consistent, this was not the aim of this survey and therefore, external reliability was not tested. Internal reliability was ensured as much as possible by careful construction of the attitude statements in a manner which would eliminate mis-interpretation and misunderstanding, and by the piloting process which identified any ambiguities within the scale.

4.5.4. Research limitations:

The inclusion of responses from personnel representing Hospitality and Catering establishments in North Wales would have provided a greater breadth of information to be analysed and added strength to the sample group, as well as further contributing to the validity and reliability of the data. Whilst an additional postal survey to the North Wales area was considered, this was discounted for two reasons. Firstly, the lack of detailed information regarding a variety of suitable outlets, and secondly, the results obtained in the previous survey (see chapter 3) did not indicate any differences in responses between hotels in North or South Wales. The problems associated with providing food for large numbers of people were discussed in the previous chapter and consideration was given to restricting participants in this attitude survey to those working in establishments where conferences and/or functions were provided. It may be argued that this would have resulted in a greater degree of consistency regarding the findings and subsequent discussion. As previously referred to however, many caterers are nomadic by nature and it is to some extent inevitable that significant numbers of them will have worked in both small and large scale catering environments at some time during their career. This factor, combined with the need for all caterers to have positive attitudes towards food safety no matter how many people they are catering for, contributed to the decision not to restrict the survey in this way. The more general limitations associated with questionnaires referred to in the previous chapter were to some extent minimised by utilising the conferences as a source of respondents. The tendency for respondents to provide answers which they consider more appropriate could not however, be overcome, and it is possible that attendance at one of the conferences did contribute to a degree of bias which perhaps provided more

optimism within the results. The representative nature of the audiences and the large number of responses obtained however, was recognised as a positive factor. The results presented and the subsequent discussion should be interpreted against these factors.

4.6. Results:

4.6.1. Introduction:

A total of 211 completed questionnaires were returned reflecting a response rate of 76%. Such a response rate was higher than originally anticipated and justified the primary data collection method adopted. The respondents job titles and descriptions were used to categorise the results within the industry and six main industrial sectors were identified (see table 4.1)

Table 4.1: Hospitality and Catering industry sectors represented in the survey.

Industry sector	Number from each sector (N)	Percentage of total * (%)
Hotels	27	13
Restaurants	48	23
Hospitals and welfare establishments	69	33
Industrial/contract caterers	28	13
Schools and institutional establishments	25	12
Others	14	7
Total	211	100*

* percentage figures rounded up/down to nearest 1.0%

Data were subjected to chi-squared tests to determine any statistically significant differences between the sectors and out of the total number of statements six elicited differences between industrial sectors ($p < 0.05$). These are indicated in tables 4.2, 4.3, and 4.4 (percentage figures are shown in parentheses and have been rounded up/down to the nearest 1.0%). It should be noted however, that not all statistically significant differences were directly related to differences between sector responses. In some instances, high numbers of responses in one or more of the attitude scale columns resulted in less than expected counts when subjected to the chi-squared test. For example, for statement number 10 in table 4.3, virtually all respondents agreed with the statement. Consequently, a low p value was arrived at. For analysis purposes the results are reported in three areas: Legislation and Enforcement, Management and Staff Responsibilities, and Food Production Practices. Results were consistent across all industry sectors unless otherwise indicated.

4.6.2. Legislation and Enforcement:

The results (table 4.2) indicated that food safety legislation was clearly an area of some concern. A large majority (82%) of respondents stated that they would be better able to comply with the legislation if it was made simpler, especially as considerable thought and planning time was necessary to implement precautions (81%). A number of respondents however (59%), were uncertain whether the forthcoming 1995 Food Safety (General food Hygiene) Regulations and 1995 Food Safety (Temperature Control) Regulations would help to simplify matters, although 41% thought that they would. Responses regarding the amount of food safety legislation also varied. Overall, 55% of respondents disagreed that it was excessive, but this was only indicated by 31% of replies from the hotel sector. Equally, more responses from the hotel sector (54%) than from the other sectors, indicated agreement that the amount of legislation had become excessive.

Table 4.2: Responses to WAFSAB statements in the area of Legislation and Enforcement (percentage figues).

SERIAL	STATEMENT	STRONGLY AGREE	AGREE	UNCERTAIN	DISAGREE	STRONGLY DISAGREE
1	Adherence to Due Diligence procedures will reduce food poisoning	58	35	3	4	---
2	The introduction of the Food Safety Act 1990 has reduced the number of cases of food poisoning	2	16	32	38	11
3	The amount of food safety legislation has become excessive~	6	24	15	46	9
4	Food safety legislation poses particular problems for small establishments #	1	20	27	44	9
5	Sufficient information regarding the new food safety legislation is readily available.	6	42	24	24	4
6	EHOs enforce legislation consistently	14	47	23	13	3
7	Simplified food safety legislation would enable me to adhere to its requirements more rigorously	23	59	7	11	---
8	Adequate food safety precautions require a lot of thought and planning time	21	60	3	15	1
9	The 1995 food safety legislation will similify existing regulations	6	34	59	1	1
10	Caterers should not be involved in designing their own Risk Assessment programme	2	9	19	47	22
11	Risk assessment programmes for food safety will reduce the chances of food poisoning	26	65	8	1	1

Key: # indicates differing responses from individual sectors (i.e. $p < 0.05$), using chi-squared test.
Note: All percentage figures rounded up / down to nearest 1.0%

The effect of the legislation on smaller businesses also revealed a mixed set of responses and uncertainty. Fifty three percent of responses indicated disagreement that food safety legislation posed particular problems for small businesses especially from the "others" category (83%), although 21% stated that it would pose problems, and 27% were uncertain. Further uncertainties were also expressed about other aspects of the legislation, including whether the introduction of the Food Safety Act 1990 had led to a reduced number of cases of food poisoning. Forty nine percent stated that it had, but 32% were uncertain of its effect and 19% felt that it had not done so. Equally

mixed responses were received regarding the availability of information, with 48% reporting that sufficient information was available to them, 24% unsure and 28% disagreeing. Some elements of the 1990 Act however, were considered to be effective, with 93% of respondents indicating that adherence to procedures that could be used to demonstrate Due Diligence would reduce food poisoning, as would the introduction of Risk Assessment based programmes (91%). Whilst $p < 0.05$ for this statement regarding Risk Assessment programmes, this may have been due to the lower number of responses from the institutional sector (18%), and respondents representing other sectors (14%), who indicated that they were uncertain. A lower majority of respondents however (69%), thought that they should be involved in designing their own Risk Assessment programme. In relation to enforcement, a similar proportion (61%), agreed that EHOs were consistent in their enforcement of the legislation, although fewer responses from the institutional sector agreed with this. Regarding qualifications, the vast majority of replies (95%), indicated agreement that all food handlers should have a food hygiene qualification, and 87% stated that this should apply to hospitality and catering managers also.

4.6.3. Management and Staff Responsibilities:

An understanding of the importance of the risk of food poisoning was demonstrated in this area, (table 4.3) with 96% of respondents stating that it was their responsibility to ensure that the legislation was correctly implemented, and that they would feel more confident about managing food safety by complying with the legislation (96%).

Table 4.3: Responses to WAFSAB statements in the area of Management and Staff Responsibilities (percentage figures).

SERIAL	STATEMENT	STRONGLY AGREE	AGREE	UNCERTAIN	DISAGREE	STRONGLY DISAGREE
12	I am now taking a more proactive approach to food hygiene compared with 5 years ago.	38	54	1	5	1
13	Written records are useful as part of our food safety monitoring programme.	34	56	8	1	1
14	The main reason for me complying with food safety legislation is the threat of prosecution.	8	18	4	52	19
15	Complying with food safety legislation would make me feel confident about food safety	36	60	2	2	—
16	Food safety systems in this establishment are likely to be reviewed in order to comply with new legislation	14	51	32	4	—
17	It is my responsibility to ensure that the new food safety legislation is correctly implemented	40	55	4	1	—
18	I do not have time to deal with the new food safety requirements	1	3	5	62	30
19	If cases of food poisoning are suspected, the food handlers are likely to be responsible #	6	43	18	32	2
20	Food handlers are in position to exert a strong amount of control over the potential for food poisoning	31	67	2	1	—
21	Hotel and Catering Managers are in a position to exert strong control in the prevention of food poisoning #	34	62	3	2	—
22	All food handlers should have a food hygiene qualification	70	25	3	1	1
23	Hotel Managers do not need to have a food hygiene qualification	2	7	3	47	40
24	Training programmes for staff and management will be held as part of the preparation for the new food safety legislation #	27	61	11	1	—

Key: # indicates statistically differing responses from individual sectors (i.e. p.<0/05), using chi-quared test.

Note: All percentage figures rounded up / down to nearest 1.0%

The threat of prosecution was not seen as a major reason for compliance by most caterers (71%). The majority of responses indicated that caterers were taking a more proactive approach to food safety than they were five years ago (91%) and although

not required within the legislation, 90% felt that written records were useful as part of their monitoring programme. Time was not seen as a barrier with 92% of respondents stating that they had sufficient time to implement food safety requirements. Eighty eight percent replied that training programmes would be held as part of their preparation for the 1995 Regulations, although more uncertainty was shown by the institutional sector (28%). Sixty five percent of responses indicated that food safety systems in their establishment were likely to be reviewed when the Regulations were introduced. A slightly higher degree of uncertainty was however shown within the industrial sector (42%). Ninety seven percent of respondents indicated that food handlers held a strong amount of control over the potential for food poisoning, and 95% felt that this also applied to managers. Uncertainty was shown however, regarding where responsibility would rest if cases of food poisoning were suspected in their establishment. Whilst 48% overall stated that food handlers would be responsible, this was not so strongly believed by the institutional sector (21%) and the hotel sector (33%). Similarly, a higher percentage of respondents from the institutional sector (50%), disagreed with the statement.

4.6.4. Operational Practices:

Most caterers (table 4.4) stated that they intended to handle poultry with greater care than other foods (84%) and 74% of all responses displayed reservations about serving lightly cooked eggs, especially from within the industrial sector.

A more mixed set of responses were evident when considering the desirability of serving rare or underdone foods, and although 60% replied that this was to be avoided, 17% were unsure and 23% disagreed. Caterers were more certain when it came to handling cooked rice however, with 94% stating that it should be handled and stored with particular care. A lower overall majority (81%) replied that prepared meat products and pies were foods associated with food poisoning, with fewer responses from the restaurant sector (66%) and other caterers (64%) falling into this category.

Table 4.4: Responses to WAFSAB statements in the area of Operational Practices (percentage figues).

SERIAL	STATEMENT	STRONGLY AGREE	AGREE	UNCERTAIN	DISAGREE	STRONGLY DISAGREE
25	I intend to handle poultry with no greater care than other foods #	3	9	3	49	35
26	Prepared meat products and pies are rarely implicated in food poisoning #	2	9	8	55	26
27	Cooked rice should be handled and stored with particular care #	48	46	2	3	1
28	I have no reservations about serving lightly cooked eggs	2	12	12	50	24
29	Temperature controls are an effective method of reducing the number of cases of food poisoning	40	58	1	—	—
30	Cross – contamination is easy to avoid in catering operations	14	54	9	23	1
31	Cooling cooked foods rapidly helps to prevent food poisoning	37	44	4	11	4
32	Serving food rare or underdone is undesirable	13	47	17	20	3
33	Preparation of food in advance is likely to contribute to food poisoning	16	46	12	25	1
34	Correct control of temperature is more important for raw foods than cooked foods	3	19	9	60	10
35	Reheating of cooked or previously prepared foods is of minor importance in food safety	1	3	1	54	41

Key: # indicates statistically differing responses from individual sectors (i.e. $p<0/05$), using chi-squared test.

Note: All percentage figures rounded up / down to nearest 1.0%

Disagreement with this was slightly more prominent from within the restaurant sector. Sixty seven percent of respondents overall stated that cross-contamination was easy to avoid in catering operations, especially from within the hospital sector (80%). Disagreement to this statement varied across all sectors, ranging from 13% (hospitals) to 44% (industrial). Ninety five percent of the caterers recognised the dangers of reheating cooked or previously prepared foods. There was however, a more diverse set of responses regarding the preparation of food in advance. Some diversity in responses was also reflected with regard to temperature control. Twenty two percent of the replies stated that the correct control of temperatures was more important for raw foods and sixty nine percent disagreed with this statement. Virtually all respondents

however (99%), agreed that temperature controls were an effective method of reducing the number of cases of food poisoning, and 81% stated that the rapid cooling of cooked foods would also help to prevent food poisoning. Overall, 60% of respondents believed that the preparation of food in advance was likely to contribute to food poisoning. Twenty six percent however, and 12% were uncertain. Of those respondents who disagreed, 25% were from the hospital and welfare sector and over 30% were from the hotel, restaurant and industrial sectors. A slightly lower figure of 25% was obtained from the institutional sector.

4.7. Discussion:

4.7.1. Introduction:

In general, participating caterers were receptive to the survey and indicated a desire to co-operate although it should be recognised that this was due in part to the respondents in the sample attending the food safety conferences. It should be noted however, that the responses obtained represented a diverse range of industry sectors, personal backgrounds, levels of responsibility, and geographical locations. Many people enter the Hospitality and Catering industry without formal training and the value of in-service food hygiene training for caterers cannot be underestimated. Studies have shown however, that the efficacy of training is questionable in terms of changing behaviour and staff and management attitudes to food safety (Griffith, 1999, p. 251), (Taylor, 1994, p. 14). This is especially so in an industry which employs large numbers of part-time and casual staff, and has an acknowledged high staff turnover rate (Richmond, 1990, p. 126). Caterers may have been provided with the appropriate information and knowledge, but this does not necessarily indicate that they will behave appropriately and transpose this knowledge into physical actions (Morrison, et al, 1998, p. 368). The important role of managers in setting an appropriate culture within the kitchen environment and facilitating conditions for behavioural change cannot be underestimated (Griffith, Price and Peters, 1999, p. 13). As Howes et al (1996, p. 744) state, managers have the authority and opportunities to affect behavioural change. It is

not only managers however, who should be considered in this context. Food handlers also, must take responsibility for their actions and modify their behaviour (Rennie, 1995, p. 78).

The results of this survey show that although many caterers recognise the dangers associated with food poisoning and have positive beliefs and attitudes to food safety legislation and compliance with it, there are several areas of concern that indicate the need for further study. Such concerns mainly relate to specific food preparation and handling practices such as the handling of poultry, the adequate cooking of eggs and the preparation of food in advance. Factors which have been previously recognised as contributing to food poisoning (Ryan et al, 1996, p. 181).

4.7.2. Legislation and enforcement:

Reservations in the industry regarding the amount and complexity of the legislation have been reported elsewhere (Griffith and Coleman, 1993, pp. 11-13)., and reflect the findings of a much earlier Audit Commission report (1990, p. 7). This reflects the growing frustration of caterers who find themselves having to adapt to legislation which has changed significantly over a relatively short space of time (Coleman and Griffith, 1997, p. 233). Even though there appears to be a genuine willingness to comply with the legislation, caterers still feel that it is not as simple for them to understand as it could be and are not optimistic about it becoming any simpler in the future; sentiments shared by Brown (2000, p. 5). By implication therefore, the majority of respondents found the legislation difficult to understand. This to some extent, may provide part of the explanation why not one respondent in the previous survey (see chapter 3) was able to satisfactorily explain the principles of Due Diligence. A situation which has also been reported elsewhere (Anon, 1992, p. 9). Similarly, replies indicated a significant degree of uncertainty regarding the effectiveness of the 1990 Food Safety Act in terms of reducing the number of reported cases of food poisoning, a feature previously reported by Coleman and Griffith (1997, p. 233). Appropriate enforcement of food safety legislation has been subject to some criticism (Crossley, 1996, p. 25), (Audit Commission for Local Authorities and the National Health service in England

and Wales, 1990, p. 7), and also remains an issue for many caterers, even though LACOTS, was introduced partly to alleviate such concerns. Mortlock et al (1999, p. 790) reported that communication was an area of concern, especially if caterers are to fully understand food safety legislation. The findings of this survey show that many caterers however, do not receive sufficient information regarding the legislation. This is the case across all industry sectors, but especially so in the industrial sector (52%). As the sample group for this survey included food handlers as well as managers and proprietors, this re-enforced this concern, although in the previous survey (see chapter 3) most replies indicated that legislative information was at least fairly easy to obtain.

Management procedures based upon some of the principles of HACCP are central to the current national and European legislation and perceived to be crucial to ensuring adequate food safety standards (MAFF, Department of Health, Scottish Office and Welsh Office, 1995, p. 11). It has been reported that most small businesses do not have the resources that are frequently available to larger establishments or organisations (Richmond, 1990, p. 137), (Panisello, Quantick and Knowles, 1999, p. 94) and as indicated in this survey, a significant number of caterers felt that the legislation posed particular problems for smaller establishments. The statistically significant difference ($p < 0.05$) for the responses to this statement may be explained by the large numbers of respondents from the "others" category (71%) compared with the other sectors. The results show that caterers would feel more confident about food safety by complying with the legislation, and there was general agreement that they were responsible for ensuring implementation of it. Also, that they had time to do this even though food safety procedures require a lot of thought and planning time. Clayton et al (2000, p. 63) however, in their more recent survey, found that 62% of food handlers did not carry out appropriate precautions every time they handled food. This would seem to indicate that knowledge and attitudes to food safety are not reflected in actual behaviour. This may be due to inappropriate or poor levels of training, inappropriate working conditions, poor levels of supervision and management, or the lack of an organisational culture which encourages a positive and safe approach to the production of food in a safe environment. Reference to an appropriate organisational culture has been referred to elsewhere in this thesis and is of particular concern as it is dependent

upon positive attitudes of managers if success is to be achieved. The Audit Commission for Local Authorities in England and Wales (1990, p. 4) reported similar concerns stating that management attitudes to hygiene were a high risk factor in 52% of catering businesses. When compared with the findings of Clayton et al (2000, p. 63), this would suggest that attitudes to food safety and behavioural practices have not significantly changed in the last decade. Previous surveys in the South Wales area (Griffith and Coleman, 1993, p. 11), showed some ignorance regarding Due Diligence as well as other aspects of food safety legislation. Although this survey did not seek to confirm the findings of the earlier study, the responses indicated that Welsh caterers had developed an increased awareness of the value of procedures required to demonstrate Due Diligence, including written records. This must be a step in the right direction, especially as many of the respondents stated that food safety systems and training would be reviewed as part of their preparations for the 1995 Regulations. There is however, a dichotomy between this belief and their actual level of knowledge and understanding of the principles of Due Diligence.

4.7.3. Management and staff responsibilities:

Responses from all sectors indicated that written records were useful as part of their food safety monitoring programme. From the previous survey however (see chapter 3), it was apparent that in many hotels, the maintenance of supporting documentation was not undertaken. This would again indicate that there is a difference between what is believed to be beneficial and actual behaviour.

The positive responses across all sectors to the need for both food handlers and managers to have a food hygiene qualification was also encouraging, especially as many respondents also felt that the responsibility for safe food is not the food handlers alone. A sentiment shared by Gillespie et al (2000, p. 473). Significant numbers of caterers from all sectors disagreed that food handlers were solely responsible for cases of food poisoning. This was especially so in the institutional sector where 50% disagreed. Equally, the majority of caterers believed that managers were in a position to exert strong control over the prevention of food poisoning. A belief shared by

Morrison et al (1998, p. 368). Of some concern however, was the fact that 37% of hotel, and 29% of institutional responses indicated uncertainty regarding this statement. This may be indicative of inappropriate communication from their managers and/or a poor understanding of the legislation, or adverse attitudes towards food safety. Whatever the reason, these findings demonstrated some contradiction to the responses to statement number six in table 4.3 which showed that the majority of respondents believed that the prevention of food poisoning was their responsibility. Managers and owners within the industry should be aware that they have a legal (as well as moral) responsibility and prosecutions can affect them as well as the individual food handler (Netherton, 2000, p. 1008). Managers and owners are responsible for setting appropriate standards and developing an organisational culture which promotes a safe environment for the preparation and production of food. Regarding the hotel sector, results from the previous survey (see chapter 3) indicated that in approximately a quarter of medium and large hotels, nobody was directly responsible for food hygiene training. This could imply that in these establishments the responsibility for being adequately trained was with the individual food handler as opposed to the organisation. Whilst specific data is unavailable to support this speculation, it raises questions regarding where responsibility lays, especially in view of the Food Safety (General Food Hygiene) Regulations 1995. It was encouraging however, to note that the majority of caterers across all industry sectors indicated that they should be involved in designing their own Risk Assessment programme, especially as the respondents also believed that such programmes would reduce the chances of food poisoning. Where some negativity was demonstrated in the responses, this may have been due to many factors including ignorance, lack of confidence, time, or ineffective communication, it may also be as a result of insufficient or inappropriate training (Mortlock et al, 1999, p. 790), reflecting Rennies' (1995, p. 78) earlier views.

4.7.4. Operational practices:

Although it is clear that positive attitudes to food safety are critical if training and systematic approaches to food safety are to be fully effective (Ehiri et al, 1997, p. 19), a sound knowledge of the production process and the implementation of appropriate food preparation methods is equally necessary (Jouve et al, 1999, pp. 84-85). It was in this area that some disturbing findings were reported. Thirteen percent of caterers did not recognise the importance of poultry as a vehicle for food poisoning. Some consistency regarding these responses was shown across four sectors (health, institutional, industrial, and "others") where between 13-18% of the respondents stated that they intended to handle poultry with no greater care than other foods. Even in the hotel and restaurant sectors, just under 10% of respondents gave the same response. This is despite the plethora of media attention that has occurred over the past few years, as well as increased government communications and the introduction of the Catering Guide to Good Hygiene Practice which emphasises the need for diligence when handling and preparing high-risk foods (JHIC, 1997, pp. 53-64). In contrast, the dangers associated with cooked rice seemed well understood. The risks associated with undercooking foods, especially high risk foods have previously been reported (Evans, Madden, Douglas, Adak, O'Brien, Djuretic, Wall and Stanwell-Smith, 1998, p. 169), but 23% of caterers indicated that they have no reservations about serving foods rare or underdone, and 14% stated that they had no reservations about serving lightly cooked eggs. Of those respondents who disagreed with this statement, 26% were from hotels. Even higher percentages were recorded for institutional (30%) and industrial caterers (32%). Whilst the results obtained from the previous survey (see chapter 3) related to hotel caterers only, many of the foods used may be considered to be indicative of those used in other sectors. Significant numbers of caterers therefore, believed that serving food rare or underdone presented little danger to their customers. The risks associated with this practice have previously been discussed in this thesis as well as being reported upon in other arenas (Weingold, Guzewich and Fudela, 1994, p. 823), (Knabel, 1995, p. 127). This view may to some extent be understandable in the commercial sectors because of classical approaches to the preparation of certain dishes and customer expectations and demands, but as these responses were reflected across

all the industry sectors surveyed, there is clearly a need for more informed guidance, better communication, advice, and training.

Similar concerns may be seen in the responses regarding food preparation and production practices. The preparation of food in advance has been recognised as a contributing factor to food poisoning (Knabel, 1995, p. 127). The results of this survey demonstrate however, that many caterers from at least four industry sectors did not believe that there was a risk attached to this practice. Cross-contamination has been reported as contributing to 39% of outbreaks of food poisoning (Evans et al, 1998, p. 169), although some authors state that figures tend to be underestimated because of the difficulty in detection during short inspections (Worsfold and Griffith, 1996, p. 101). Significantly large numbers of caterers across all sectors however, did not perceive cross-contamination to be a problem, even though the risk of contamination increases when bacteria with low minimum infective doses (MIDs) such as E.coli 0157 and Campylobacter (Dillon and Griffith, 1996, p. 83) are involved. The importance of handling and storing foods at correct temperatures has been well documented (Worsfold and Griffith, 1997, pp. 100-101) and is an important part of food safety legislation. A number of respondents (14%) from a range of industry sectors however, were in disagreement with the statement that rapid cooling of foods helps to prevent food poisoning; a food handling practice which has been previously reported as being misunderstood (Worsfold and Griffith, 1997, p. 102), (Weingold, Guzewich and Fudela, 1994, p. 823). A disturbing finding in view of the fact that food hygiene training courses as well as numerous texts and leaflets emphasise the "danger zone" very clearly. As many food handlers and managers will have experienced some form of training and/or instruction, either formal or informal, this suggests that there may be other reasons for taking this view. These may include negative attitudes and beliefs, or difficulties in translating general hygiene advice into the implementation of specific food safety practices. Findings such as these add weight to the recommendations that food hygiene training in operational situations should be orientated towards hazards and risks (Morrison et al, 1998, p. 368).

4.8. Conclusions:

This survey has investigated attitudes of caterers towards issues relating to food safety. Results indicated that variable attitudes prevailed across some sectors. It is clearly important to continue to further develop WAFSAB as a valid and reliable measure of food safety attitudes. How these beliefs and evaluations are sustained might best be explored through direct observation in kitchens or through in-depth qualitative methods. The refinement of WAFSAB is an essential step in developing a consistent set of behavioural intentions with which to work. In some models of attitude/behaviour (Azjen, 1991, pp. 195-196), it has been suggested that the influence of peers, in the form of fellow food handlers, supervisors and managers also influence the behavioural intention of an individual. The findings of this survey together with the subsequent discussion, would appear to support that suggestion.

Together with positive attitudes and beliefs towards food safety, many caterers stated that they were more proactive in their approaches to the prevention of food poisoning and had a desire to comply with the legislation, which in turn would make them more confident regarding the management of food safety. They also believed however, that the legislation was confusing and difficult to understand, presented particularly problems for small establishments, and would be more effectively understood, interpreted and applied if it was made simpler and more readily available to them. The issue of availability was more strongly demonstrated in this survey than that previously conducted in the hotel sector (see chapter 3). The belief that Risk Assessment based preventative programmes would reduce levels of food poisoning was a positive outcome of this survey, as was the fact that most caterers stated that they should be involved with the design and development of such programmes. It has been previously reported however, that an understanding of hazard analysis and risk based approaches together with effective implementation within the Hospitality and Catering industry is ineffective and limited (Ehiri et al, 1997, p. 18), especially in small establishments. Whilst attitudes towards this have been stated as one contributing factor (Mortlock et al, 1999, p. 790), it is also clear that confusion regarding food safety legislation together with a poor understanding of the requirements and contents, is another. The relevance of adhering to the principles of Due Diligence was well recognised. The

results of the earlier 1992 survey as well as the findings reported upon in chapter three however, demonstrated a lack of understanding regarding this component of the legislation. Therefore, whilst caterers appreciated its importance, there were uncertainties regarding their ability to adequately explain its principles. This must have an adverse effect upon staff training and the application of appropriate preventative and supporting measures, including the maintenance of written records. In attitudinal terms, whilst a positive belief towards these areas was held and many responses indicated an intention to act in a particular manner, intentions did not always did not reflect this.

A shared responsibility for preventing food poisoning was recognised and this was a positive finding. Many caterers believed that managers were in a strong position to influence and control food safety measures. Unfortunately, other research has shown that managerial attitudes towards controlling food safety, training, and proactive approaches are not always positive (Mortlock et al, 1999, p. 790), (Aston, 1996, p. 21). The degree of (positive) influence may therefore, be questionable. Attitudes and approaches to training have attracted considerable debate (Ehiri et al, 1996, p. 243), (Griffiths, 1998, p. 32) and as the previous survey (see chapter 3) indicated, in approximately 25% of the participating hotels, nobody was responsible for food hygiene training.

Regarding operational practices, the stated beliefs and intentions of many of the caterers indicated cause for concern, and were common to both commercial and non-profit making establishments. This was particularly exemplified by the responses regarding the handling of poultry. A number of respondents did not intend to handle poultry any differently to other foods, even though the associated risks have been well documented (Border and Norton, 1997, p. 33). Conversely, almost all caterers were appreciative of the risks associated with cooked rice, even though it is a food which is less frequently reported as a vehicle of contamination (Evans et al, 1998, p. 169). Beliefs across all sectors regarding other factors associated with food poisoning were also worrying. Significant numbers of respondents did not perceive there to be a danger associated with preparing foods in advance of their service time, undercooking foods and not cooling foods rapidly. When compared with results indicating that 25%

of the caterers believed that cross-contamination was difficult to avoid, there were clearly issues surrounding knowledge levels, adequacy of supervision, appropriate management, and attitudes towards food safety. If these beliefs were (and are) reflected in actual behaviour, this is contradictory to their intentions to comply with food safety legislation and the belief that by so doing, they would feel more confident about reducing levels of food poisoning. Equally, unacceptable levels of risk existed for their customers.

The incorporation of measures including subjective norms, moral obligations, perceived control, and relationships between beliefs, intentions and behaviour should therefore be built into future studies in order to build a more sophisticated model of behavioural intention. Greater understanding of this in the context of food safety in the Hospitality and Catering industry has the potential to turn the assumption underpinning the training requirement in the legislation into a safer reality for the consumer, and possibly explain the reason why 25% of Welsh caterers in this survey complied with food safety legislation simply because of the fear of prosecution.

CHAPTER FIVE

FOOD SAFETY - WHAT HAPPENS IN PRACTICE?

5.1. Introduction:

Chapters two to four have examined the need for high standards of hygiene when handling, storing and preparing food, the need for management commitment and support, the need to comply with food safety legislation, and the importance of appropriate and continuous training within a culture which is genuinely positive towards high levels of food safety. Surveys have been conducted in Welsh hotels and other catering establishments with regard to the types of foods used, the types of meals served, as well as knowledge of and attitudes towards, food production procedures and food safety legislation. The need for effective food safety management systems is an important element of current food safety legislation. Such systems however, will only be successful if they are planned and implemented within an environment where GHPs or PRPs are already embedded within the culture of the organisation (Dillon and Griffith, 1997, p. 87), and ideally, as part of a wider quality assurance strategy in general. Whilst the need for food safety procedures to be monitored and reviewed has been briefly referred to in this thesis, this chapter focuses upon one aspect of monitoring in greater detail - auditing. It should be noted that for the purposes of this chapter the terms "monitor" and "review" are discussed in a different context to that utilised when conducting HACCP procedures. They are used in a more general context, as defined in Chambers 21st Century Dictionary, 1996, (Robinson, (Ed.) pp. 884:1197). Secondary sources were reviewed to establish the role of food safety audits as tools for assessing food safety standards, as well as auditing instruments used within the public and industrial arenas. The collection of primary data was also undertaken by way of a series of interviews and pre-planned observations which were conducted in a range of catering establishments representing various industry sectors. New food safety regulations (MAFF, Department of Health, Scottish Office, and Welsh Office, 1995, p. 11) with greater emphasis upon incorporating some of the principles of HACCP had been introduced prior to this study being conducted, and a two part audit checklist was

constructed which enabled the researcher to investigate both systems and levels of compliance within each establishment. As such, the audit instrument was designed to establish information regarding management approaches to food safety, the practices and procedures being implemented, and the facilities in place to support appropriate levels of food safety. One common link between all food businesses is the recipe for each of the dishes that are produced. Unlike many food manufacturing companies which develop, pilot and utilise standard recipes, most catering establishments rely upon the design and layout of their premises, and the experience of their chefs and their individual interpretations of recipes, to inject a creative appeal designed to attract customers. This practice however, has implications for food safety, especially if the chefs have not been adequately trained, are not suitably experienced, or do not follow the recipe guidelines accurately. The high turnover of staff in many sectors of the Hospitality and Catering industry also means that it is very difficult to use standardised recipes, except in certain larger catering organisations where the resources are available to do so and contracts demand it, e.g. airline catering companies and industrial catering companies with large central production units. Questions were included therefore, which were designed to elicit information regarding recipe development and design, and the extent to which the assessment of risks is considered in recipe formulation.

5.1.1. The importance of effective management and assessment of food safety:

Food safety is something that needs to be worked at. It doesn't just happen. Producing safe food for large numbers of people requires a systematic approach. Approaches to the analysis, assessment and management of hazards and risks may be very different between large organisations and small establishments, and between all establishments across all industry sectors. Such approaches to food safety are relatively new even though the concept of risk had previously been introduced into the industry via Health and Safety legislation. Unfortunately however, research has shown that managers in the Hospitality and Catering industry only consider food hygiene to be important when something goes wrong (Guerrier et al, 1992, p. 192). Irrespective of size, complexity or type of business however, appropriate food safety management approaches must be

adopted and be effectively implemented, sustained and monitored (Jouve et al, 1999, p. 82), and this is clearly reflected in the legislation at both national and European levels (The Food Safety (General Food Hygiene) Regulations 1995, p. 10), (Council Directive 93/43/EEC, 1993, p. 2). Everyone in the organisation must be made aware of the importance of food safety and the potential for causing harm to their consumers, as well as the effects that an outbreak of food poisoning may have on the business itself, which may be extremely severe and damaging (Naval, 1998, p. 32). Equally, they should be actively involved in the implementation of any food safety measures introduced.

5.1.2. Good Hygiene Practices or Pre-requisite Procedures:

Any system must be based upon a firm foundation. For food safety management systems, the foundations are GHPs or PRPs in which the auditing process is one component. According to Dillon and Griffith (1997, pp. 87-92) the assessment of GHPs or PRPs should include:

- The siting, design and construction of the premises (e.g. in terms of workflows, pest infestation possibility, and appropriate materials).
- Suitable equipment and machinery (e.g. location, design and construction, and maintenance).
- Pest controls (e.g. evidence of infestation, a preventative programme, and the storage of toxic chemicals used to control pest infestation).
- Cleaning/sanitation (e.g. the effective use of cleaning schedules, any requirement for disinfection, and the storage of cleaning chemicals).
- Raw materials (e.g. the use of specifications and nominated suppliers, delivery and storage, a quality assurance programme for assessing delivery and storage).
- Personal hygiene (e.g. monitoring and reporting health and illness, high standards of personal hygiene especially in relation to food handling, and appropriate training).
- Training (e.g. a training policy and strategy, training records, and a nominated member of staff or management responsible for training).

Even the most basic of food hygiene courses delivered in colleges or by private organisations attempt to instil many of these "basics" within their content. Managers and proprietors where appropriate, however, are responsible for ensuring that systems, GHPs and SOPs are in place which include specific products, processes and methods of handling (Jouve et al, 1999, p. 82). It is here that the systematic review and assessment of performance has an important role to play. Regular assessment of food safety procedures can identify any weaknesses as well as strengths in a food safety programme, identifying issues which need modification or change.

5.1.3. Audits:

There are many types of audits with a range of purposes. In the context of food safety however, audits may:

- assess the effectiveness of the management quality assurance activities and systems
- assess compliance with company food safety policies
- evaluate the effectiveness/roles of individuals in quality management
- identify weaknesses in the quality system
- promote understanding of food safety quality processes
- act as a means of communication to managers
- help to ensure safe food is produced and reduce customer complaints
- demonstrate suitability to a third party (e.g. to an EHO)

The data obtained during audits may be qualitative or quantitative in style and may be used to help assess systems and/or procedures. Qualitative audits however, have several disadvantages. For example, inconsistencies when gathering information, and between auditors, non-comparability of information gained in different locations, and the lack of a numerical value which arguably has more meaning when considering priorities for action (Dillon and Griffith, 1997, p. 72). Quantitative audits have been recognised as being more advantageous, although they too, are subject to criticism.

For example, too much emphasis may be placed upon a numerical value allocated during a single visit instead of focusing upon the planning and procedures in place, and the integration of all appropriate information (Barnes, 1996, p. 142). They do however, provide a numerical value which provides an indication of the level of risk, especially when incorporating a risk assessment score, as well as indicating the degree of compliance with the legislation. They also provide greater consistency between auditors, allow for comparisons to be made between establishments, and they are easier to use and interpret by more than one person. By linking responses to the auditor's questions or observations, a numerical score can be given for the audit as a whole, or for specific parts of it. Audits may be undertaken as part of internal quality procedures or they may form a part of an external review or assessment, for example by independent consultants or validating organisations such as the British Standards Institute (BSI).

The conduct and consistency of inspections by EHOs has been subject to some criticism in the past (Bartlett, 1993, p. 14). As part of an initiative to ensure a more even and consistent approach to inspections, local authorities and EHOs have moved to an approach which incorporates quantitative methods into an inspection rating scheme divided into three main sections (MAFF, Department of Health, Scottish Office, and Welsh Office, 1995, pp. 20-26):

- Potential hazards (including the handling and preparation of low or high risk foods, methods of processing, and the potential risk to the consumer).
- Compliance with food safety legislation (including general food hygiene and safety, and structural issues).
- Confidence in management/control systems (ranging from no too high levels of confidence).

The type of foods used and the methods in which they are prepared are assessed on a scale of five to forty according to the degree of risk attached, with forty being the maximum risk score. As previously established and discussed in this thesis, open high-risk foods are frequently prepared and served on a daily basis in catering establishments, and this would indicate a score in the higher bands. Additionally, large numbers of customers are frequently catered for, especially where functions are offered. This would again indicate a higher score being allocated. This score could be increased where customers are mainly comprised of people considered to be vulnerable to infection, e.g. the old, infirmed, pregnant women, and the very young. As it is not unusual for these groups to be customers in catering establishments, a steadily increasing score is almost inevitable. A score for compliance with food safety legislation is allocated depending upon the food handling practices, temperature control procedures, and structural aspects including cleanliness, layout, lighting and ventilation. EHOs also make a judgement on their confidence in the management of the establishment. The score allocated will be dependant upon existing practices as well as the likelihood of these practices (good or bad) being maintained in the future. Confidence or the lack of it, in the management of catering premises has been the subject of some debate (Mortlock et al, 1999, p. 790), (Taylor, 1994, p. 14). Caterers should therefore, take all appropriate precautions to ensure that their visiting EHO comes away from his/her inspection with a high degree of confidence that systems and procedures are in place, or are planned, that will ensure the service of safe food to their customers. Depending upon the accumulated score, the establishment is categorised between A to F as shown below:

Category	Points range	Minimum frequency of inspection
A	91-175	(at least) every 6 months
B	71-90	(at least) every year
C	41-70	(at least) every 18 months
D	31-40	(at least) every 2 years
E	21-30	(at least) every 3 years
F	less than 21	(at least) every 5 years

5.1.4. Aims:

Information obtained in the previous two surveys contributing to this thesis have identified areas of concern regarding knowledge of, and attitudes towards, food safety legislation, as well as food handling and production practices. Little difference was established however, between establishments in terms of their size and ownership, although in other surveys (Gillespie, Little and Mitchell, 2000, p. 467), (Ehiri et al, 1997, pp. 8-20), smaller establishments proved to be of more concern with more differences being identified. Having examined levels of knowledge and differences between attitudes of catering industry personnel, it was appropriate therefore to determine what actually happens in practice, and identify possible relationships between knowledge, attitudes and behaviour. For example, were food safety management systems implemented and maintained? Were food handlers aware of them? To what extent were GHPs being applied? Were food preparation environments conducive to the production of safe food? Traditional approaches to many aspects of management and operations have been retained in many sectors of the Hospitality and Catering industry. The development and use of recipes is one example. Little has been done in the past however, to ascertain the views of catering personnel regarding this central link in the food preparation chain, and it was appropriate to investigate their views during the audit visits. Consequently, as well as the questions contained within the audit instrument, two example recipes were developed for the same dish. One in a traditional style and one in a format designed to reflect a Hazard Analysis style process (see appendix 4). Four statements in the form of a Likert scale, regarding the suitability and acceptability of these styles accompanied the recipes and food handlers were asked to complete the scale and make comments where appropriate.

As such, the Aims of this study were to:

- design and develop an audit instrument which could be utilised in a range of catering establishments.
- analyse and discuss the results of a series of food safety audits conducted in Welsh catering establishments.

- evaluate and compare the findings with those of the previous surveys conducted as part of this thesis, and with other surveys conducted in the UK.
- identify and evaluate the views of catering personnel regarding the style and format of recipes.

5.2. Methods:

5.2.1. Introduction:

The background to Hospitality and Catering establishments in Wales has been discussed in previous chapters, as has the rationale for the selection of those included in the two previous surveys. The survey in chapter three focused upon the hotel sector because of its diversity of operations within the Hospitality and Catering industry. The survey of attitudes reported in chapter four opened up the investigations to include other sectors so that views and beliefs between the sectors could be compared. For the purposes of this phase of the thesis, it was again decided that a range of sector establishments be surveyed. This would enable the researcher to either support the findings previously obtained or gain data which would establish any differences. The planning and implementation of audits is a time consuming process and in this instance the researcher was reliant upon three main factors. Firstly, the geographical location of establishments to be audited. Normal work commitments were such that any establishments visited had to be reasonably close to Cardiff but representative in nature. Secondly, there was a need for visits to be scheduled around the working hours of the researcher, but at the same time to be convenient to the manager/proprietor of the establishment concerned. Thirdly, the receptiveness and willingness of the managers/proprietors to participate in the audit process. Even within these restrictions however, it was considered that the results would be indicative of Welsh catering establishments as a range of different sized establishments with differing ownership categories, across four industry sectors (hotels, restaurants, institutional, and leisure) were studied. The emotive nature of food safety and outside individuals carrying out an inspection is such that the latter proved to be an important consideration when

"selecting" establishments. Many respondents from the previous surveys were reluctant to allow access to their food production and storage areas, stating either that they were too busy, or concerned about confidentiality being maintained. Consequently, selection of participating establishments as a sample group was conducted by a non-probability (non-random) approach, specifically the opportunity (or convenience) method (Coolican, 1999, p. 39). As in the survey reported upon in chapter four, the provision of functions or conferences, whilst desirable, was not seen as entirely critical to successfully achieving the Aims of this study. The rationale for this decision was based upon the fact that appropriate management systems and operating procedures should be in place whatever the type of business being conducted, and whatever the numbers of customers being catered for.

5.2.2. Data Collection methods:

Fifty six establishments were approached either personally or by telephone communication, to ascertain whether they would be willing to participate in an audit visit and interview. Sixteen declined to be involved. Reasons for this varied, but included "a lack of time", and a reluctance to participate fearing that the information would be used "for official purposes" and relayed to the local authorities. As such, forty establishments were identified as the sample for this study, and a further four establishments were identified as a pilot group, representing 10% of the sample. Normally, as a part of the audit process, pre-preparatory visits would be made to the establishments concerned. In view of the high degree of hesitation shown by some caterers however, it was decided that this would be inappropriate and a pre-visit briefing was conducted by telephone instead.

A quantitative based audit instrument was devised which consisted of two parts. The first allowed the researcher to interview the manager/proprietor with regard to food safety management systems and procedures, and available documentation was used to verify the responses. Where interviewees were unable or reluctant to produce written verification or other forms of evidence, a negative response was recorded on the audit sheet. The second part allowed for observations to take place in the food production

areas, and for food handlers to be questioned as they were working. Where possible, observations were scheduled to coincide with service times so that a range of food handling and production activities could be assessed. The use of quantitative questions limited the possibility of bias and subjectivity although the design of the checklist was such that qualitative comments could be inserted by the researcher where appropriate. The initial checklist was administered as a pilot exercise. As a result, modifications were made and the final audit instrument was devised (see appendix 5) and administered during the period November 1996 to April 1997. A pilot exercise was conducted in five establishments with regard to the HACCP style recipe and statements, and three copies were left in each establishment to be considered, answered and returned to the researcher after the audit visit. For data analysis purposes, SPSS for windows was used as a tool for analysing quantitative data. Qualitative data was analysed manually.

The two main parts of the audit instrument were sub-divided as follows:

Part one -

- management approaches to food safety
- steps critical to food safety
- documentation
- recipes

Part two -

- awareness of food handlers regarding policies and procedures
- staff and management training
- preparation practices, hygiene and cleanliness
- delivery and storage
- temperature control
- personal hygiene

5.2.3. Validity and Reliability:

For the purposes of this study validity was ensured as much as possible by testing for Face Validity, by matching the questions and observation points with the Aims of this study as well as with other audit checklists, and Content Validity by conducting a pilot exercise in selected industrial establishments. Reliability was considered in three ways - by developing a quantitative based audit instrument, by using objective type questions which reduced the element of individual interpretation, and the piloting process itself which identified any anomalies within the checklist.

5.2.4. Research Limitations:

Ideally, a larger number of establishments spread across a wider geographical area would have increased the amount of data obtained and contributed to the validity and reliability of the data, although premises included in the study reflected a mix of urban and rural locations. A larger sample group would also have enabled the researcher to include more establishments included in the previous surveys, and reduce the chances of any possible sampling error or sampling bias. Given more time, opportunities to undertake pre-visits to explain the nature of the survey may also have resulted in more participants across a wider range of establishments. As with questionnaires, there are also general limitations to conducting audits, especially with regard to food safety. The sensitive nature of food safety has already been referred to in this and previous chapters. Additional more general limitations include:

- ensuring that the appropriate person is available to be interviewed
- lengthy planning and implementation times
- a possible tendency for respondents to provide answers which they consider the auditor may want
- "artificial" preparation for an audit instead of allowing the auditor to inspect normal working procedures and practices

For this study, care was taken to ensure that either an appropriate manager or the proprietor was available to be interviewed, and observations were scheduled to allow for meal services to be viewed. Construction of the audit checklist had been ongoing for some time and consequently, was ready for piloting when needed. The use of closed objective type questions and the scrutiny of available documentation reduced the chances of respondent bias, although it could not be guaranteed that all audits had not been "prepared for". It should also be noted that the outcome of any audit is based purely upon conditions existing at the time of the audit. Whilst Oakley (1994, p. 3) states that such "snapshot" views cannot determine past and future practices, audits do provide an opportunity for discussion and for indicators and circumstances to be observed, enabling the auditor to make judgements and predictions (North, 1999, p. 14). The use of quantitative data collection methods also assisted in ensuring that a standard and consistent approach to the audits was conducted on each occasion. As such, the results and discussion should be considered with these points in mind.

5.3. Results:

5.3.1. Introduction:

Audits were conducted in a range of establishments both commercial and otherwise. Using numbers of staff and volume of custom as criteria, seventeen were classed as small businesses, sixteen medium sized, and seven large. Twenty one were privately owned, eleven were part of a privately owned company, and eight were part of a major chain. Analysis was carried out using a pre-coded structure in SPSS. Qualitative data was used where appropriate to support quantitative findings. For reporting purposes, the data are presented in sequence according to the sections of the audit checklist, together with any statistically significant differences in findings between ownership or size categories. These differences will be discussed in section 5.4. A breakdown of the statistically significant differences obtained for the size and ownership groups may be seen in appendix 6. All percentage figures in tables are displayed in parentheses and have been rounded to omit decimal points. In order to ensure that observations

conducted in a uniform and standardised manner it was necessary for criteria to be established for certain elements of the audit checklist. These criteria are attached as appendix 7. As an additional exercise, a total audit score for each establishment was calculated and the means for both size and ownership groups were compared with the mean scores obtained in the hotel survey reported in chapter three. Whilst in the audit survey, others industry sectors were included and not all of the managers and proprietors of the original hotels participated, the results obtained proved useful and to some extent supported the findings discussed in section 5.4. of this chapter.

Fifty one recipe returns were received shortly after the audits had been conducted and the findings are also discussed in section 5.4.

5.3.2. Part One:

a). Management approaches to Food safety:

This section consisted of fourteen questions related to food safety planning and commitment, responsibilities, training, communication, and sources of reference. Responses for this section, for all establishments are shown in table 5.1. In the majority of establishments (85%), it was stated that senior management were committed to providing adequate resources. This percentage figure was approximately the same for all size and ownership categories, although in all large establishments a positive reply was given. Significant numbers of respondents however, replied that a policy for food safety had not been produced (45%) and that management responsibilities were not clearly defined (32%) or communicated (37%). There was some variation however, between the different groups. In sixty five percent of small establishments, 25% of medium and 43% of large, food safety policies had not been produced. In terms of ownership, in 25% of multi-chain, 55% of private company and 48% of privately owned establishments, policies had not been produced. Non-clarification of management responsibilities was approximately the same in each size group, but the responses varied between ownership categories. In 25% of multi-chain, 64% of private company and 19% of privately owned establishments, it was stated that management

responsibilities were not clearly defined. Responses also varied in terms of communication. In 29% of small, 37% of medium and 57% of large establishments, replies indicated that communication was unclear. In fifty percent of multi-chain, 64% of private company and 19% of privately owned establishments, communication between managers and staff was also stated as being problematic. Forty three percent of respondents stated that there were no written instructions for either management or staff. This figure was approximately the same for all ownership and size categories except for privately owned establishments where a slightly higher percentage (48%) was obtained. Eighty percent of the replies indicated that food safety procedures were clearly communicated to staff. Lower figures of 69% were given however, in medium sized establishments, and in 64% of private company establishments. In 75% of the establishments, staff responsibilities were clearly defined, even though 67% of the replies indicated that staff were not involved in the development of food safety policy or procedures. Responses for defining staff responsibilities varied slightly between size groups (76% for small, 69% for medium and 86% for large establishments). In terms of ownership, a higher figure of 88% was obtained from multi-chain establishments. Some variance between groups was also evident when referring to involving staff in food safety developments. In 82% of small, 63% of medium and 42% of large establishments, staff were not involved. A slightly closer range of figures was found between ownership groups (75% for multi-chain, 64% for private company and 67% for privately owned establishments).

Almost half of the respondents stated that a pre-determined plan for training or instruction was not in place, although a slightly higher response rate of 59% was obtained from small establishments, and a much lower figure of 12% resulted from multi-chain establishments. Responses indicated that in 43% of the establishments, food safety was not planned for in a structured manner, and in a higher proportion (57%), food safety procedures that were in place were not monitored or reviewed according to a pre-determined plan. Variation was again evident between groups. A lower percentage of respondents (35%) in small establishments, and a higher percentage of 50% in medium establishments, stated that food safety was not planned for in a structured manner. More varied responses were obtained from the different ownership categories (12% multi-chain, 73% private company and 38% privately

owned establishments). A pre-determined monitoring and review plan for food safety procedures was not in place in a higher proportion of medium sized establishments, and a more varied set of responses were gained from within the ownership category (25% of multi-chain, 82% of private company and 57% of privately owned establishments). Thirty five percent of respondents stated that food safety legislation had not been referred to when deciding policy or procedures. Specific results for the differing sized establishments were 47% of small, 31% of medium and 14% of large. In terms of ownership, results from multi-chain and privately owned establishments were similar (25% and 29% respectively), but much higher (55%) for privately owned establishments. Sixty five percent of respondents stated that the Industry Guide to Good Hygiene Practice had not been referred to when deciding food safety procedures, although large variances were again obtained (76% of small, 69% of medium and 29% of large establishments) and (37% for multi-chain, 73% for private company and 71% for privately owned establishments). Forty seven percent of the replies indicated that EHOs were not used a sources of advice or guidance. Much lower differences were obtained for this question (53% of small, 47% of medium and 43% of large establishments) and (50% multi-chain, 55% private company and 43% privately owned establishments).

Table 5.1. Management approaches to Food Safety:

Serial	Question	YES (N) (%)	NO (N) (%)
1	Is there a written statement or policy for food safety?	22 (55)	18 (45)
2	Are management responsibilities for food safety clearly defined? #	27 (68)	13 (32)
3	Are management responsibilities for food safety clearly communicated? #	25 (63)	15 (37)
4	Are food safety issues planned for in a structured manner? #	23 (57)	17 (43)
5	Are food safety procedures monitored and reviewed according to a pre-determined plan? #	17 (43)	23 (57)
6	Is senior management committed to the provision of appropriate resources?	34 (85)	6 (15)
7	Are management and staff trained/instructed according to a pre-determined plan? *	22 (55)	18 (45)
8	Has the legislation been referred to as part of the process for deciding food safety policies and/or procedures?	26 (65)	14 (35)
9	Are there written statements of instruction for management and staff?	23 (57)	17 (43)
10	Is the Industry Guide to Good Hygiene Practice used as a source of reference for developing food safety policy?	14 (35)	26 (65)
11	Are EHO's used as a source of advice and guidance?	21 (53)	19 (47)
12	Are staff involved in the development of food safety policy?	13 (33)	27 (67)
13	Are staff responsibilities for food safety clearly defined?	30 (75)	10 (25)
14	Are food safety procedures clearly communicated to staff?	32 (80)	8 (20)

Key: # indicates statistically differing responses from groups defined by ownership (i.e. $p < 0.05$), using chi-squared test.

* indicates statistically differing responses from groups defined by size.

b). Steps critical to Food Safety:

Questions in the second section of the checklist focused upon the identification and analysis of hazards as a basis for deciding and developing food safety practices. Responses are shown in table 5.2.

Table 5.2. Steps critical to Food Safety, all establishments:

Serial	Question	YES (N) (%)	NO (N) (%)
1	Are food safety practices based upon the identification and analysis of potential hazards? *	9 (23)	31 (77)
2	Have points where food hazards may occur (CP's) been identified? *	9 (23)	31 (77)
3	Have points which are critical to food safety (CCP's) been identified? *	8 (20)	32 (80)
4	Have targets and critical limits been set for CCP's?	6 (15)	34 (85)
5	Are control measures in place for CCP's?	7 (17)	33 (83)
6	Are the above procedures subject to periodic review?	8 (20)	32 (80)

Key: * indicates statistically differing responses from groups defined by size (i.e. $p < 0.05$), using chi-squared test.

It is in this section that the majority of responses were negative. When asked whether food safety practices were based upon the identification and analysis of potential hazards, in 88% of small and 81% of medium establishments they weren't, although only 43% of respondents in large establishments replied in this way. More varied negative responses were obtained from the ownership category (50% multi-chain, 91% private company and 81% of privately owned establishments). The same breakdown of results were obtained when asked if control points (CPs) had been identified, but varied slightly when asked about critical control points (CCPs)(88% of small, 87% of medium and 43% of large establishments) and (63% of multi-chain, 91% of private

company and 81% of privately owned establishments). Unsurprisingly, similarly large negative responses were recorded regarding the implementation of control measures for CCPs (88% of small, 87% of medium and 57% of large establishments). It can be noted that whilst in 57% of large establishments CCPs had been identified, control measures were in place in only 43% of them. By ownership, the negative responses were 75% of multi-chain, 91% of private company and 81% of privately owned establishments. A periodic review of food safety practices was not carried out in 80% of the establishments, although in approximately half of large and multi-chain establishments, reviews were undertaken. For the two groups, the responses were (88% of small, 81% of medium and 57% of large establishments) and 50% of multi-chain, 91% of private company and 86% of privately owned establishments.

c). Documentation:

Sixteen questions were asked regarding the maintenance of documentation as part of the food safety management process. Responses are shown in table 5.3. The findings of the previous section were reflected here in that large percentages in both groups did not maintain documentation for the identification, analysis and review of potential hazards (88% of small and medium, and 71% of large establishments) and (75% of multi-chain, 91% of private company and 86% of privately owned establishments). Similarly, for CCPs, negative responses were 77% of small, 75% of medium and 86% of large establishments, and 88% of multi-chain, 91% of private company and 67% of privately owned establishments. Some variation can be noted between the responses here and in the previous section. In just over half of the establishments, a policy for maintaining documentation was not in place, although a variety of responses were given within the two groups (65% of small, 56% of medium and 43% of large establishments) and (37% of multi-chain, 54% of private company and 67% of privately owned establishments). In most establishments (93%) staff and management recruitment was documented and this figure was reflected in both groups. In several areas, over half of the responses indicated that documentation was maintained, although results from within the two groups showed variation.

Table 5.3. Is documentation maintained for .....?:

Serial	Question	YES (N) (%)	NO (N) (%)
1	Is there a policy for maintaining food safety documentation?	17 (43)	23 (57)
2	Staff and management training/instruction?	31 (77)	9 (23)
3	Receipt of food commodities?	25 (62)	15 (38)
4	Storage of food commodities?	21 (53)	19 (47)
5	Monitoring chilled/refrigerated food storage?	39 (97)	1 (3)
6	Monitoring frozen food storage?	39 (97)	1 (3)
7	Monitoring the temperature of food during cooking?	16 (40)	24 (60)
8	Monitoring the temperature of hot foods for service?	20 (50)	20 (50)
9	Monitoring staff and management health and illness?	31 (77)	9 (23)
10	Monitoring staff and management recruitment?	37 (93)	3 (7)
11	Selecting/visiting/inspecting suppliers? #	11 (27)	29 (73)
12	Cleaning schedules?	31 (78)	9 (22)
13	EHO visits and inspections?	20 (50)	20 (50)
14	Pest control? *	25 (63)	15 (37)
15	The identification, analysis and review of potential hazards?	6 (15)	34 (85)
16	Defining, monitoring and reviewing CCP's?	6 (15)	34 (85)

Key: # indicates statistically differing responses from groups defined by ownership (i.e. $p < 0.05$), using chi-squared test.

* indicates statistically differing responses from groups defined by size.

For example, whilst 77% of respondents replied that training/instruction was documented, this was more evident in large establishments (100%), in multi-chain (88%) and in private company establishments (82%). Sixty two percent of respondents stated that food deliveries were documented, but from within the two groups results were more varied (47% of small, 69% of medium and 86% of large establishments) and (75% of multi-chain, 69% of private company and 57% of privately owned

establishments). Overall, slightly lower percentages were obtained for the documenting of foods in storage (47% of small, 50% of medium and 71% of large establishments) and (63% of multi-chain, 46% of private company and 52% of privately owned establishments).

Almost all respondents indicated that refrigerator (97%) and freezer (97%) temperatures were recorded and these figures were largely reflected in both groups. At least half of the responses however, showed that this was not the case for hot foods. In sixty percent of establishments, documentation was not kept when cooking foods (65% of small, 63% of medium and 43% of large establishments) (and in 37% of multi-chain, 82% of private company and 57% of privately owned establishments). In 50% of establishments documentation was not maintained when recording the temperature of foods being kept hot for service (59% of small, 56% of medium and 14% of large) and (25% of multi-chain, 64% of private company and 52% of privately owned establishments). A response rate of 78% was recorded for documenting cleaning schedules, although this figure was higher for some establishments (77% of small, 75% of medium and 86% of large establishments) and (88% of multi-chain, 91% of private company and 67% of privately owned establishments). Very similar positive results were obtained regarding the recording of staff and management health and illness (71% of small, 81% of medium and 86% of large establishments) and (88% of multi-chain, 91% of private company and 67% of privately owned establishments). Sixty three percent of respondents replied that documentation was kept with regard to pest control (35% of small, 75% of medium and 100% of large establishments) and (88% of multi-chain, 64% of private company and 52% of privately owned establishments).

Apart from in large or multi-chain establishments, few respondents stated that visits to, or inspections of, suppliers was recorded. The following percentages reflect negative responses (88% of small, 69% of medium and 43% of large establishments) and (37% of multi-chain, 73% of private company and 86% of privately owned establishments). Half of all responses indicated that EHO visits or inspections were documented, but within the two groups some variation was evident (35% of small, 44% of medium and 71% of large establishments) and (75% of multi-chain, 54% of private company and 38% of privately owned establishments).

d). Recipes:

Four questions were asked about the use of recipes in terms of standardisation and whether they were developed using hazard analysis based principles. The results are shown in table 5.4. In the majority of establishments, standardised recipes were not used (76% of small, 75% of medium and 71% of large establishments) and (63% of multi-chain, 91% of private company and 71% of privately owned establishments). In almost all establishments, use of the principles of HACCP or those given in the ASC or SAFE booklets, were not referred to when developing or reviewing recipes:

- not used when developing new recipes - (100% of small, 88% of medium and 86% of large establishments) and (100% of multi-chain, 91% of private company and 91% of privately owned establishments. The same figures were given for the review of recipes.

Results of the statements regarding recipe format and style can be seen in table 5.5. At least one return was received from each establishment and twenty one were received from medium sized, together with thirteen from large establishments. As a result of incomplete or spoiled questionnaires, it was not possible to determine their ownership category. As may be seen from the data, the majority of responses (80%) indicated that recipes in the HACCP format would be helpful in producing safer food and this was reflected across all size groups. Under half (41%) however, thought that they should be used in all catering establishments, with 33% uncertain and 26% disagreeing. Thirty five percent of food handlers in small establishments formed those that disagreed. Many respondents thought that this style of recipe was easy to understand (61%), but over a quarter (28%) disagreed, again including 35% from small establishments.

Table 5.4. Recipe development:

Serial	Question	YES (N) (%)	NO (N) (%)
1	Is one set of standard recipes used by all food handlers?	10 (25)	30 (75)
2	Has HACCP, ASC or SAFE been considered when devising recipes?	3 (7)	37 (93)
3	Is HACCP, ASC or SAFE considered when new recipes are devised?	3 (7)	37 (93)
4	Is HACCP, ASC or SAFE considered when recipes are changes or altered?	3 (7)	37 (93)

Table 5.5. Responses regarding the HACCP style recipe:

Serial	Statement	Agree (N) (%)	Uncertain (N) (%)	Disagree (N) (%)
1	Use of recipes in this format would be helpful in producing safer food.	41 (80)	3 (6)	7 (14)
2	All catering establishments should use recipes in this format.	21 (41)	17 (33)	13 (26)
3	Recipes in this format are not easily understood.	14 (28)	5 (10)	31 (61)

5.3.3. Part two:

Part two of the audit checklist consisted of observations of food handlers and the food production environment. Food handlers were also asked questions designed to verify (or not) responses given by the manager/proprietor.

a). Awareness of Food Handlers regarding policies and procedures:

Questions in this section specifically related to the levels of awareness of food handlers in relation to aspects of food safety policy and responsibilities. Responses are shown in table 5.6.

Table 5.6. Awareness of Food Handlers regarding policies and procedures:

Serial	Question	YES (N) (%)	NO (N) (%)
1	Are all food handlers aware of the food safety statement/policy?	22 (55)	18 (45)
2	Are all food handlers aware of their responsibilities regarding food safety? *	30 (75)	10 (25)
3	Are all food handlers trained/instructed to a level commensurate with their job role?	33 (83)	7 (17)
4	Are all food handlers aware of the Industry Guide to Good Hygiene Practice?	10 (25)	30 (75)
5	Are all food handlers aware of the potential hazards within their areas of responsibility? *	19 (47)	21 (53)
6	Are all food handlers aware of the CCP's within their areas of responsibility?	10 (25)	30 (75)
7	Are all food handlers aware of the establishment's Hazard Analysis programme?	6 (15)	34 (85)

Key: * indicates statistically differing responses from groups defined by size (i.e. $p < 0.05$), using chi-squared test.

Over half (55%) of the food handlers questioned stated that they were aware of a food safety statement or policy being in place, although responses from within the two groups varied (24% of small, 75% of medium and 86% of large establishments) and (75% of multi-chain, 55% of private company and 48% of privately owned establishments). The majority however (85%), did not know if a hazard analysis

program was in place (88% of small and medium, and 71% of large establishments) and (63% of multi-chain, and 91% of private company and privately owned establishments). A large diversity was also found when food handlers were asked about their awareness of potential hazards. The following percentages reflect the negative responses (71% of small, 50% of medium and 14% of large establishments) and (37% of multi-chain, 55% of private company and 57% of privately owned establishments). A higher proportion (75%) were not aware of the CCP's within their areas of responsibility (76% of small, 88% of medium and 43% of large establishments) and (63% of multi-chain, 82% of private company and 76% of privately owned establishments). The majority of respondents (75%) stated that they were aware of their responsibilities regarding food safety (65% of small, 75% of medium and 100% of large establishments) and (88% of multi-chain, 82% of private company and 67% of privately owned establishments). Seventy five percent of the food handlers questioned were not aware of the Industry Guide to Good Hygiene Practice and this figure was much higher in some establishments (76% of small, 81% of medium and 57% of large establishments) and (63% of multi-chain, 91% of private company and 71% of privately owned establishments). A large percentage (83%) thought that they had been trained/instructed to a level commensurate with their job role (82% of small, 81% of medium and 86% of large establishments) and (88% of multi-chain, 91% of private company and 76% of privately owned establishments). Large variations in levels of supervision or instruction however, were displayed during observations, and was evident in the following numbers of establishments (47% of small and 44% of medium, but in 100% of large establishments) and (88% of multi-chain, 55% of private company and 43% of privately owned establishments).

b). Preparation practices, hygiene and cleanliness:

Observations in this section related to the adequacy of food preparation areas and equipment, facilities and cleaning schedules. Results are shown in table 5.7.

Table 5.7. Preparation practices, hygiene and cleanliness:

Serial	Observation question	YES (N) (%)	NO (N) (%)
1	Are the food preparation areas generally clean and in a good state of repair?	30 (75)	10 (25)
2	Is food preparation equipment sited so as to aid ease of cleaning?	15 (37)	25 (63)
3	Are pest control measures in place?	30 (75)	10 (25)
4	Are staff handwashing facilities provided?	38 (95)	2 (5)
5	Are staff toilets provided?	37 (93)	3 (7)
6	Are staff changing/locker facilities provided?	32 (80)	8 (20)
7	Is ventilation provided in food preparation areas?	38 (95)	2 (5)
8	Is the ventilation system conducive to easy cleaning?	26 (65)	14 (3)5
9	Are all areas of the food preparation environment well lit?	31 (77)	9 (23)
10	Are floor areas free from accumulating pools of water?	32 (80)	8 (20)
11	Are cleaning schedules being used?	36 (90)	4 (10)
12	Are cleaning procedures supervised or monitored?	33 (83)	7 (17)
13	Is equipment generally clean and in a good state of repair?	24 (60)	16 (40)
14	Are separate washing facilities provided for foods/hands/equipment?	35 (87)	5 (13)
15	Are these washing facilities being correctly used? # *	23 (57)	17 (43)
16	Do food preparation areas comply with legislation regarding ease of cleaning? *	24 (60)	16 (40)
17	Are utensils and other equipment constructed of materials which comply with legal requirements? *	28 (70)	12 (30)
18	Do facilities for the storage and removal of food (and other) waste comply with legal requirements?	22 (55)	18 (45)
19	Are cleaning materials and other hazardous substances clearly labelled and secured?	24 (60)	16 (40)
20	Do operating procedures include measures to prevent cross-contamination?	25 (63)	15 (37)
21	Where foods are transported to other preparation or service areas, is this carried out hygienically? *	31 (77)	9 (23)

Key: # indicates statistically differing responses from groups defined by ownership (i.e. $p < 0.05$), using chi-squared test. * indicates statistically differing responses from groups defined by size.

In 75% of the establishments, food preparation areas were generally clean and in a good state of repair, although as in previous sections, some variation was evident between the two groups (88% of small, 69% of medium and 57% of large establishments) and (88% of multi-chain, 55% of private company and 43% of privately owned establishments). Staff toilets were provided in nearly all of the establishments (93%) and this figure was generally reflected in both groups of establishments. Staff locker or changing facilities were provided in fewer establishments (80%) with the breakdown between groups being (74% small, 75% medium and 100% of large establishments) and (100% multi-chain, 82% private company and 71% of privately owned establishments). Pest control measures were in place in 75% of the establishments, although fewer small and privately owned establishments had adequate provision (65% of small, 75% of medium and 100% of large establishments) and (88% of multi-chain, 91% of private company and 62% of privately owned establishments). Compliance of food preparation areas with legislation regarding ease of cleaning was shown to be the case in 60% of establishments (35% of small, 69% of medium and 100% of large establishments) and (75% of multi-chain, 73% of private company and 48% of privately owned establishments). Adequate facilities for the storage and removal of food (and other) waste were demonstrated in a lower number of establishments (55%), (53% of small, 56% of medium and 57% of large establishments) and (50% of multi-chain, 64% of private company and 52% of privately owned establishments).

Staff handwashing facilities were provided in nearly all of the establishments (95%) and this figure was generally reflected in both groups. Large numbers of establishments provided separate washing facilities for foods, hands and equipment (87%) and again, the responses from both groups generally reflected this figure. The appropriate use of these facilities however, was not so evident, especially in small and privately owned establishments (35% of small, 69% of medium and 86% of large establishments) and (75% of multi-chain, 82% of private company and 38% of privately owned establishments). Ventilation was provided in almost all establishments (95% overall), although the design of the extractors was such that in only 65% of establishments were they conducive to easy cleaning (47% of small, 81% of medium and 71% of large

establishments) and (63% of multi-chain, 55% of private company and 71% of privately owned establishments). Adequate lighting of food preparation areas was demonstrated in 77% of establishments (71% of small, 88% of medium and 71% of large establishments) and (88% of multi-chain, 55% of private company and 86% of privately owned establishments). Cleaning schedules were being used in nearly all establishments in both groups (90% overall), and in most cases the cleaning was being supervised (83%), although a slightly lower figure of 73% was obtained from private company establishments. Cleaning materials and related hazardous substances were clearly labelled and secured in a lower number of establishments (60%) (59% of small, 50% of medium and 86% of large establishments) and (75% of multi-chain, 55% of private company and 57% of privately owned establishments).

In 60% of cases, equipment was observed to be generally clean and in a good state of repair. Some variation was shown between groups however, (71% of small, 63% of medium and 29% of large establishments) and (50% of multi-chain, 55% of private company and 67% of privately owned establishments). In 70% of establishments, equipment and utensils were constructed of appropriate materials, although this was only demonstrated in 47% of small establishments. The food handling and preparation practices of the food handlers were also observed. In 63% of establishments, these practices appropriately demonstrated measures to prevent cross-contamination (59% of small, 63% of medium and 71% of large establishments) and (63% of multi-chain, 64% of private company and 62% of privately owned establishments. Where foods were transported to other preparation or service areas, the majority of food handlers carried this out hygienically (77% overall), although this was only the case in 43% of large establishments.

c). Delivery and Storage:

As part of the audit process, the delivery and receipt of commodities were observed together with available storage facilities. The results are shown in table 5.8. In over half of the establishments (65%), all commodities were checked as soon as they were delivered (65% of small, 69% of medium and 57% of large establishments) and (63% of multi-chain, 64% of private company and 67% of privately owned establishments).

In 65% of the occasions, deliveries were not documented (70% of small, 56% of medium and 71% of large establishments) and (63% of multi-chain, 82% of private company and 57% of privately owned establishments). In similar numbers of establishments (65%), all deliveries were put into storage as soon as they were delivered (47% of small, 69% of medium and 100% of large establishments) and (75% of multi-chain, 64% of private company and 62% of privately owned establishments). Appropriate stock rotation was displayed in 80% of establishments, although a slightly lower recording was taken in small establishments (65%). Whilst storage facilities generally complied with legal requirements in 70% of the establishments, this was the case in fewer small and privately owned establishments (47% of small, 81% of medium and 100% of large establishments) and (88% of multi-chain, 82% of private company and 57% of privately owned establishments). The use of the storage facilities however, gave some cause for concern. In 80% of the observations, foods were being incorrectly stored and this was evident in both groups (88% of small, 69% of medium and 86% of large establishments) and (88% of multi-chain, 73% of private company and 81% of privately owned establishments).

d). Temperature Control:

Temperature control procedures for both hot and cold foods were also observed during the audits by directly monitoring the use of probes or other methods of temperature control The findings are shown in table 5.9. Regular recording of refrigerator and freezer temperatures was demonstrated in 63% and 60% of establishments respectively. The breakdown within the two groups was as follows:

Table 5.8. Delivery and Storage:

Serial	Observation question	YES (N) (%)	NO (N) (%)
1	Are all commodities checked upon delivery?	26 (65)	14 (35)
2	Are all deliveries documented?	14 (35)	26 (65)
3	Are all deliveries put into storage as soon as they have been received? *	26 (65)	14 (35)
4	Is stock rotation practised?	32 (80)	8 (20)
5	Do storage facilities comply with legal requirements? *	28 (70)	12 (30)
6	Are storage facilities being correctly used?	8 (20)	32 (80)

Key: * indicates statistically differing responses from groups defined by size (i.e. $p < 0.05$), using chi-squared test.

- refrigerators - (47% of small, 81% of medium and 57% of large establishments) and (75% of multi-chain, 55% of private company and 62% of privately owned establishments).
- freezers - (47% of small, 75% of medium and 57% of large establishments) and (75% of multi-chain establishments, 55% of private company and 57% of privately owned establishments).

In the majority of establishments (90%), refrigerator and food temperatures complied with legal requirements and this was generally reflected in both groups. Slightly lower levels of compliance were found however with regard to freezer temperatures (77%), (77% of small, 75% of medium and 86% of large establishments) and (73% of private company and 71% of privately owned establishments,) although all temperatures were compliant in multi-chain establishments. The types of refrigerators and freezers used differed greatly and in many cases, the cabinets did not have temperatures visually displayed (47% of small, 69% of medium and 29% of large establishments) and (37% of multi-chain, 73% of private company and 48% of privately owned establishments).

Table 5.9. Temperature Control:

Serial	Observation question	YES (N) (%)	NO (N) (%)
1	Is the temperature of chilled/refrigerated foods checked and recorded at regular intervals?	25 (63)	15 (37)
2	Is the temperature of frozen foods checked and recorded at regular intervals?	24 (60)	16 (40)
3	Are cooking temperatures monitored and recorded?	17 (43)	33 (57)
4	Where foods are being reheated, is this carried out quickly?	37 (93)	3 (7)
5	Where foods are reheated, is this carried out to a sufficient core temperature?	26 (65)	14 (35)
6	Do refrigerator (and food core) temperatures comply with legal requirements?	36 (90)	4 (10)
7	Do freezer temperatures comply with legal requirements?	31 (77)	9 (23)
8	Are hot foods for service maintained at or above legal temperature requirements?	26 (65)	14 (35)
9	Are cooked foods not for immediate use cooled within 90 minutes?	12 (30)	28 (70)
10	Are temperature probes used as part of the monitoring process? *	28 (70)	12 (30)
11	Are wipes or solution used for the sterilisation of temperature probes?	25 (63)	15 (37)
12	Are temperature probes regularly calibrated?	7 (17)	33 (83)
13	Are the temperatures of all refrigerators and freezers displayed visually?	19 (47)	21 (53)

Key: * indicates statistically differing responses from groups defined by size (i.e. $p < 0.05$), using chi-squared test.

In the case of hot foods, more variation was observed. In many of the establishments (57%), cooking temperatures were not monitored or recorded (65% of small, 56% of medium and 43% of large establishments) and (55% of private company and 67% of privately owned establishments), although this was the case in fewer multi-chain establishments (37%). In most cases (93%), foods were being reheated quickly and efficiently and this was reflected in both groups. Reheating to a sufficient core temperature was not so evident. In 65% of establishments, this was carried out adequately, but some variation was clear (53% of small, 63% of medium and 100% of large establishments) and (88% of multi-chain, 73% of private company and 52% of privately owned establishments). Similarly, varied results were obtained from those establishments where foods were maintained at or above legal requirements (59% of small, 69% of medium and 71% of large establishments) and (88% of multi-chain, 55% of private company and 62% of privately owned establishments). In many cases (70%), cooked foods not for immediate use were not cooled within 90 minutes (82% of small, 69% of medium and 43% of large establishments) and (50% of multi-chain, 73% of private company and 76% of privately owned establishments). The use of temperature probes was demonstrated in at least 70% of establishments apart from small (47%) and privately owned (62%) establishments. In at least 63% of establishments, wipes or solutions were used to sterilise the probes, although this was only the case in 47% of small and 57% of privately owned establishments. In most cases however (83%), probes were not regularly calibrated (88% of small, 81% of medium and 71% of large establishments) and (63% of multi-chain, 91% of private company and 86% of privately owned establishments).

e). Personal Hygiene:

The final section of the audit contained four questions concerning aspects of personal hygiene and access to the food preparation areas. The findings are shown in table 5.10. In nearly of the establishments (43%), food handlers were not wearing clean and suitable protective clothing and this percentage was higher in some cases (35% of small, 56% of medium and 29% of large establishments) and (25% of multi-chain, 45%

of private company and 47% of privately owned establishments). At least 75% of food handlers were free from open cuts or wounds, although slightly lower numbers were observed in small (65%) and privately owned (67%) establishments. Evidence of good hand habits was less clearly evident in many establishments (53% of small, 44% of medium and 43% of large establishments) and (50% of multi-chain, 55% of private company and 43% of privately owned establishments). In virtually all establishments (97%), non-food handlers were allowed to walk through the food preparation areas without protective clothing.

Table 5.10. Personal Hygiene:

Serial	Observation question	YES (N) (%)	NO (N) (%)
1	Are all food handlers wearing clean and suitable protective clothing?	23 (57)	17 (43)
2	Are all food handlers free from open cuts or wounds?	30 (75)	10 (25)
3	Is there evidence of good hand habits?	21 (53)	19 (47)
4	Where non-food handlers use, or walk through the kitchen area, is protective clothing worn?	1 (3)	39 (97)

As previously indicated, the mean audit percentage scores were calculated for both size and ownership groups, and compared with the mean percentage scores for the Risk Assessment rating given to hotels in the first survey. The results can be seen in tables 5.11 and 5.12.

Table 5.11. Comparison of mean percentage scores by size:

Serial	Scores	Small establishments (%)	Medium sized establishments (%)	Large establishments (%)
1	Total mean Risk Assessment score	57	62	60
2	Total mean Audit score	45	56	67

Table 5.12. Comparison of mean percentage scores by ownership:

Serial	Scores	Privately owned establishments (%)	Multi-chain establishments (%)	Private company establishments (%)
1	Total mean Risk Assessment score	61	59	63
2	Total mean Audit score	47	70	55

As the results indicate, some similarities existed between this aspect of the two surveys. All three types of establishments in the size category scored just below or just over 60% in the Risk Assessment exercise. In the audit, larger establishments achieved a score of 67%, whilst small and medium sized establishments attained scores of 45% and 56% respectively. In terms of ownership, all three types of establishments were also given scores of approximately 60% for Risk Assessment. For the audits, multi-chain establishments attained a score of 70% and privately owned and private company establishments achieved scores of 47% and 55% respectively.

5.4. Discussion:

5.4.1. Managing food safety

The audits conducted in this study were designed to obtain a wide range of information from establishments differing in size and ownership. The use of observations enabled the researcher to identify food preparation practices and obtain the views of food handlers, as well as those of managers or proprietors. A number of statistically significant differences were noted and they will be included in this discussion. Comprehensive procedures are necessary to ensure the production of safe food (Jouve et al, 1999, p. 82) but structured approaches by management to food safety was clearly an area of concern in many establishments, and the lack of written policies reflected this. This is despite the fact that the Food Safety Act 1990 had been in place for over five years prior to this study being conducted, and the 1995 Regulations for over a year. The difference in approaches between the high number of private company establishments and the relatively low number of multi-chain establishments may be indicative of the resources, support and access to information available in larger organisations as previously reported by Konopka (1997, pp. iv-v). This finding also to some extent, reflected the results reported upon in chapter four in terms of access to information. Whilst in a quarter of multi-chain establishments, written policies were not in place, and was of concern, this reflected a lower number than in most other types of establishments and again may be reflective of larger organisational support. In three of the groups however (small, large and private company establishments), staff were not aware of the policy, indicating either a lack of communication or that the staff had forgotten. Management responsibility for food safety has been the subject of much debate (Mortlock et al, 1999, p. 790). The findings of this audit study in terms of defining management roles, developing an appropriate culture conducive to encouraging high levels of food safety, and improving communication would seem to endorse the findings of other authors (Taylor, 1994, p. 14), (Sheppard et al, 1990, p. 203). Ownership as well as size however, seemed to be a contributing factor in this study. Significant differences in results ($p < 0.05$) indicated that management responsibilities were more clearly defined in private company establishments than in

those which were privately owned or part of a multi-chain organisation. This was somewhat surprising considering that large chains frequently have the resources to provide support and systems for their individual establishments (Gillespie et al, 2000, p. 473). Without clear definition of roles and responsibilities, adequate food safety systems will not be implemented and the level of potential risk to the customer will increase (Ehiri and Morris, 1996, pp. 302-303). Compared with the results of the attitude survey (see chapter 4), where most caterers stated that it was their responsibility to ensure appropriate levels of food safety and comply with the legislation, these findings suggested that in these two groups particularly, such responsibilities were not defined. As such, it would suggest that some difficulty existed in effecting actual suitable measures, especially as it was also believed that managers were in a strong position to influence food safety precautions. It is difficult therefore, for EHOs to have confidence in management in these conditions, and managers and proprietors should be reminded that EHOs include a "confidence in management" score when inspecting premises (Gillespie et al, 2000, p. 471). Staff responsibilities however, seemed to have been more clearly defined, and this was supported by them when asked. This may have been as a result of training, especially during induction periods or in colleges prior to commencing work, and/or because of supervision by senior departmental colleagues. Where written instructions were utilised, these referred to induction packs and handbooks, and notes from training courses, although in significantly more multi-chain establishments ($p < 0.05$) pre-determined training plans were evident, indicating a more structured approach to training. It would appear that whilst staff stated that they were aware of their specific responsibilities, and considered themselves to be sufficiently trained or instructed (even though levels of supervision were variable during observations), managers were much less certain.

5.4.2. Legislative aspects

Against this background, it was surprising therefore that the majority of interviewees (approximately 85%), and all of them in large establishments, stated that senior management were committed to the provision of adequate resources. Whilst in many establishments, the legislation had not been referred to when developing food safety

policies or procedures, the trend for more positive responses in multi-chain establishments continued (75% had referred to the legislation). Access to and awareness of, food safety legislation has been reported as being problematic in small businesses (Coleman and Griffith, 1997, p. 235), and this may provide an explanation for the higher number of small (47%) and privately owned establishments (55%) where the legislation had not been referred to. This finding regarding lack of reference to the legislation was disturbing and demonstrated a possible association with the previous survey (see chapter 4) where the results showed that many caterers believed that they did not receive sufficient information about food safety legislation.

The Catering Industry Guide to Good Hygiene Practice (JHIC, 1997, p. iii) was first published in September 1995. In the experience of the author, many caterers were still not aware of it's existence at the time of this study. This opinion was supported during a food safety seminar held for caterers in Swansea, in 1996. When asked, not one caterer of the approximately eighty present, were aware of the Guide. The findings of this study regarding reference to it therefore, were not surprising, although they were again disappointing and disturbing. The lack of adequate information regarding food safety legislation has been criticised in the past (Coleman and Griffith, 1997, p. 235) and this is another indication of that situation. The role of EHOs as advisors and sources of reference and not just as enforcers, has been promoted in recent years (Knowles, 1997, p. 3). Even so, in approximately half of all establishments, EHOs were not used as sources of advice, even in large and multi-chain establishments. This was a little surprising as in the first survey conducted as part of this thesis, EHOs were reported as being the prime source of information. One reason for this may be the lack of resourcing of EHOs in relation to the number of food businesses (Pointing and Littleton, 1995, p. 217) which indicates that fewer EHOs were available to seek advice from.

5.4.3. The identification and control of hazards

The identification, analysis and management of potential hazards and CCPs is a legal requirement (JHIC, 1997, pp. 5-6). In the majority of cases however, this was not being undertaken, especially in private company, privately owned, small and medium sized establishments. Whilst this was also the case in 43% of large establishments, this was significantly fewer ($p < 0.05$) than in the other groups. Even though analysis did not show a statistically significant difference, the 50% of multi-chain establishments where the identification, analysis and management of potential hazards did not occur was equally worrying and reflected the results obtained by Mortlock et al (1999, p. 790). The results of the survey discussed in chapter three indicated diverse levels of knowledge and understanding of the basic terminology associated with this approach to food safety management including HACCP and ASC for example. There would seem to be therefore, some association between a lack of understanding and implementation. Not surprisingly, it followed that in most establishments reviews of such procedures were not conducted, although in approximately half of large and multi-chain establishments, food safety practices that were in place were reviewed periodically. It was also not surprising that large numbers of staff were unaware of any hazard analysis programme or CCPs within their areas of responsibility. What is perhaps more worrying is the fact that many food handlers especially in small establishments, were unaware of the potential hazards within their areas of responsibility, even though they considered themselves to be adequately trained for their job role and aware of their responsibilities regarding food safety. Indeed, this was stated by all food handlers in large establishments and may provide some explanation for the statistically significant results obtained ($p < 0.05$). Such a lack of awareness regarding potential hazards was reflective of other studies (Ehiri et al, 1997, p. 144), (Taylor, 1994, p. 14), and added to the concerns regarding food handling practices discussed in the previous chapter (e.g. handling poultry, under-cooking foods and cooling processes). People's perceptions of their level of competence and degree of risk has been referred to in terms of optimistic bias (Miles, Braxton and Frewer, 1999, p. 754), with individuals often believing that "it won't happen to me" (Weinstein, as cited in Miles et al, 1999), p. 754). By not appreciating and understanding the risks involved, and by not undertaking appropriate approaches to the identification and

control of hazards, a false illusion of control is maintained and the level of risk to customers is increased. This does little to enhance the poor image that the catering industry has achieved regarding food safety (Knowles, 1997, p. 3).

5.4.4. Documentation

Whilst the maintenance of documentation is not a legal requirement, it is good practice to do so wherever possible and contributes to the overall approach taken by managers, as well as emphasising areas of concern (Coleman and Griffith, 1998, p. 300). In many cases however, a policy for maintaining written records had not been implemented, especially in small (65%) and privately owned (67%) establishments. The large number of establishments where documentation was not maintained for hazard analysis and review, including the defining of CCPs was not surprising considering the findings discussed above. This finding also reflected the results of the earlier hotel survey (see chapter 3) in that the maintenance of documentation in general was not well practiced, and echoed the results obtained by Ehiri et al (1997, p. 13) during their survey of HACCP implementation in Glasgow in 1995. It was interesting to note however, that according to the results of the attitude survey (see chapter 4) many caterers believed that written records should be maintained as this would help them in their overall approach to ensuring adequate levels of food safety. The fact that in nearly all establishments, staff and management recruitment documentation was kept was also not surprising because of the need to record salary and national insurance information. Whilst in many of the establishments training was documented, there were some areas of concern. For example, in at least five of the establishments, such "documentation" only consisted of a wall chart year planner and in each case, at least one of the food handlers had not attended the training course s/he was scheduled to. It was also interesting to note that in many of the establishments especially small, private company and privately owned, training documentation was maintained for staff only, and not for managers. It may be that some managers had attended courses, but if so, any relevant information was kept by them individually and not within the establishment. It may also indicate however, that managers had not received adequate training, a situation also identified by Griffiths (1998, p. 32).

The purchasing process is an important contributing factor to the control of food safety, and the receipt of foods are a part of this process. Whilst in a number of small and privately owned establishments purchasing may take place in "cash and carry" outlets, managers and proprietors should still inspect their suppliers and assure themselves of the quality assurance and hygiene practices in place, as recommended in the Catering Industry Guide to Good Hygiene Practice (JHIC, 1997, p. 49). Again, however, it was in these types of establishments where most of the negative responses were obtained (88% of small and 86% of privately owned). Also of concern were the significant numbers of other establishments where this did not occur either, especially in medium (69%) and private company (73%) establishments, demonstrating that this was not being practiced in large numbers of catering establishments in this study. These findings were reflective of those established in the survey conducted in hotels, reported upon in chapter three where 39% of respondents stated that they did not visit suppliers. They also reflect the findings of Morrison et al (1998) who refer to food service managers who are "far more concerned with managing costs and optimising customer satisfaction" (p. 368). Similarly, the documenting of foods upon delivery and whilst in general storage was not widely practiced, reflecting the findings of Ehiri et al (1997, p. 13). Adequate stock rotation seemed to be practiced in all establishments. It was also apparent that food deliveries in many small establishments (53%) were left for some time before being placed into storage. This was a much higher number than for all other groups, especially large establishments where all deliveries were stored as soon as they arrived and this may account for the significant difference shown in table 5.8. It was reassuring that in almost all establishments refrigerator and freezer temperatures were documented, although the frequency of recording times varied greatly and whilst this finding supported the results obtained in chapter three, it did not reflect the experiences of Mortlock et al (1999, p. 790). Interestingly, whilst in 93% of establishments documentation was maintained for recording refrigerator and freezer temperatures, the recording of temperatures was only evident in 63% of establishments for refrigerators and in 60% for freezers. Whilst it is possible that recordings were taken outside of the audit periods, care was taken during observations to monitor recording charts as well as actual recording being taken. In several instances, it was apparent that the charts had not been completed for some time.

Diligence regarding the monitoring and recording of temperatures when cooking and maintaining hot foods was also of concern, although apart from in private company establishments (64%), the temperature of foods being held for hot service was recorded slightly more often. Such concerns were also expressed by Johnston et al (1992, p. 291) in their earlier 1990 survey where they reported poor practices in relation to time/temperature monitoring. The lack of monitoring and recording was evident during the observation process, where many food handlers relied upon their experience and "knowledge of the ovens" during the cooking process. Even though temperature probes were available, they were mainly used and temperatures recorded, after the cooking or reheating process when foods were held for service. Inadequate cooking to sufficiently high temperatures has been identified as a contributing factor to food poisoning (Worsfold and Griffith, 1997, p. 102) and practices such as those described above do nothing to lessen the risk of food poisoning, especially when considered in conjunction with the beliefs reported upon in chapter four regarding the under-cooking of food. There was less of a divide between the types of establishments with regard to documented cleaning schedules, and these findings reflected the apparent importance which was placed upon this aspect by managers and supervisors. It was reassuring to observe that in nearly all establishments cleaning schedules were being used and that cleaning procedures were being supervised or monitored. Often however, the cleaning process was superficial and focused upon walls, floors and general surfaces to the neglect of equipment and food storage areas. For example, in significant numbers of instances, and surprisingly in many large establishments (71%), items of equipment were unclean or in a state of disrepair. Areas which were not regularly cleaned included the insides and backs of ovens, the sides and backs of deep fryers, the insides of steaming cabinets, and the insides of storage cupboards, and this contributed to an increased risk of food poisoning (Worsfold and Griffith, 1997, p. 101). In some cases, the siting of the equipment was such that it made cleaning very difficult. These observations put in doubt the planning and thought put into cleaning schedules, the adequacy of supervision, and in some instances, the manner in which some food preparation areas were designed. Aston (1995/6) describes the frequent occasions when he found similar situations when conducting inspections as an EHO,

referring to the "hypocrisy born out of double standards" (p. 21) where managers concentrate their resources on "an acceptable front for the customer" (p. 21).

The recording of EHO visits or inspections would seem to be natural as EHOs provide written reports once an establishment has been visited. It was unsettling therefore, to note that in many cases records were not kept or had been mislaid, even in larger and multi-chain establishments. Reasons are speculative. In some instances such communications had been forwarded to head office, but one would assume that a copy would be kept for information. Pest control measures were evident during many visits and in the main these were in the form of bait for vermin and electrocutors for flying insects. Few establishments however, had secured windows or mesh attached to them and in most instances, external doors and windows were open, directly contravening food safety legislation (JHIC, 1997, p. 24). As the audits were conducted during the Winter period, few flying insects were observed, but in the warmer periods of the year it is clear that flies and other insects would gain access and become a potential contamination threat. This would be compounded by the fact that in many establishments, refuse bags were over-filled and uncovered.

5.4.5. Recipes

Recipes are sometime taken for granted in catering establishments with many food handlers relying on "tried and tested" traditional recipes, and others (mainly in the commercial sectors) experimenting with recipes seen in books, in other establishments, and on the television. In some non-commercial establishments, especially larger organisations, standardised recipes are used. In some smaller establishments the proprietor may insist that his/her own recipe is used by all food handlers, although these are not standardised recipes in the true sense. In most cases however, this was not the case and managers and proprietors relied upon the knowledge and expertise of their chefs, allowing high levels of flexibility, a situation previously experienced by the author. In some instances, this could have had implications for the level of risk attached to the food being prepared and therefore to the customer. For example, many dishes incorporating warm butter sauces, mayonnaise, cream and other high-risk foods (Evans et al, 1998, pp. 167-169) were still widely used. Individual interpretations of

these dishes and their preparation can lead to inappropriate preparation practices including insufficient cooking or reheating times and temperatures, adding to the risk discussed earlier regarding the lack of monitoring of cooking temperatures. Whilst not all standardised recipes are necessarily "safe", they do demonstrate that some extra thought has been put into the recipes and how foods and dishes are prepared. Bearing in mind the earlier findings and discussion regarding the application of hazard analysis techniques and the management of them, it was not surprising that in virtually all of the establishments, reference had not been made to the principles of HACCP, ASC or SAFE when developing or reviewing recipes. The fact that most respondents thought HACCP style recipes would contribute to safer food was however, both interesting and surprising, especially as many thought that the particular example provided in this study was easy to understand and follow. The relatively high number of negative responses from some establishments however, would seem to reflect the earlier views discussed regarding a reluctance by individuals to accept that they are considered to be high-risk. For example, examples of comments made by food handlers included:

> "... it doesn't apply to us. We are only a small family business" (proprietor of a small restaurant)

> "... it is too difficult to follow. We would just skim down the left-hand column and disregard the other instructions" (Head Chef in a medium sized hotel)

> "... this only applies to large catering businesses" (chef in a small restaurant)

Conversely, many food handlers in larger establishments made comments like:

> "... it's easy to follow and ensures that the chef doesn't make any mistakes" (Head Chef in a large hotel)

> "... it's logical, simple, and makes the chefs do it properly" (Food and Beverage manager in a university)

Apart for use in the food manufacturing industry, little has been done to develop this type of recipe format for use in the catering industry. Examples in both ASC and SAFE booklets whilst reflecting some of the principles of HACCP, focus upon a more holistic emphasis, concentrating on processes and the grouping of similarly prepared and cooked foods (e.g. stews, roasts, grills, etc.). It is possible that the development of a well publicised easy to use HACCP style recipe book would be one method of effectively communicating with personnel in the industry, improving standards of food safety, reducing the level of risk to the customer, and promoting the principles of a hazard analysis approach, in catering establishments.

5.4.6. Preparation practices, hygiene and cleanliness

Statistically significant differences between the various sized establishments regarding ease of cleaning of food preparation areas was evident ($p < 0.05$). In all large establishments the kitchen areas were designed and constructed to facilitate effective cleaning and although this was also the case in 69% of medium sized establishments, in only 35% of small establishments was this observed. Whilst not statistically significant, relatively lower numbers of privately owned establishments (43%) were also observed to be problematic in terms of ease of cleaning. There may be a number of reasons why in these two groups of establishments food preparation areas were not designed with ease of cleaning in mind. These may include a lack of space and a lack of knowledge regarding effective kitchen design, although in some establishments visited the food preparation and service areas had been designed and built by previous owners. In most establishments appropriate equipment and utensils were being used although this was the case in significantly fewer numbers of small establishments (47%) compared with the other groups ($p < 0.05$). The main reasons for this were the use of wooden cutting boards which were badly worn, the use of Formica boards and surfaces to prepare food on, and in some instances, the use of poorly maintained knives with wooden/riveted handles. In virtually all establishments, staff handwashing and toilet facilities were provided, although a slightly lower number of employers provided locker and changing rooms. In two instances, staff were required to change in the dry food store, directly contravening food safety legislation (JHIC, 1997, p. 21). When asked, the managers

replied that there was nowhere else for them to go! Lighting was generally adequate although in some areas, food preparation areas were quite dark, especially directly under ventilation ducts. This could easily have led to both surface and "established" dirt and grease being missed and inevitably had an adverse effect upon the overall cleaning process. Whilst in nearly all establishments heavy duty ventilation was in place, levels of cleanliness varied. Some ventilation grids were clearly heavily encrusted with accumulated grease and dirt which could easily drop into foods being cooked on the stovetops, as well as being a fire hazard.

The appropriate use of hand, equipment and food washing areas was a cause of concern especially in small and privately owned establishments, even though separate facilities were available in many instances. Statistically significant differences were recorded for both size and ownership categories ($p < 0.05$) with the correct use especially lower in small and privately owned establishments (35% and 38% respectively). In many cases, food handlers washed their hands in food preparation sinks ("drying" their hands in their protective aprons), and conversely, washed foods such as salad items and vegetables in handwashing sinks. Such practices do nothing to re-enforce GHPs including the prevention of cross-contamination and again reflect concerns expressed regarding small establishments (Border and Norton, 1997, p. 53). They are also contradictory to the results obtained in the previous attitude survey where respondents stated that they felt more confidant about ensuring food safety if the complied with the legislation. The importance of preventing cross-contamination has been extensively reported (Evans et al, 1998, p. 169) and a number of food handlers observed took great care to prevent this during their working activities. Several procedures however, gave cause for concern. For example, in some establishments raw food was being prepared in close proximity to the cooking areas (in one medium sized multi-chain hotel, a butchers chopping block was situated next to the cooking range). Raw and cooked foods were also being prepared in the same work areas (and sometimes on the same cutting boards). Even though the areas and the boards were washed in between use, the use of a sanitising agent was limited to a small number of establishments. Such practices clearly increased risk levels and were surprising when compared to the responses given in the previous attitude survey regarding more proactive approaches to food safety being taken. Where foods were

taken to service kitchens, this was generally carried out hygienically, although a significant difference was noted in large establishments (67%) ($p < 0.05$) where appropriate care was not demonstrated. For example, foods were transported to service and/or banquet kitchen areas by way of trolleys and lifts and were frequently uncovered with trays of cooked and raw foods on the same trolley shelf. This finding was surprising when compared to the other more positive results for large establishments obtained elsewhere in this study and whilst they may be attributed to the large distances involved and the heavy workloads, they do not provide an excuse for not adhering to basic good hygienic practices. In one privately owned medium sized hotel, an outside catering business formed a part of the overall operation, and was conducted both professionally and safely.

In terms of the risk of cross-contamination, the use of storage space, particularly refrigerators was also a major area of concern in all establishments. Statistically significant differences were recorded between large and medium, and small establishments, regarding the availability of suitable storage facilities ($p < 0.05$). Whilst in all large and most medium sized establishments facilities were appropriate and complied with legislative requirements, this was only the case in 47% of small establishments. This was mainly because domestic type refrigerators were being used and both raw and cooked foods were being stored together, and because of a lack of general storage space. Many dry food items were stored on under-table shelving in the cooking areas. In many (walk-in) refrigerators in all groups, foods were stored on the floor including cooked meats and poultry, and fruits and vegetables, and frequently, the floor area was scattered with debris or had blood and/or water over parts of it. Refrigerators were often used to store wines for functions and frequently, the boxes were placed directly on top of open foods. In many cases, raw meat, poultry or fish was situated over or very close to cooked foods providing a potential for cross-contamination, and in some instances the raw foods were sitting in large quantities of blood, indicating that they had been in store for some time. In several smaller establishments, the refrigerator and freezer space was inadequate and extensive quantities of foods were being inappropriately stored, frequently unnecessarily. For example, it was not uncommon to observe tinned vegetables, jars of marmalade or jam, bread, and fruit and vegetables being stored in refrigerators. In the experience of the

author, the appropriate storage of food may sometimes be problematic. It is not however, difficult to overcome when common sense and GHPs are applied. It was extremely worrying therefore to observe such practices, especially as many respondents in the attitude survey believed that cross-contamination was not difficult to avoid in catering establishments when in fact, in the opinion of the author, it isn't.

Of all the establishments visited, only five had blast chilling cabinets. In many instances hot foods not for immediate use were left in large containers and then placed into the larder area for cooling purposes. Whilst it is good practice to cover foods, on several occasions, tight fitting lids were placed onto the containers therefore keeping the heat in and prolonging the cooling process. These practices provided an explanation of why foods were not being cooled within 90 minutes as recommended in the Catering Industry Guide to Good Hygiene Practice (JHIC, 1997, p. 64). The importance of the rapid cooling of foods has been referred to elsewhere (Ehiri and Morris, 1994, p. 256) and practices such as these only serve to increase the risk of bacterial growth and therefore, the potential for food poisoning. Of equal concern was the fact that senior food handlers also cooled foods in this way in the belief that it was "the best way to do it"! In some establishments, hot foods were observed being placed directly into refrigerators and freezers as a means of cooling them. This practice inevitably creates steam in the cabinet and raises the temperature, adversely affecting other foods.

Commercial detergents, bleach and other harmful substances were not secured in some establishments, and in several instances, were stored in the food preparation areas in close proximity to foods. This potentially dangerous practice could lead to chemical contamination, as well as being harmful to the food handlers themselves if spilled or incorrectly used. The storage and removal of food and other waste was also subject to erratic practices in many cases. Within many food preparation areas, disposable rubbish bags were in use. Frequently, these were over-filled and the covers left open. Externally situated bins and skips were largely well maintained, although in most cases, a policy for keeping food and other waste separate was not evident.

Inappropriate temperature control is a major contributing factor to food poisoning (Powell and Attwell, 1994, p. 150). A number of differing practices were observed

during the course of this study for both cold and hot foods. In many cases, refrigerators and freezers were working efficiently and the foods contained within them were being stored at appropriate temperatures. Where cabinets were being incorrectly used to cool hot foods this provided some explanation for the slightly lower numbers of freezers which were at correct temperatures, together with poorly fitting seals in some cases. In some larger and multi-chain establishments, electronic temperature monitoring systems were in place with regular printouts being produced. Where this was not the case, some variation was observed in terms of checking temperatures and in smaller establishments, fewer recordings were being taken. As previously discussed, whilst in many establishments hot foods were maintained at sufficiently high temperatures, the temperatures to which reheated foods were being taken showed some variation and temperature recordings were not being taken. The inadequate reheating of foods has also been identified as a factor which contributes to food poisoning (The Food and Drink Federation, 1996, p. 3) and the observations showed that risks were being taken in many catering establishments. Temperature probes were often used although a statistically significant difference was recorded ($p < 0.05$) among the different sized establishments. This was mainly due to the fact that they were used in only 47% of small establishments but 75% of medium and all large establishments. Where temperature probes were being used, these were of the "handheld" type and tended to be used for hot foods with refrigerator and freezer displays being relied upon to record the temperature of cold foods. Frequently, the probes were used to monitor the temperature of foods once cooked or reheated, and placed on to the hotplate for service, and not during the cooking or reheating processes. Heavy reliance was placed upon the experience of the chefs to do this and in two instances, chefs were observed testing the temperature of hot food with their fingers. Whilst in most cases, the probes were sterilised with commercial "wipes", some were rinsed in hot water and dried with the chefs' tea towels. All probes, especially the handheld variety needs to be regularly re-calibrated. In most establishments however, managers, staff and proprietors were unaware of this and consequently few probes were put through this process. The implications of this are that the accuracy of the probes becomes less reliable over time and may result in foods, especially high-risk items, not being cooked or reheated to sufficient core temperatures.

Suitable protective clothing must be worn by all food handlers (JHIC, 1997, p. 46). In many cases however, chefs were inappropriately dressed and this was apparent in all types of establishments, reflecting the findings of a Which investigation conducted in catering establishments (Anon, 1997, p. 23). For example, many chefs did not wear hats or aprons, and in several instances footwear was unsuitable. In some smaller establishments, normal clothing was worn in the kitchen areas with a waist level apron as "protection". Where protective clothing was worn it was generally clean and well maintained. Of equal concern, were the hand habits of many food handlers. On many occasions, chefs were observed handling both cooked and raw foods without adequate hand washing in between and in some instances, oven cloths and tea towels were used to wipe hands without any washing at all. This practice is potentially very dangerous as food handlers have previously been identified as carriers of harmful bacteria which may be transmitted to the cloths and foods (Evans et al, 1998, p. 169). Unlike food manufacturing companies, catering establishments do not have rigid procedures in place for hand washing and in many instances chefs handled a variety of foods in the course of their duties without washing their hands. This is despite the fact that most had been trained or instructed to at least basic levels of food hygiene. Supervision and monitoring was almost non-existent in this area with most senior personnel apparently condoning this practice and often doing it themselves. One of the characteristics of catering establishments is that non-food handlers frequently walk into or through food preparation areas. This was observed to be the case in virtually all establishments. Examples of such personnel included housekeepers, receptionists and managers. Apart from one or two isolated instances, there was no requirement or provision for them to wear white coats or other protection. As such breaches of good practice are frequent in the industry, it does again give rise to potential contamination and bad practice, and in some cases, non-food handlers were observed to be eating their meal in the kitchens whilst work was continuing around them.

5.5. Conclusions:

Whilst conducting the audits, many examples of good practice were observed and large numbers of caterers proved to be responsible and receptive to the needs of satisfactory

levels of food safety. In many establishments however, it was clear that managers and proprietors took a reactive, unstructured and sometimes ambivalent approach to the prevention of food poisoning. This generally supports some of the findings of the first survey reported in chapter three and reflects the findings of Mortlock et al (1999, p. 790). Food handling practices were frequently unsatisfactory and a cause for some concern. Generally, in multi-chain and larger establishments approaches to food safety were more likely to be conducted in a systematic manner, a food safety policy was more likely to be in place, and some communication between managers was more evident. It was mainly in these types of establishments that a quality assurance culture incorporating food safety requirements was largely to be found. In many privately owned establishments however, this was not the case with food safety management systems and policies unlikely to be developed and management responsibilities less well defined. Whilst not all large establishments are owned by multi-chain organisations, many in this study were, with the majority of small, and some medium establishments, either privately owned or part of a private company. It is in small establishments that many of these concerns were greatest, reflecting the findings of other researchers including Mortlock et al (1998, p. 790) and Ehiri et al (1997, pp. 18-19).

In chapter three, it was reported that many caterers found food safety legislation readily accessible but difficult to read and understand. When considered against the findings of this study, it would suggest that difficulties in interpreting or understanding the legislation may be one reason why many caterers did not satisfactorily meet the legislation requirements, especially in small establishments. The Catering Industry Guide to Good Hygiene Practice however, has been well publicised, is easily obtainable, and provides easily understood explanations of the 1995 Regulations. It was surprising therefore, that greater use of this source of reference was not being made. Communication between managers and staff was not entirely effective in many instances including in some larger establishments, with large numbers of staff unaware of management policies. If food safety is to be successfully managed, it is important that everyone is informed, involved and committed to the production of safe food (Jouve et al, 1999, p. 84), GHPs are practiced and monitored, and an appropriate culture of prevention is embedded from "the top down". On the whole, food handlers stated that they were aware of their responsibilities regarding food safety. In practice

however, this was not found to be the case with many of them unaware of the potential hazards in their workplace, and many of them working in an unsafe manner, especially with regard to the prevention of cross-contamination. Other procedural weaknesses were also evident, including the unsatisfactory temperature monitoring of hot foods, poor use of storage facilities including refrigerators and freezers, and incorrect use of protective attire by both food handlers, non-food handlers and visitors. Approaches to cleaning were variable, inconsistent and frequently superficial, with more attention being paid to "walls and floors" than ingrained grease and dirt which were potential breeding grounds for bacteria. It was apparent that the adequate planning and monitoring of cleaning schedules had not been satisfactorily considered.

It was clear from the findings of the study that not only were appropriate systems not in place and basic GHPs not being implemented, the management and supervision of food handlers was in many cases inconsistent or non-existent. Not only does this have implications for food safety and risk levels, it denotes an unawareness or disregard of the actions necessary to support a Due Diligence defence if the need should arise, again supporting the findings reported in chapter three. These findings were further reflected in the inconsistent approach to the maintenance of documentation in several areas. Whilst the training of staff was in the main well documented, the adequacy of the training was questionable. It was reported in chapter three that many hotels did not have a nominated food safety training manager. In larger establishments, such training is frequently the responsibility of the Personnel Manager, but often carried out off the premises. This may be at Head Office organised training sessions, in colleges, or with contracted external trainers. Wherever it was undertaken for the food handlers in this study, it's effectiveness must be in doubt, as food handling practices left much to be desired in many establishments. Several authors including Griffiths (1998, p. 32) and Taylor (1994, p. 14) have commented on the inadequacies of food hygiene training and the findings of this survey would seem to endorse their sentiments.

The use of traditional style recipes is widespread in the Hospitality and Catering industry, but arguably, they contribute little to GHPs and food safety levels. The findings of this study suggested that recipes which incorporate some of the principles of HACCP would contribute more effectively to the production of safe food and would

be easily interpreted by food handlers. The application of the Risk Assessment model to the hotels discussed in chapter three resulted in little difference between either size or ownership in terms of knowledge and understanding of the legislation, or the application of good practices. In practice however, and when broadened to encompass other sectors, this survey has shown that differences did occur, especially between multi-chain (often large) and small (often privately owned or part of a private company) establishments.

The comparison of mean scores between those obtained as a result of the audits with those of the Risk Assessment exercise reported upon in chapter three produced interesting results. Apart from large and multi-chain establishments, higher risk scores compared with lower scores for the audits, indicating some similarity between the risk score allocation and what actually happens in practice. When audited however, the systems and procedures in large and multi-chain establishments were such that they did not always reflect the confidence, levels of knowledge, and intentions reflected in the responses from the previous two surveys. Additionally, the results of the observation exercises were such that many procedures and policies reported by managers as being in place, were not being implemented or adhered to.

CHAPTER SIX

SYNOPTIC DISCUSSION

6.1. Introduction:

Most notifications of food poisoning arise from within the home environment (Miles et al, 1999, p. 751), but outbreaks of food poisoning in the Hospitality and Catering industry are significant (Robinson, 1997, p. 5). Members of the public may not always adhere to safe food practices themselves, they expect professionals within the industry to do so, even if it means paying more for that reassurance (Henson, 1996, p. 403). Whilst formal legal action against caterers may not be as high as in the food manufacturing and retail sectors (Allen, (Ed), 1999, p. 5), personnel in the Hospitality and Catering industry interact more directly with their customers and therefore attract a high profile, especially if a food poisoning outbreak occurs. This is particularly the case in the hotel sector where guests may be residential for considerable periods of time, and large numbers of people may be catered for at the same time (McDonnell, Wall, Adak, Evans, Cowden and Caul, 1995, p. 150).

This thesis has explored a number of issues related to food poisoning, food safety legislation, and the Hospitality and Catering industry in Wales. It has expanded upon previous research conducted by the author and widened the areas of investigation to include a range of other sectors. Specifically, the research has focused upon Welsh caterers' knowledge and understanding of food safety legislation, their attitudes towards food safety and the legislation, and their behavioural practices when handling and preparing food. Respondents and participants included proprietors, managers and food handlers, so that differing perspectives could be ascertained. In chapter two of this thesis, a set of Aims were formulated and the subsequent research activities reported in chapters three, four and five, were designed to achieve these Aims. This chapter aims to review chapters three, four and five, and provide a collective overview of the findings within the context of the thesis as a whole.

6.2. The hotel survey:

Responses to this survey showed that the ratio between the number of food handlers and customers served were relatively low, especially when considered in the context of the number of functions (and therefore numbers of people) catered for, the range of high-risk foods used, and the methods of service employed. When compared with the high turnover of staff and the reliance upon part-time and casual staff, as well as the pressures placed upon human and physical resources, that are characteristic of the industry (van den Bergh, 1998, p. 3), the ability of managers to ensure that GHPs are implemented, and that safe food is consistently served to the customer, may be in question. Such reasoning may in part be exemplified by the varied responses regarding temperature monitoring and recording, and the preparation of food over six hours in advance of service times.

Regarding food safety legislation, it was apparent that the introduction of the new legislation was having a limited impact upon the hotels in the survey. It was also apparent that many catering managers and proprietors perceived it to be excessive, complex and confusing, although access to information was readily available, a perception previously recognised by government (Collings, 1993, p. 9). Levels of knowledge and understanding of certain aspects of food safety legislation also varied, a finding also reported by West and Hancock (1994, pp. 12-13). The responses regarding HACCP, ASC and SAFE provided some evidence of such perceptions and supported the findings of other authors, for example Griffiths (1998, p. 32). The inability of respondents to appropriately state the principles of Due Diligence, even though they considered their levels of knowledge and understanding to be at least adequate, provided further evidence of this. Responses to other questions regarding supporting procedures (for example, a lack of written documentation) also supported the conclusion that in significant numbers of establishments, Due Diligence could not have been considered in an appropriate manner. Whether other aspects of the legislation were equally poorly understood (or inappropriately applied) became clear in the subsequent investigations and will be referred to later in this chapter.

Cumulatively, the findings demonstrated inconsistent and variable approaches to quality assurance procedures and food preparation practices including GHPs, and variable levels of knowledge and understanding regarding food safety legislation. This despite the fact that many respondents across all size and ownership groups perceived their level of knowledge and understanding to be at least adequate. On this basis alone, it may be argued that in some of the hotels surveyed, there was a potential for customers to be at risk from food poisoning. This was verified to some extent by the results of the Risk Assessment Rating Test in which hotels in all groups were allocated high risk scores in terms of foods used and their frequency of use, and significantly high risk scores in relation to food safety practices.

6.3. The attitude survey:

When compared with the findings of the first (hotel) survey, it was apparent that caterers from other sectors also found the food safety legislation confusing and difficult to understand, and was also perceived to be particularly problematic for personnel in small establishments. A situation also reported by Maryton (1998, p. 131). It was also clear however, that many caterers did not receive sufficient information regarding the legislation, a contradiction to the findings of the first survey. The fact that many respondents stated that they had become more proactive in the prevention of food poisoning, and would feel more confident about providing safe food if they complied with food safety legislation, was reassuring. This must be tempered against the more negative outcomes however, and should also be considered in the context of surveys conducted elsewhere (Powell et al, 1997, p. 330). For example, there are concerns regarding the motivation of managers and proprietors with regard to implementing effective food safety procedures (Heasman and Henson, 1997, p. 181), and the ability of managers to develop food safety programmes based upon the principles of HACCP, especially in small businesses (Panisello et al, 1998, p. 94). As the findings of this survey indicated, positive beliefs and attitudes to food safety were not always reflected by intended behaviour. This was demonstrated in the responses regarding food handling practices such as the preparation of poultry, the preparation of food in advance, the rapid cooling of foods, and the degree to which foods should be

thoroughly cooked. Such food handling practices have also been referred to by other authors in relation to their potential for causing food poisoning (Taylor, 1994, p. 14). The intended behaviour of respondents with regard to the handling of poultry was particularly of concern as many caterers believed that cross-contamination was easily avoided in their operations. An issue which is discussed in the following section of this chapter. In view of these findings it was interesting therefore, to note that many respondents believed that the introduction of food safety programmes based upon Risk Assessment would reduce incidents of food poisoning, and that caterers should be involved in the development of their own programmes.

Collectively, the findings indicated that several inconsistencies between caterer's attitudes, beliefs, and intentions to act, regarding food safety and food safety legislation existed. The respondents may have had positive beliefs and attitudes to the prevention of food poisoning, but these were not always transmitted into their actual behavioural intentions. A situation also reported by Mortlock et al (1999, p. 790). As managers and proprietors have a responsibility for ensuring an appropriate organisational culture which encompasses the effective implementation of GHPs, these findings did little to reassure the researcher that levels of risk were adequately being managed and controlled in all establishments. Overall, the results also brought into question the adequacy of training, a subject which continues to be the subject of intense debate (Traylen (Ed.), 2000, p. 1). If food hygiene training is to be effective, it must not rely solely upon acquired knowledge, but must be designed to ensure that the knowledge gained is translated into actual behaviour, both by managers and food handlers.

6.4. The audit study:

In general, the results of this study indicated that systematic approaches to food safety management and effective communication was more likely to be found in large and multi-chain establishments. Jouve et al (1999, p. 82) refer to the need for comprehensive food safety control procedures and systems in food businesses. The findings of this study however, raised several concerns regarding management procedures and the behaviour of food handlers across all groups, including some large

and multi-chain establishments. This was despite the fact that the majority of managers in multi-chain establishments stated that they had referred to the legislation when considering food safety precautions. The problems of managing food safety in small establishments has previously been referred to in this thesis as well as by other authors (Ehiri and Morris, 1996, pp. 302-303). The results of this study showed that in many privately owned and private company establishments, the legislation had not been referred to when considering their approaches to food safety. This finding gave some indication of why such problems in small establishments exist. The lack of planned and structured approaches to the management of food safety were clearly evident in many of the groups studied, and the lack of clarity regarding managers responsibilities for food safety was demonstrated by the unsatisfactory levels of supervision during food preparation. Such findings also raised questions regarding the actual implementation of the philosophy of shared responsibility for food safety referred to in chapter four. It may be speculated that the larger and more diverse management structures in larger and multi-chain establishments sometimes hinder the communication process instead of facilitating it. The combination of poor communication channels, the lack of proactive approaches to the management of food safety, and the lack of written policies or guidelines clearly had an adverse impact upon effective food handling procedures. Food handler's perceptions that their responsibilities regarding food safety were clearly defined were also not reflected in their behaviour, again raising questions about the effectiveness of any training that they had received.

At the time of this study the Food Safety (General Food Hygiene) Regulations 1995 had been in place for over two years. In at least 50% of multi-chain establishments, and the majority of all other groups however, management procedures based upon the identification, analysis and management of hazards had not been implemented. Neither had a systematic approach to the review of food safety precautions been considered. A situation also found by other researchers (Ehiri and Morris 1996, p. 243); (Morris et al, 1998, pp. 367-368). Equally, low levels of awareness existed regarding any potential hazards in the food preparation environment, and during the handling and preparation of food. This lack of awareness was evident during the observations where practices related to food handling, food storage, waste management, temperature control, and cleaning were noted.

When considered collectively, the findings of this study showed that actual behaviour did not always reflect perceived levels of knowledge and understanding, especially in smaller establishments. Ambivalence to ensuring that safe food is consistently prepared and served to the customer, and some disregard for legislative requirements were also evident in many establishments. Uncertainties existed therefore, regarding the satisfactory management of food safety, attitudes towards food safety, and therefore the potential risk to the consumer.

6.5. Summary:

Richmond (1990, pp. 126-137) reported several areas of concern with regard to the Hospitality and Catering industry, including:

- the lack of one representative organisation for the industry
- the increasing size and diversity of labour within the industry
- the rapid pace of change and increased number of catering outlets
- the significant levels of risk associated with certain sectors of the industry, especially in commercial outlets
- the large numbers of customers catered for
- the need for adequate training, both for food handlers and for managers

The results of the Audit Commission for Local Authorities in England and Wales survey (1990, pp 1-8) echoed many of these concerns, as well as reporting upon specific practices undertaken by food handlers which were health risks. Also of some concern to the Commission was the lack of management hygiene awareness within the industry. The association between the Hospitality and Catering industry and outbreaks of food poisoning has been the subject of much debate since the introduction of the new food safety legislation, for example Aston (1996, p. 14) and Konopka (1997, pp. 4-5). A number of researchers have also investigated issue relating to the industry and implementation of the legislation, for example Coleman et al (2000, pp. 145-157),

Mortlock et al (1999, pp. 786-792) and Ehiri et al (1997, pp. 71-84). Many of the issues originally raised by Richmond (1990, pp. 126-137) and the Audit Commission (1990, pp. 1-8) were found to be still of concern, even though the Food safety Act 1990 and the subsequent Regulations had been in place for some time.

From the findings discussed in this thesis, it is clear that a number of issues debated by others were equally of concern in Wales, at the time that the research was being conducted. It has become clear that many personnel in the Welsh Hospitality and Catering industry regarded food safety as important, both as individuals and for the benefit of their business activities. Levels of knowledge of food safety legislation, and the management and control of food safety however, were variable. Intended and actual behaviour also varied and was of particular concern in smaller privately owned and private company establishments. Cumulatively, the results of the three surveys indicated that Welsh caterers had low levels of knowledge of, and varying attitudes towards, certain aspects of the legislation. Several reasons for this were identified including limited access to information, communication difficulties within individual organisations, and inadequate training processes. Whilst overall attitudes towards food safety and the legislation were positive among many respondents, these were not always reflected in intended and actual behaviour. Inadequate communication and training were again identified as reasons, although the perceived complexity of the legislation also contributed to the differences between beliefs and intentions. In many instances, management procedures and controls regarding food safety were unsatisfactory and limited actions were being taken regarding cohesive, combined quality assurance approaches which incorporated the principles of Due Diligence, hazard analysis and risk assessment. Consequently, food-handling practices in a number of establishments were poorly supervised and managed. As a result, risks associated with cross-contamination and other factors contributing to the possibility of food poisoning were evident. Whilst there are clearly many unique pressures upon managers and staff in the industry, these do not absolve caterers from discharging their moral and legal responsibilities. When compared with the findings of Richmond (1990, pp. 126-137) and the Audit Commission (1990, pp. 1-8) however, it would appear that the introduction of new food safety legislation has had a limited impact upon the Welsh Hospitality and Catering industry.

The CIEH (Allen, (Ed.). 1998) calculate that food poisoning costs Britain £1 billion a year in treatment and time off work, ... the highest level since records began in 1949" (p. 6). If Welsh caterers are to contribute to reducing the possibility of food related illness for their customers, as well as reducing the costs that such illnesses may incur, they must accept responsibility for their actions. (Ehiri et al, 1997, p. 16). Equally, the government must understand the costs to caterers of complying with food safety legislation and clearly communicate the benefits of compliance to the industry, especially to small businesses. The recognition that confidence in MAFF was declining (anon, 1997, p. 3) and the subsequent introduction of the Food Standards Agency (Traylen, (ed.), 1998, p. 3) has been a positive move forward. If however, food safety is to be better managed and food-handling practices are to be improved in the industry, and levels of risk are to be reduced, the Agency must include in their strategies a clearer focus upon certain areas. These include clearer and simpler legislation, a more consolidated approach through industry professional bodies and trade associations, and a more prescriptive policy on food hygiene training and it's monitoring which takes account of actual behaviour, not just acquired knowledge. Together with central government, it must also ensure that any forthcoming European legislation is sensible, realistic and practical.

It is the view of the author that the Aims as stated in chapter two have been fully achieved. Upon reflection, some of the procedures and approaches undertaken when conducting the research could undoubtedly have been improved upon. The findings of this thesis illustrate however, that many aspects relating to food safety in the Welsh Hospitality and Catering industry merit further monitoring and investigation. It would be inappropriate to suggest that researchers should adopt specific methodologies to do this, although the relationship between knowledge, attitudes and behaviour is clearly worth emphasising.

More specifically, the following areas would seem to require further research:

- the relationship between small, medium sized, and large establishments, in terms of managing food safety.

- The relationship between privately owned establishments and those owned by large organisations, in terms of managing food safety.

- Perceptions of risk in terms of food safety. This applies to both food handlers and managers.

- The relationship between (the sometimes low) level of knowledge and food handling practices.

- The relationship between traditional methods of food safety training, attitudes to food safety, and food handling practices.

CHAPTER SEVEN

RECOMMENDATIONS

As a result of the findings of this thesis, the following recommendations are made:

- The Food Standards Agency should consider more effective strategies for raising food safety awareness in the Welsh Hospitality and Catering industry.

- The Food Standards Agency should review the existing training, instruction and supervision requirements within the Food Safety (General Food Hygiene) Regulations 1995.

- All managers and proprietors in the Hospitality and Catering industry in Wales should be trained to a level appropriate to their responsibilites.

- Personnel within the industry with responsibility for training should ensure that managers and proprietors are appropriately trained in the principles of hazard analysis and risk assessment, and that training programmes take account of actual behaviour, not just the acquisition of knowledge.

- All managers and proprietors in Welsh Hospitality and Catering outlets should ensure that appropriate food safety management control systems are implemented, and that all legal requirements are acted upon.

- All managers and proprietors in Welsh Hospitality and Catering outlets should ensure that all information, policies and procedures are effectively communicated to staff.

- All managers and proprietors in Welsh Hospitality and Catering outlets should consider the use of standardised recipes which are developed to include the principles of Hazard Analysis and Risk Assessment.

- Further research should be undertaken into the potential for food poisoning in Welsh Hospitality and Catering establishments, and strategies for reducing the levels of risk to the consumer.

- Further research should be undertaken into the relationship between the attitudes of food handlers managers and proprietors, and their behavioural practices.

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APPENDIX ONE

WELSH HOTELS SURVEY QUESTIONNAIRE

Cardiff Institute of Higher Education

Faculty of Tourism, Hospitality and Food

Welsh Hotels Survey 1994

CONFIDENTIAL

1994

WELSH HOTELS SURVEY

The following questions relate to the effect of food legislation on hotels in Wales.

A. INTRODUCTORY QUESTIONS

1. Please indicate the number of people that you normally serve food to in the hotel:

1 - 10	❐
11 - 20	❐
21 - 40	❐
41 - 60	❐
61 - 100	❐
101 - 150	❐
151 - 200	❐
201 - 250	❐
above 250	❐

Comments:.....

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2. Which of the following categories applies to the hotel?

A single privately owned hotel	❐	go to Q.4
Part of a privately owned company	❐	
Part of a major hotel chain	❐	
Other (please specify) -	❐	go to Q.4

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Confidential

3. Please indicate the number of hotels in your company or chain:

Under 5	❒
6 - 10	❒
11 - 20	❒
21 - 50	❒
51 - 100	❒
101 +	❒
Not Applicable	❒

4. Please indicate the number of staff involved in the preparation or service of food in your hotel (please include both full-time and part-time staff):

Below 10	❒
11 - 20	❒
21 - 30	❒
31 - 50	❒
51 - 100	❒
Above 100	❒

Other staff involved?.....

.....

.....

5. Please indicate the maximum number of guests that can be accommodated in your hotel at any one time:

Under 10	❒
11 - 20	❒
21 - 50	❒
51 - 100	❒
101 - 150	❒
151 plus	❒

Comments

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B. FUNCTIONS/BANQUETS/CONFERENCES

6. Please indicate the type(s) of functions that you normally provide for, together with the numbers of customers normally catered for (tick one box for each type of function):

	none	less than 20	21-50	51-100	over 100
Conferences	❐	❐	❐	❐	❐
Weddings	❐	❐	❐	❐	❐
Banquets	❐	❐	❐	❐	❐
Office/Retirement Parties	❐	❐	❐	❐	❐
Childrens Parties	❐	❐	❐	❐	❐

Comments.....

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7. Please indicate how often each of the following types of functions are catered for - a) in the Summer Period. b) in the Winter Period (tick one box for each type of function):

A. Summer

	never	1 a week or less	5 – 10 a month	more than 10 a month
Conferences	❐	❐	❐	❐
Weddings	❐	❐	❐	❐
Banquets	❐	❐	❐	❐
Office/Retirement Parties	❐	❐	❐	❐
Childrens Parties	❐	❐	❐	❐

Other (As specified below) and Comments

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B. Winter

	never	1 a week or less	5 – 10 a month	more than 10 a month
Conferences	❐	❐	❐	❐
Weddings	❐	❐	❐	❐
Banquets	❐	❐	❐	❐
Office/Retirement Parties	❐	❐	❐	❐
Childrens Parties	❐	❐	❐	❐

Other (as specified below) and Comments

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8. Approximately what percentage of the meals served in your hotel are made up of (tick one box for each type of function).

	none	10% or less	10-25%	26-50%	51-100%
Conferences	❐	❐	❐	❐	❐
Weddings	❐	❐	❐	❐	❐
Banquets	❐	❐	❐	❐	❐
+Office/Retirement Parties	❐	❐	❐	❐	❐
Childrens Parties	❐	❐	❐	❐	❐

Other (as specified below) and Comments

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9. Please indicate which type(s) of function meals are regularly served in your hotel:

	Yes	No
Finger Buffets	❐	❐
Fork Buffets	❐	❐
Hot and Cold Buffets	❐	❐
"Sit-Down" Hot Meals	❐	❐

Other (please specify below) and Comments

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10. Please indicate which of the following foods are used in the preparation or service of your functions:

	Any day	1 per week	1 per month	less than 1 per month	never
Soft Cheeses	❒	❒	❒	❒	❒
Mayonnaise	❒	❒	❒	❒	❒
Mayonnaise	❒	❒	❒	❒	❒
Eggs	❒	❒	❒	❒	❒
Commercial/Pasteurised	❒	❒	❒	❒	❒
Egg Products	❒	❒	❒	❒	❒
Fresh Cream (and/or Fresh Cream Products)	❒	❒	❒	❒	❒
Cooked Cold Meats	❒	❒	❒	❒	❒
Reheated Meats	❒	❒	❒	❒	❒
Cooked Cold Poultry	❒	❒	❒	❒	❒
Rice	❒	❒	❒	❒	❒
Reheated Poultry	❒	❒	❒	❒	❒
Mayonnaise	❒	❒	❒	❒	❒
Shellfish	❒	❒	❒	❒	❒
Stewed Meat Items)ie Curries, Fricassees,Goulash, .Chilli	❒	❒	❒	❒	❒
Soups and/or Gravies	❒	❒	❒	❒	❒
Trifles	❒	❒	❒	❒	❒
Custards	❒	❒	❒	❒	❒

Other 'High Risk' Foods?

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11. How frequently is food for functions and banquets prepared in advance?

Frequently ❒ Sometimes ❒ Rarely ❒ Never ❒

Comments

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12. Where food is prepared in advance, is the time period likely to be:

Less than 2 hours	❐	2 - 6 hours	❐	6 - 10 hours	❐
10 - 12 hours	❐	More than 12 hours	❐		

Comments

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C. FOOD HYGIENE AND SAFETY

13. Do you keep or possess a copy of the following items in the hotel?

	Yes	No
The Food Safety Act 1990	❐	❐
The Food Hygiene (Amendment) Regulations 1990/91	❐	❐
The Ec Hygiene Directive	❐	❐

14. Have you or a member of your staff read the following items?

	Yes	No
The Food Safety Act 1990	❐	❐
The Food Hygiene (Amendment) Regulations 1990/91	❐	❐
The Ec Hygiene Directive	❐	❐

15. In your opinion, is the amount of food safety legislation:

Excessive	❐	About right	❐	Insufficient	❐

Comments

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Confidential

16. Do you feel that your knowledge of the new food safety legislation in relation to your job function is:

More than adequate	❐
Adequate	❐
Inadequate	❐

Comments

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17. Please indicate the degree of knowledge and understanding you have of the following terms:

	very good	good	moderately good	not good	No knowledge
BS5750	❐	❐	❐	❐	❐
Quality Assurance	❐	❐	❐	❐	❐
Quality Control	❐	❐	❐	❐	❐
Good Catering Practice (GCP)	❐	❐	❐	❐	❐
Hazard Analysis and Critical Control Points (HACCP)	❐	❐	❐	❐	❐
Due Diligence	❐	❐	❐	❐	❐
Total Quality Management	❐	❐	❐	❐	❐
Assured Safe Catering (ASC)	❐	❐	❐	❐	❐

Comments

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18. Do you feel confident enough to explain the meaning of Due Diligence to your staff?

YES ❒ NO ❒

If NO, what do you need to increase your confidence?

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19. In order to assure quality products, how often do you or any of your staff visit your suppliers?

	Regularly	Sometimes	Never
All of them	❒	❒	❒
Some of them	❒	❒	❒
None of them	❒	❒	❒

If **ALL** or **SOME**, please specify:

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20. Are any of your food deliveries checked according to a pre-determined system?

All of them ❒
Some of them ❒
None of them ❒

If **ALL** or **SOME**, please specify commodity and frequency of checks:

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Confidential

21. Please indicate the number of times each day that your refrigerator temperatures are:

	monitored	recorded
Less than once a day	❒	❒
Once a day	❒	❒
Twice a day	❒	❒
More than twice a day	❒	❒

Comments

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22. Are the refrigerator temperatures monitored:

Manually ❒ Automatically ❒ Both ❒

23. Please briefly explain your interpretation of Due Diligence:

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24. Please list below any factors that you have considered to be barriers to the implementation of the new food safety legislation:

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25. In your opinion, is the new food safety legislation: **(tick one box only)**

Generally easy to read and understand	❐
Easy to read and understand in parts only	❐
Confusing in one or two areas	❐
Generally hard to read and understand	❐

Comments

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26. Please indicate which of the following you consider to be the most useful sources of information regarding food safety legislation:
(please place in rank order, i.e. 1 = best source, 7 = least)

MAFF Publications/Mailshots	❐
Local Environmental Health Office	❐
Local Press	❐
Colleges of Further/Higher Education	❐
Independent Training Organisations	❐
Head Office (in the case of Companies)	❐
Trade Associations	❐

Other (please specify below): and Comments

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27. In your opinion is information on food safety legislation - (tick one box only)

Very easy to obtain	❐
Fairly easy to obtain	❐
Not so easy to obtain	❐
Fairly difficult to obtain	❐
Very difficult to obtain	❐
Not available to you	❐

Comments

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28. Please indicate your relative knowledge and understanding of the following terms:

	very good	good	moderately	not good	No knowledge
Improvement Notice	❐	❐	❐	❐	❐
Prohibition Order	❐	❐	❐	❐	❐
Emergency Prohibition Order	❐	❐	❐	❐	❐
Emergency Prohibition Notice	❐	❐	❐	❐	❐

Comments

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29. Please indicate the approximate number of visits made by an Environmental Health Officer since January 1991:

None	❐
1 - 3	❐
4 - 6	❐
More than SIX	❐

Comments

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.....

D. QUALITY ASSURANCE AND CONTROL

30. Do you feel that the number of visits that you receive from an Environmental Health Officer is:

Excessive	❐
About right	❐
Insufficient	❐

Comments

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31. Do you have any measures in place which help to improve the quality of food production?

Yes ❐ No ❐ (if NO go to Q33)

32. If the answer to question 31 is positive, please list some or all of the measures that you take:

.....

.....

.....

33. When monitoring customer satisfaction, do you use:

	Yes	No
Room Questionnaires	❐	❐
Staff Feedback	❐	❐
Customer Complaints	❐	❐

Other Methods (Please Specify Below) And Comments

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34. Do you have a member of your management or staff responsible for food hygiene/safety training?

Yes ❒ No ❒

If YES, please give their job title/position:

.....

35. Please indicate whether food samples are regularly taken for micro-biological analysis:

Never ❒
Once/twice a month ❒
Three/four times a month ❒
More than four times a month ❒

36. Does your hotel possess BS5750 accreditation?

Yes ❒ No ❒

37. Please indicate in which of the following areas you maintain quality assurance documentation: (tick more than one box if appropriate)

Purchasing procedures ❒
Storage procedures ❒
Refrigeration and temperature control ❒
Cleaning procedures ❒
Food sampling ❒
Staff/management training ❒
Customer comments/complaints ❒
EHO visits ❒
None of these ❒

OTHER (please specify below)

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38. Please indicate the degree of importance that you attach to the following in relation to Food and Beverage Operations and Management.

	Very important	Fairly important	Not important
BS5750	❐	❐	❐
Quality Assurance	❐	❐	❐
Quality Control	❐	❐	❐
Good Catering Practice (GCP)	❐	❐	❐
Hazard Analysis and Critical Control Points (HACCP)	❐	❐	❐
Due Diligence	❐	❐	❐
Total Quality Management (TQM)	❐	❐	❐
Assured Safe Catering (ASC)	❐	❐	❐

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Name of Person responding to questions: .....

Name of Hotel .....

.....

.....

Position: .....

Telephone No. .....

Qualifications:

- Degree ☐
- HND ☐
- Nat Diploma ☐
- Craft Certificate ☐

Food Hygiene Qualification (Please indicate whether):

- Basic ☐
- Intermediate ☐
- Advanced ☐

THANK YOU FOR YOUR ASSISTANCE

APPENDIX TWO

RISK ASSESSMENT RATING TEST

RISK ASSESSMENT RATING LIST

No. of Establishment: .....

A. FOODS INVOLVED:			B. FREQUENCY OF USE:				SCORE:	
Fresh eggs	10	plus frequency of use ...	5	3	2	1	=	
Made-up meat dishes	10	"	5	3	2	1	=	
Reheated meats/poultry	10	"	5	3	2	1	=	
Cooked cold meats/poultry	10	"	5	3	2	1	=	
Rice	10	"	5	3	2	1	=	
Fish/fish dishes	10	"	5	3	2	1	=	
Soft cheeses	5	"	5	3	2	1	=	
Scotch eggs	5	"	5	3	2	1	=	
Mayonnaise	5	"	5	3	2	1	=	
Shellfish	5	"	5	3	2	1	=	
Fresh cream/products	5	"	5	3	2	1	=	
Soups	5	"	5	3	2	1	=	
Gravies	5	"	5	3	2	1	=	
Trifles	5	"	5	3	2	1	=	
Custards	5	"	5	3	2	1	=	
Comm/past. Egg/products	2	"	5	3	2	1	=	
						Sub-total	=	out of max 187 (%)

A. PROCEDURES INVOLVED:								
Deliveries checked	---	5	3	---	---	0	=	
Foods prepared in advance	10	5	2	---	---	0	=	
No. of stages in food preparation	---	8	4	2	---	---	=	
Timescale involved	10	8	6	2	1	---	=	
Refrigerator temperatures monitored/recorded	---	8	4	2	---	0	=	
Cooking/reheating temperatures monitored/recorded	10	---	---	---	---	0	=	
Food service temperatures monitored/recorded	10	---	---	---	---	0	=	
Training manager	---	5	---	---	---	0	=	
QA documentation	---	5	3	---	---	0	=	
						Sub-total	=	out of max 71 (%)
						ASSESSMENT RATING LIST TOTAL	=	out of max 258 (%)

APPENDIX THREE

WALES FOOD SAFETY ATTITUDE BATTERY

Cardiff Institute of Higher Education

Faculty of Tourism, Hospitality and Food

Welsh Catering Survey 1995

(Part Two)

Confidential

Welsh Catering Survey

1995

Directions for Completion of Questionnaire:

Unless otherwise stated, please respond to each statement listed by placing a tick in one of the boxes under the "Response Scale" heading.

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Welsh Catering Survey

1995

Name of person responding to questions:

.....

Position .....

Name of Establishment: .....

.....

.....

Telephone Contact Number: .....

THANK YOU FOR YOUR ASSISTANCE

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GENERAL

STATEMENTS	RESPONSE SCALE				
	Strongly Agree	*Agree*	*Uncertain*	*Disagree*	*Strongly Disagree*
1. Adherence to Due Diligence procedures will reduce food poisoning.					
2. BS5750 accreditation ensures high standards of food safety and hygiene.					
3. All food handlers should have a food hygiene qualification.					
4. Catering managers do not need to have a food hygiene qualification.					
5. I am now taking a more pro-active approach to food hygiene and safety compared to 5 years ago.					
6.. Written records are useful as part of our food safety monitoring programme.					
7. One or more members of my food handling team have direct experience of food poisoning.					
8. My past experiences with Environmental Health Officers have been helpful.					
9. An outbreak of food poisoning in this establishment would cause major problems.					
10. Catering establishments rarely give rise to incidents of food poisoning.					

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LEGISLATION

STATEMENTS	RESPONSE SCALE				
	Strongly Agree	*Agree*	*Uncertain*	*Disagree*	*Strongly Disagree*
11. The introduction of the Food Safety Act 1990 has reduced the number of cases of food poisoning.					
12. The amount of food safety legislation has become too excessive.					
13. Compliance with food safety legislation is not important to me.					
14. Food safety legislation poses particular difficulties for small establishments.					
15. Environmental Health Officers are useful sources of information on food safety legislation.					
16. The main reason for me complying with food safety legislation is the threat of prosecution.					
17. Complying with food safety legislation would make me feel confident about food safety.					
18. I intend to make every effort to comply with the new food safety legislation.					
19. My customers expect me to comply with new food safety legislation.					
20. Environmental Health Officers enforce food legislation consistently.					

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LEGISLATION

STATEMENTS	RESPONSE SCALE				
	Strongly Agree	*Agree*	*Uncertain*	*Disagree*	*Strongly Disagree*
21. Food safety systems in this establishment are likely to be reviewed when the new legislation is introduced later this year.					
22. Training programmes for staff and management will be held as part of the preparation for the new food safety legislation.					
23. Other caterers think that I should comply with new food safety legislation.					
24. Sufficient information regarding the new food safety legislation is readily available to me.					
25. It is my responsibility to ensure that the new food safety legislation is correctly implemented.					
26. Food safety legislation requirements have been easily adopted in this establishment					
27. Simplified food safety legislation would enable me to adhere to its requirements more rigorously.					
28. The temperature controls introduced in the 1991 Food Hygiene (Amendment) Regulations are easily understood.					
29. The forthcoming (1995) food safety legislation will simplify existing regulations.					
30. I do not have time to deal with the new food safety requirements.					

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FOOD HANDLING

STATEMENTS	RESPONSE SCALE				
	Strongly Agree	*Agree*	*Uncertain*	*Disagree*	*Strongly Disagree*
31. I intend to handle poultry with no greater care than other foods.					
32. Beef and Pork are foods often implicated in food poisoning.					
33. Prepared meat products and pies are rarely implicated in food poisoning.					
34. Cooked rise should be handled and stored with particular care.					
35. I have no reservations about serving lightly cooked eggs.					
36. Adequate food safety precautions require a lot of thought and planning time.					
37. Temperature controls are an effective method of reducing the number of cases for food poisoning.					
38. Cross-contamination is easy to avoid in catering operations.					
39. Cooling cooked foods rapidly helps to prevent food poisoning.					
40. Poor personal hygiene is more critical when handling raw foods than with cooked foods.					
41. Serving food rare or underdone is undesirable.					

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FOOD HANDLING

STATEMENTS	RESPONSE SCALE				
	Strongly Agree	*Agree*	*Uncertain*	*Disagree*	*Strongly Disagree*
42. Preparation of food in advance is likely to contribute significantly to food poisoning.					
43. Correct control of refrigeration temperatures is more important for raw foods than cooked foods.					
44. Storing foods at ambient temperatures is difficult to avoid in catering operations.					
45. Re-heating of cooked or previously prepared foods is of minor importance in food safety.					
46. If cases of food poisoning are suspected, the food handlers are like to be responsible.					
47. Food handlers in this establishment have adequate time to implement food safety systems and procedures.					
48. Food handlers are in a position to exert a strong amount of control over the potential for food poisoning.					
49. Managers are in a position to exert strong control in the prevention of food poisoning.					

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RISK ASSESSMENT

STATEMENTS	RESPONSE SCALE				
	Strongly Agree	*Agree*	*Uncertain*	*Disagree*	*Strongly Disagree*
50. Caterers should not be involved in designing their own Risk Assessment programme.					
51. Risk Assessment programmes for food safety will reduce the chances of food poisoning.					

APPENDIX FOUR

TRADITIONAL AND HACCP STYLE RECIPES

RECIPE - STYLE ONE

SAMPLE RECIPE - BOILED RICE: (for immediate use)

METHOD

NOTE: CARE MUST BE TAKEN TO ENSURE THAT THE FOOD HANDLERS HANDS AND ALL EQUIPMENT/UTENSILS HAVE BEEN SUITABLY CLEANED FOR ALL STAGES IN THE PREPARATION OF THIS DISH.

1. "Pick over" and wash the rice ensuring that all foreign bodies are removed. This must be carried out well away from raw food preparation areas. Cook rice immediately.

2. Boil sufficient salted water in a deep pan and sprinkle in the rice, stir occasionally until it re-boils. Care should be taken to ensure that contamination from other foods is not possible.

3. Ensuring that the water temperature remains at boiling point, gently boil the rice for a minimum of 12 minutes, stirring occasionally. A minimum temperature of 100°C should be maintained for at least 8 minutes.

4. When cooked, drain well and put into a buttered dish to a maximum depth of 2-2.5", ensuring that no foreign bodies are present and that no hand contact occurs. This should be carried out well away from raw food preparation areas.

5. Cover with a stainless steel lid and keep at a minimum temperature of 63°C until served, stirring every 5 minutes. Ensure that the rice is kept well away from raw food preparation areas. Do not replenish part-used trays of rice and do not keep hot for longer than 2 hours.

6. Cool unused rice as quickly as possible under cold running water, well away from raw food preparation areas. When thoroughly cooled, drain well and transfer to a clean container, ensuring no foreign bodies are present and no hand contact occurs. Refrigerate immediately.

RECIPE - STYLE ONE

Please place a tick in <u>one</u> box next to <u>each</u> statement.

Statements **Response Scale**

Statement	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
1. Use of recipes in this format would be helpful in producing safer food.					
2. Recipes written in this format are of no use to me.					
3. All catering establishments should use recipes written in this format.					
4. Only traditionally styled recipes should be used in catering establishments.					
5. Recipes in this format are not easily understood.					
6. Recipes in books should be written in this format.					

RECIPE - STYLE TWO

SAMPLE RECIPE - BOILED RICE (for immediate use)

Step	Method	Hazard	Preventative measure
1	Boil salted water in a deep pan. Pick over and wash rice, use immediately.	Foreign body or other contamination. Contamination by pathogenic bacteria and/or toxins.	Ensure hands are clean (ALL STAGES). Use clean equipment and utensils. Visually check rice. Ensure this is carried out well away from raw food preparation areas.
2	Sprinkle rice into boiling water and stir occasionally until it re-boils.	Foreign body or other contamination.	Use clean equipment and utensils.
3	Boil gently for a minimum of 12 minutes, stirring occasionally.	Survival of pathogenic bacteria.	Cook at a minimum temperature of 100°C for at least 8 minutes.
4	When cooked, drain well and transfer to a buttered stainless steel tray to a maximum depth of 2-2.5".	Contamination by pathogenic bacteria and/or toxins. Foreign body or other contamination.	Ensure this is carried out well away from raw food preparation areas. Ensure hand contact with rice is avoided. Use clean equipment and utensils.
5	Cover with a stainless steel lid and keep hot until required, allowing excess steam to escape.	Germination of spores and possible toxin production. Contamination by pathogenic bacteria and/or toxins. Foreign body or other contamination. Possible contamination by subsequent batches of cooked rice. Overlong standing of rice.	Maintain at or above 63°C. Test temperature with a clean probe every 20 minutes. Stir every 5 minutes Ensure rice is kept well away from raw food preparation areas. Use clean equipment and utensils. Do not replenish part-used trays of rice. Do not keep hot for longer than 2 hours.
6	Cool unused rice as quickly as possible under cold running water. Drain well and place in a clean covered container. Refrigerate immediately.	Foreign body or other contamination. Contamination by pathogenic bacteria and/or toxins. Survival of spores and/or toxins.	Use clean equipment and utensils. Ensure rice is kept well away from raw food preparation areas. Ensure hand contact with rice is avoided. Ensure rice is thoroughly cooled before draining.

RECIPE - STYLE TWO

Please place a tick in <u>one</u> box next to <u>each</u> statement.

Statements **Response Scale**

Statement	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
1. Use of recipes in this format would be helpful in producing safer food.					
2. Recipes written in this format are of no use to me.					
3. All catering establishments should use recipes written in this format.					
4. Only traditionally styled recipes should be used in catering establishments.					
5. Recipes in this format are not easily understood.					
6. Recipes in books should be written in this format.					

Which of these two recipe styles do you prefer?
(please delete as appropriate)

STYLE ONE

STYLE TWO

Please give reasons for your choice:

.....

.....

.....

THANK YOU FOR YOUR CO-OPERATION

APPENDIX FIVE

AUDIT QUESTIONNAIRE AND CHECKLIST

Audit Checklist

Food Safety Audit

Auditor	:	**P D Coleman**
Location	:	
Date	:	

	Maximum Score	Actual Score	Percentage %

Overall Score

Section 1 :- Food Safety Audit
Part 1 :- Systems audit (part one)
Element 1 :- Management Approaches to Food Safety

		Y	N
Question 1 :-	Is there a written statement or policy for food safety?	☐	☐
Question 2 :-	Are management responsibilities for food safety clearly defined?	☐	☐
Question 3 :-	Are management responsibilities for food safety clearly communicated?	☐	☐
Question 4 :-	Are food safety issues planned for in a structured manner?	☐	☐
Question 5 :-	Are food safety procedures monitored and reviewed according to a pre-determined plan?	☐	☐
Question 6 :-	Is senior management committed to the provision of appropriate resources?	☐	☐
Question 7 :-	Are management and staff trained/instructed according to a pre-determined plan?	☐	☐
Question 8 :-	Has the legislation been referred to as part of the process for deciding food safety policies and/or procedures?	☐	☐
		Y	N

Question 9 :- Are there written statements of instruction for management and staff? ❒ ❒

Y N

Question 10:- Is the Industry Guide to Good Hygiene Practice used as a source of reference for developing Food Safety policy? ❒ ❒

Y N

Question 11:- Are EHOs used as a source of advice and guidance? ❒ ❒

Y N

Question 12:- Are staff involved in the development of food safety policy? ❒ ❒

Y N

Question 13:- Are staff responsibilities for food safety clearly defined? ❒ ❒

Y N

Question 14:- Are food safety procedures clearly communicated to staff? ❒ ❒

Section 1 :- Food Safety Audit
Part 1 :- Systems audit (part one)
Element 2 :- Steps critical to Food Safety

			Y	N
Question	1 :-	Are food safety practices based upon the identification and analysis of potential hazards?	☐	☐
Question	2 :-	Have points where food hazards may occur (CPs) been identified?	☐	☐
Question	3 :-	Have points which are critical to food safety (CCPs) been identified?	☐	☐
Question	4 :-	Have targets and critical limits been set for CCPs?	☐	☐
Question	5 :-	Are control measures in place for CCPs?	☐	☐
Question	6 :-	Are the above procedures subject to periodic review?	☐	☐

Section 1 :- Food Safety Audit
Part 1 :- Systems audit (part one)
Element 3 :- Is documentation maintained for:

		Y	N
Question 1 :-	(Is there a policy for maintaining food safety documentation?)	❐	❐
Question 2 :-	Staff and management training/instruction?	❐	❐
Question 3 :-	Receipt of food commodities?	❐	❐
Question 4 :-	Storage of commodities?	❐	❐
Question 5 :-	Monitoring chilled/refrigerated food storage?	❐	❐
Question 6 :-	Monitoring frozen food storage?	❐	❐
Question 7 :-	Monitoring the temperature of foods during cooking?	❐	❐
Question 8 :-	Monitoring the temperature of hot foods for service?	❐	❐
Question 9 :-	Monitoring staff and management illnesses?	❐	❐

			Y	N
Question	10:-	Monitoring staff and management recruitment?	❒	❒
Question	11:-	Selecting/visiting/inspecting suppliers?	❒	❒
Question	12:-	Monitoring the health of food handlers?	❒	❒
Question	13:-	Cleaning schedules?	❒	❒
Question	14:-	EHO visits and inspections?	❒	❒
Question	15:-	Pest control?	❒	❒
Question	16:-	The identification, analysis and review of potential hazards?	❒	❒
Question	17:-	Defining, monitoring and reviewing CCPs??	❒	❒

Section 1 :- Food Safety Audit
Part 1 :- Systems audit (part one)
Element 4 :-- Recipes

		Y	N
Question 1 :-	Is one set of standard recipes used by all food handlers?	❒	❒
Question 2 :-	Has either HACCP, ASC or SAFE been considered when devising recipes?	❒	❒
Question 3 :-	Is either HACCP, ASC or SAFE considered when new recipes are devised?	❒	❒
Question 4 :-	Is either HACC, ASC or SAFE considered when recipes are changed or altered?	❒	❒

Section 1 :- Food Safety Audit
Part 2 :- Systems audit (part two)
Element 1 :- Awareness of food handlers

		Y	N
Question 1 :-	Are all food handlers aware of the food safety statement/ policy?	❐	❐
Question 2 :-	Are all food handlers aware of their responsibilities regarding food safety?	❐	❐
Question 3 :-	Are all food handlers trained/instructed to a level commensurate with their job roles?	❐	❐
Question 4 :-	Are all food handlers aware of the Industry Guide to Good Hygiene Practice?	❐	❐
Question 5 :-	Are all food handlers aware of the potential hazards within their areas of responsibility?	❐	❐
Question 6 :-	Are all food handlers aware of the CCPs within their areas of responsibility?	❐	❐
Question 7 :-	Are all food handlers aware of the hotels' Hazard Analysis Programme?	❐	❐

Section 1 :- Food Safety Audit
Part 2 :- Systems audit (part two)
Element 2 :- Training

		Y	N
Question 1 :-	Is supervision and/or instruction apparent during operational procedures?	❒	❒

Section 1 :- Food Safety Audit
Part 2 :- Systems audit (part two)
Element 3 :- Preparation, hygiene and cleanliness

		Y	N
Question 1 :-	Are the food preparation areas generally clean and in a good state of repair.	❒	❒
Question 2 :-	Is food preparation equipment sited so as to aid ease of cleaning?	❒	❒
Question 3 :-	Are pest control measures in place?	❒	❒
Question 4 :-	Are staff handwash facilities provided?	❒	❒
Question 5 :-	Are staff toilet facilities provided?	❒	❒
Question 6 :-	Are staff changing/locker facilities provided?	❒	❒

		Y	N
Question 7 :-	Is ventilation provided in food preparation areas?	❒	❒
Question 8 :-	Is the ventilation system conducive to easy cleaning?	❒	❒
Question 9 :-	Are all areas of the food preparation environment well lit?	❒	❒
Question 10 :-	Are floor areas free from accumulating pools of water?	❒	❒
Question 11 :-	Are cleaning schedules being used?	❒	❒
Question 12 :-	Are cleaning procedures supervised or monitored?	❒	❒
Question 13 :-	Is equipment generally clean and in a good state of repair?	❒	❒
Question 14 :-	Are separate washing facilities provided for foods/hands/ equipment?	❒	❒
Question 15 :-	Do food preparation areas comply with legislation regarding ease of cleaning?	❒	❒
Question 16 :-	Are utensils and other equipment constructed of materials which comply with legal requirements?	❒	❒

			Y	N
Question	17:-	Do facilities for the storage and removal of food (and other) waste comply with legal requirements?	❒	❒
Question	18:-	Are cleaning materials and other hazardous substances clearly labelled and secured?	❒	❒
Question	19:-	Do operating procedures include measures to prevent cross-contamination?	❒	❒
Question	20:-	Where foods are transported to other preparation or service areas, is this carried out hygienically?	❒	❒

Section 1 :- Food Safety Audit
Part 2 :- Systems audit (part two)
Element 4 :- Delivery and Storage

		Y	N
Question 1 :-	Are all commodities checked upon delivery?	❐	❐
Question 2 :-	Are all deliveries documented?	❐	❐
Question 3 :-	Are all deliveries put into storage as soon as they have been received?	❐	❐
Question 4 :-	Is stock rotation practiced?	❐	❐
Question 5 :-	Do storage facilities comply with legal requirements?	❐	❐

Section 1 :- Food Safety Audit
Part 2 :- Systems audit (part one)
Element 5 :- Temperature Control

		Y	N
Question 1 :-	Is the temperature of chilled/refrigerated foods checked and recorded at regular intervals?	❒	❒
Question 2 :-	Is the temperature of frozen foods checked and recorded at regular intervals?	❒	❒
Question 3 :-	Are cooking temperatures monitored and recorded	❒	❒
Question 4 :-	Where foods are being re-heated, is this carried out quickly and to a sufficient core temperature?	❒	❒
Question 5 :-	Do refrigerator (and core food) temperatures comply with legal requirements.	❒	❒
Question 6 :-	Do freezer temperatures comply with legal requirements?	❒	❒
Question 7 :-	Are hot foods for service maintained at or above legal temperature requirements?	❒	❒
Question 8 :-	Are cooked foods not for immediate use cooled within 90 minutes?	❒	❒

		Y	N
Question 9 :-	Are temperature probes used as part of the monitoring process?	❒	❒
Question 10:-	Are wipes or solutions used for the sterilisation of temperature probes?	❒	❒
Question 11:-	Are temperature probes regularly calibrated?	❒	❒
Question 12:-	Are the temperatures of all refrigerators and freezers displayed visually?	❒	❒

Section 1 :- Food Safety Audit
Part 2 :- Compliance audit
Element 6 :- Personal Hygiene

Question 1 :- Are all food handlers wearing clean and suitable protective clothing? Y ☐ N ☐

Question 2 :- Are all food handlers free from open cuts or wounds? Y ☐ N ☐

Question 3 :- Is there evidence of good hand habits? Y ☐ N ☐

Question 4 :- Where non-food handlers visit food preparation areas, is protective clothing worn? Y ☐ N ☐

APPENDIX SIX

THE AUDIT STUDY: RESPONSES OR OBSERVATIONS WITH STATISTICALLY SIGNIFICANT DIFFERENCES

The audit study. Questions or Observations with statistically significant differences ($p < 0.05$), by ownership of establishment:

Serial	Question or Observation	All Responses		Multi-chain establishments		Private Company establishments		Privately owned establishments	
		YES	NO	YES	NO	YES	NO	YES	NO
1	Are management responsibilities for food safety clearly defined?	27 (68)	13 (32)	6 (75)	2 (25)	4 (36)	7 (64)	17 (81)	4 (19)
2	Are management responsibilities for food safety clearly communicated?	25 (63)	15 (37)	4 (50)	4 (50)	4 (36)	7 (64)	17 (81)	4 (19)
3	Are food safety issues planned for in a structured manner?	23 (57)	17 (43)	7 (88)	1 (12)	3 (27)	8 (73)	13 (62)	8 (38)
4	Are food safety procedures monitored and reviewed according to a pre-determined plan?	17 (43)	23 (57)	6 (75)	2 (25)	2 (18)	9 (82)	9 (43)	12 (57)
5	Is documentation maintained for selecting/visiting/inspecting suppliers?	11 (27)	29 (73)	5 (63)	3 (37)	3 (27)	8 (73)	3 (14)	18 (86)
6	Are washing facilities correctly used?	23 (57)	17 (43)	6 (75)	2 (25)	9 (82)	2 (18)	8 (38)	13 (62)

The audit study. Questions or Observations with statistically significant differences ($p < 0.05$), by size of establishment:

Serial	Question or Observation	All Responses		Small establishments		Medium sized establishments		Large establishments	
		YES	NO	YES	NO	YES	NO	YES	NO
1	Are management and staff trained/instructed according to a pre-determined plan?	22 (55)	18 (45)	7 (41)	10 (59)	8 (50)	8 (50)	7 (100)	--------
2	Are food safety practices based upon the identification and analysis of potential hazards?	9 (23)	31 (77)	2 (12)	15 (88)	3 (19)	13 (81)	4 (57)	3 (43)
3	Have points where food hazards may occur (CP's) been identified?	9 (23)	31 (77)	2 (12)	15 (88)	3 (19)	13 (81)	4 (57)	3 (43)
4	Have points which are critical to food safety (CCP's) been identified?	8 (20)	32 (80)	2 (12)	15 (88)	2 (12)	14 (88)	4 (57)	3 (43)
5	Is there documentation for pest control?	25 (63)	15 (37)	6 (35)	11 (65)	12 (75)	4 (25)	7 (100)	--------
6	Are all food handlers aware of the food safety statement/policy?	22 (55)	18 (45)	4 (24)	13 (76)	12 (75)	4 (25)	6 (86)	1 (14)
7	Are all food handlers aware of the potential hazards within their areas of responsibility?	19 (47)	21 (53)	5 (29)	12 (71)	8 (50)	8 (50)	6 (86)	1 (14)
8	Is supervision and/or instruction apparent during operational procedures?	22 (55)	18 (45)	8 (47)	9 (53)	7 (44)	9 (56)	7 (100)	--------
9	Are washing facilities being correctly used?	23 (57)	17 (43)	6 (35)	11 (65)	11 (69)	5 (31)	6 (86)	1 (14)

10	Do food preparation areas comply with legislation regarding ease of cleaning?	24 (60)	16 (40)	6 (35)	11 (65)	11 (69)	5 (31)	7 (100)	--------
11	Are utensils and other equipment constructed of materials which comply with legal requirements?	28 (70)	12 (30)	8 (47)	9 (53)	13 (81)	3 (19)	7 (100)	--------
12	Where foods are transported to other preparation or service areas, is this carried out hygienically?	31 (77)	9 (23)	15 (88)	2 (12)	13 (81)	3 (19)	3 (43)	4 (57)
13	Are all deliveries put into (storage as soon as they have been received?	26 (65)	14 (35)	8 (47)	9 (53)	11 (69)	5 (31)	7 (100)	----------
14	Do storage facilities comply with legal requirements?	28 (70)	12 (30)	8 (47)	9 (53)	13 (81)	3 (19)	7 (100)	----------
15	Are temperature probes used as part of the monitoring process?	28 (70)	12 (30)	8 (47)	9 (53)	13 (81)	3 (19)	7 (100)	----------

APPENDIX SEVEN

THE AUDIT STUDY: CRITERIA REFERRED TO DURING OBSERVATIONS

CRITERIA REFERRED TO DURING AUDIT OBSERVATIONS (SEE CHAPTER FIVE)

NOTE: All criteria are based upon information contained within the Catering Industry Guide to Good Hygiene Practice. (1997), pp. 16-27 and 45-64, unless otherwise stated.

Table 5.7. Preparation, hygiene and cleanliness:

Serials: 1, 2, 8, 13,

- Internal and external surfaces visually clean, easily cleaned, and in a good state of repair
- Surfaces and equipment easily accessible, easily cleaned, and systematically cleaned during and after use
- Non-food surfaces easily cleaned, and cleaned periodically
- Floor spaces easily accessible and in a good state of repair with adequate drainage, that allows them to be kept clean, and where appropriate, disinfected
- All floors, other non-food surfaces easily accessible, and equipment constructed of appropriate materials, and maintained, as stated in the Food Safety (General Food Hygiene) Regulations 1995
- Ceilings and overhead facilities including ventilation, constructed of appropriate materials, easily and safely accessible, and periodically cleaned and maintained, as stated in the Food Safety (General Food Hygiene) Regulations 1995
- Windows and other openings constructed of appropriate materials, easily accessible, and periodically cleaned and maintained, as stated in the Food Safety (General Food Hygiene) Regulations 1995

Serial 15:

- Proximity of cleaning facilities to food preparation areas
- Cleaning facilities include detergents, disinfectants, sterilising sinks, dishwashers (where appropriate), and suitable drying measures.
- Where one sink area is used for the cleaning of both equipment and foods, food safety is not prejudiced, and suitable cleaning between each process is undertaken
- Adequate supplies of hot and cold water are available and used in accordance with legislative requirements
- Foods, equipment and personal washing is conducted separately and appropriately, according to legislative requirements

Serial 20:

- Sufficient space is allocated in food preparation rooms to allow high-risk foods to be prepared on separate work surfaces, and with separate equipment
- Where sufficient space is not practical, work flows are such that the possibility of cross-contamination is eliminated or minimilised
- Appropriate cleaning and disinfection is undertaken between preparation processes
- Food and other waste is stored away from immediate preparation areas, and covered
- Good hand habits are evident

Table 5.8. Delivery and storage:

Serials 5, 6.

- The criteria applied for Table 5.7. serials 1,2,8,13,and 20 will apply, plus –
- Storage areas are clean and tidy, minimising foreign body and other forms of contamination, including the harbourage of pests
- Non-food items are stored separately from foods
- Storage temperatures are maintained according to legislative requirements
- Temperatures are regularly monitored and recorded
- Where appropriate, "use by" labelling is utilised and rotated accordingly
- Raw foods and ready-to-eat foods are stored separately
- Where this is not possible, raw foods and ready-to-eat foods are kept apart, and suitably wrapped or covered
- Food handling procedures are such that cross-contamination is minimised
- Utensils or other items of equipment are not being kept in foodstuffs
- Personal habits of food handlers and other personnel with access to storage areas is such that contamination is unlikely to occur

Table 5.9. Temperature control:

Serials: 5,6,7,8:

- Where appropriate, the criteria applied above will apply, plus –
- All storage, handling, cooking, re-heating, and hot-holding temperatures of foods comply with legislative requirements

Table 5.10. Personal hygiene:

Serial 3:

- All food handlers wash their hands after leaving and returning to, food preparation areas
- Handwashing and drying is carried out using appropriate detergents, steriliants, hot water, and drying facilities
- Food handlers are not smoking, eating or drinking whilst handling foods
- Food handlers are not wearing jewellery or false nails that may present a risk of contamination
- Food handlers are not touching their hair, facial area, or other parts of their body whilst handling foods