

Food Provisioning and the Domestic Food Handling Practices of the Over 60s in the North East of England

Dissertation submitted in partial fulfilment of the degree of
Doctor of Philosophy

School of Agriculture, Food and Rural Development
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Confirmation

I confirm that the contents of this thesis are my own and have not been presented or accepted in any previous application for a degree and all sources are fully referenced and acknowledged.

Helen. E. Kendall

Date: 01/05/2013

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Abbreviations

ACMSF	Advisory Committee on the Microbiological Safety of Food
AR(T)	Activity Recognition and Temperature devices
BBD	Best-Before Date
BSE	Bovine Spongiform Encephalopathy
CDC	Centre for Disease Control
CJD	Creutzfeldt-Jakob Disease
DOH	Department of Health
DIG	Digital Interaction Group (Newcastle University, Culture Lab)
DIT	Diffusion of Innovations Theory
DWP	Department for Work and Pensions
EFSA	The European Food Safety Authority
EIOA	Ethnographically Inspired Observational Approach
FCPM	Food Choice Process Model
FDSG	Foodborne Disease Strategy Group
FMD	Foot and Mouth Disease
FSA	Food Standards Agency
GT	Grounded Theory
HPA	Health Protection Agency
IAC	Integrated Advice for Consumers (Project)
IID	Infectious Intestinal Disease
LLTI	Limiting Long-Term Illness
<i>L.mono</i>	<i>Listeria Monocytogenes</i>
MAFF	Ministry of Agriculture, Fisheries and Food
ONS	Office for National Statistics
PCA	Principal Component Analysis
RTE	Ready To Eat
SCM	Stages of Change Model
SAFRD	School of Agriculture Food and Rural Development
SiDE	Social Inclusion through the Digital Economy

SSRC	Social Science Research Committee
SSRU	Social Science Research Unit
SPA	State Pension Act
SPT	Social Practice Theory
TiKL	Transitions in Kitchen Living
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UBD	Use-By Date
UK	United Kingdom
WHO	World Health Organisation

Definition of Terms

Acute Disease

A disease which has rapid onset and lasts for a relatively short period of time. It can also refer to a very severe or painful disease

Antibiotics^{1*}

A medicine that inhibits the growth of, or destroys, bacteria

Arthritis*

A painful inflammation and stiffness of the joints

Asymptomatic

Without symptoms

Attitude*

A settled way of thinking or feeling

Bacteraemia

Presence of bacteria in the bloodstream

Behaviour*

The way in which someone or something behaves

Bereave(ment)*

To be deprived of a close relation or friend through their death

¹ All definitions marked with * are taken from the Oxford English Dictionary see <http://oxforddictionaries.com/> (Accessed 12th August 2012)

Best-Before Dates²

Concern food quality rather than safety, when the date is reached, the food may begin to lose its flavour and texture

Campylobacteriosis

Gastro intestinal infection caused by a member of the genus *Campylobacter*; in humans this is usually *C.jejuni*.

Cancer*

A disease caused by an uncontrolled division of abnormal cells in a part of the body,
2. A malignant growth or tumor resulting from such a division of cells

Cardiovascular Diseases

Cardiovascular diseases (CVDs) are a group of disorders of the heart and blood vessels and include coronary heart disease, being a disease of the blood vessels supplying the heart muscle

Cases

Those identified as having a particular condition

Cfu/g

Colony forming unit per gram. A measure of the number of micro organisms within a sample

Chronic Condition

Long lasting health related condition

Clostridium Deficile

Species of a gram-positive spore forming bacteria. Can be associated with disease particularly hospital acquired infections.

² See <http://www.eatwell.gov.uk/foodlabels/labellingterms/bestbefore/?lang=en/> (Accessed 12th August 2012)

Co-morbidity

Disease or condition, which exists independently of another

Cumulative Risk

The risk that an event will occur as time progresses

Cytotoxic Treatment

Any treatment that is toxic to cells

Demographic

Population characteristic

Dentition*

The arrangement or condition of the teeth in a particular species or individual

Dependency Ratio/Old-Age Dependency Ratio

Measures that compare the numbers in different groups of the population, the most common is the old-age dependency ratio, which divides the number of people above retirement or pension age by the number of working age

Disease*

A disorder of structure or function in a human, animal, or plant, especially one that produces specific symptoms

Disease Modifying Anti-Rheumatic Drugs (DMARDs)

A class of drugs used to slow the progression of anti-immune diseases

Enteric Infections

Infection of the gut/intestinal system

Enumeration

To count/quantify/define numerically. Enumeration tests are used to establish the amount of a specific micro-organism that is present in a sample

Epidemiology

The study of occurrence, transmission and control of disease in a population

Foodborne disease*

Illness caused by bacteria or other toxins in food, typically with vomiting and diarrhoea

Foodborne disease outbreak³

Two or more people from more than one household, or residents of an institution, suffer from the same disease caused by the ingestion of contaminated food

Food hygiene/safety⁴

The practice of keeping food safe from bacteria, including correct chilling, cooking, cleaning and cross-contamination behaviours

Food Provision(ing)*

The act of supplying or providing food 2. Food obtained for a household (*plural*)

Gastroenteritis

Inflammation of the gastrointestinal track

Genus

A level of the biological classification of organisms based in the fundamental properties of the organism

Gestation

Carrying of an embryo/fetus inside a female animal i.e. during pregnancy

³ See FSA (2011)

⁴ See <http://www.eatwell.gov.uk/keepingfoodsafes/> (Accessed 12th August, 2012)

Habit*

A settled or regular tendency or practice

Health*

The state of being free from illness or injury, 2. A person's mental or physical condition

Household*

Defined as one person living alone; or a group of people (not necessarily related) living at the same address and sharing cooking facilities and who also share a living room or sitting room or dining area

Immune system

A system (including the thymus and bone marrow and lymphoid tissues) that protects the body from foreign substances and pathogenic organisms by producing the immune response

Immunocompromised

Used to describe someone who has an impaired immune system due to treatment or underlying illness

Immunodeficiency

See immunocompromised

Immunosuppressive

Inhibit/prevent immune system action

Intestinal disorders

Condition affecting the intestines

Listeriosis*

Disease caused by infection with listeria, which can resemble influenza or meningitis and may cause miscarriage

Malnutrition

Not obtaining recommended daily intakes of key nutrients, as applicable to age group, and includes both under- and over- consumption of nutrients

Meningitic/Meningitis

Inflammation of the meninges of the brain and spinal cord

Mild cognitive impairment

Mild cognitive impairment (MCI) is a general term most commonly defined as a subtle but measurable memory disorder. A person with MCI experiences memory problems greater than normally expected with ageing, but does not show other symptoms of dementia, such as impaired judgment or reasoning

Morbidity

The incidence or prevalence of a disease

Mortality (rate)*

The number of deaths in a given area or period, or from a particular cause

Neonatal

Infant in first four weeks after birth

Notifiable disease

A disease that must be reported to the competent authority when diagnosed

Norovirus

Norovirus infection can cause severe diarrhoea and vomiting

Pathogen

Organism able to cause disease/illness

Perinatal

Of, relating to, or occurring in the period from about three months before to one month after birth

pH

A measure of how acidic or alkaline something is. Low pH is acidic, high pH is alkaline

Population Ageing*

An increasing median age of a population or an alteration in the age structure of a population so, that elderly persons are increasing represented

Physiological ageing

The physical ageing of the human body

Poverty*

The state of being extremely poor, 2. The state of being insufficient in amount

Practice (Praxis)⁵

An emphatic term to describe the whole of human action

Practice (Praktik)⁶

Is a routinized type of behaviour which consists of several elements, interconnected to one another: forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understandings, know-how, states of emotion and motivational knowledge

⁵ See Reckwitz (2002)

⁶ See Reckwitz (2002)

Psychiatric morbidity

The occurrence of mental disorders

Ready-to-eat foods⁷

Food intended by the producer or the manufacturer for direct human consumption without the need for cooking or other processing

Quality of life

Your personal satisfaction (or dissatisfaction) with the cultural or intellectual conditions under which you live (as distinct from material comfort)

Retirement*

The action or fact of retiring, 2. The period of one's life after retiring from work

Rheumatoid Arthritis

Long lasting disorder that causes the immune system to attack the joints, leading to inflammation of the joints and other organs in the body

Rillettes

A course pâté-type product

Routine*

A sequence of actions regularly followed

***Salmonella* Typhimurium**

Specific type of *Salmonella* bacterium. Full name *Salmonella enterica* *senovar* Typhimurium

Septicaemic

Bacteria present in the blood, where symptoms are seen (blood poisoning)

⁷ See Goodburn (2010)

Stereotyping

A method of distinguishing types of bacteria

Strain

A population of organisms within a species or sub-species distinguished by typing

Symptomatic

Displaying symptoms of a disease

Social deprivation/detachment

A lack of social interaction with others

Socioeconomic status

A person's income status

State income

Income received from a Government body

Stomach acidity

The amount of acid found in a person's stomach

Symbol of identity

Something that an individual views as representative of who they are as a person

Transitional life events

Major life events, which include bereavement, redundancy and retirement

Typing

Any method used to distinguish between closely related organisms

Use-by dates

'Use-by' means that foods and drinks should not be used after the end of this date

Virulence

The capacity of a micro organism to cause disease

Vulnerable societal groups

Population groups who may require additional help from mass society (whether in terms of health care, finance etc.)

Wellbeing

A good state of personal health and happiness

Abstract

Over the last decade there has been an unexplained increase in cases of listeriosis in the UK observed almost exclusively in those aged over 60 (SSRC, 2009, ACMSF, 2009). Domestic food safety practices have been hypothesised as one contributing factor to this increase (SSRC, 2009), and this research was funded to explore these practices in more detail. Using the North East of England as the geographical focus for the research, a mixed method approach was chosen using a complement of traditional and innovative research methods in a two-phase approach.

Phase 1 was a large-scale administered questionnaire (n=213), designed to profile independently residing older adults (aged 60+) based upon their knowledge of, and reported practices associated with, domestic food safety. Factor and cluster analyses revealed a 3-cluster solution, which provided the basis for detailed narrative typologies of the clusters which were labelled; i) 'Independent Self-assessors', ii) 'Experienced Dismissers' and iii) 'Compliant Minimalists'. These findings highlighted the heterogeneity of the 60+ population with respect to their living and health circumstances, social networks and their food safety knowledge and behavioural practices. The risk of foodborne illness was not identified as linear with age, rather levels of vulnerability to foodborne risks varied across the cohort.

Phase 2 purposively sampled 10 households from Phase 1 for an ethnographically inspired study (EIS), which took a Social Practice Theory perspective to observe domestic food handling practices. Data were generated using life-course interviews, fridge auditing including microbiological sampling, kitchen 'go-alongs', food purchase history, activity recognition and video documentation. In addition to confirming the findings of Phase 1, the substantive theoretical contribution of Phase 2 was the concept of '*Independence Transitioning*'. Food provisioning practices were the observed outcome of the value negotiations made by the household to adapt to the incremental changes experienced as part of the ageing process that facilitated independent living. Although food safety issues were

implicit within these practices, they were not a salient factor within food provisioning or handling. This was therefore concluded to compound their risk of contracting illness as a result of foodborne disease.

Chapter 1 : Introduction

1.1 Introduction

In 2009, the UK Health Protection Agency (HPA) reported an increase of 53% in sporadic cases of listeriosis between 2001-2007 from a baseline in 2000 (FSA, 2011; ACMSF, 2009 and SSRC, 2009). Most of these cases were sporadic or unrelated⁸ and the increase was witnessed almost exclusively in people aged 60+ (FSA, 2011). Within the Food Standards Agency (FSA) and specifically the Social Science Research Committee (SSRC), a review into the causes of this increase identified a limited understanding of the food safety behaviours and attitudes of older consumers and their domestic food safety practices (SSRC, 2009). This study, funded by the FSA, aims to address these gaps in knowledge by first, developing a baseline quantitative understanding of the attitudes, knowledge of, and behaviours associated with food and food safety amongst those aged 60+ in the North East of England. Second by exploring the everyday domestic food provisioning practices of a sub-sample of the households questioned in Phase 1 of the research and understanding how food safety fits into these practices.

To introduce food safety and the older consumer as a substantive area of study, this chapter begins with an outline of the microbiological food safety context from a public food safety and policy perspective, with a specific focus on *Listeria monocytogenes*. Next, the research aims and objectives, and the research design are presented. The anticipated contributions to the extant body of knowledge and methodological approaches in this area are acknowledged, and finally, a description of the thesis structure is given.

⁸ Most cases of listeriosis are sporadic and so not associated with outbreaks where 2 or more people are contaminated from the same food source (FSA, 2011).

1.2 Microbiological Foodborne Disease in the UK

Microbiological foodborne disease is an important global public health concern (Redmond and Griffith, 2009) and can be caused by production methods, improper handling, storage, transportation and preparation of food, and *via* cross contamination between raw and ready to eat (RTE) food products (FSA, 2012). It can also occur at different points within the food chain. The Advisory Committee on the Microbiological Safety of Food (ACMSF, 1992) define foodborne disease as:

‘Any disease of an infectious or toxic nature caused by, or thought to be caused by, the consumption of food or water’ (FSA, 2000, p.1)

Contraction of foodborne disease through water contamination is beyond the scope of this study. Instead, this study focuses on foodborne disease caused by *‘the consumption of food contaminated with microorganisms or their toxins’* (FSA, 2000, p1).

The majority of incidences of foodborne illness in the UK are associated with five key pathogens: 1) *Salmonella* (species (S.): *S.enterica*); 2) *Campylobacter* (S.: *C.jejuni* and *C.coli*); 3) *Escherichia coli* 0157:H7; 4) *Listeria* (sp: *L.monocytogenes*) (Foodborne Disease Strategy Group, 2000); and 5) *Norovirus* whose monitoring replaced *Clostridium Perfringens*⁹ (FSA, 2011). It is estimated that annually 17 million people in the UK experience foodborne illness as a result of microbiological food contamination, with 1 million of these visiting their GP (IID2, 2011), 20,000 receiving hospital treatment and 500 dying. Notwithstanding the personal burden associated with these illnesses, the estimated economic cost is £1.5 billion (FSA, 2011). 2010 headline figures of laboratory confirmed cases for the five key pathogens listed above are presented in Table 1.1.

⁹ The FSA ceased monitoring *Clostridium Pefringes* owing to mild symptoms and low number of reported cases, in place of this they began monitoring *Norovirus* in 2005.

Table 1.1: Number of Laboratory Confirmed Cases of Foodborne Disease

Year	<i>Campylobacter</i>	<i>Salmonella</i>	<i>EColi</i>	<i>Listeria</i>	<i>Norovirus</i>
2010	56,767	6,613	929	174	15,529

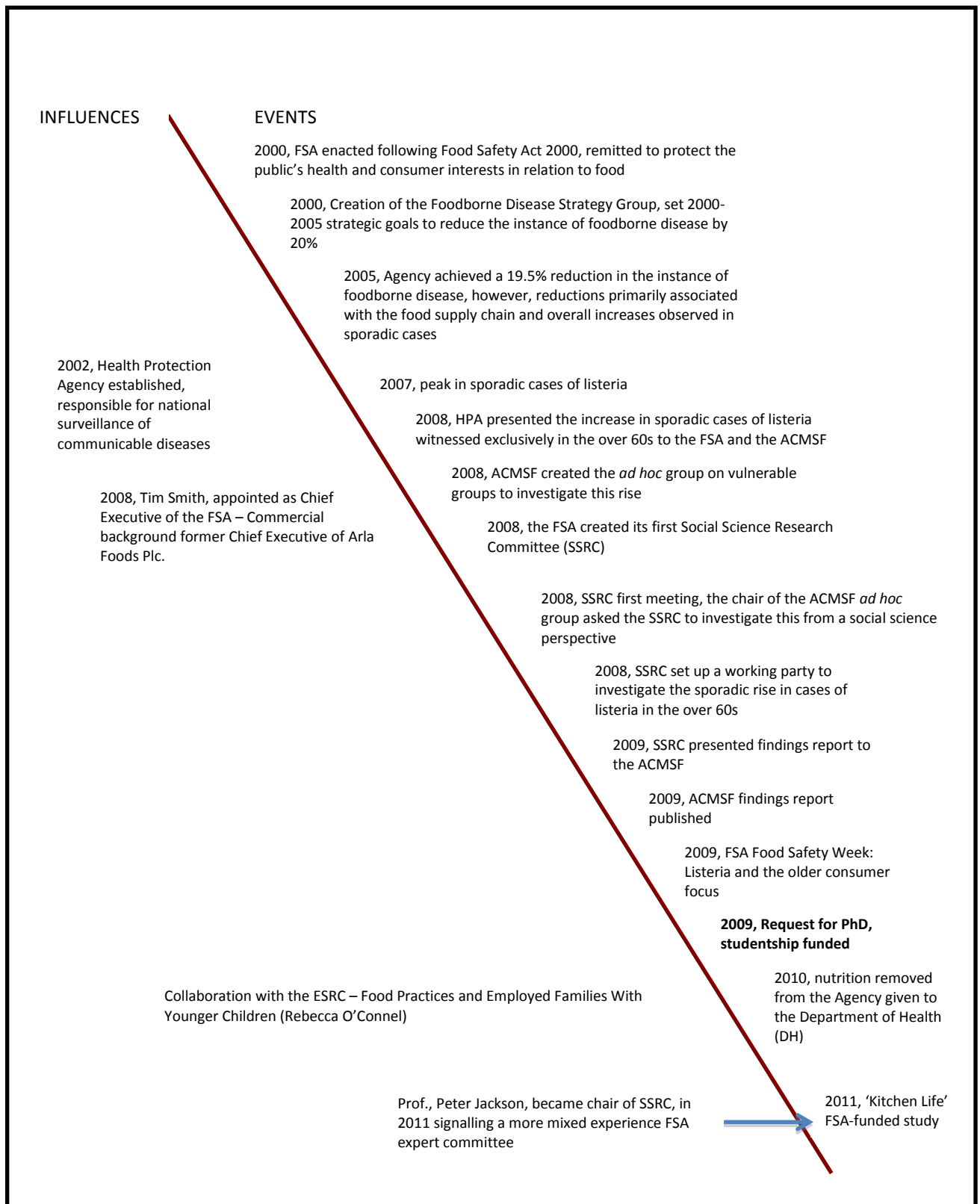
(Source: FSA 2011)

To understand the importance of reducing the incidences of foodborne disease, it is necessary to put these figures and estimates into a wider public health and policy context. For example, obesity is an acknowledged public health concern or ‘*New World Syndrome*’ (WHO, 2000, p.122), with annual costs estimated at £5.1 billion (DOH, 2012; International Obesity Taskforce, 2002) significantly reducing life expectancy (Giles, 2009; McPherson, Marsh and Brown, 2007). Although the economic costs of foodborne disease are one third of those associated with obesity, it is argued that foodborne disease is more preventable, especially when considering the greater body of evidence that demonstrates how the application of basic food safety principles throughout the food chain from farm-to-fork can minimise the growth of foodborne pathogens (Jacob, Mathiasen and Powell, 2010; Mullan, Wong and O’Moore, 2010 and Fischer and De Vries, 2008).

1.2.1 *Listeria monocytogenes*: The Policy Context

Figure 1.1 presents a timeline of the key policy-related contextual events that have shaped the UK’s food safety strategy since 2000 and have culminated in the funding of this PhD studentship.

Figure 1.1: Policy Context: Timeline of Events



The monitoring of microbiological foodborne pathogens in the UK falls within the remit of two bodies. The Health Protection Agency (HPA), established in 2002, is tasked with communicable disease surveillance within which microbial pathogens are classified (for details of the European food safety surveillance context see Appendix 1). The HPA manages the national surveillance programme and is responsible for providing the FSA with this surveillance data and infectivity trends (FSA, 2008). The FSA established in 2000, *via* the Food Safety Act (2000), is remitted with protecting consumers' interests in relation to food. They are responsible for the regulation of food and its safety across the food chain from farm-to-fork. As a non-ministerial Governmental body, the FSA is tasked with reducing the incidence and burden of consumer illness as a consequence of foodborne disease, through its Foodborne Disease Strategy (FDS), which is now in its third wave. From its inception, the FSA set out a strategic objective to reduce the incidence of foodborne disease by 20%. Reductions of 19.2% were achieved between 2000-2005 (FSA, 2007). However, it is now acknowledged that these early successes were achieved by foodborne pathogen reductions in the supply chain, through two pathogen specific programmes. First, the *Campylobacter* Evidence Programme developed as a result of the creation of the Foodborne Disease Strategy Group in 2001, which sought reductions in the broiler industry. Second, the Zoonoses National Control Programme addressed *Salmonella* in pig meat products (Brennan, 2010; DEFRA, 2008). These programmes failed to achieve reductions in the incidences of sporadic cases of foodborne disease nor consumers' behavioural change.

Since 2005, the reduction of sporadic cases of foodborne disease has remained more elusive, and there have been annual fluctuations in the total number cases. The most significant and worrying increases have been associated with *Campylobacter* and *Listeria monocytogenes (L.mono)*, accounting for 56,767 and 174 verified cases in 2010, respectively (FSA, 2011). *Campylobacter* is targeted because of the sheer number of cases and listeria because of the severity of cases, and high percentage of mortality, which is discussed in more detail below.

In 2008, the HPA informed the Advisory Committee on the Microbiological Safety of Food (ACMSF) of a sharp increase in the incidence of listeriosis. Typically listeriosis is known to affect pregnant females, the young, the elderly, the immunocompromised including those suffering from cancer and receiving chemotherapy treatment, those with chronic heart disease (CHD), kidney and liver diseases, and people suffering from alcoholism (Mook *et al.* 2011; Gillespie *et al.* 2010; Gillespie *et al.* 2009; ACMSF, 2009). While the number of pregnancy cases and cases in those under the age of 60 remained stable, the HPA data indicated the increase was almost exclusively affecting the 60+ population, reaching a peak of 254 cases in 2007 (FSA 2011).

Although, over the last decade (2000-2010) the number of cases of listeriosis has fluctuated considerably, there was an approximate tripling in the rate of the disease in those aged 60+ (ACMSF, 2009). Although listeria accounts for relatively few cases when compared with other pathogens, it is considered important as the severity of this illness is associated with high levels of hospitalisation and mortality at 20-30% (ACMSF, 2009; Cairns *et al.* 2009; FSA, 2011). Listeria is responsible for the highest number of deaths in absolute terms, of which an increasing number are from those aged 60+ (ACMSF, 2009). For this reason *L.mono* is prioritised together with campylobacter within the FSA's 2010-2015 Foodborne Disease Reduction Strategy (FSA, 2011).

Reacting to the alarming spike in cases of listeriosis the ACMSF were tasked with exploring the causal factors behind this rise. The ACMSF's *ad hoc* group on Vulnerable Groups was established to examine the change in the epidemiology of listeria in England and Wales and presented their findings in a report in March 2008 (ACMSF, 2008). This report explored in detail four key hypotheses to explain this increase:

1. The rise in compromised people aged 60 and over was an artefact associated with improved case recognition
2. The population primarily affected had become more susceptible

3. The pathogen had become more virulent and new strains had emerged
4. Levels of exposure had increased

The *ad hoc* Group rejected hypothesis 1 on the grounds that whilst there were demographic changes, with the number of those age 65 and over rising from 9.5 million in 2001 to 10.5 million in 2011 and estimated to increase to 12.75 million by 2021 (ACMSF, 2009), this was not sufficient to account for the changes in epidemiology, for the following reasons. First, improvements in laboratory methods particularly for isolating *L.mono* from blood may have explained the increase in cases; however, the majority of laboratories use one of a small number of commercial automated blood culture systems and there had not been any changes to detection technologies that the ACMSF believed could affect ascertainment of bacteraemia cases. Second, the increase in cases in the 60+ population coincides with the recognition of age discrimination within UK healthcare provision (Scott, 2000). In 2001 the NHS launched a plan to ensure that the 65+ population received the same healthcare treatment to those under this age (Kmietowicz, 2001). It is therefore possible to suggest that an increase in investigation into sepsis within this population occurred and therefore some change in listeriosis epidemiology may be artefactual. However, in 2009 there was no UK data available on the number of blood cultures submitted stratified by age, although data from a large Scottish diagnostic laboratory suggested that between 2000-2007 there did not appear to have been an increase in samples submitted from the 60+ population.

In response to hypothesis 2, increases in the 60+ population was noted and the number of people surviving longer with chronic conditions and co-morbidities was recognised. Whilst it was appreciated that this was likely to result in an increase in cases of listeriosis within this cohort, it did not account for the three-fold increase. Moreover, such an increase would have been expected in younger population groups with the same underlying conditions and this was not observed. In response, the need for targeted and controlled case studies was recommended (ACMSF, 2009). In relation to hypothesis 3, there was no conclusive evidence to suggest changes in the virulence of *L.mono*. However, the growth behaviours of

L.mono spp. had not been compared with those isolated prior to the rise and/or comparison of strains in other European countries also experiencing rises in infectivity rates (Scotland, Northern Ireland, Germany, Belgium, Denmark, France, Lithuania, Netherlands and Spain (Denny and McClauchlin, 2008; ACMSF, 2009). Confirmation of further molecular studies was therefore requested by ACMSF. In response to hypothesis 4, a paucity of data relating to those aged 60+ and their food handling practices was identified. The Group recommended that research be conducted in the domestic environment of 60+ participants to examine domestic food safety in the context of the food provisioning process and they requested expert advice from the FSA SSRC.

1.2.2 Food Safety and the Older Consumer

The FSA's Social Science Research Committee (SSRC) was tasked, by the *ACMSF ad hoc* committee, to explore the reported increase in listeriosis amongst those aged 60+ from a social science perspective. In November 2008, the SSRC set up a working group to investigate: i) what was already known of this pathogen; ii) the older food consumer and their domestic food safety practices; iii) the existing evidence; and iv) what future research needed to be commissioned in order to provide insights into the domestic food safety practices of this cohort. The conclusions of the SSRC were presented to the ACMSF in September 2009. They highlighted a disjointed research effort across the social sciences on this issue, and a distinct lack of baseline understandings and literature related to older consumers' domestic food safety practices. The SSRC recommended a research programme that should focus on providing a comprehensive review of the literature, baseline understandings of food safety attitudes and behaviours from which change could be monitored. It also requested a study of vulnerable sub-groups within the 60+ population, research to focus on actual rather than only self-reported behaviours, and a need for research to be situated in the home (SSRC, 2009).

In response to the recommendations of the ACMSF and SSRC, the FSA engaged in a range of microbiological food safety initiatives. This consisted primarily of Food

Safety Week 2009, the theme of which was older consumers and listeria. A range of events across the country occurred to highlight the key message of food safety best practice in the home, and the problems of listeria. Food Safety Week 2009, was supported by a range of promotional materials from the FSA including leaflets, posters, fridge thermometers, advertising on pharmacy bags and *via* the '*life channel*', a television channel shown exclusively in doctors' surgeries, as well as a series of advertisements in the Daily Telegraph. In addition, local authorities were encouraged to apply for FSA funding to support consumer food hygiene engagement initiatives for all consumers, but primarily targeted towards older consumers (Giles, 2009). In 2010, the FSA commissioned the first wave of the '*Food and You*' survey to provide baseline understandings of consumers' attitudes, and knowledge of food issues that included healthy eating and food safety. Subsequent waves¹⁰ of the survey intend to monitor attitudinal and behavioural changes.

In addition to the aforementioned activities, this PhD studentship was funded in 2009 by the FSA in order to contribute to the knowledge base, by providing insights into the everyday domestic food provisioning and handling practices of the 60+ population. Whilst previous research had consistently made the link between physiological changes occurring as part of the ageing process which act to weaken the immune system and create biological vulnerability to foodborne disease (ACMSF, 2009; Cates *et al.* 2007; Hummel and Nordin, 2005; Kendall *et al.* 2003; Smith, 1998 and Gerba, Rose and Haas, 1996) this was not the primary pre-occupation of this research. Here the intention was to address the fourth hypothesis of the ACMSF and seek to take a behavioural approach to provide a more nuanced understanding of domestic food handling behaviours that are identified as being mundane, habitual and tacit in nature (Brennan, 2010).

¹⁰ The second of which is currently ongoing throughout 2012 (FSA, 2011)

1.3 Research Questions

The clear gap in knowledge of the everyday domestic food handling practices of 60+ individuals, underpinned the development of the following research aim to frame this thesis, which was to investigate the:

Food provisioning and the domestic food handling practices of the over 60s in the North East of England

To satisfy the afore-stated research aim, the following objectives were developed:

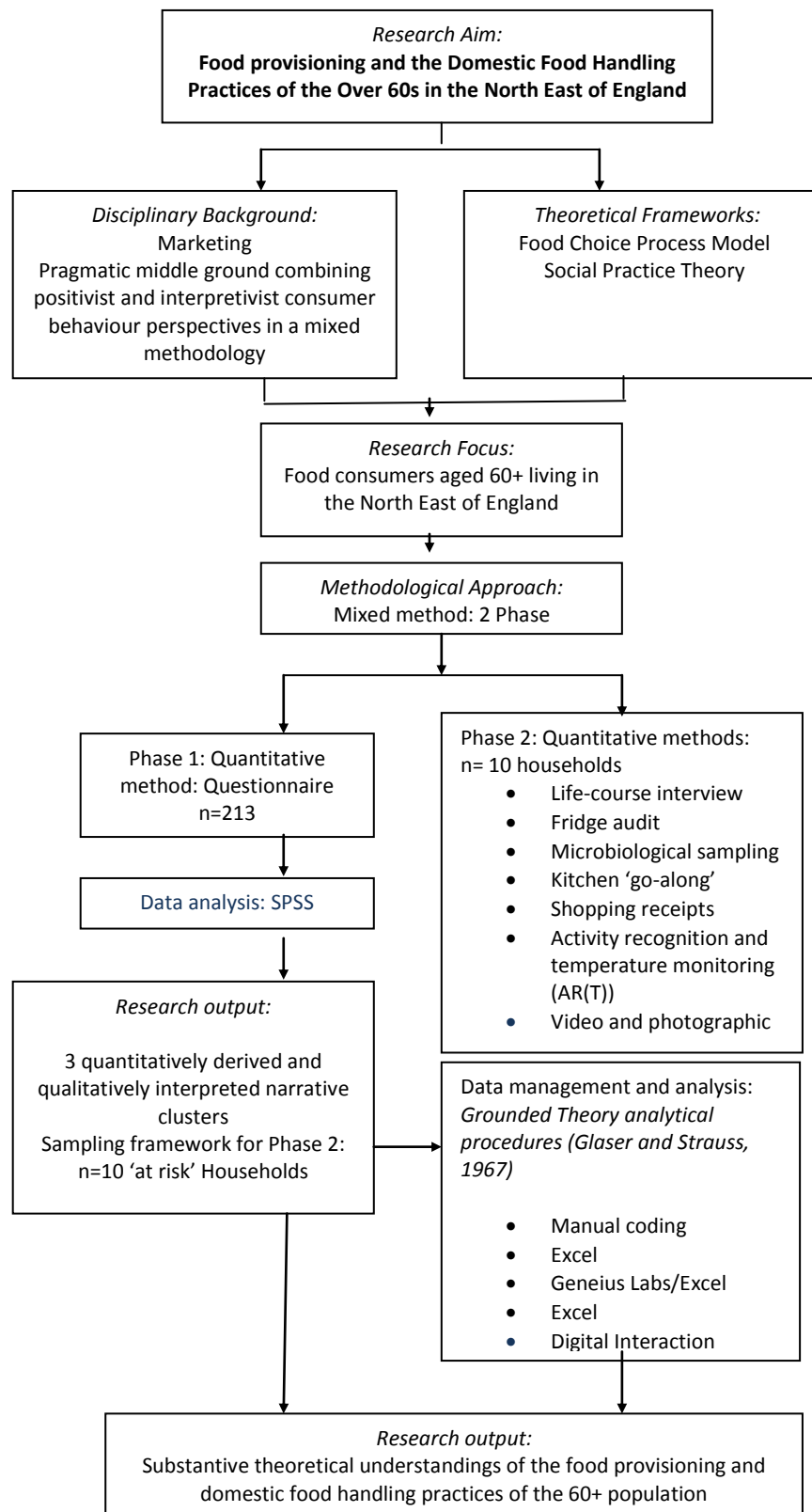
1. To critically analyse the key literatures relating to microbiological food safety, with particular reference to *Listeria monocytogenes*, ageing and food safety and the older consumer
2. To appraise the contributions of eligible theories such as the Theory of Planned Behaviour, The Food Choice Process Model and Social Practice Theory in order to assess their suitability for providing the theoretical underpinning of this research
3. To provide a sampling framework for the observational component of the research by segmenting the 60+ population in the North East of England, based on lifestyle, attitudes towards food and attitudes towards and knowledge of domestic food safety practices
4. To provide nuanced understandings of domestic kitchen practices by performing an ethnographically inspired study of ten households identified as being 'at-risk' of contracting foodborne illness from the segmentation analysis.
5. To provide rich understandings of the everyday food provisioning process (including purchase, storage, cooking, eating and disposal) and practices of 60+ individuals
6. To discuss the implications of observed practice for the successful adoption of domestic food safety best practice recommendations, and the potential barriers that inhibit their adoption in this cohort

7. To reflect on the research process, which used a mixed method multi-disciplinary approach to segment and observe the food provisioning and food handling practices of those aged 60+

1.4 Research Design

The research design was motivated by the need both to contribute to an understanding of the causes of listeria in the elderly, and to make a contribution to the theory of food handling behaviour. Figure 1.2 presents a diagrammatical representation of the key analytical commitments within the research design. This research has been approached from a marketing and mixed method perspective to understand consumer behaviour, and thus occupies the pragmatic middle ground between the opposing epistemological orientations of positivism and interpretivism. Mixed methods research represents an approach whereby both quantitative and qualitative research methods are combined within the one research endeavour. This approach is consistent with both the administered questionnaire used in Phase 1 and the adoption of multiple interdisciplinary methods in Phase 2. It is also consistent with the theory generating methodology of 'grounded theory' (GT) the qualitative data analysis.

Figure 1.2: Research Design



i. Disciplinary Background

The thesis is situated in the discipline of marketing and specifically the sub-discipline of consumer behaviour. Marketing is a young discipline that has borrowed insights from a broad spectrum of established disciplines including, economics, psychology, geography (human), sociology and anthropology in developing its own theories (Baines *et al.* 2011). Consumers and their behaviours are central to consumption, which requires an understanding of what people do and why they are motivated to do it (Brennan, 2010). Some key disciplinary assumptions have underpinned this research. First, it is widely acknowledged that food provisioning is a process that includes acquisition, preparation, cooking, eating and disposal (Marshall, 1995). Food provisioning activities are influenced and shaped by the environment and those who operate within it. This has implications for the methodological approaches that are noted below. Second, marketing acknowledges the heterogeneity of people and the need to identify and address commonalities within groups of people and also how they may differ from other groups *via* segmentation. This thesis assumes the 60+ population are a heterogeneous group, which is informed by knowledge of the ageing process affecting individuals differently and at different times (Falk *et al.* 1996; Rowe and Khan 1987). Third, consumers' behaviours are subject to change over time. In the case of this thesis' research cohort, the notion of change is embedded within the heterogeneity of the ageing process (Falk *et al.* 1996).

Marketing requires researchers to problem solve by using the array of methodological techniques relevant to the research problem. Adopting such pragmatism within this thesis has resulted in the adoption of a mixed method, interdisciplinary approach by selecting methods that extend beyond disciplinary confines that are best aligned with the research problem. These methods are discussed below (p.14-15).

ii. Theoretical framework

The problem-orientated nature of this research created the need for the pragmatic inclusion of theoretical frameworks that would best address the central aim. Three theoretical frameworks associated with food safety research, food choice and domestic practices were assessed for their theoretical ability to support the data collection and analytical approach. First, the Theory of Planned Behaviour (TPB) (Ajzen and Fishbein, 1975) was reviewed due to its importance as the only predictive model of food consumer behaviour, which has been extensively used in food consumer research (Conner and Armitage 2006) and also within food safety research (Clayton *et al.* 2010; Lobb *et al.* 2007). However, given that intention is a weak indicator and predictor of actual behaviour this approach was dismissed (Hargreaves, 2008; Conner and Armitage 2006). Second, the Food Choice Process Model (FCPM) (Furst *et al.* 1995) was analysed for its contribution to influences during the life-course that shape food choice. This model's successful application to the older consumer warranted methodological inclusion (Falk, *et al.* 1996).

Whilst traditionally understanding of consumer behaviour has drawn heavily on psychosocial models (including TPB and FCPM) that are well suited to providing insights into consumer motivation (Baines *et al.* 2011), they are less well equipped to explore actual behaviour. Social Practice Theory (SPT) addresses this deficiency and is a sociological model that de-centres the individual to focus on practices and the reproduction of these within everyday life (Hargreaves, 2008; Reckwitz, 2002; Warde 2005). Studying practice takes emphasis away from the individual and enables researchers to sympathetically and uncritically observe action and aligns well with ethnographic research methods (Halikier and Jensen, 2011). For this reason, SPT was used to augment the data generation of Phase 2 of the research.

Thus the FCPM permitted the consideration of personal food systems that are established over the life-course and was particularly valuable in Phase 2 of the

research. SPT provided the primary theoretical and methodological framework for Phase 2 as it focused the gaze of the researcher within the home and provided an *a priori* framework for the practice based observations made in the home (Chapter 6 and 7). However, SPT provides little in the way of methodological advice as to how one should empirically study practice (Strengers, 2009; Hargreaves, 2008). The qualitative data analysis procedures suggested by Glaser and Strauss (1967) as part of grounded theory, provides a systematic, inductive and comparative approach to the analysis of data. This was adopted to analyse the Phase 2 research data, thereby providing a substantive theoretical contribution to the understanding of food provisioning and handling practices of the 60+ population (Kuznesof, 2010; Charmaz, 2006).

iii. Research focus

Owing to the identified increase in cases of listeria being witnessed exclusively in those aged 60+ (ACMSF, 2009 and SSRC, 2009), this cohort was the primary focus of this research. However, owing to the heterogeneity of the cohort and the distinct differences in food provisioning approaches, dictated fundamentally by living arrangements, the focus of the research was further refined to include only those who were aged 60+ and were living independently. This included those who were cohabiting (spouse or other), who may not have been solely responsible for food provisioning, but ensured the exclusion of those in residential care who do not have control over food provisioning including the preparation of food that they eat.

The geographical focus of this research was the North East of England, which has an ageing population profile consistent with the UK as a whole (Chapman and Jackson, 2007) and was local to the research institute to which the PhD studentship was awarded.

iv. Methodological approach

As described above, the research employed a mixed methods approach that was divided into two phases, with Phase 1 informing Phase 2 of the research (Trochim, 2006).

1. Phase 1

Phase 1, was an empirical quantitative study that used a face-to-face administered questionnaire to provide baseline insights into the lifestyle, attitudes towards food and knowledge of domestic food safety best practice of the 60+ population. The questionnaire provided a basis upon which to segment the cohort and allowed for the identification of 'at risk' households thereby providing a sampling framework for Phase 2 of the research. The sample included n= 213 independently living adults from across the North East who ranged in age from 60 to 97 years of age.

a. Data analysis

The data generated by Phase 1 were analysed with the assistance of the computer program SPSS 18.0 (Mac edition) and used the multivariate techniques of Principal Component Analysis (PCA) and Cluster Analysis. The principal advantage of conducting PCA was the identification of underlying structure amongst variables, this allowed for the prioritisation and reduction of the data (Field, 2005). The underlying dimensions or '*factors*' provided the basis for cluster analysis. This identified groups of participants and attributed attitudinal and behavioural variables to these groups of individuals. Notwithstanding the sampling framework that this approach provided for Phase 2, it also gave valuable insights into the lifestyles, food and food safety knowledge, attitudes and behaviours of those aged 60+ in its own right.

2. Phase 2

Phase 2 was an ethnographically inspired study (EIS) that adopted interdisciplinary methods as part of a 'toolkit' for exploring the domestic food provisioning and handling practices of the 60+. The FCPM and SPT provided the theoretical and methodological framework for this phase. The former advocates consideration of the life-course in understanding food choice decisions. Epistemologically this approach is aligned with interpretivism and the use of life-course interviewing and self-reported methods that are representative of the '*sayings*' of practice (Warde, 2005, p.134). Ontologically SPT aligns with FCPM, although it provides little in the way of practical methodological or analytical recommendations (Strengers, 2009; Hargreaves, 2008). However, in decentring the individual and focusing specifically on practice, SPT is concerned with extending the understanding of behaviour by considering both '*doings*' and '*sayings*' (Warde, 2005, p.134) and thus, holds parity with observational methods (Halkier and Jensen, 2011; Hargreaves, 2011). Adopting the favourable elements of each theoretical approach negated the associated weaknesses (Johnson and Onwuegbuzie, 2004) and was sympathetic to the growing interest in capturing social and technological data simultaneously in real life kitchens (Brennan, 2010). The multi-disciplinary 'toolkit' assembled included; life-course interviewing, fridge auditing, microbiological sampling, kitchen 'go-alongs' (Kusenbach, 2003), activity recognition and video documentation. The methods selected aimed to deconstruct the layers of micro-influences that shape behaviour in the domestic environment and in so doing provide rich and nuanced understanding of the everyday food provisioning and handling practices of the 60+, whilst also being sympathetic to their potential vulnerabilities. For example, such susceptibility could include the potential for reduced mobility that may result in research fatigue. Owing to the complexity of the methodological approach it was neither advisable nor desirable to attempt to triangulate the data (Mason, 2006; Brannen, 2005). Rather the qualitative data analysis procedures suggested by Glaser and Strauss (1967) as part of the GT methodology was chosen to provide a

rigorous and reflective cross-case comparative framework for the analysis (Kuznesof, 2010; Chamaz, 2006; Spiggle, 1994 and Glaser and Strauss, 1967).

a. Data management and analysis

Owing to the breadth of data generated by Phase 2 and the data collection methods used, some of which were developed exclusively for the research (namely the Fridge Audit and AR(T) devices) data management was a significant component of the EIS. Although, it is acknowledged that there are computer software packages that can assist with the storage and analysis of multiple streams of qualitative data, QSR NVivo and Atlas ti to name but two, in this instance they were not used, in part due to the significant time and skill required to use them appropriately (Cresswell, 2009; Bell, 2010). In the absence of this, the interviews were transcribed verbatim and manually coded. In addition, researcher field notes and activity transcripts (of videos) were also manually coded. Owing to the innovation of the methodological approach adopted in Phase 2, pre-existing data analysis techniques were not available for all methods adopted. In addition, owing to the interdisciplinary approach taken, part of the analysis was undertaken by the research collaborators. The microbiological samples were analysed by Geneius Laboratories (Newcastle University spin off company, based within the campus), and the AR(T) data by the Digital Interaction Group (DIG) at Newcastle University's Culture Lab. In the case of the AR(T) devices, analysis was presented back to the researcher in two forms, as raw data files and as histograms. Thus further interpretive analysis was conducted by the researcher on the processed data.

Excel databases were created for the management and subsequent analysis of the microbiological sampling results and AR(T)s data. Additional databases were created for the fridge audit data and shopping receipts to enable case analyses of each household (intra-household analysis) and cross-comparative analyses or inter-household analysis. Kitchen 'go-along' data were collated and presented using Keynote for Mac (2009) (see Appendix 1). Video data were replayed using Elan (LAT, 2008) to assist with subsequent activity transcription.

v. Research Outputs

The output of the above is a substantive theoretical understanding of the food provisioning and domestic food handling practices of the 60+, based on both attitudinal and observed practice which may be applicable to other older food consumers.

1.5 Anticipated Contributions

In addressing the identified deficiency in knowledge of the domestic food handling practices of the 60+ (ACMSF, 2009; SSRC, 2009), it is anticipated that this research will make a number of key contributions. As will be argued throughout this thesis, the methodological approach taken provides a rigorous examination of the older consumer and their food handling practices, extending insight to include observations made within the sphere in which they are performed. The empirical quantitative research (Phase 1) will make significant contributions to the deficient baseline understanding and knowledge of the older consumer in relation to their lifestyles, knowledge of, attitudes and behaviours towards food and food safety. The exclusive focus on the 60+ makes this a considerable contribution to the wider food safety literature. Segmenting the older consumer on this basis contributes further to the appreciation of the heterogeneity of this subgroup of the population. Implementing the quantitative phase first, allows the phenomenon of interest to be refined and adds to the richness of understanding by taking a '*broad*' then '*deep*' perspective (Linderson, 2010, p.4). Moreover, the inclusion of a quantitative phase within a study increases the researcher's power to generalise findings to parent populations (Brannen, 2005).

The empirical qualitative research (Phase 2) is the first piece of empirical research to be situated in the domestic homes of the 60+ to be commissioned by this

funding body¹¹. Crossing the threshold and situating this research in the home, is a significant advance in consumer behaviour research, both in terms of the combination and the suitability of the 'toolkit' of methods for investigating older consumers. Observation in the home provides rich insights into the actual food provisioning and handling practices of food consumers generally and the older food consumer specifically, which is a significant advance on the self-reported accounts that have dominated much of the food safety literature to date. Moreover, understanding practices by situating the research in the sphere in which they are performed enables an appreciation of the complexity of lived experience and the micro-social interactions that intersect and influence behaviour. From a methodological perspective the interdisciplinary 'toolkit' of methods used in Phase 2 was intentionally sympathetic to the multi-dimensionality of life and the way it is lived in domestic kitchens of this cohort as well as to the potential for their reduced physical ability and household vulnerability. Notwithstanding the contributions of the research to the emerging body of empirical research on practices, the 'toolkit' of methods used is a demonstration of how social technological methods and data can be successfully integrated. This has challenged the confines and limitations of traditional research techniques (for example ethnographic observation) for understanding consumer behaviour in the home. Moreover, this thesis provided methodological advice and established and tested an interdisciplinary 'toolkit' of methods that could be replicable by future researchers wishing to investigate older consumers and, specifically, their domestic food handling and provisioning practices.

Taking a GT analytical approach to the analysis of the data generated in Phase 2 provides a substantive theoretical contribution to knowledge of the food provisioning and handling practices of the 60+. The theoretical contribution of this research is valuable from a food safety perspective and directly to the funding body of this research, but beyond this it provides insights that are beneficial to a range of

¹¹ This project was followed by the FSA commissioning a further ethnographic research study, Kitchen Life project, situated within the homes of participants, selected from the Food and You survey.

stakeholders with an interest in the older person, including health services, community service initiatives, housing providers and their designers.

1.6 Thesis Structure

Table 1.2 outlines the structure of this thesis, which has been divided into four sections within which the chapters are situated. Contained within Section 1 is the critical analysis of key literatures and theoretical appraisal. Section 2, is Phase 1 of the research and includes the methodology and presentation of results, whilst Section 3 is concerned with Phase 2 of the research in its entirety including the presentation of results. Finally, Section 4 contains the thesis discussion, conclusions and reflections. In addition this table presents each chapter, its affiliation with the research objectives and the methodological approach taken.

Table 1.2: Research Objectives and Methods

RO No.	Research Objective (RO)	Methodological Approach	Chapter
Section 1			
1	To provide a contextual analysis for the research by analysing key literatures relating to: <ul style="list-style-type: none"> • Microbiological food safety, with specific focus on <i>L.mono</i> • The population focus of ‘older consumers’ • An empirical review of the food safety and older consumer literature 	Review of literature relating to microbiological food safety, ageing, food safety and the older consumer	2 and 3
2	To appraise the contributions of eligible theories such as the Theory of Planned Behaviour, The Food Choice Process Model and Social Practice Theory in order to assess their suitability for providing the theoretical underpinning of this research	Theoretical and empirical literature	4
Section 2			
3	To provide a sampling framework for the observational component of the research by segmenting the 60+ population in the North East of England, based on lifestyle, attitudes towards food and attitudes towards and knowledge of domestic food safety practices	Discussion and results of the methodological approach of the empirical quantitative research (Phase 1) and the sampling framework for Phase 2	5
Section 3			
4	To provide nuanced understandings of domestic kitchen practices by performing an ethnographically inspired study of ten households identified as being ‘at-risk’ of contracting foodborne illness from the segmentation analysis	Discussion of the methodological approach to the empirical qualitative research (Phase 2)	6
5	To provide rich understandings of the everyday food provisioning process (including purchase, storage, cooking, eating and disposal) and practices of 60+ individuals	Results of empirical qualitative research (Phase 2)	7
Section 4			
6	To discuss the implications of observed practice for the successful adoption of food safety best practice recommendations and the potential barriers for this cohort, that inhibit their adoption	Discussion in relation to the reviewed literature in chapters 2-6	8
7	To reflect on the research process, using a mixed method interdisciplinary approach to segmenting and observing the food provisioning and food handling practices of the 60+	Reflections on the methodological approach and process	9

Chapter 2, of this thesis is the first of three literature review chapters and focuses on reviewing key literatures relating microbiological food safety. Contained within this chapter is an examination of the scale of concern relating to food safety at a global and national level, the main illness causing pathogens and the epidemiology of these in the UK, the surveillance of foodborne disease in the UK, as well as the burden of foodborne disease. *L.mono* is characterised by providing an overview of what is known of this pathogen, the foods implicated in contraction, the levels of infectivity, risk factors, trends in infectivity and susceptibility. The chapter also considers the role of the consumer and the home in foodborne disease contraction, by providing a comprehensive critical evaluation of the extant body of literature, concerning food safety and the consumer generally and the older consumer more specifically. The recommendations given to consumers to mediate and control risk of illness beyond the point of sale are also outlined.

Chapter 3 focuses specifically on understanding the 60+ cohort. The chapter examines the process of ageing, it first considers the way in which the 'older adult' is defined and classified in the UK by considering demographic trends; it seeks to understand the cohort's 'vulnerability' to foodborne disease. The chapter considers the diverse range of lifestyle and biological factors that influence the food provisioning process of the 60+.

Chapter 4 outlines the epistemological orientation of this research and the theoretical and methodological frameworks that have been chosen to structure it. The chapter justifies the adoption of mixed methods and rationalizes the pragmatic middle ground between the epistemological orientations that this research occupies. In so doing, this chapter also validates the use of two theoretical frameworks FCPM and SPT to provide theoretical and methodological structure to Phase 2. Evaluation of the merits and limitations of each of these approaches substantiates their inclusion in combination.

Consideration is first given to the psychosocial approaches to understanding food consumer behaviour (TPB and FCPM) although celebrated as predictive and contextual models, the inherently individualistic focus of these approaches and their alignment with self-reported methods, attracted criticism in their ability to explain actual behaviour in the domestic environment. Therefore this chapter includes consideration of SPT, as a sociological model that de-centres the individual to focus specifically upon practices and the reproduction of these in everyday life. The chapter concludes by providing a theoretical and methodological 'route-map' for the thesis.

Chapter 5 provides a comprehensive account of the empirical quantitative research and Phase 1 of the research. The chapter begins by providing justification for the methodological approach. The research design is outlined and the methodological and analytical procedure is given. As Phase 1 of this research is informing Phase 2, this chapter also provides a comprehensive account of the results and the basis upon which the participants for Phase 2 were selected.

Chapter 6, the second methodology chapter, reports on the development of empirical qualitative research and the EIS. First, the composition of the sample for Phase 2 is outlined, including consideration of the piloting procedures and incentives for participation. Following the methodological procedure for Phase 2, the chapter provides detailed consideration of the methodological 'toolkit' presented in the order in which the methods were deployed. Outlining each of the data generating methods used provides validation of their inclusion based on their individual and collective contributions. The chapter concludes by presenting the analytical strategy adopted for the analysis of the multiple streams of data generated by the 'toolkit'.

Chapter 7 presents the empirical results of Phase 2. This is first presented at the level of the household. An introduction to each household to contextualise the subsequent analysis is given in the form of vignettes. The substantial theoretical contribution to understanding the food provisioning and handling practices of the

60+ is explored through illustrated examples from the data, incorporating elements of kitchen design, materiality and practice. The negotiations that households undertake in making food choices and the practices to which they subscribe are outlined, and the common food provisioning practice outcomes of the households are identified.

In light of the results of the EIS presented in *Chapter 7*, drawing on the literature reviewed, *Chapter 8* provides a discussion of the food safety implications of Phases 1 and 2. First, a discussion of the findings of Phase 1 is presented, and the food safety implications of these reviewed and used to inform the discussion of Phase 2. The implications of each of the food provisioning practices identified by Phase 2 are considered in turn, before the chapter concludes by providing a discussion of the collective contributions of Phases 1 and 2 to understanding food safety practice.

Chapter 10 draws this research endeavour to a close by providing the central conclusions of the research in relation to the aim and objectives. The methodological innovations of this research warranted the consideration of researcher reflections; therefore, this thesis concludes by providing a reflective account of the methodological process and identifies areas for future research.

1.7 Summary

This chapter introduced the central policy-focused research problem that has been the catalyst behind this investigation; namely the rise in cases of listeriosis in the UK, exclusively affecting the 60+ (ACMSF, 2009). Thus this study seeks further understanding on: who the older food consumer is; their knowledge and attitudes towards food and food safety; their everyday food provisioning practices; and how all these may relate to their risk of becoming ill from food prepared in their own homes. This thesis occupies the epistemological middle ground between the two paradigms of positivism and interpretivism and takes a mixed method approach to understanding the food provisioning handling practices of those aged 60+. The research is divided into two phases, Phase 1 quantitative investigation of the

lifestyles, attitudes towards and knowledge of food and food safety best practice, and Phase 2 a qualitative ethnographically inspired study of the everyday domestic food provisioning and handling practices of the 60+ that uses multiple data generating streams. In adopting this mixed methods approach, this thesis also extends the methodological 'toolkit' beyond the conventional techniques used to generate self-reported accounts of behaviours; it also captures actual behaviours in the home, thereby addressing some of the widely acknowledged shortcomings associated with self-reported data (Shove, 2010; Murcott, 2000). Adopting GT analytical procedures enabled the development of a core concept '*Independence Transitioning*' to explain the everyday food provisioning and handling practices in the home.

Section 1

Chapter 2 : Microbiological Food Safety and *Listeria monocytogenes*

2.1 Introduction

Food remains a prevalent vehicle for the contraction of disease and an important global public health issue (Redmond and Griffith, 2009). This chapter provides a contextual analysis of microbiological food safety, first, by defining it and establishing the importance of its study, through the identification of the associated costs, in terms of human health and economic losses. Second, the chapter will focus on the significance of *Listeria monocytogenes*, which is the particular food safety focus of this study; its increased prevalence as a foodborne disease-causing pathogen, is considered. The current infectivity trends of the pathogen and the increase in cases in the 60+ are outlined, the food products associated as vehicles for contraction of the human disease listeriosis identified and 'at risk' subgroups of the population profiled. The public and their domestic food safety practices are noted to play a central role in the contraction of listeria specifically and foodborne disease generally¹². Therefore, an assessment of best practice is made and a detailed examination of the extant body of literature relating to domestic food safety is evaluated. What is known specifically about the 60+ is examined, and the way in which their food handling practices differ from other population cohorts is established.

2.2 Food Safety

Food safety was not a political, scientific or societal concern until the late 1970s (Knowels, Moody and McEachern, 2007). However, in the 1980s the notion of 'food scares' became a prominent feature of the media landscape and so entered

¹² For review of this literature consult (Milne, 2011; Meah and Watson, 2011; SSRC, 2009; ACMSF, 2009; Brennan *et al.* 2007; McCarthy *et al.* 2007; Jackson *et al.* 2007; Kennedy *et al.* 2005; Wilcock *et al.* 2004; Scott, 2003; Redmond and Griffith, 2005, Miles and Frewer, 2001; Henson and Caswell, 1999; Bruhn and Schutz, 1999; Miles, Braxton and Frewer, 1999; Griffith, Worsfold and Mitchell, 1998)

the consumer consciousness. The combination of persistent food safety incidents and the media representation of these, has amplified consumers' perceived risks such that fear *'is the dominant currency of public life...despite the unprecedented security of life in the West...we seem to be more anxious and fearful than ever'* (Bunting, M. in Jackson, 2010, p.150). Although public concern relating to food is considerable, the majority of concerns are associated with little if any adverse effects upon human health. Media coverage of 'crises' can be argued to have heightened consumer awareness and anxiety, often out of all proportion to the actual risk (Jackson, 2010; FAO/WHO, 2002; Frewer, Raats and Shepherd, 1993). Despite this, it is important to acknowledge the climate that has fostered much consumer anxiety and distrust in food. Table 2.1 presents a timeline of the major European food scares from 1988-2006 that has contributed to this.

In the UK, media reporting of food safety concerns began most notably in the late 1980s, when the Department of Health (DOH) issued a warning to the public to avoid eating raw eggs. Edwina Currie, the then Junior Health Minister, remarked that the majority of UK egg production was contaminated with *Salmonella*. The repercussions, which prompted her resignation, included the Ministry of Agriculture, Fisheries and Food (MAFF) allocating £20 million to compensate egg producers (Knowels, Moody and McEachern, 2007). This was followed by a succession of notorious food scares throughout the 1990s continuing to the present day. The most significant was the decade long Bovine Spongiform Encephalopathy (BSE) crisis. BSE was a disease that had been recognized as being responsible for causing rapid fatal brain disease in 200,000 cattle and in 1996 a strong causal link was established between BSE in contaminated beef and variant Creutzfeldt-Jakob Disease (vCJD), a deadly human form of the disease (DEFRA, 2010; Knowels, Moody and McEachern, 2007 and McDonald and Roberts, 1998).

Table 2.1: Summary of Main European Food Scares 1988-2006

Date	Microbiological	Contaminants	Zoonotic/Epizootic
1988	<i>Salmonella</i> in eggs (UK)	-	-
1989	<i>Listeria</i> (UK) <i>Salmonella Enteritidis</i> (UK) Botulism in hazelnut puree (UK)	Alar pesticide (EU) Sewage contamination of fresh meat (Fr)	BSE (UK)
1990		Benzene in Perrier bottled water (EU)	
1992	<i>Listeria</i> (Fr)	-	-
1995	<i>Campylobacter</i> (UK) <i>E coli</i> (Sw)		
1996	<i>E coli</i> (UK/Sw)	-	CJD Deaths (UK) FMD (Ty/Gr/Bul)
1998	<i>Salmonella Enteritidis</i> (Gr) <i>Salmonella Bongori</i> (It) Botulism (It/Fr/UK/No)	-	-
1999	<i>Salmonella Typhimurium</i> (Fr) <i>Listeria</i> (Fr)	Dioxins in animal feeds (EU) Fungicide/ poor carbon dioxide in Coca-Cola (EU)	CJD alert in red wine (Fr)
2000	<i>Salmonella Enteritidis</i> (Ne) <i>Salmonella Typhimurium</i> (UK/Ic/Ne/Gy) <i>E.coli</i> (sp)_	-	BSE (Fr/Gy/Sp)
2001	Listeriosis (Be)	Olive oil contamination (sp/UK)	BSE (It) FMD** (UK/Ir/Fr/Ne)
2002	-	Nitrofurans in prawns (UK) Nitrofen in wheat (EU) Acrylamide (EU)	FMD (UK)
2003	<i>Campylobacter</i> (UK/Sp) <i>E.coli</i> (Dk)	Mercury poisoning in swordfish (UK) Sudan 1 (EU)	-
2004	<i>E. coli</i> (Dk) <i>Salmonella Enteritidis</i> (Ne) <i>Salmonella Bovis-morbificans</i> (Gy)	Lasalocid in eggs (UK) PCB's and dioxins in salmon (UK) Sudan 1 (EU)	Avian flu (EU)
2005	<i>Salmonella Bovis-morbificans</i> (Gy) <i>Salmonella Typhimurium</i> (UK/No/Dk/Ne) <i>Campylobacter</i> (DK)/ <i>Listeria</i> (Ne) <i>Salmonella</i> Hadar (Sp)/ <i>E.coli</i> (Fr) <i>Salmonella</i> Stourbridge (UK/Fr/Swe/Sz/Gy/Au)	Sudan 1 (EU) Para red (EU)	Avian flu (EU)
2006	<i>Salmonella Montevideo</i> (UK)	Enzine in soft drinks (Fr/UK) Dioxins in animal feed (Be/Ne)	Avian flu (EU)

** Foot and Mouth Disease (FMD) (Source: Knowels, Moody and McEachern, 2007)

Later in 2001 concerns over the safety of foods were once again raised following the outbreak of FMD. Despite this posing no threat to food safety and only causing mild flu like symptoms in humans, of which no cases were recorded during the 2001 outbreak (NHS, 2012). This further fuelled consumer concerns over the safety of their food (Jackson, 2010).

Consumer anxiety has increased regulation of food-production at all points in the food chain, and food is heralded as being as safe today as it ever has been (Cabinet Office, 2008). However, debates rumble on, and current concerns relating to genetically modified foods (GM), cloning and nanotechnology (Kuznesof, 2010), have maintained heightened levels of anxiety and continued the low public confidence and trust in food and its safety (Jackson, 2010). Frewer *et al.* (1998) have shown public concern over food to be high; they suggest the essential role it plays in the lives of all consumers makes it impossible to reduce the absolute risks associated to zero. Moreover, consumers attribute risk differently, for example perceiving the risk of microbiological foodborne hazards very differently from those associated with technologies in food production (Redmond and Griffith, 2004; Miles and Frewer, 2001; Frewer *et al.* 1998; Rabb and Woodburn, 1997).

2.3 Microbiological Foodborne Disease

Microbiological food safety is a subsection of food safety that is concerned with the microbiological pathogens that cause human illness in the form of foodborne disease. As introduced in *Chapter 1*, the food safety focus of this thesis is the microbiological contamination of food by *L.mono*. The symptoms most commonly associated with foodborne disease include, diarrhoea, vomiting and abdominal pain (FSA, 2000). Hospitalization can occur in severe cases, primarily as a consequence of dehydration and meningococcal septicaemia. If these symptoms are due to infection, the term 'infectious intestinal disease' (IID) is used. However, it must be recognized that not all IIDs are foodborne (only 14% of all cases are caused by

foodborne transmission) (Brennan, 2010: IID1, 2000). Other routes of transmission include person-to-person spread and direct contact with animals (FSA, 2000). Food does however, represent the most dominant vehicle for contamination and spread of foodborne illness (FSA, 2000a; FSA, 2002; Flint *et al.* 2005).

As introduced in Section 1.2, microbiological contamination of food can occur *via* a variety of means and at varying points within the food chain. The FSA highlights three key stages with responsibility falling to differing stakeholders involved in the process. The first point at which food can become contaminated is during the production of raw foods, such as eggs, meat, fish and shellfish, fruits and vegetables. The second is due to improper handling, storage, transportation and preparation of food, in which all supply chain members including the public can play a role. The third is a result of cross-contamination of raw and RTE food products, with responsibility for reduction relevant to both food producers and consumers (FSA, 2012). This highlights foods that are vehicles for contraction of foodborne disease are pathogen specific, vary considerably and can include vegetables, raw meat products, RTE and composite food products.

When thinking about the incidences of microbiological foodborne disease, clear distinctions needs to be made with respect to the classification of foodborne disease episodes. These fall into one of two categories, either as part of an outbreak or as a sporadic case. Outbreaks (which are identified in Table 2.1) can be defined as:

‘Either two or more linked cases of the same disease’ (FSA, 2008, p.17)

However, outbreaks do not tell the whole story of microbiological foodborne disease and are reported to account for less than 5% of foodborne illness in the UK (FSA, 2000a). Sporadic cases, account for the vast majority of verified cases in the UK, and occur in isolation, they are not associated with other incidents. Conclusions of the FSA’s initial five-year foodborne disease reduction strategy (2000-2005) reported that a concentration on reducing the number of foodborne

disease outbreaks alone would not achieve reduction targets and recommended that it was essential for future efforts to acknowledge the significant contribution of sporadic cases (FSA, 2000a). However, sporadic case reporting is not reliable, with a significant amount of incidents going un-reported, or misreported owing to individuals reporting illness as a consequence of something that they ate, when they experience upset stomach, sickness and diarrhoea. This is not necessarily originating from food or pathogens and no confirmation is obtained. In reality, data suggests that as many as 50% of these cases are not caused by food (FSA, 2002). Accurate confirmation of the incidences of foodborne illness relies on the testing of stool samples, without which it is not possible to isolate the pathogen that is responsible, upon which causal conclusions are drawn.

The route of transmission must also be recognized with a considerable proportion of cases contracted abroad and reported and verified on return to the UK. Food poisoning and travellers' diarrhoea are caused by a variety of pathogens. The data available on the contribution of this to cases in the UK is acknowledged to be dated, with the most recent report from the HPA published in 2007 that reports on data collected in 2005. In 2005, 4,500 cases of gastrointestinal illness were reported to the HPA where recent foreign travel was stated. This accounted for 8% of notifications of foodborne disease at that time; which was consistent with previous years. Of this small percentage, 56% of cases were due to *Salmonella spp.*, 28% due to *Campylobacter spp.*, 6% due to *Giardi*, 3% to *Shigella*, and 3% due to other organisms (HPA, 2007). According to these data, no reported and verified cases of listeria were contracted outside of the UK, however, this is not to say that this has not occurred outside this surveillance period.

2.3.1 The Big Five

As outlined in *Chapter 1*, 5 main pathogens are responsible for foodborne illness as shown in Table 2.2. There are considerable numbers of foodborne pathogens that have potential to cause human illness. In the UK monitoring, surveillance and reduction focuses primarily on those foodborne pathogens identified as being the

primary causes of the majority of incidences of foodborne disease are often referred to as the 'big five'. Table 2.2 presents, the most accurate UK data (2007/08) on the number of cases of human illness they caused and where food is the source of contraction against the estimated community cases for the same surveillance period, from which the significance of under-reporting is distinguishable. The table also provides information as to the percentage of cases for each pathogen, the level of infectious dose required to cause illness and the typical incubation period and symptoms associated with each.

Table 2.2: The 'Big Five' Cases and Characterisation of Foodborne Illness 2008/2009

Pathogen	Food vehicle	Symptoms	% Associated with foodborne transmission	Infective dose level	Incubation period	Number of reported cases attributed (FSA, 2008/09)	Number of estimated cases in the community (FSA, 2008/09) ¹³
<i>Salmonella</i>	Unpasteurised milk, eggs, products containing raw egg, meat and poultry	Diarrhoea, vomiting, fever, abdominal pain	90%	Mixed evidence	3-7 days	8,494	32,000
<i>Campylobacter</i>	Poultry, red meat, unpasteurised milk and untreated water	Diarrhoea, which can be severe and bloody, with abdominal cramps and vomiting	80%	Low	Several days- 2 weeks	44,732	334,000
<i>E.coli 0157</i>	Eating, drinking or contact with undercooked minced beef and milk that is unpasteurised	Bloody diarrhoea, abdominal cramp, kidney failure, severe anemia and neurological problems. Can sometimes lead to death	50%	Low	5-10 days	1,084	920
<i>Listeria monocytogenes</i>	Ready to eat foods (RTE), re-packed sandwiches, butter, cooked sliced meats, smoked salmon, soft cheeses and pâtés	Flu-like symptoms (can include nausea and diarrhoea), blood poisoning and meningitis, can cause spontaneous abortion or stillbirth in pregnant women. Can sometimes lead to death	99%	Unknown	1-90 days	205	455
** <i>Clostridium perfringens</i>	Found at low levels in many types of food, particularly meat and poultry, and products made out of them	Diarrhoea and severe abdominal pain, occasionally causes nausea; vomiting or fever are rare	90%	High	24 hours	201	n/a
**Norovirus	Most frequently associated with food handlers who can be infectious whilst a-symptomatic. Particularly linked to consumption of raw oysters	Sickness, diarrhoea, raised temperature, headaches, stomach cramps and aching limbs	60%	Low	24-48 hours	9,438	n/a

(Source: Author compiled; FSA 2010; FSA 2011b; Brennan 2010)

¹³ The estimated number of cases in the community are those that are not recorded by national surveillance and are in addition to the number of reported cases.

As shown in section 1.2 the time taken to compile case data and publish reports means that the foodborne disease data are presented retrospectively. Despite there being many other pathogens that can cause human illness, it is not possible to provide surveillance of each and report upon them individually (FSA 2010). Therefore, the FSA have chosen to focus specifically on the ‘big five’. Whilst Table 2.2 provides a snap shot of the situation in 2008, it does not depict the variation in number of cases over time. Changes in virulence and trends in infectivity are presented in Table 2.3, which presents a more up-to-date picture of the virulence and number of sporadic cases of illness caused by each.

Table 2.3: Laboratory Confirmed Cases of Foodborne Illness Acquired in the UK: 2000 to 2010

Year	<i>Campylobacter</i>	<i>Salmonella</i>	<i>Ecoli</i>	<i>Listeria</i>	<i>Norovirus</i>
2000	52,567	12,784	1035	114	-
2001	49,287	13,935	916	162	-
2002	43,355	12,736	748	160	-
2003	41,283	13,207	777	248	-
2004	39,822	12,344	819	230	-
2005	41,882	10,220	1,029	220	4,653
2006	42,360	10,970	1,146	208	7,320
2007	46,733	10,570	974	254	8,495
2008	44,842	8,542	1,096	205	9,438
2009	52,617	7,677	1,160	234	10,377
2010	56,767	6,613	929	174	15,529

(Source: FSA 2011)

One of the strategic aims of the FSA is to monitor closely the changes in virulence of these pathogens and they aimed to reduce foodborne disease by 20% (FSA, 2000), between 2000-2005 and achieved reductions of 19.2% during this period (FSA, 2007). Following this and consistent reductions in the number of sporadic cases of salmonella and *Ecoli*, since 2005, the 2010-2015 FSA Foodborne Disease Strategy (FBDS) has been streamlined, and although still monitoring the top five pathogens, focus has shifted specifically to campylobacter and *L. monocytogenes* as reductions in these pathogens offers the greatest potential for public health gains (FSA 2011).

Unlike other pathogens such as *L.mono* and *E.coli* the symptoms associated with campylobacter are less severe, an observation supported by the substantial amount

of community cases that go unreported to medical practitioners. However, trend analysis issued by the HPA reports a change in age structure for the contraction of campylobacteriosis. Like *L.mono* a clear increase in cases of campylobacter primarily in the elderly between 2005-2007 had been observed. Similarly, causal factors are unidentified and it is unknown if this incremental rise has continued into 2008 as data are pending (ACMSF, 2010). By comparison listeria is responsible for significantly fewer cases of foodborne disease. However, the fluctuation in cases over the last decade, the spike in cases in the 60+, the severity of the symptoms and the high mortality rates associated with this pathogen have made it a key concern for the FSA.

2.3.2 Costs of Foodborne Disease

As noted in *Chapter 1*, the burden of foodborne disease in terms of both cost to public health and cost to the national economy is significant. When the FSA was established in 2000, the findings of the IID1 study estimated the cost of foodborne disease to be £745 million at 1994/5 prices (FSA, 2000). In a breakdown of associated costs it was identified that the majority of this burden was carried by employers through employees' absence accounting for 56% of the total expense. The National Health Service (NHS) carried 37%, while 8% of costs fell to the individual, predominantly through loss of earnings (FSA 2000). Table 2.4 provides a more current financial evaluation of the cost of foodborne disease and presents the breakdown of this financial burden in England and Wales from 2003-2010.

Table 2.4: Breakdown of Costs: Financial Burden of Foodborne Disease in England and Wales 2003-2010

Year	Economic Cost in (£) Millions			Total cost
	NHS	Earnings	Pain and suffering	
2003	24	96	1239	1359
2004	33	128	1664	1825
2005	28	112	1392	1532
2006	26	105	1284	1415
2007	27	111	1312	1450
2008	28	116	1313	1457
2009	36	147	1670	1853
2010	33	141	1370	1544

(Source: FSA 2011)

Following the establishment of the FSA and the rollout of the 2000-2005 FBDS, significant cost savings were reported. In review of the effectiveness of the FBDS a cumulative cost saving estimated to have been more than £750 million was estimated to have been achieved (FSA, 2006). This was shown to benefit a number of stakeholders, saving the NHS approximately £25 million, as a result of 10,000 fewer hospitalisations and 38,000 fewer hospital bed days (FSA, 2006). It was calculated that sufferers of foodborne illness saved £150 million in lost earnings and associated costs, and £580 million in direct saving for the cost of pain and grief (FSA, 2006). More contemporary evidence suggests that the cost of foodborne disease has remained relatively stable since 2005 with an estimated cost of £1.5 billion in England and Wales (FSA, 2010). A breakdown of costs for 2011/12, again calculated the total cost of foodborne disease in England and Wales to be £1.5 billion. Although beyond the jurisdiction of the FSA, inclusion of the cost of foodborne disease in Scotland and Northern Ireland (estimated to be £400 million) increases the total cost for the UK to £1.9 billion (FSA 2011).

2.3.3 Who is Most 'At Risk'?

It is recognised that certain subsections of the population are more vulnerable to the contraction of foodborne disease than others (ACMSF, 2009; McCarthy *et al.*, 2007; Kennedy *et al.* 2005; Buzby, 2002 and Gerba, Rose and Haas, 1996). Risk manifests itself in one of two ways, first in terms of physical vulnerability through compromised health status and second, in terms of knowledge, attitudes and beliefs that compound risk through lack of adherence to food safety principles and by demonstrating poor domestic hygiene practices. From a health perspective those at greatest risk of illness from foodborne disease are reported to be the very young, the elderly and pregnant women. Those that are immunocompromised are also noted to be vulnerable to foodborne disease generally and listeria specifically (ACMSF, 2009). However, it is recognised that the term immunocompromised is ill-defined and it is often applied without sufficient clarification (ACMSF, 2009). For the purpose of this thesis, the term immunocompromised will refer to those who

have underlying medical conditions (comorbidities) and have received treatment such as those who are organ transplant recipients; cancer sufferers and AIDS patients (Kendall *et al.* 2003; Gerba, Rose and Haas, 1996). Taking a listeria perspective, three groups are disproportionately affected through an increase in vulnerability and are: i) pregnant females including their unborn and newly delivered infants, ii) the elderly, which including the 60+ regardless of any comorbidities, cancer patients, and iii) patients receiving immunosuppressive or cytotoxic treatments. Infection rarely occurs in anyone outside these criteria, and although subclinical cases do occur, they are rarely identified (Mook, 2011; ACMSF, 2009; McLauchlin, 2005).

Whilst it is acknowledged that physical vulnerability to foodborne disease plays a significant role in determining an individual's 'at risk' status, individual attitudes, knowledge and behaviours towards food and domestic food safety are also known to contribute. By taking a knowledge and attitudinal perspective, research highlights a more eclectic variety of groups to be at risk of illness from foodborne disease. Specifically, extant food safety research highlights males, both young and old, to be at risk of demonstrating behaviours that deviate from best practice recommendations, given their lack of experience and formal education in food preparation and handling (Brennan *et al.* 2007; Kennedy *et al.* 2006; McCarthy *et al.* 2005; Altekruze *et al.* 1999). However, more unexpectedly, females aged 45+ have also been highlighted as a potential 'at risk' group, despite considerable practical experience and often being primarily responsible for everyday domestic food provision and handling in the household (McCarthy *et al.* 2007). The latter findings suggest certain sub-groups hold optimistic attitudes towards their own abilities and food safety judgements and consequently disregard best practice recommendations. The psychological explanation extensively cited within the literature for this discrepancy is the optimistic bias effect, which is considered in more detail in section 2.2.6 (Miles, Braxton and Frewer, 1999 and Wilcock *et al.* 2004).

There is evidence to suggest that financial constraints can also increase risk, as a result of the increased likelihood that these households will have poorly functioning

kitchen equipment (De Boer *et al.* 2005, Johnson *et al.* 1998); will purchase foods from small convenience stores and are likely to purchase foods that have exceeded or are close to their UBD (Gillespie *et al.* 2010; ACMSF, 2009; FSA, 2009).

Older food consumers are a subgroup of the population that is consistently identified as being at risk, in terms of both their health status (Milne, 2011; Gerba, Rose and Haas, 1996) and their behavioural and attitudinal approaches to food provisioning and handling (SSRC, 2009; ACMSF, 2009; Hudson and Hartwell, 2002; Johnson *et al.* 1998). In terms of health, infectious diseases, including foodborne diseases are considered a major concern for older adults, most notably because of reduced immune functionality associated with advancing age, the reduced effectiveness of antibiotic treatments and malnutrition (Gillespie *et al.* 2010; ACMSF, 2009; Gerba, Rose and Haas, 1996). Infectivity trends reported by the HPA have identified rises in *Campylobacter* and *Listeria* affecting this group specifically (SSRC, 2009; ACMSF, 2009; ACMSF, 2010). However, from a knowledge, attitude and behavioural perspective the 60+ are given scarce attention by the food safety literature, and little is known of their actual food provisioning and handling practices.

2.4 Listeria

Incidences of *Listeria* in the UK have both increased and fluctuated significantly over the last decade (FSA, 2007). *Listeria* consists of 6 species (*L. monocytogenes*, *L. ivanovii*, and sub spp. *Ivanovii*, *Londoniensis*, *L. innocua*, *L. welshimeri*, *L. seeligeri* and *L. grayi*) that are commonly found in many environments, although *L. monocytogenes* (*L. mono*) is a bacterial pathogen and is the only known species to cause human illness (Gillespie *et al.* 2009; Beumer *et al.* 1996).

2.4.1 Routes of Transmission

It is possible to identify a number of foods that act as the primary vehicles for the transmission of listeria. Table 2.5 presents the main food vehicles that have been implicated in the contraction of *L.mono* worldwide.

Table 2.5: Food Vehicles for Listeriosis Worldwide

Dairy Products	Meats	Fish	Vegetables	Complex Foods
Soft cheese: camembert (Raw) milk Soy milk Ice/cream Soft cream Butter: butter, butter milk yoghurt Eggs: raw and cooked	Cooked chicken Turkey Frankfurters Sausages Pâte and Rillettes Pork tongue in aspic Sliced meats	Shell fish Cooked fish Cod roe	Coleslaw Vegetable rennet Salted mushrooms Alfalfa tablets Raw vegetables Pickled olives Rice salad Cut fruit - melons Houmous	Sandwiches

(Source: ACMSF, 2009; Farber and Peterkin, 1991)

The majority of these are RTE or extended shelf-life products (usually refrigerated) that can be defined in regulation 2073/2005 as a:

‘food intended by the producer or the manufacturer for direct human consumption without the need for cooking or other processing effective to reduce to an acceptable level or eliminate microorganisms of concern’ (regulation 2073/2005, Article 2)

Specifically these products have a shelf-life greater than ten days (Farber *et al.* 1996) and support the growth of *L.mono* bacterium. The bacterium can survive temperatures that are consistent with normal refrigeration (0-5 degrees) as well as growing on foods with high pH and salt concentrations. Although it is usually killed during cooking and the pasteurization process, some products can become contaminated after they are cooked, often in the packaging process (FSA, 2011; Delgado, 2008). Although numerous experiments have been conducted in order to establish a causal link between vegetables and the growth of *L.mono*, there appears to be little supporting evidence other than for its growth in radishes and potatoes and to a lesser extent it can be found in individual ingredients of pre-packed salads.

However, in the case of salads, the fact that this is found only in individual ingredients is more indicative of contamination in the preparation process (Farber and Peterkin, 1991).

pH level, particularly of meat products, has been shown to affect the growth of *L.mono*. In a study looking at *L.mono* incubation in meat products, Glass and Doyle (1989, cited in Farber and Peterkin, 1991) found that the pathogen's growth in meat was dependent upon the type of product and its pH balance. *L.mono* was found to grow best on products with a pH value of 6.0 or higher and growth was suppressed in products with pH levels of 5.0 and below. Additionally, in a co-ordinated study between the Local Authorities' Co-ordinators of Regulators Services (LACORS, 2009) and the HPA, it was suggested that increased handling or cutting of meat products prior to packaging could further increase the risk of contamination. In support of this finding, the greatest reported prevalence of *L.mono* contamination was in meats which were sliced to order rather than pre-packed. In these incidents *L.mono* is known to persist on meat slicing machines and contaminate products in the slicing process. Thus, there are concerns relating to foods purchased from delicatessen style counters, where this type of service is typical. Moreover, of additional concern relating to foods purchased from delicatessen counters is the lack of food labelling, which is often supplied without clear storage and consumption instructions (Goodburn, 2010).

2.4.2 Infectivity Levels and Incubation Period

There appears to be a lack of international consensus as to the acceptable levels of *L.mono* contained within food products. The US employs a zero-tolerance policy and no traces of the bacteria are tolerated at any point within the food production and retail process. However, the UK has taken a more relaxed approach, advocating that food products containing levels of *L.monocytogenes* >100 cfu/g are considered safe for human consumption (Hitchins, 1996). However, in the UK this is not universal, and for foods served to vulnerable groups (i.e. hospital and care home service users) a zero tolerance level is upheld, the reasons for which will be

discussed later (ACMSF, 2011). In addition to the variance in acceptable levels of *L.mono*, there is also variability in shelf-life of products of RTE foods in the UK, Europe and America, with considerable differences in shelf-life times given to the same products in these countries (Goodburn, 2010).

Owing to the tolerance levels accepted in the UK, it appears that most individuals will come into contact with and eat products with small amounts of the *L.mono* pathogen. The evidence of the infective dose is required to cause infection/illness is unclear (Farber *et al.* 1996). What has been suggested, however, is that human infection is dependent on the variant of the strain and the host's susceptibility to the disease (Faber and Peterkin, 1991). However, extended infection incubation periods, which can range from 1 to 90 days, often make it difficult to pin-point an exact food vehicle as the cause of listeriosis infection (Gillespie *et al.* 2006). Often increases in cases can be associated with a single food product and characterised as an outbreak. Table 2.6 presents the major global outbreaks of listeriosis, mortality rates and the food vehicle at the centre of contamination.

Table 2.6: Timeline of Global Listeria Outbreaks

Year	Country	Cases/Deaths	Mortality rates	Food Contaminant
1980-81	Canada	41/18	44	Coleslaw
1983	USA	49/14	29	Milk
1983-7	Switzerland	122/34	29	Soft cheese
1985	USA	142/48	34	Soft cheese
1992	France	279/63	23	Pork tongue in aspic
1989-9	Finland	25/6	24	Butter
1999-2000	France	26/7	27	Pork tongue in jelly
2000	USA	29/7	24	Turkey meat

(Source: ACMSF, 2009)

Not included in Table 2.6, was a doubling of cases between 1987-1989 in the UK, where the cause was traced to a specific brand of pâté. Following its withdrawal, levels stabilised and throughout the 1990s the average number of annual cases levelled at 110 (Gillespie *et al.* 2006). It is unclear why this was not reported by the ACMSF, though it may be associated with historically patchy surveillance data for

that time period. Surveillance data covering 2008-2010 reported in 2011 identified more recent cases and reported 3 cases clustered in time but not in geography. These were traced back to the consumption of tongue from two national supermarkets and various sliced meats (ACMSF, 2011). A review of *L.mono* food isolates in 2010 found that three meat products originating from the same supplier were also contaminated. The manufacturer was requested to recall chicken roll products. Later the same year cooked and sliced corned beef products were also recalled due to unsatisfactorily high levels of *L.mono*. In total, 10 cases of listeria presented with between October 2009 and 2010, with 8 of those reported to have eaten tongue and all reported to have eaten cooked and sliced meats.

During the same period two outbreaks of listeria were linked back to sandwiches served in two hospitals, one in Northern Ireland and the other in the North East of England, and had potential to cause serious/fatal infection in vulnerable patients (ACMSF, 2011; ACMSF, 2009). The outbreak in the North East was responsible for 5 cases, of which low levels of the pathogen were isolated from sandwiches and further environmental sampling at the manufacturing site, isolated the same strain from the production environment (ACMSF, 2011). This outbreak and identification led to the introduction of the regulation that hospital food should be free from *L.mono*.

2.4.3 Risk Factors

Although this pathogen can be seen to affect both humans and animals, human transmission is predominantly through contaminated food and three groups are disproportionately disadvantaged; those that are immunocompromised, the elderly and pregnant women and their unborn children as well as newly delivered infants (Gillespie *et al.* 2010; Gillespie *et al.* 2009). Thus cases are recognised as falling into one of two groups, pregnancy and non-pregnancy related cases (ACMSF, 2009). Specifically in pregnancy related cases, listeria can cause feto-maternal infections that can result in premature births and in some cases spontaneous abortion (Gillespie, 2010; ACMSF, 2009; Giliot *et al.* 1996). Notwithstanding pregnancy

related cases, listeria is rare and most cases that occur beyond infancy are as a result of individuals being immunocompromised. The risk factors involved in these cases include; those suffering from cancer, autoimmune disease, receiving treatment, which includes the administration of immunosuppressant drugs and those suffering from alcoholism or diabetes. Clinical manifestations of listeria, includes the presentation of meningitis, however, the progression of this is more rapid in immunocompromised groups. There is a spectrum of listeriosis associated symptoms that ranges from mild flu like symptoms to the more severe including meningococcal septicaemia and central nervous system infections. Rare non-specific signs of infection include arthritis, hepatitis, endophthalmitis, cutaneous lesions, peritonitis in patients on peritoneal dialysis, endocarditis and pneumonia (ACMSF, 2009). Sub-clinical cases of this disease do occur, although they are rarely identified (ACMSF, 2009; McLaughlin, 2005).

Research conducted by Gillespie *et al.* (2010) highlights an association with listeriosis and neighbourhood deprivation¹⁴. The study focused on 29 confirmed cases and used a combination of laboratory surveillance data and indices of deprivation, calculated based on patient postcodes. It was concluded that incidents of listeriosis were greatest in the most deprived areas of the UK, when compared to the most affluent areas. This result appears to contradict *a priori* hypothesis that listeriosis is a disease of affluence, owing to its associations with expensive products such as pâté and soft mould-ripened cheeses (Gillespie *et al.* 2010). This study presents a number of possible explanations for the observed relationship between deprivation and cases of listeriosis including: financial pressures, poor or limited kitchen equipment, most notably refrigerators and freezer facilities; the practice of purchasing reduced food items that are close to their use by dates; and the storage of food items beyond a product's shelf-life. Poor health and susceptibility to certain health conditions are also seen to be associated with lower

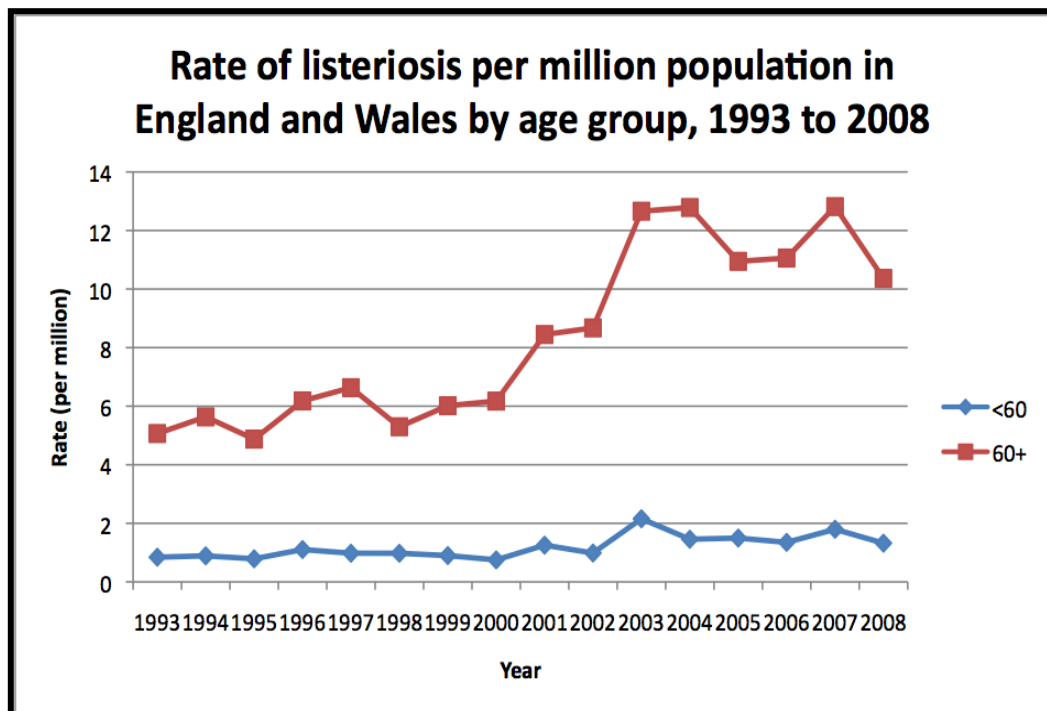
¹⁴ Indices of Deprivation are an important tool for identifying the most disadvantaged areas in England. The Index of Multiple Deprivation 2010 (IMD 2010) is a measure of multiple deprivation at the small area level, and is based on the idea of distinct dimensions of deprivation which can be recognised and measured separately (Great Britain. Department for Communities and Local Government, 2011).

socio-economic groups. Additionally people contracting listeria were found to be more likely to have shopped for food from convenience or local stores, bakers and butchers for example, than the general population (Goodburn, 2010). Poverty, coupled with poor health and inflating food costs, are increasingly being considered as factors that may further predispose older adults to contracting listeriosis (Gillespie *et al.* 2010).

2.4.4 Trends in Infectivity

Levels of infection are low when compared to other pathogens, although the mortality rates associated with the pathogen are considerable, with reports suggesting death as an outcome in a third of all cases (FSA, 2011a; Cairns *et al.* 2009). In the UK, listeria is the pathogen responsible for highest number of foodborne disease related deaths (FSA, 2011a), and infectivity trends show cases have fluctuated over the last decade. Despite the levels of sporadic cases of human listeriosis remaining relative stable throughout the 1990s, with between 87 and 128 cases per year, the number of annual cases rose to over 146 in 2001, 213 cases in 2004, up to a peak of 455 verified cases in 2007 of which 162 resulted in mortality (Wadge, 2010; ACMSF, 2009 and Gillespie *et al.* 2006). Established infectivity trends for listeriosis are weak, although pregnancy related cases and central nervous system infection in those aged less than 60 had remained at similar levels. The increase in cases has been witnessed almost exclusively in the 60+ and is considered to be independent of demographic trends, representing a tripling of the number of cases in this age group since 1993 (ACMSF, 2009; Cairns *et al.* 2009). Figure 2.1 presents this observed trend in cases between 1993-2008 for all disadvantaged groups.

Figure 2.1: Rates of Listeriosis Per Million Population in England and Wales by Age Group



(source: HPA 2009)

This rise in cases has been mirrored in a number of other European countries including: Scotland; Northern Ireland; Germany; France; Spain; the Netherlands; and Lithuania. However, there is no evidence to suggest a common cause for these increases (Denny and McClachlin, 2008; ACMSF, 2009). In an attempt to explain the increase, both the ACMSF (2009) and the Social Science Research Committee (SSRC, 2009) hypothesised that the domestic food procurement, storage and handling behaviours of the 60+, could be significant and help explain the increase witnessed in this age group. More recent trend data has shown that the number of cases of listeriosis has actually fallen, with 176 cases in 2010 and 164 cases in 2011. Despite this decrease, the number of cases still exceeds the 1990's baseline figures, and represents a rise of 53% from the 2000 baseline (FSA, 2011; ACMSF, 2009 and SSRC, 2009). The financial cost of listeria is estimated to exceed £245 million/year, with the high proportion of cases resulting in hospitalisations and, as such, the majority of costs associated are experienced by the health system (FSA, 2011).

In response to the fluctuating levels of listeria the FSA is currently coordinating a Listeria Risk Management programme 2010-2015, that is targeted at the highest risk groups in order to make the most substantial health gains. The programme has three main aims: 1) increase awareness and promote preventative behaviours in vulnerable groups and those that care for them, 2) ensure listeria risk is considered as part of food procurement in settings where those who are vulnerable are cared for, and 3) improve industry compliance. This programme has already achieved reductions and the vision is that this will help to attain continued and sustained reductions in listeria.

2.4.5 Age and Susceptibility

As established, susceptibility to foodborne disease increases with age (Lew *et al.* 1991; Simth, 1998; Cates *et al.* 2007). Figure 2.1 highlighted the increased prevalence of listeriosis in adults' aged 60+ a large and varied demographic cohort. Figure 2.2 focuses specifically on adults aged 60+ and illustrates the relationship between advancing age and vulnerability to listeriosis. In addition, evidence shows that mortality as a result of contracting listeriosis is higher amongst older adults than it is amongst other vulnerable groups (Buzby, 2002; Cates *et al.* 2007). This is further shown in Table 2.7, which represents the total number of non-pregnancy cases and fatalities from listeriosis, by age group in England and Wales from 1990-2007, prior to the identified spike.

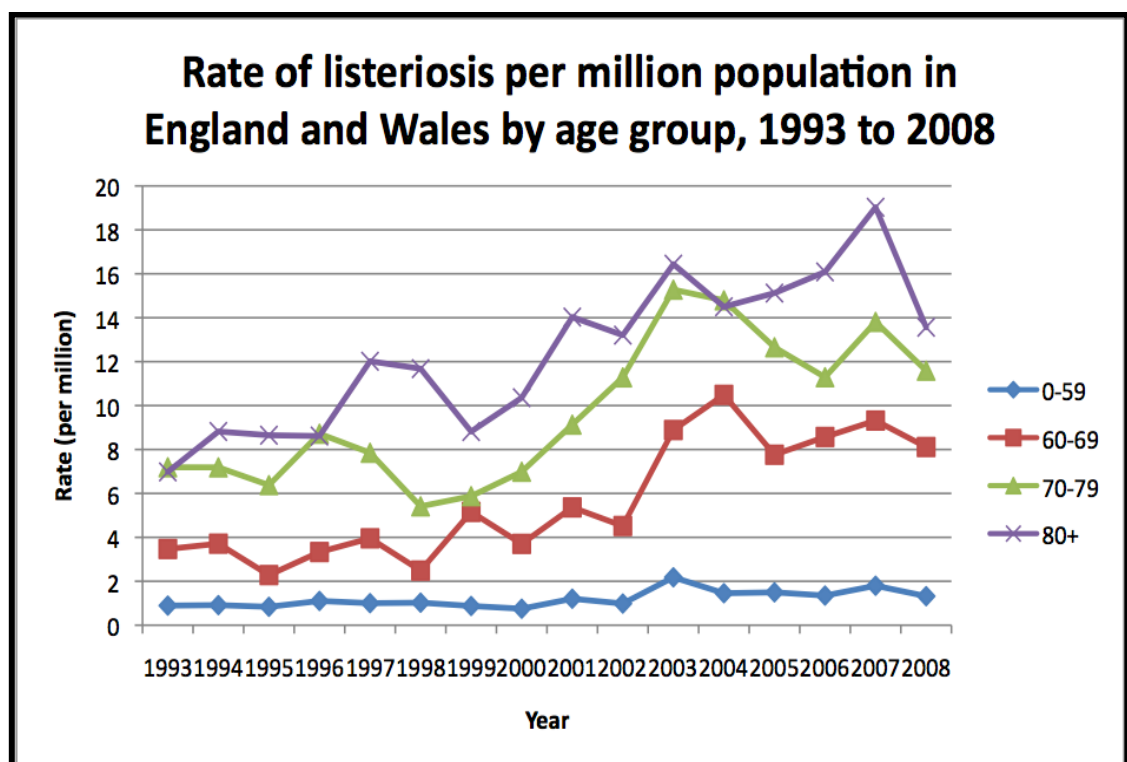
Table 2.7: Listeriosis Causes and Fatalities in Non-Pregnancy Cases by Age Group

Age	Death of Patient (% of cases)			Total
	Yes	No	Don't Know	
0-9	2 (10%)	17 (81%)	2 (9%)	21
10-19	5 (16%)	26 (81%)	4 (2%)	32
20-29	4 (12%)	25 (76%)	4 (12%)	33
30-39	17 (22%)	39 (50%)	12 (28%)	78
40-49	29 (21%)	91 (66%)	18 (13%)	138
50-59	73 (27%)	152 (57%)	43 (16%)	268
60-69	151 (32%)	269 (57%)	48 (10%)	468
70-79	226 (37%)	308 (51%)	69 (11%)	603
80+	207 (44%)	211 (45%)	48 (10%)	466
Unknown	8	14	23	45
Total	722	1152	278	2152

(Source: ACMSF, 2009)

Table 2.7 and Figure 2.2 reinforce how crucial age is as one of the primary predisposing risk factors for contracting listeriosis and how the likelihood of dying from listeriosis increases significantly with age. Figure 2.2 shows that within the 0 - 59 age range the rate of listeriosis is 1 case per million and relatively stable. By comparison for adults age 60+ the rate is much higher (peaking at 19 cases per million in the 80+) and increasing.

Figure 2.2: Rates of *Listeriosis* Per Million in England and Wales by Age Group, 1993-2008



(Source: HPA, 2009)

Although it is recognised that age is not the sole causal factor in this increase, accounting for only a small proportion of the increase, as adults aged over 80 are the fastest growing segment of the ageing population (ONS, 2012; ACMSF, 2009), this graph indicates the largest proportion of sporadic infection cases and deaths have incurred in adults of and approaching this age. Moreover, it is fair to assume that if the numbers within this population group continue to rise as predicted, the instances of listeriosis occurring amongst the over 80s will inevitably increase. Notwithstanding the association made with age, a number of additional potential

causal factors for the increase in listeriosis observed in the 60+ population, have been identified. These include changes in methods of reporting, the demography of the UK and increased life expectancy, as well as mutations in the disease pathogenicity of *L.mono* and a considerable gap in knowledge of the domestic food provisioning and handling practices of the 60+. However, none of these factors have been substantiated (ACMSF, 2009).

2.5 Food Safety and the Home

It is widely argued that microbiological foodborne illness is preventable, including listeria, if food safety guidelines are followed throughout the food chain from production to consumption (farm-to-fork) (Jacob, Mathiasen and Powell, 2010; Mullan, Wong and O'Moore, 2010 and Fischer and De Vries, 2008). The Food and Agriculture Organization of United Nations/World Health Organization (FAO/WHO) have argued that *'the private home is the single location where most foodborne cases occur'* (FAO/WHO, 2002 in Redmond and Griffith, 2002a, p.70). Increased regulation of food manufacturers and inspection of food retail premises in line with the EU Regulation 852/2004 (Article 5) have required that Hazard Analysis and Critical Control Point (HACCP) principles be followed. This has gone a long way to ensuring the safety of food at the point-of-sale across Europe (FSA, 2010). However, regulation beyond this point it is more difficult to achieve. Instead, the public are expected to know, understand and be capable of adhering to domestic food safety guidelines. The paucity of evidence of what happens to food beyond the point-of-sale has led to food industry and policy makers reaching uninformed assumptions that the public are ignorant of and low in knowledge about food and food safety, that their competence in cooking is low and that they are weakest link in the chain (Meah and Watson, 2011; Unusan, 2007; Redmond and Griffith, 2005; Terpstra *et al.* 2005 and Jones, 1998). Changes in lifestyle patterns and a perception that levels of hygiene in the home have dropped have further compounded these positions. This is further compounded by the fact that research in this area has primarily been based on attitudinal and self-reported conclusions, and there is a dearth of information of what actually happens beyond the point-of-

purchase and behind the kitchen door (Meah and Watson, 2011; Brennan, 2010; SSRC, 2009 and ACMSF, 2009).

The dominance of this attitude held by the food industry and policy makers is further exacerbated by the acknowledgement of the considerable amount of community cases that go unreported (Beumer & Kusumaningrum, 2003, Jackson *et al.* 2007; Gorman, Bloomfield and Adley, 2002; FSA, 2001, IID1, 2000, IID2, 2002 and Foster and Kaferstein, 1985). However, from a consumer perspective the role of the home and domestic food handling practices and behaviours are downplayed and it is argued that the contribution of external caterers and food establishments in cases of foodborne illness are often overestimated (Kennedy, *et al.* 2005; Bruhn and Schutz, 1999).

In a report looking at cross-contamination of foodborne pathogens in the domestic environment, Gorman *et al.* (2002) highlight that more than 50% of cases of foodborne illness in the Netherlands, Spain and Germany originated in the home. Table 2.8 presents the percentage of cases foodborne illness originating from the home across Europe.

Table 2.8: Foodborne Disease of Cases Attributed to the Home Across Europe

Country	% of Cases of foodborne illness originating in the home
Denmark	32%
Hungary	46%
Romania	44%
Finland	52%
Poland	52%

(Gorman *et al.* 2002)

Compared to commercial food production sites, it is neither possible nor practical to regulate food practices in the home and insist that all citizens undergo formal food safety training (Stenberg, Macdonald, and Hunter, 2008; Jones 1998; Haysom and Sharp, 2005 and Gorman *et al.* 2002). Essentially, the public controls their own risk of illness from microbiological foodborne pathogens through their existing knowledge, knowledge transfer and adherence to best practice recommendations,

however, they cannot be compelled to take these measures (Meah and Watson, 2011; Milton and Mullan, 2010; Fischer and De Vries, 2008; Griffith, Worsfold and Mitchell, 1999). What is more, and as will be shown in the next section, food safety advice is not static (Meah and Watson, 2011) and has been shown to differ between cookbooks, grandmother's counsel and expert advice. Everyday cooking is thus considered to be fraught with microbiological concerns that previous generations would not have considered.

It is possible for pathogens to enter the domestic kitchen of homes through a variety of routes including, raw foods, most notably raw meat products, RTE as well as transmission *via* pets, dirty laundry or from the garden. The multifunctional nature of the modern domestic kitchen sees it used as a setting that goes above and beyond the storage and preparation of food being a dynamic social space at the heart of the home (Wills and Brennan, 2012; Meah and Watson, 2011; Brennan, 2010). The domestic kitchen is used for a diverse range of non-food related practice, extreme examples being mechanical repairs and the feeding of chickens (Wills and Brennan, 2012). Collectively these insights reinforce the need to explore in more detail, using a diverse range of methods, the role the domestic kitchen plays in everyday life, and the actual food provisioning, handling and kitchen practices that are performed within it. This will allow for better understandings of the role that food safety plays in the lives of consumers. Thus, this will help support the development of more grounded, relevant strategies for improving compliance with domestic food safety best practice guidelines and reduce the incidences of foodborne illness originating in the home (Brennan, 2010; Redmond and Griffith 2009a).

2.6 The 4-Cs

Good domestic food safety practices (in line with best practice recommendations) in the home can reduce the incidences of infection caused by foodborne pathogens (FSA, 2006). However, evidence recognises that consumers' need '*professional assistance*' (Unusan, 2007, p.50; Wilcock *et al.* 2004), which is primarily offered

through educational advice. As part of their farm-to-fork accountability, the FSA assumed responsibility for food safety risk communication to the UK public. This is achieved through a variety of traditional and innovative media; introduced in 2004 to coincide with the White Paper on public health, the FSA launched the Eatwell website. This aimed to provide an easy to understand practical portal of food safety tips for stakeholders and the public. Additionally, the umbrella brand of ‘GermWatch’, was created in 2008 to communicate the importance of practising the 4Cs, of cooking, cleaning, chilling and avoiding cross-contamination (Giles, 2009; FSA, 2006). Table 2.9 outlines the 4Cs of public food safety recommendations. However, following review and a scoping study in 2009, it was decided that the UK public required more holistic information from a range of stakeholders and Livewell was launched in 2011. The information provided to consumers focused less specifically on the 4C framework, however, it is still evident within.

Table 2.9: Consumer Food Safety Best Practice Recommendations (The 4 Cs)

<p>Cooking</p> <ul style="list-style-type: none"> • Always follow the instructions on the label • Always check you food is steaming hot in the middle - there should be no steam coming out • Do not heat food more than once • When re-heating, take extra care that your food is cooked all the way through 	<p>Cleaning</p> <ul style="list-style-type: none"> • Remember to wash your hands: <ul style="list-style-type: none"> ○ Before preparing ○ After touching raw food, especially meat ○ After going to the toilet
<p>Cross-Contamination</p> <ul style="list-style-type: none"> • Keep raw meat separate from ready-to-eat food • Don't let raw meat drip onto other food-keep it in sealed containers in the bottom of your fridge • Never use the same chopping board for raw meat and RTE food without washing it (and the knife) thoroughly in between • Don't wash meat before cooking it- washing does not get rid of harmful germs only cooking it will. You also run the risk of splashing germs onto worktops and other utensils 	<p>Chilling</p> <ul style="list-style-type: none"> • Keep the fridge at the right temperature (Between 0 and 5 degrees) • Keep the fridge door closed as much as possible • Wait for food to cool before you put it in the fridge • If the fridge is full it might need help, turn the temperature down to help fight germs

(Source: Giles, 2009)

The Livewell website expands on these basic principles and defines use-by and best-before dates as well as including recommendations for freezing and the storage of certain food products (eggs and tinned foods). UBD are defined as being used on foods that '*go off quickly*' and can be dangerous to health if eaten after that date has passed, whereas best-before dates are a quality indicator, suggesting the food should be safe past this date but it will not be at its best quality (Livewell, 2010). Specific advice on the storage of eggs is provided which recommends that they are stored within the fridge and can be safe to eat one or two days past the BBD but no later. Opened tinned foods should not be kept in the fridge, rather the contents should be transferred to a storage container or a covered bowl (Livewell, 2010).

In terms of the advice given for freezing and defrosting the following recommendations are provided:

1. Food are frozen before the UDB
2. Meat and fish is thoroughly defrosted before cooking and defrosted items are stored in a bowl or container so that liquid from the defrosting process does not run on to other things and to stop bacteria spreading
3. The microwave is used to defrost only if foods are intended to be cooked straight away, otherwise it should be covered and defrosted in the fridge
4. Food should not be stored in the freezer indefinitely
5. Raw meat or fish that has been defrosted should not be re-frozen
6. It is possible to re-freeze cooked meat as long as it has been properly cooled before being stored in the freezer
7. Frozen raw food can be defrosted and stored in the fridge for two days before consumption or disposal
8. Cooked food from the freezer should be re-heated and cooked immediately once defrosted and only re-heated once
9. Re-heated food should reach 70°C
10. Foods stored in the freezer (Ice cream and frozen desserts) should not be placed back in the freezer if thawed.

In addition to providing these consumer recommendations, the FSA holds an annual food safety week to promote the importance of good food safety practices in the home. Each week had a specific focus with 2009 concentrating on the 60+ and listeria and the need for correct food handling and storage practices in the home. In subsequent years, the event has focused on the prevention of *Campylobacter* through safe outdoor eating, good home hygiene, while more recently in 2012, UBDs (Giles, 2009; FSA, 2010 and Livewell 2011).

The recommendations above are indicative of the advice given to the public as to what are appropriate domestic food safety practices. However, it is acknowledged that despite this, consumers do not consistently adhere to, or practise, these guidelines. Observational research conducted in Australia by Jay *et al.* (1999, cited in Mullan, Wong and O'Moore, 2010) highlights that despite these recommendations and guidelines, consumers frequently engage in unsafe food handling and hygiene practices, being found to wash their hands infrequently and not washing chopping boards and utensils during the preparation of raw meat. Furthermore, consumers are less knowledgeable when pressed about specific advice such as fridge temperatures, and UBDs (James, Evans and James, 2007; Jackson *et al.* 2007 and Johnson, *et al.* 1998). Concerns relating to consumer 'optimistic bias' towards food safety messages, has been raised and the literature highlights that despite targeted efforts, some may ignore messages assuming that they are intended for others and not directly relevant to themselves (Fischer and De Vries, 2008; Brennan *et al.* 2007; Wilcock, *et al.* 2004; Redmond and Griffith, 2004; and Miles and Frewer, 2003). Lifestyle factors have been found to contribute to public resistance to interventions intended to change their everyday cooking and food preparation practices, many of which are considered very habitual in nature. The frequency of the performance of such practices contributes to this, increasing the strength and prominence of behaviours and the automation of particular patterns that are less than ideal from a food safety perspective (Aarts and Dijkserhuis 1999; Bargh and Ferguson, 2000, cited in Fischer and De Vries, 2008).

2.7 Engaging Consumers

In order for food safety education to have an impact on whether and how the public translate knowledge into practice, it is recommended that educational efforts be targeted towards specific subgroups of the population, primarily those deemed to be most likely to deviate from best practice and considered most at risk from foodborne illness (Unusan, 2007; Redmond and Griffith, 2005; Kendall *et al.* 2006). A collaborative approach is required to ensure that more rigorous domestic food safety practices are performed in the home, which will require cooperation between: governments, the food industry and the public (Unusan, 2007). Research conducted by Unusan (2007) suggests that for educational efforts to be effective they should begin in childhood and continue throughout life and that material used should be age specific and reinforced through practical classes.

Hanson and Benedict (2002) further reinforce the need for targeted educational approaches. In a study looking specifically at adherence to food safety best practice amongst older adults, it was concluded that the impact of food safety education differs amongst the cohort, with recognition of the need for targeted education, designed to provide more attentive safe food handling information to some than others; a category in which men are included. Moreover, older adults are more engaged with nutrition and healthful behaviours and are more receptive to food safety messages than younger cohorts, demonstrating a preference for written information such as booklets and brochures (Cates *et al.* 2009; Kendall *et al.* 2006).

Redmond and Griffith (2005, p.468) suggest that behavioural change is possible although it is reliant upon the extent to which the individual 'trusts' the source of food risk information. They suggested that a '*source low in credibility may be discounted and have limited or no impact*'. However, it is shown, that '*men in white coats*', governments and industry are less trusted whilst consumer organisations and parts of the mass media are held in higher regard (Frewer *et al.* 1994, p.20). However, it is recognised that for consumers to change their existing food safety practices they must perceive their existing practices to endanger their health or be

in need of change (Hargreaves, 2011; Redmond and Griffith, 2004), hence using multiple channels for information dissemination may increase effectiveness (Bruhn and Schultz, 1999). Redmond and Griffith (2005) found consumer preference for information on pack and reported high exposure to advice *via* this method of message delivery. Additionally, it was suggested that information should be provided in doctors' surgeries especially in waiting areas as often patients wait for extended periods with little other distractions (Redmond and Griffith, 2005). Cates *et al.* (2009) support these suggestions, indicating that older consumers hold preferences for message provision, preferring it to come from either supermarkets or health care practitioners.

2.7.1 Consumer Non-Conformance

Consumer knowledge of best practice does not necessarily translate into good practice (Brennan *et al.* 2007; McCarthy, *et al.* 2007 and Gorman, *et al.* 2002). In order to improve practical adherence to food safety recommendations McCarthy, *et al.* (2007) concluded that food safety risk communication should concentrate less on educating consumers about 'best practice' and focus more on understanding the reason why consumers deviate from such recommendations, focusing specifically upon at-risk groups within populations (Wilcock *et al.* 2004). Despite clear consideration of best practice message communication and the assumption of the positive relationship between frequency of cooking (habitual cooks) and safety (Fischer and Frewer, 2008) it is increasingly recognised that consumers are '*evermore careless*' with regards to their food safety practices (Fischer and De Vries, 2008, p.392). Concerns relating to consumer 'optimistic bias' towards food safety messages have been raised. The literature highlights that despite targeted efforts, some may ignore messages assuming that they are intended for others and not directly relevant to themselves (Fischer and De Vries, 2008; Brennan *et al.* 2007; Redmond and Griffith, 2004; Wilcock, *et al.* 2004; Miles and Scaife, 2003; and Miles and Frewer, 2003).

In a selective review of papers, Miles and Scaife (2003) highlight there to be several determinants of optimistic bias, including when problems are perceived as being likely to occur; where the individual may have had some experience of the concern and when individuals believe they can exert control over the problem. Additionally, optimistic bias is demonstrated around the belief that a problem has not yet happened and that it is unlikely to occur in the future. Cates *et al.* (2007, p.600) in a focus group study related to the contraction of listeria, found that older consumers, whilst being aware that they may be more physically vulnerable to foodborne disease, felt that they had safer and less risky domestic food handling practices in comparison to other age cohorts and on the whole did a '*better job*'. In addition, the study further found issues relating to what the cohort considered to be old, thus who was most vulnerable. It was expressed that the oldest old, those aged 80+, were vulnerable '*but not us*' (Cates *et al.* 2007, p.600). Moreover, in the minds of the public it has been suggested that the low incidence of illness compared against the frequency with which cooking occurs acts to compound these issues and reinforces deviation from best practice guidelines (Miles and Frewer, 2003).

In instances where deviation from best practice recommendations occurs, optimistic bias has been identified with the likelihood that people perceive themselves to be more knowledgeable than others, and attribute illness as something that affects others and not themselves (Fischer and Frewer, 2008). It is suggested that this notion becomes engrained in practice as a result of daily lifestyle related behaviours, such as cooking and food preparation becoming habitual, through the frequency of the performance, increasing the strength and prominence of behaviours (Fischer and De Vries, 2008). This can include the automation of behaviours that are less than ideal from a food safety perspective (Aarts and Dijkserhuis 1999; Bargh and Ferguson, 2000, cited in Fischer and De Vries, 2008). Such automation can be especially problematic for behavioural change and education efforts, as often lifestyle factors have been found to be resistant to interventions intended to change such habits (Fischer and Frewer, 2008).

Psychological research offers insights into how consumers behave in relation to every day risks and consideration is valuable if consumer protection is to be optimised (Fischer and Frewer, 2008). Taking this into consideration, Fischer and De Vries (2008) acknowledge that the low likelihood of illness and consumers' desire to minimise the demand on their cognitive resources leads to a reliance on heuristic processing of information. Heuristics are presented as set of rules that apply to certain 'real-life' situations, where complete information is not available and little mental effort is required. For example, bad smelling food should not be eaten as it indicates spoilage is a heuristic that will help individuals avoid foodborne illness. However, Fischer and De Vries (2008) recognise that relying upon a single heuristic maybe be risky, and although time consuming, the inclusion of personal experiences and expert advice will increase safety. In this sense consumers are considered to 'parcel' relevant information together, using accumulated knowledge to guide food safety decisions. Although used to avoid risk successfully on many occasions, it is this parcelling of information to bypass elaborate decision-making processes that can account for consumers practising increasingly careless food safety behaviours (Fischer and De Vries, 2008). Given the frequency that food is prepared in the domestic environment, illness as a result rarely occurs and therefore, consumers associate this with 'low risk'. An accumulation of positive outcomes when preparing food therefore occurs. Encountering illness may decrease optimism, although, this is often temporary, fading as no further negative experiences are accumulated.

2.8 Food Safety and the Older Consumer: The Evidence

Notwithstanding the acknowledgement of physical and medical vulnerability in the 60+, the research evidence suggests that the way older adults provision, handle and consume food differs from their younger counterparts (Milne, 2011, ACMSF, 2009). Whilst there has been considerable interest in the relationship older consumers have with food in terms of health and nutrition, and food safety from an attitudinal perspective, little is known about the actual domestic food safety practices of the 60+ and the few studies available can be argued to be somewhat limited and

exploratory in nature (ACMSF, 2009 and SSRC, 2009). This is especially evident in the UK and Republic of Ireland, where only three studies have focused specifically on the domestic food hygiene practices of the 60+ generally, and only one focused on listeria and the older consumer specifically (Milne, 2011). Across the limited body of research, the older consumer is considered as a homogeneous group and little focus upon subsections within this large cohort is given (Brennan *et al.* 2007; Hudson and Hartwell, 2002; Johnson *et al.* 1998). Research conducted by Brennan *et al.* (2007) does however, make note of gender discrepancies, and recognises the tendency for research to focus predominantly upon traditional sampling frames, biased towards females, as they often are often assumed to be the primary food purchaser and handler within the home.

Research appears to be a little more comprehensive in the US where a larger body of research has been conducted (Cates *et al.* 2007; Kendall *et al.* 2006; Hanson and Benedict, 2002; Gettings and Kiernan, 2001 and Smith, 1998). Despite the US providing additional insights, the ability to generalise findings and its applicability to older food consumers in the UK is limited, as practices and guidelines differ cross-culturally. Additionally, whilst these studies acknowledge that there are differences in the way older adults procure and handle food, little acknowledgement is given to the reasoning behind such differences in behaviours. As recognised by the ACMSF (2009) and the SSRC (2009) there is considerable scope for further investigation and research in this area.

Research focusing specifically on understanding the food safety and hygiene practices of the 60+ indicates discrepancies between knowledge and practice. Despite older consumers appearing to know the do's and don'ts in relation to food safety guidelines, research repeatedly reports them to be an 'at risk' group (Brennan *et al.* 2007 and McCarthy *et al.* 2007). Despite knowledge and understanding, and in some cases education in home economics, deviating behaviour demonstrates that knowledge alone is not enough to ensure compliance with best practice guidelines. Research conducted on the island of Ireland by Brennan *et al.* (2007) argued that one possible rationale for lack of adherence to

food safety recommendations in older adults may lie in best practice recommendations changing over time and current guidelines differing substantially from those of previous years and from past formal food safety education initiatives. The authors highlight this to be particularly the case with cooling, storage and reheating of leftovers, and suggest that optimistic bias may be resulting in the 60+ believing that their own well-established practices are safer than the newer recommended guidelines. This hypothesis is supported Meah and Watson (2011) who looked at how knowledge of food and cooking competence is transferred between generations in households. Older adults have been shown to assume a default position in a set of considered responses to food safety that are logically argued to be more appropriate than the current best practice recommendations (Jackson, 2010).

Some studies have shown that older adults cook more safely than their younger counterparts, as in the past food education was more formal, in particular for women (domestic sciences was historically taught in school to females rather than males in the UK) (Fischer and Frewer, 2008). Furthermore, research highlights that older consumers also consider themselves to be safer and take less risks with food handling (Cates *et al.* 2007). However, this is not a belief universally held, and older adults are considered to be at risk of illness as a result of engaging in domestic food safety practices that deviate from best practice recommendations. Brennan *et al.* (2007) identified three common, inter-related factors influencing the behaviours of the 'at risk' groups they identified. These were, time and energy invested in conforming to the best practice guidelines; past experience with the consequences of microbiological foodborne illness; and habit (Brennan *et al.* 2007).

For example, time and effort has been specifically linked to defrosting and thawing practices, particularly of meat products. Adhering to best practice was considered time consuming, neither realistic nor necessary for the safe defrosting of meat products across the at-risk groups identified (Brennan *et al.* 2007). In addition, time and energy can pose specific problems for older adults above and beyond those for other groups. It can be suggested that for some, the act of making a meal demands

a significant amount of effort in itself. For example, an older person who may have difficulty in standing for extended periods of time, may view the best practice food safety guidelines as a lower priority than providing a meal that is, for example, nutritionally balanced or even a meal at all. However, it is worth acknowledging that the notion of time as a primary prohibiter in the performance of domestic food safety best practice is also recognised in the commercial food environment and is not a factor solely affecting the uptake of food safety in older adults (Clayton *et al.* 2002). Thus time and available resources can be suggested to be a factor that transcends and affects the adherence to best practice food safety guidelines across different food preparation environments.

Understanding of and adherence to food safety labelling advice is an additional concern in the preparation of food. Research indicates that within older age groups the distinction between 'use-by' and 'best-before' advice is often not made (Brennan *et al.* 2007; Hudson and Hartwell, 2002). For some, this relates to visual impairment and difficulty in seeing the labelling (Johnson *et al.* 1998), whereas for others, this advice is dismissed as being prescriptive rather than regulatory. This also ties into the notion of past experience, which results in microbiological food safety being considered as less of a priority if the person or anyone within his or her wider network has not suffered from foodborne illness (Hudson and Hartwell, 2002). Moreover, optimistic bias and lack of personal experience of the consequences of food safety malpractice has been reported in studies relating specifically to the older adult demographic (Brennan *et al.* 2007; Gettings and Kiernan, 2001). In this sense, older consumers are characterised as being past rather than future orientated (Dibsdall *et al.* 2003) especially if they have suffered no direct consequences as a result of the way that they handle and prepare food. As such, the food preparation, storage and consumption practices that they engage in routinely, prevail.

Further research has indicated differences in attention given by older adults to educational literature, with the tendency for this age cohort to dismiss such information as not directly relevant to them. Gettings and Kiernan (2002) suggest

that the credibility of the source of educational information plays a significant role in adherence to best practice guidelines within the older age cohort. This is supported by research conducted in America by Cates *et al.*, (2007), who found in relation to the provision of food safety advice and specifically in relation to advice on listeria, older consumers require message provision to be from trustworthy organisations and educators. Moreover, in order for effective behavioural change to be initiated, it is important that risk communication focuses less on best practice education and more upon understanding the reasons and rationale behind the behaviours (McCarthy *et al.* 2007).

Common insight across this limited body of research to date on the 60+, have reported a number of central differences in the food safety practices of this population compared to other subgroups. This includes differences in personal hygiene, hand washing and cross-contamination practices (Hanson and Benedict, 2002; Hudson and Hartwell, 2002). Additionally, differences in available kitchen equipment have been suggested, most notably refrigeration facilities, with some older adults having old or no refrigeration appliances in their homes and few having means of monitoring internal fridge temperatures or knowledge of what temperature this should be (James, Evans and James, 2007; Cates *et al.* 2007; Hudson and Hartwell, 2002 and Johnson *et al.* 1998). Unsafe defrosting and thawing practices have been raised as a cause for concern in this age cohort (McCarthy *et al.* 2005; Gettings and Kiernan, 2001 and Johnson *et al.* 1998). Moreover, shared attitudinal values of not wasting food, precipitated by experiences of food shortages during the interwar years and periods after, are reported to have impacted upon interpretations and behaviours relating to UBDs (Milne, 2011).

Little distinction is made within the 60+ cohort and it appears that, within the literature, they are presented as a homogeneous group. Three studies have acknowledge heterogeneity in this cohort and have attempted to segment them based on their knowledge of and attitudes towards food and food safety best practice, as well as considering the role of socioeconomics and gender (McCarthy *et*

al. 2007 and Brennan *et al.* 2007 and Johnson *et al.* 1998). Consistent across all three studies is the notion that typically, men aged 60+ with primary level education are deemed to be most 'at risk' and engage with practices that deviate most from best practice guidelines. Additionally, lower socioeconomic groups were associated with lower levels of education and ownership of kitchen equipment that was in poorer condition.

Despite this, these studies can be criticised for the lack of emphasis they place on observing the actual food safety and domestic food hygiene practices of the 60+ (Brennan, 2010; Murcott, 2000). Research conducted thus far has relied upon the self-reported behaviours of this age cohort (Clayton *et al.* 2002; Worsfold and Griffith, 1997). As Anderson *et al.* (2004) suggest, there are often substantial differences between what people report as being their usual practice. They may forget, answer with what is considered to be the most appropriate response, or respond with what they perceive as being what the interviewer would want to hear. In addition, it can be argued that when asked, individuals often find it difficult to articulate mundane, tacit, everyday behaviours to which they may not have previously given consideration (Power, 2000).

In the absence of research looking specifically at the domestic food safety practices of the 60+, a critique of evidence that has explored the everyday relationship between older adults and food is considered. It can be suggested that the way in which this cohort prepare, handle and store food should not be viewed in isolation, rather, the notion that such behaviours are influenced by a myriad of external factors and mundane everyday food behaviours and practices learnt and developed over time, can provide significant understanding of their food safety attitudes and values (Meah and Watson, 2011; Milne, 2011; Brennan, 2010; ASMSF, 2009 and SSRC, 2009). Therefore, in order to truly understand the behavioural motivations of the 60+ with respect to food safety it is valuable to understand more generally the influencers that shape their everyday life and relationship with food.

2.9 Summary

This chapter has critically evaluated the contextual landscape into which this research is situated. The chapter began by identifying food safety as a political, scientific and societal concern, and an umbrella term within which microbiological food safety is encompassed. Consideration of the associated costs in terms of public health and to the economy, substantiated microbiological food safety as the primary area for this research study. Building on the specific problem identified in *Chapter 1*, this chapter provided a detailed characterisation of *L.mono*. The chapter identified those groups known to be disproportionately vulnerable to contracting listeriosis, which included the 60+. The key food vehicles implicated in the contraction of listeriosis were highlighted, and included chilled RTE foods such as pâte, soft cheeses, cooked meats and pre-made sandwiches. The bacterium was also noted to survive and grow at recommended refrigeration temperatures (0-5 degrees).

The remainder of the chapter considered the role of the home and the domestic food handling practices of consumers, which were identified to play a pivotal role in the contraction of foodborne diseases. Domestic food safety best practice recommendations were identified as being the only domestic food safety control beyond the point of sale although, it was acknowledged that food consumers do not consistently comply with these guidelines. Consideration of vulnerable groups, highlighted those aged 60+ to be consistently considered as 'at risk', and their food provisioning and handling practices to differ from their younger age groups. Despite this, a gap in knowledge and understanding of the 60+ food provisioning and handling practices was further substantiated as under researched, with the current body of literature confirmed to be limited and exploratory in nature (ACMSF, 2009; SSRC, 2009).

The insights gained from this chapter will be used to inform the methodology in both Phase 1 and Phase 2 of this research, and are reported in *Chapter 5, 6 and 7* respectively. Specifically methods will be used to establish if and to what extent

the 60+ consume high-risk listeria foods, and to explore knowledge and practice of domestic food safety, best practice recommendations generally and particularly those relating to fridge temperatures. Moreover, the consistent identification of the older consumer as the focus of this research and the limited insights from a food safety perspective have reinforced the necessity of considering ageing more specifically. *Chapter 3* will address this by defining the older adult and exploring more specifically their relationships with food.

Chapter 3 : Ageing and the Older Consumer

3.1 Introduction

Older adults are acknowledged to be an 'at risk' sub-group from a food safety perspective, vulnerable to foodborne disease generally and listeria specifically (Milne, 2011; ACMSF, 2009; SSRC, 2009; Brennan *et al.* 2007; McCarthy *et al.* 2007; Terpstra, 2005; Hudson and Hartwell, 2002; Johnson *et al.* 1998). The burden of vulnerability within this cohort is further compounded by the ageing profile of the UK population and the increasing numbers of individuals aged 60+ (ACMSF, 2009; UN, 2008). This chapter provides an in-depth analysis of the UK's ageing population, the intention of which is to consider what it is to be old (aged 60+) in the UK and the impact that this may have on food provisioning and handling. First, the chapter provides a demographic account of the UK's ageing population and explores the factors that have contributed to its maturation. Existing definitions of old age are critiqued and a defence of the use of aged 60+ to define the older consumer used in this study is given. The chapter reflects on the variation and degree of heterogeneity in lifestyles and physical abilities of the cohort and the impacts this has upon their relationships with food and their food provisioning and handling practices.

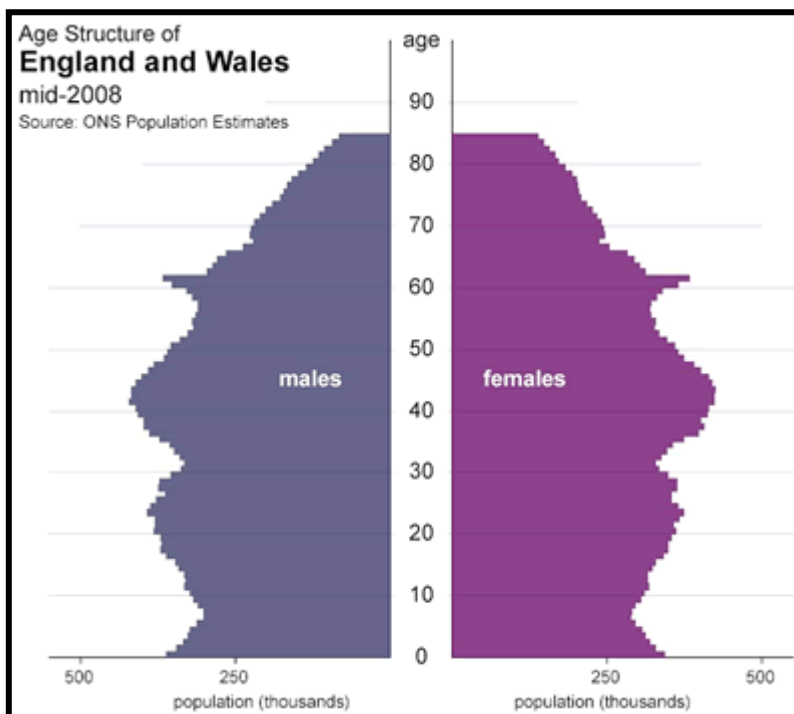
3.2 Ageing Populations

Population ageing is defined as '*an increasing median age of the population or an alteration in the age structure of a population so that elderly persons are increasingly represented*' (Sherstha, 2000, p.204). Since the 1950s the UK's population has aged steadily with adults aged 60+ comprising a significant proportion (22.7%) of the populace (UN, 2008). This trajectory is certain to continue and the 60+ are expected to account for 23.3% of the population in 2015 (UN, 2008; Kinsella and He, 2009). Current and extended projections predict that those aged 65+ will increase from 17% to 24% between 2010 and 2051 (Tomassini, 2005). Within this, the greatest increase will be amongst the octogenarian cohort, which will grow by 5% from 2 to 7% over the same period (ONS, 2012). The main

determinants of this population change are reductions in rates of fertility and mortality (ONS, 2012). The social and economic problem faced by governments in respect of this relates to funding an increasing dependency on support services, which include; health care; housing; income; security and long-term care, which has been exacerbated by reductions in the working age sub-groups of the population. Therefore, the critical question facing governments with respect to population ageing is one of 'who pays?' (ONS, 2012; Sherstha, 2000). These issues are discussed in the following analysis.

The population pyramid, which diagrammatically represents age structure within a given nation provides a useful platform to discuss the UK's ageing population profile. Whilst a classic population pyramid is typically wide at its base and narrows as age increases, the age structure of the population in England and Wales as depicted in, Figure 3.1 illustrates a profile typical of a mature society and is now discussed.

Figure 3.1: Age Structure of the UK



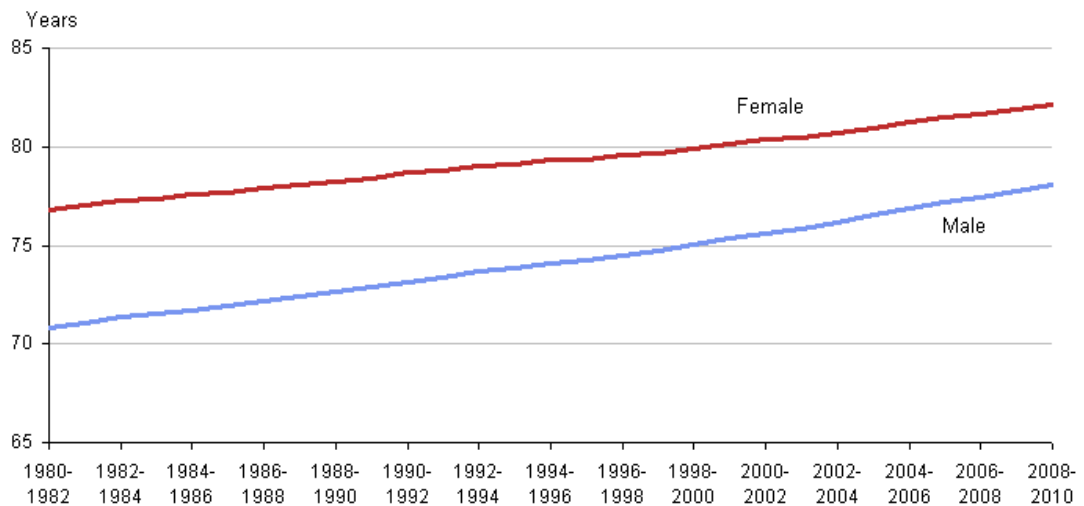
(Source: ONS 2008)

Dependency ratios are used to measure structural changes in the population over time. The most common of these is the old age dependency ratio, which measures the number of people within the population of state pension age (SPA) for every 1000 people of working age (ONS, 2012). It is desirable that the country is able to balance this ratio and avoid exerting pressure on support services (Sherstha, 2000). In the UK, from the mid-1970 until 2006 this ratio was steady (300:1000), and the concerns of supporting an ageing population were controlled. However, withdrawal from the labour market of the post-war baby-boomers altered this balance and, in the absence of any change to state pension age, was projected to reach proportions of 492:1000 by 2051 (ONS, 2012) perpetuated by those born post WWII retiring. This is expected to place considerable pressure on health and social care services. To counteract this the UK Coalition government has made changes to the SPA, discussed in detail in section 3.4.8, increasing it to offset the dependency ratio. This will begin to take effect over the next decade and it is hoped that it will reduce the ratio so that it is more in line with the 1970s levels and is projected to be 342:1000 by 2051 (ONS, 2012).

The UK's ageing population is associated with increased life expectancy, which has been rising over the past three decades (see Figure 3.1). Ageing populations are a consequence of a number of contributory factors, although principally relating to reduced mortality and fertility rates (ONS, 2012; Raats, de Goot, and van Staveren, 2009; Tomassini, 2005; Rice and Fineman, 2003 and Sherlock, 2000). Over the last century, two factors have been of particular significance in accounting for this. First, at the beginning of the 20th century reduced mortality rates were a direct result of reductions in infectious and respiratory diseases, and also improvements in the treatments for long-term disabilities as a result of advances in medical technology (ONS, 2012). Second, during the later part of the 20th century a significant reduction in circulatory diseases, in part a result of the reductions in smoking, significantly increased the percentage of the population reaching and living beyond the age of 65 (ONS, 2012; Rice and Fineman, 2003).

Assuming life expectancy remains consistent with 2008-10 figures, a male could expect to live for 78.1 years and a female for 82.1 years (ONS, 2011). Although women typically outlive men, this gap has narrowed from 6 years to 4.1 years over the past 28 years (ONS, 2011). The narrowing of this gap is reflected in Figure 3.2.

Figure 3.2: Life Expectancy At Birth, UK, 1980-82 to 2008-10



(Source: ONS, 2011)

In addition to gender differences in life expectancy, there are also geographical variations in the UK's constitutional countries (see Figure 3.3). England has the highest life expectancy for both males and females standing at 78.4 years and 82.4 years respectively, whilst Scotland has the lowest.

Figure 3.3: Life Expectancy At Birth and At Age 65, UK and Consistent Countries

	Male (At Birth)	Female (At Birth)	Male at 65	Female at 65
UK	78.1	82.1	17.8	20.4
England	78.4	82.4	18.0	20.6
Wales	77.5	81.7	17.5	20.1
Scotland	75.8	80.3	16.6	19.2
Northern Ireland	77.0	81.4	17.3	20.1

(Source: ONS, 2011)

In relation to fertility rates, falling birth rates as a result of the 'shelf' generation, who comprise of fertile women, who themselves have been one of many children, but subsequently chose to bear only one, two or in some cases no children (Harper,

2006), resulted in fertility rates that were below the replacement rate¹⁵ (ONS, 2012). Despite sharp increases in fertility rates post WWII, the cohort collectively known as the baby-boomers (ONS 2012; Mintel 2009) and notwithstanding the rises that have occurred between 2001 and 2010 (increasing from 1.61 to 2.00), fertility rates have remained below the rate of replacement (ONS, 2012).

Whilst improvements in life expectancy can be widely regarded as a humanitarian achievement, consideration must be given to the social and economic challenges that this presents in terms of the burden that this places on health care, housing and income security; detailed consideration of these will be presented in sections 3.4.4-6 (Kinsella and He, 2009; Clifton, 2009 and Sherstha, 2000). It is also argued that whilst life expectancy is increasing, medical advances have meant that populations are surviving longer with chronic conditions and co-morbidities¹⁶, raising debates about the quality of life (ACMSF, 2009).

Demographers have classified the UK as a 'mature society', which occurs when the number of adults aged 60+ exceeds the number of young, those under the age of fifteen (Harper, 2006). Statistics to support this mature society include the increasing average age in the UK from 35.4 years in 1960 to 39.9 years in 2010, which is projected to reach 42.5 years in 2050 (UN, 2008). Indeed evidence suggests that the UK's older population has been growing nearly twice as fast (0.7% aged 65+ in 2004) as the population as a whole (0.4% in 2004), confirming this period of demographic transition (UN, 2008; Börsch-Supan, 2004). However, the most significant population growth has been witnessed in the number of adults reaching the age of eighty+ (Dini and Goldring, 2008). Currently this accounts for 4.7% of the UK's total population and this is projected to increase steadily over the next decade to 5% in 2020 and 6.2% in 2030 (UN, 2008). It is within the octogenarian age group that the number of older women disproportionately outweighs that of men (Sherlock, 2000; Tomassini, 2005). Reasons for the

¹⁵ The replacement rate is the total fertility rate required for the population to replace itself in size in the long term (ONS, 2012)

¹⁶ Co-morbidities are defined as a disease or condition, which exists independently of another

gendered nature of ageing are presented as a complex interplay of factors including genetic predisposal, higher rates of male mortality through increased vulnerability to accidents and violence in early adult life, as well as chronic disease in later life (Sherlock, 2000). However, the relevance of the UK's demographic shifts for this thesis is the observed increase in sporadic cases of listeria being associated with the aged 60+, and more specifically, those aged 80+ identified as most vulnerable (Gillespie *et al.* 2006; Gillespie *et al.* 2010). The UK's ageing profile thus suggests an increasing number of this 'at risk' population.

3.3 Defining Old Age

A review of the literature relating to old age paints a confused picture of what it is to be old which is confounded further by the lack of consensus on how older adults are defined¹⁷. Although there are some commonly used definitions of old age, most are heavily reliant upon chronological age (WHO, 2009) such as aged 65+ years, which are also contested (Sherlock, 2000). Chronological age definitions are criticised for ignoring the health, social, emotional and psychological diversity of the cohort, and thus treating older adults as a homogeneous group is rejected (Burt and Gabbott, 1995; Rowe and Kahn, 1987).

In the 1980s, geriatric and gerontology research characterised the ageing process as '*a chronic, progressive, irreversible and degenerative syndrome that universally and inevitably culminated in death*' (Rice & Fineman, 2003, p.34). Furthermore, suggestions have been made that advancing age is characterised by '*decline and disengagement from society*' (Clifton, 2009, p. 4). Although this view of ageing for some may be regarded as an accurate representation of the process involved (Help the Aged, 2008), it has also been criticised for neglecting those for whom ageing is a healthy and active period differing marginally from their younger years (Rowe and Kahn, 1987). Equally, examination of cross cultural evidence shows that experiences of old age is subject to variations in culture, environments, attitudes,

¹⁷ This is evident in the multiple baselines presented by the data of old age used within the first section of this chapter

and social policies (Clifton, 2009), thus highlighting the heterogeneity within the ageing process. However, in order to enrich the general understanding of the older adult, methods by which this cohort has been profiled are discussed.

Heterogeneity within the 60+ cohort is recognised by the many attempts that have been made to segment them (see Darnton, 2005). However, present methods for profiling older adults are polarised, as segmentation has occurred either in traditional demographic terms, using measuring frames such as age, gender and income level or *via* medical accounts which employ significant competency based assessments such as the Activities of Daily Living rating scale (for a review see Bucks *et al.*, 1996 and Lawton and Brady 1969). Such discrepancies prove challenging when attempting to clearly define old age, the benefits of which are highlighted by Burkhauser and Lillard (2005, cited in Kinsella & He, 2009) who present the advantages of harmonized data in helping countries better address the challenges of an ageing world. On a micro-level it can be argued that without clear consensus the task of truly understanding the lived experience of older adults proves problematic. In addition, realising the complexities of the issues older age presents in terms of consumption patterns, behaviours and attitudes is near impossible. From the perspective of this thesis, whilst attempts have been made to segment consumers based on their attitudes, knowledge and behaviours in relation to food and food safety (Brennan *et al.* 2007; Kennedy *et al.* 2005 and Medeiros *et al.* 2001), none of the aforementioned have focused specifically upon the 60+. It is therefore necessary to give consideration to the extant segmentation approaches that have been taken.

3.3.1 Chronology

Most developed countries can be seen to adopt the chronological age of 65 as the point at which old age commences and a person can be considered old. Despite this, age 65+ is not a universally adopted criterion, evidenced not least by the fact that the UN's agreed cut-off for old age is anyone aged 60 and over (WHO, 2009). Moreover, it can be argued that chronological definitions of old age disregard the

heterogeneity of later life and the use of calendar age assumes consistency in physical ability with biological age, which for many is not a reality (WHO, 2009). As such, any definition of old age must recognise that the population group this encompasses is as disparate and as varied as the population at large (Mintel, 2008; Rose and Kahn, 1987). In the UK, old age is generally taken as being in line with pensionable age of 60 years for females and 65 for males¹⁸. This is arguably the default definition of old age, and it is somewhat arbitrary and not universally accepted (WHO, 2010), with some organisations such as Mintel (2008) using the age of 50 as the start of old age. In addition, the raising of SPA in the UK has introduced greater ambiguity and further compounds the confusion as to the point at which old age beings.

The current chronological classifications of old age in the UK are the result of a process, which began in the 19th Century. In 1875 the Friendly Society Act defined old age as anyone aged 50 or over (Roebuck, 1979). However, this definition was not universally adopted and the British government increased the pensionable age to 70 as a response to the amount the nation could afford to spend on its aged population¹⁹. Following the First World War, this age was reduced as a means of encouraging older workers to leave the labour force to make way for younger workers and provide a solution to the mass unemployment of the time (Roebuck, 1979). It is therefore possible to argue that little consideration was given to the meaning of old age in attributing official pension ages, and as such caution should be taken in accepting a definition of 'old' which is reliant solely on this chronological criterion. This is further supported by research conducted by the Central Office for Information (COI) which suggests *'age alone is not an inadequate predictor of attitudes and aspirations...wealth, health status, gender, mobility, and living status...each mediate the effect of age'* (COI, 2005, p.29).

Historically, older adults made up a significantly smaller proportion of the total population (Dini & Goldring, 2008) and thus using chronological age as the primary

¹⁸ Although it is recognized that changes in SPA may change this (see Section 3.4.8)

¹⁹ Changes which are mirrored in the most recent changes to SPA

indicator of old age may have been appropriate. However, with an increasingly ageing population it has been suggested that broad chronological classification offers little to the understanding of what it is to be old (Ahmad, 2002). Moreover, this standard criterion is not universal and for some researching the 'grey' market, ages as low as 49 have been used as a reference point for old age (Butt & Gabbott, 1995, p.43). Giles (2009) highlights the way in which selected publications emphasise the importance of defining older consumers at younger ages and relates this specifically to health policy. From a policy and educational perspective the benefit of targeting the younger 'old' means they are well placed to target these groups of consumers before they reach advanced old age. This is highlighted in Holland *et al.*'s (2008) study aimed at incentivising adults over the age of 50 to improve their health and fitness levels, which found that younger adults felt themselves to have more control over their health and consequently were more likely to make changes than older cohorts.

3.3.2 Descriptive Age Classifications

Chronological age is a convenient way of categorising the older person. However, setting an arbitrary value as the point at which old age begins can be argued merely to provide a convenient reference point at which old age begins and does not distinguish this cohort beyond this, or account for heterogeneity. The COI makes attempts to differentiate beyond this using the following descriptive categories (COI, 2005):

- Thrivers (aged 50-59)
- Seniors (aged 60-79)
- Elders (aged 80+)

A further method of segmentation presented by the COI using age suggests the following segments:

- Emerging Greys (aged 50-64)

- Transients (aged 65-74)
- Twilight Greys (aged 75+)

The aforementioned age segmentation can be seen to use similar age ranges and appears to be comparing similar groups. However, they use distinctly different terminology and they can be criticised for the lack of recognition of the diversity of beyond the age of 75+, which can span more than two decades and given that this is the fastest growing segment of older adults, they can be argued to require inclusion (UN, 2008). Furthermore, the classification provides accompanying terminology to the age ranges presented, although it provides no descriptive explanation of these and therefore their application can be argued to be limited.

3.4 Ageing and Health

There is a general acceptance that chronological age is not synonymous with health for many older adults, thus attitudes and behaviours can differ dramatically (Winter Falk *et al.* 1996). As Coni, Davidson & Webster, (1992, p.17) suggest *'ageing usually implies deterioration but we should not assume that this is universal to all human activities and talents'*. With advancing age, physical, medical and behavioural profiles become increasingly divergent, (Bales, 2009). As Bales (2009, p. 3) highlights *'this is because for both genetic and environmental reasons, age related physiological changes and major chronic diseases develop at highly variable rates in individuals'*, not least also because often old age can span three decades (Sherlock, 2000; Winter Falk, Bisogni and Sobal, 1996).

Taking a health-orientated approach, the WHO recognises that as we age, deterioration of physical health occurs (WHO, 2010). In recognition of this, a general model of health transition is presented. The model defines old age in terms of differing health states and broadly distinguishes between, *'total survival, disability free survival and survival without disabling chronic disease'* (Kinsella & He, 2009, p.51). Although adding value to the debate of what old age is and how it is defined by appreciation of the variation of health status of individuals irrespective

of age, it can be criticised for its lack of acknowledgement of the behaviours that accompany health status. Moreover, the definition of disability, like old age, is elusive and measurement relies predominantly on rating scales such as ADL for assessment (Kinsella & He, 2009). Furthermore, it could be argued that for some disability does not define behaviours and attitudes, whilst for others it can be debilitating to the extent that it consumes all aspects of their lives.

3.4.1 Describing Old Age

Defining old age appears to lack consensus and is confused further by a multitude of descriptive references used for this vast age cohort. Descriptive references used to refer to older adults include, 'seniors' (Getting & Kiernan, 2001) elders, elderly, senior citizens, old age pensioners (OAPs) and range to more colloquial and collective terminology such as in the 'golden years of life' and belonging to the 'quiet' or 'Saga' generations (Saga, 2010; Paulionis, 2008; Mintel, 2008 and Carrigan, 1998). Marketing is a discipline that requires the segmentation of consumer markets in the promotion of products, goods and services, and in so doing refers to older populations as the 'grey market' spending the 'grey pound' (Carrigan, 1998). In medical terms, geriatrics refers to the branch of medicine that deals with the care of older adults and gerontology is the term used to describe the scientific study of ageing and its effects. Additionally more collective terms are used to refer to the cohort describing them as being part of 'the third age' (Mintel, 2008) signifying the third transitional path that follows 'middle age' and starts with 'youth'.

Crude distinctions have been made between the 'young-old' and the 'old-old', using the age reference points of 65-74 years to constitute 'young-old' and 75 for 'old-old' (Adbel-Ghany and Sharpe, 1997; Coni, Davidson and Webster, 1992). Despite this classification offering some acknowledgment of the concern that older people cannot be considered as a homogeneous group (Burt and Gabbot, 1995) its appropriateness must be questioned. In light of the picture presented by population statistics and demographers, improvements in life expectancy have

made it more common for older adults living in the UK to reach the age of eighty and beyond, commentators have therefore, been compelled to include the category of the 'oldest-old' (Abdel-Ghany and Sharpe, 1997). Although no exact age is assigned to the definition of the 'oldest old', it refers to those in the later stages of life who may be physically frail.

Similarly, although arguably a more detailed profiling of old age is presented by Carrigan (1998, p.50) who establishes old age as consisting of the following four profiles, 'young-old', 'new-old', 'middle-old' and 'very-old' (see Figure 3.4 for the characteristics of each profile). However, it is recognised that this means of segmentation is simplistic and does not account for the behaviour of those whose chronological age is at odds with their biological age.

Figure 3.4: Profiles of the 'Grey Consumer'

Profile	Characteristics
Young-old	Pre-retired, no health restrictions, independent, restricted leisure time
New-old	Newly-retired, few health restrictions, independent, substantial leisure time
Middle-old	Some health restrictions, requires limited assistance, substantial leisure time
Very-old	Extensive health restrictions, requires extensive assistance, substantial leisure time

(Source: Carrigan, 1998)

The DOH supports the view for the varied nature of old age and the fact that diversity within the broad cohort occurs. In line with the suggestions made by Carrigan (1998) the DOH classifies old-age populations as constituting three distinct groups including those 'entering old age', 'transitional phase' and 'frail older people' (DOH, 2010). Those classified as 'entering old age', include adults from age 50 who are 'active and independent' (DOH, 2001). The 'transitional phase' refers to adults who are beginning to move from leading a healthy and active life towards frailty. Although the transition can occur at any point, typically this phase is associated with the seventh and eighth decade of life (DOH, 2001; Falk *et al.* 1996). Finally the classification of 'frail older people' accounts for those who are vulnerable as a result of their health and is usually considered only to account for

adults in advanced old age (DOH, 2001). Such classifications go some way in acknowledging the diversity of ageing profiles and are beneficial in their lack of dependency on chronological age, although they can be criticised for their broad classification of old age.

Mintel (2008) provide a further means of descriptive classification of old age using A Classification of Residential Neighbourhoods (ACORN) geo-demographical classification system. ACORN presents four lifestyle related descriptive classifications of adults' aged 50+, which are outlined in Figure 3.5.

Figure 3.5: ACORN Lifestyle Categorisation of the 60+

Profile	Characteristics
Wealthy Achievers	Wealthy executives, flourishing families and affluent greys
Urban Prosperity	Located in urban areas and popular with younger professionals
Comfortably Off	Suburban locations popular with older adults
Hard Pressed	Areas of social deprivation and hardship

(Source: Mintel, 2008)

Mintel (2008) suggest that there is a gravitation of the over 50s towards the wealthy achiever category. However, the majority of adults in the UK over the age of 50 fall into the categories of 'wealth achiever', 'comfortably off' and 'hard pressed'. This categorisation is essentially aspirational, and can thus be criticised for the lack of consideration that this gives to the multidimensionality of ageing which includes inequality, health and chronological age in addition to wellbeing indicators (Help the Aged, 2008).

3.4.2 Transitions

All of the factors affecting adults as part of the ageing process are indicative of it being a dynamic process, during which transitions are made (Darnton, 2005; Falk *et al.* 1996). Transitional stages are regarded as the points of change at which the older adult moves from one stage or segment to another (outlined above section 3.3.1-3.4.1). Changes in circumstance are a result of these transitions, which can

have profound effects on the lives, including relationships with food, of the individual. Moreover, transition points are noted to coincide and can set off other transitions in a domino effect (Darnton, 2005). According to Darnton (2005) the key transition stages are identified as follows.

i. Giving up work

Giving up work is the first major transition point in later life, and the circumstances under which withdrawal from the work force occurs has profoundly different effects. For those choosing to take retirement, and doing so in a planned way, this can be regarded as a gain and opportunity, whereas, those forced to retire as a result of ill-health or redundancy, tend to view retirement as a loss, both in terms of financial uncertainty and changes in their identity (Darnton, 2005). Withdrawal from the workforce is dependent on the individual, occurring in the main between the ages of 50 and 80, although for the majority it coincides with SPA (ONS, 2012; DWP, 2010; Darnton, 2005). However, greater diversity may occur in the future in line with the phasing out of the SPA (see Section 3.5.8).

ii. Bereavement

The loss of a life partner is a significant life event (Lopata, 1996, cited in Davidson, Arber and Marshall, 2009; Rose and Kahn, 1987) and according to Darnton (2005, p.36) it is a '*fundamental shock to older married people*', triggering loss of identity and practical support. Bereavement is shown to have different effects on male and female widowers respectively (Hank and Jürges, 2007; McKie *et al.* 2000 and Herne, 1995). For men, widowhood was most likely to be the catalyst to depression and loneliness and whilst both genders report to feel this long after losing their significant other, this was most pronounced in males. Additionally, it was found that males were more likely to remarry, whilst females were more inclined to remain single (Bennett, Smith and Hughes, 2002). For females, the loss of a partner was shown to present some gains, with female widowers expressing a sense of pride in coping (Sidenvall, *et al.* 2000; Darnton, 2005).

iii. Giving up driving

Having access to and being able to drive is a key factor in independence and quality of life. It is contested whether this constitutes a major life event, although it is included on the basis that it constitutes a major loss in terms of the aforementioned and commonly follows other transitions; ill-health for example (Darnton, 2005). Single female pensioner and widower households were shown to be least likely to have a car or access to one and this was a factor in feelings of isolation in this group (Gilhooly *et al.* 2002). Moreover, in those who can drive there was shown to be a strong fear of losing this ability, resulting in reduced independence (Darnton, 2005).

iv. Ill-health

Although biological age and chronological age are not always aligned, experiencing ill-health presents a range of trajectories, the most notable of which is the reduction in independence (Kinsella and He, 2009; Sherlock, 2000; Falk *et al.* 1996 and Rose and Khan, 1897). Ill-health can contribute to individuals becoming house-bound, it can contribute significantly to isolation and depression, and is noted to have more rapid onset in those aged 80+ (Darnton, 2005).

v. Giving up home

Moving into care (discussed in detail in Section 3.4.5) is regarded as a last resort and expressed in terms of the loss of the '*final vestiges of independence*' (Darnton, 2005, p. 40). Making modifications to the home to facilitate independence was something that is reported to be conducted reluctantly. However, this was favoured over going into institutional care (Cohen-Mansfield and Jensen, 1996; Tomassini, 2005). Although regarded as the end of independence, remaining in a private residence is not always aligned with quality of life, particularly if it is ill-

suiting to physical needs, with the potential for those remaining in private residences being increasingly linked to isolation and loneliness (Darnton, 2005).

Thus far, this chapter has given consideration to the maturation of the UK's population, and the precursors and the consequences of this. The different frames of reference used to describe 'old-age' and the attempts made to recognise heterogeneity within this cohort have been discussed, and the following section considers more specifically the demographic characteristics.

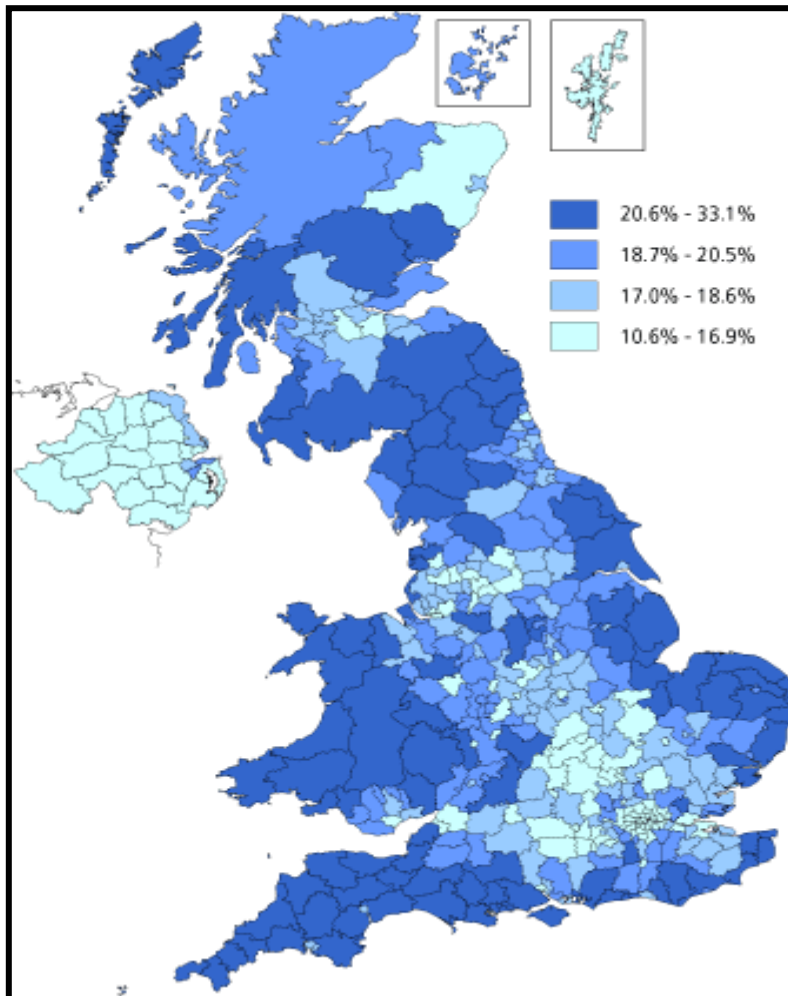
3.5 Demographic Characteristics of the 60+

Demographic characteristics of those aged 60+ relates primarily to considerations of geographical dispersal, household composition, marital status and income. Each of which will now be considered.

3.5.1 Geographical Dispersal

Significant geographical dispersal of those aged 60+ is evident (see Figure 3.6) with the highest densities of older adults concentrated in Wales, the South East and West of England and Southern Scotland; by comparison there appears to be relatively small numbers of older adults residing in Northern Ireland. Across all four countries, proportionately larger numbers of older adults reside in Scotland, followed by England, Wales and finally Northern Ireland.

Figure 3.6: People Over State Pension Age 60/65 and Over: By Area, 2001, United Kingdom



(Source: ONS, 2001)

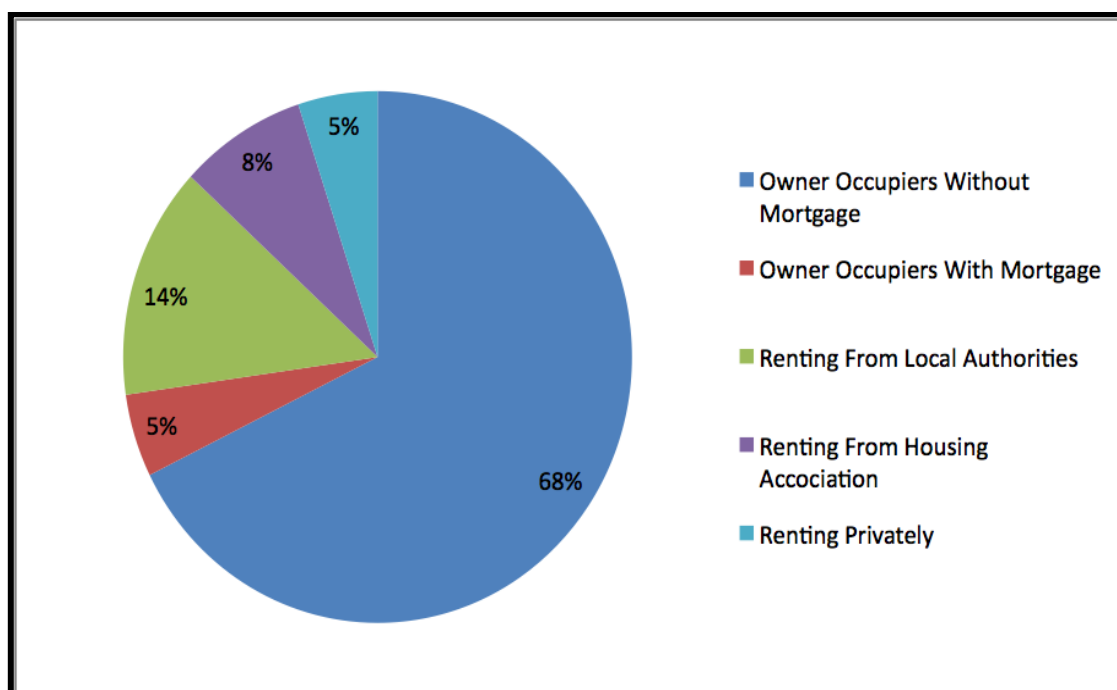
This geographical distribution, based upon 2001 Census data²⁰ clearly indicates higher proportions of older adults residing in coastal areas of the UK, including the North East of England. Internal migration is suggested as being behind this trend, with older adults choosing to move away from urban areas towards rural and coastal locations in retirement (Kinsella and He, 2009; Tomassini, 2005). Changes in residential location in the later stages of adulthood could be dictated by moves into residential care facilities or sheltered accommodation or motivated by moves to be closer to family members (Tomassini, 2005). The population distribution of the North East, in which over 20% of the population is over the age of 60, further justifies it as the geographical focus for this research.

²⁰ Since this the 2011 census has been undertaken, however, no comparable data is yet available.

3.5.2 Household Consumption

To develop a detailed demographic understanding of the older adult in the UK it is necessary to consider household composition and the variations in living arrangements of the 60+ in the UK.

Figure 3.7: Household Tenure in England During 2005 of People Aged 65+



(Source: Age Concern Older People in the United Kingdom Report, 2007)

Figure 3.7 illustrates the variety of household tenure circumstances of adults over the age of 65 in the UK. Over 70% of adults over the age of 65 are living in a home that they personally own. The next largest group at 14% are adults aged 65+ who rent their accommodation from local authorities. However, what is not clear is the extent to which the classification of housing association accounts for those living in sheltered accommodation. Those residing in social care institutions are not included within the UK census; therefore, the chart fails to depict the percentage of adults aged 60+ residing within these institutions (ONS, 2012). Moreover, it does not accommodate older adults living with family members, which can be presented as being strongly tied to cultural norms. Arguably this is a potentially less

significant determinant of older adults' living circumstances in western societies, and the UK specifically, where looser geographical ties are evident and greater emphasis is placed on individualistic relationships (Tomassini, *et al.* 2004).

3.5.3 Marital Status and Co-habitation

Population data from the 1950s onwards shows a distinct increase in the number of adults living alone (Tomassini, *et al.* 2004; Arber and Ginn, 1991). Mirroring the gendered nature of life expectancy in the UK, there are significantly more single older female households than there are male (Arber and Ginn, 1991). Statistics suggest that as age increases so does the likelihood of living alone. For example, in the UK in 2005, 19% of men and 33% of females aged between 65-74 lived alone (Age Concern, 2007). As suggested this can increase significantly with age, and for those aged 75+, 29% and 60% of males and females respectively resided alone (Age Concern, 2007). It is uncommon for older adults to cohabit out of wedlock. However, statistics show that this is more common for the younger old, and is becoming more popular with those in their 50s. Although the overall percentage is minimal, there have been marginal increases in the percentage of cohabiting adults aged 50-59 from 2002-2007. In 2002, 4% of males and 5% of females' aged 50-59 were cohabiting with these figures increasing by 1% respectively during the 2002-2007 period (ONS, 2009). Thus, it can be suggested that as those in their fifties age and move into later life, the proportions of people cohabiting may increase.

3.5.4 Independent Living

Maintaining independence in later life through independent living has become a key policy objective for successive UK governments, and is illustrated by a number of policy changes since the 1980s. Following the publication of the controversial 1989 White Paper, 'Caring for People', the need to enable individuals to maintain independence, through residing in private residences where possible, for as long as possible was recognised (Wanless, 1996). Further policy initiatives have supported this, and in 1998, a second White Paper report, 'Home Alone: the Housing Aspects

of Community Care' was published that re-iterated the commitments made to community based care and the promotion of independence (Thane, 2009; Wanless, 1996). Latterly, the 2009 Green Paper, 'Shaping the Future of Care Together', requested a system that was fair, simple and affordable, and delivered through the national care system (Humphries, Forder and Fernández, 2010). Central to this was the notion of 'putting people first', with the personalisation of service provision. Whilst beneficial in terms of reducing the burden of care and promoting independence, ultimately these top-down policies have resulted in increased numbers of older adults living independently, albeit assisted, in private residences, and, as highlighted in Section 3.2, doing so with chronic conditions and co-morbidities. From a food safety perspective it could be argued that these policies have acted to increase the numbers of older adults who are responsible for their own food preparation and handling; whilst medically being more susceptible to contracting foodborne diseases. This is further compounded by the lack of food safety regulation within the domestic environment, with the risk of foodborne illness controlled by the consumer (Meah and Watson, 2011; Milton and Mullan, 2010; Stenberg, Macdonald, and Hunter, 2008; Fischer and De Vries, 2008; Haysom and Sharp, 2005 and Gorman *et al.* 2002; Griffith, Worsfold and Mitchell, 1999 and Jones 1998).

3.5.5 Informal Care

This prominence of independent living in later life, which is desired by both individuals and governments, requires support from a range of stakeholders (Humphries, Forder and Fernández, 2010; Thane, 2009). As noted the ageing of the UK's population means increasing the burden on the long-term care system, which relies heavily on the provision of informal care (Pickard. 2008). Informal care includes consideration of the informal networks of care given and received amongst individuals and communities to assist with the tasks of daily living (Pickard, 2003; Arber and Ginn, 1991). Figure 3.8 shows the breakdown of informal care provision.

Figure 3.8: Informal Care

Carer relationship	% of informal care provided
Children	52%
Spouses	18%
Grandchildren	8%
Other relatives	21%
Friends and neighbours	21%

(Source: Pickard, 2003)

Informal care is most likely to be received as a result of disability, with 1% of the population providing care for spouses/family members, friends, neighbour because of long-term health problems that are related to age (Vlachantoni, 2010). Moreover, it is estimated that 85% of disabled older adults in the UK receive informal care from a spouse or partner with this figure set to double between 2005-2041 (Pickard *et al.* 2007). The relationship of the carer to the individual changes with age, with 'young-old', sometimes referred to as 'mid-life' carers (Pickard, 2003), being more likely to care for parents, including parent-in-laws and grandchildren, and the 'older-old' relying considerably on care from adult children. With increasing numbers reaching the age of 60+ the demand for informal care by spouses and children is suggested to increase dramatically (Pickard *et al.* 2007). This dynamic is set to change as concern for the supply of informal care from children becomes more prominent for reasons that include, decreasing family sizes, the increase of childless families and the decline of multi-generational households (Pickard, 2000; Pickard 2002 and Pickard 2008).

Additionally, research highlights there to be a strong gendered dynamic to informal care provision, not only in terms of whom the care is provided too but also in regards to intensity of care. Women categorised as being 'young-old' aged 50-69 are more likely than their male counterparts to have care responsibilities for grandchildren; by contrast, males of all age groups were more likely to have care responsibilities for their partner or spouse (Vlachantoni, 2010).

In terms of intensity of care, Vlachantoni (2010) reports that this increases with age, with older carers (65+) providing a greater quantity of care hours. This is more likely to be intensive between those living in the same home than when care is provided to someone outside of the home (Vlachantoni, 2010; Pickard, 2003 and Arber and Ginn, 1991). In terms of regional differences, it is reported that the North East, specifically Tyne and Wear, was found to be one of the areas in the UK with the highest occurrence of informal care, the high prevalence of those aged 80+ with limiting long-term illness (LLTI) residing in this area was cited as a key determinant (Young, Grundy and Kalogirou, 2005).

3.5.6 Income

Difference in material resources and financial wellbeing in old age are determined largely by experiences throughout the life-course (Burholt and Windle, 2006). The income of those over SPA is 26% (in 2008) lower than those under SPA (ELSA, 2008). Withdrawal from the workforce can increase financial constraints despite individuals being encouraged to make alternative provisions for retirement through occupational schemes and private investments. Whilst it must be acknowledged that there is considerable variation in the income levels of adults, state pension provision is indicative of the lowest amount that individuals receive. This is modest and for many older adults reliance solely upon state pension provisions is a reality. Approximately 6.5 million pensioner households received state benefit in 2008/9 of which 4.6 million received private pensions (ONS, 2010). Private pension provisions include a range of schemes, the most common being the occupational pension.

In the UK those aged 75+ rely most heavily on benefit provision and receive the smallest proportion of their income from investments and contributions from occupational pension schemes (Burholt and Windle, 2006). Currently the basic level of state pension for females and males aged 60 and 65 respectively is £95.25 per week (Direct Gov, 2010). Mean levels of state pension income calculated in 2008/2009, for pensioner couples SPA was £11,200, £7,500 for single males and £7,400 for single females. Often, the amount received increases depending upon

the number of qualifying years in work and national insurance contributions made (Direct Gov, 2010). For those in receipt of additional private pensions, the mean levels received are £11,200 for couples, £7,100, and £5,500 for single males and females respectively on top of the basic state allowance. However, significant numbers receive only small private pension provisions and 29% have no private pension provisions (ONS, 2010). The gendered dynamic of ageing is reflected within income levels with single female pensioners receiving the lowest proportion of annual income due to lower rates of pay throughout the life-course and breaks in employment (Help the Aged, 2008).

3.5.7 Poverty

For some, the experience of ageing is happy and marks a period of *'gain and growth'* (Help the Aged, 2008, p.1). However, for others the outlook is less optimistic and income plays a considerable role in this, for those on low incomes in old age poverty is a reality. Poverty tracks throughout the life-course and evidence indicates that experiencing poverty in childhood and early in life increases the likelihood of experiencing poverty in later life. Poverty is a multifaceted concept, incorporating, relative, absolute, material, deprivation and fuel poverty. Relative poverty is defined as *'having a disposable income below 60 per cent of contemporary median income'* (Help the Aged, 2008, p1). In 2010/2011, the Department for Work and Pensions (DWP) recorded that 17% of pensioner households in the UK had disposable incomes of less than 60% of median income (DWP, 2012; Age UK, 2010). Determinants of poverty include age, gender, marital status, disability and ethnicity with those who are single most likely to experience deprivation.

Greater proportions of female pensioners (17%) experience acute poverty in their retirement and later-life by comparison to their male (14%) counterparts. Single female pensioners' incomes account for 86.5% of those received by single males (Age UK, 2010). This is further highlighted by retirement income and the value of female private and occupational pension remuneration (see Section 3.3.2), which is

'socially and structurally produced due largely to women's historic roles and treatment in and by the family, the market and the state' (Estes, 2004, p.10). Taking a feminist, political, economic perspective the welfare provisions in the UK have led to the cumulative economic disadvantage of women, and is argued to reward the traditional nuclear family structure of the male breadwinner and female care giver. It is further argued that the significant proportion of time females devote to unpaid caring labour has lifelong and cumulative negative consequences and prevents contributions being made to occupational and national insurance schemes (Estes, 2004).

Black and minority ethnic groups (BME) pensioners are more likely to experience poverty than their white peers, with Pakistani and Bangladeshi pensioners being the most deprived subgroup, with 39% of these individuals classified as experiencing poverty. In relation to fuel poverty (spending >10% of total income on fuel) 1.5 million pensioner households were in poverty in 2005. In 2008, it was estimated that 4.5 million pensioner households were experiencing fuel poverty. In addition to this 2 million pensioner households were unable to afford to pay council tax rates (Help the Aged, 2008).

Direct associations between income level, health and mobility is seen to impact upon all aspects of wellbeing (Help the Aged, 2008; ELSA, 2008). Wealthier individuals are reported to present less depressive symptoms, lower instances of loneliness, greater satisfaction with life and generally report to have a better quality of life (ELSA, 2008). By comparison it is reported that the poorest old are five times more likely to be in poor health, two and four times more likely to experience acute joint pain, five times more likely to have mobility difficulties and to suffer from diabetes (Help the Aged, 2008).

3.5.8 Retirement

In the UK individuals' entitlement to retire has traditionally stood at the age of 60 for women and 65 for men. However, there is a considerable degree of individual

variance in the time one chooses to retire. Retirement is difficult to measure given that often different reasons are cited, for example ill-health of themselves or a family member or inability to find suitable employment (ONS, 2012). Moreover, the compulsory occupation retirement age is being phased out, which would make this at the discretion of employers and an employee choice (Directgov, 2012). Demographic shifts, increased life expectancy and changes in the State Pension Act have acted to increase the average age that people are leaving work. Exit from the labour market is taken as a proxy for the average retirement age with current census data indicating this has increased between 2004 and 2010, rising from 63.8-64.6 for men and from 61.2-62.3 years for females (ONS, 2012). The 2007 SPA identified incremental rises in retirement age, which set out plans to increase it to 66 by 2026 and 67 by 2036 and 68 by 2046 (DWP, 2010). In 2011, however, the Coalition Government brought forward these changes, raising the SPA from 65 to 66 between 2018 and 2020 (ONS, 2012).

Withdrawal from the workforce is categorised as a transitional life event (Darnton, 2006; Sobal and Bisogni, 2009; Falk *et al.* 1996 and Furst *et al.* 1996). Whilst past statistics indicate that it is typical for more men continue to work beyond SPA than their female counterparts, this gap has narrowed, reflecting the increases in state pension ages for women (ONS 2012). Moreover, individuals often opt to take a phased approach to retirement, reducing full-time working hours to part-time employment. In 2011, 7.3% of males of SPA and over worked part-time whilst 4.6% worked full-time. For women, this was greater with 8.9% of women at or over the SPA working part-time and 3.6% working full (ONS, 2012). This approach to retirement has both financial and wellbeing benefits. Although it is more common for men take early retirement than their female counterparts with 20.4% of males in 2011 reported to be fully retired between the ages of 55 and SPA, for females this was only 8.2% (ONS, 2012). This discrepancy is accounted for in that traditionally women have continued to work beyond SPA, as result of their retirement age being lower than males, the nature of women's work, often having fragmented working histories owing to caring, particularly mother-hood and the fact that often couples make joint retirement plans.

3.5.9 The Older Consumer and Food

The link between diet and health is well established and good nutrition is recognised to play a central role in maintaining independence and improving quality of life in old age (Wilson *et al.* 2004). Food consumption patterns are influenced by a number of factors including food preferences, culture and beliefs as well as social economical, geographical and environmental influences (Morais, Afonso and Almeida, 2010). Furthermore, the relationship people have with food is not static, rather it can be considered dynamic and subject to change as they progress through the life-course. Therefore, the food and dietary behaviours of older adults can be regarded as distinctly different from other age cohorts (Giles, 2009; Milne, 2011). Moreover, attitudes and mind-sets towards food storage, preparation and hygiene may vary within this sub-section of the population. It is recognised that an individual's choice is greatly dependent upon, and in some cases constrained by, their available resources (Pfau and Saba, 2009). This contributes significantly to the identification of this cohort as being vulnerable, both in terms of nutritional status and of deviating from food safety recommendations (Morais, Afonso and Almeida, 2010, Brennan *et al.* 2007, Gerba, Hudson and Heartwell, 2002; Johnson *et al.* 1998 and Rose and Haas, 1996).

Food can be considered as an intrinsic part of what defines us as individuals and for older adults, dietary intake is not only significant in terms of health but also can be recognised as contributing significantly to life satisfaction (Dean, Raats and Grunert, 2009 and Silverman *et al.* 2002). McKie (1999) recognises that control over food preparation and procurement for older adults is a symbol of independent living, a paramount concern for many older adults and the UK Government alike. In addition, older adults experience a number of transitional life events including retirement, bereavement, widowhood, divorce and separation which can alter the relationship they have with food (Sobal and Bisogni, 2009; Darnton, 2005; Falk *et al.* 1996 and Furst *et al.* 1996). Also in some instances, contributes to the diminished significance it holds in later life. Moreover, it is suggested that chronological age

may not hold the significance traditionally thought in relation to vulnerability, but rather individuals are at increased nutritional vulnerability at the transitional stages of life (Morais, Afonso, and Almeida, 2010). This section of the review reflects upon some of the primary attitudes and behaviours of older adults towards food and nutrition, and the effect these may have upon their domestic food safety practices. As food provisioning can be considered a process (Marshall, 1995), the review will consider approaches and constraints faced by the older consumer at each stage of this process from procurement through to disposal.

3.6 Food Procurement

It has been reported that for many older adults, the process of domestic food provisioning is one of social significance allowing for social interaction with friends and others and the opportunity for '*getting out*' (Wilson *et al.* 2004, p.117; Hare *et al.* 1999). This social significance is considered as being most important for those who are less physically active, in order to counteract depression and feelings of isolation (FSA, 2009). The FSA (2009) suggest that typically, older adults shop once per week, primarily to stock up cupboards, fridges and freezers but reported purchasing diminished amounts owing to reduced appetites and the lack of dependants residing in the family home. In addition to the weekly shop, older adults were reported to complete supplementary shops, usually for perishable and everyday basics such as milk, bread and butter. Moreover, this cohort placed considerable trust in supermarkets and purchased the majority of food from such retailers (Mintel, 2009; Meenly *et al.* 2009; Hare, 2003).

It can be suggested that food procurement is a mark of independence (Mckie, 1999) and factors that impinge on an individual's ability to acquire food independently could be argued to exaggerate emotional feelings of isolation and add to levels of depression. Research illustrates that older adults develop coping strategies and adapt to their difficulties in order to maintain independence in terms of food purchasing. Such coping mechanisms include carefully planned food shopping, relying on informal networks of support, such as shopping with others

including friends and family, and the use of taxis to reach shopping facilities (Meneely *et al.* 2009; Hare, 2000; McKie, 1995).

The shift of food retail environments to the periphery of many cities requires good levels of mobility and access to transport (Milne, 2011). For many older adults residing in urban areas, car ownership is not typical and it has been estimated that as many as 90% of those who are fully reliant upon a state pension do not own a vehicle (Leighton and Seaman, 1997). Access to large food retailers for such individuals requires them to use public transport and/or friends or relatives. This in turn has consequences for the way in which food is provisioned, leading to changes in the frequency of food purchase, types of food that are bought and consumed and a greater level of planning (Milne, 2010). Wilson *et al.* (2004) highlight that reliance on others can act to compound feelings of dependency and compromise, for example in choice of retail store.

i. Rural Living

For older adults, rural living presents additional food provisioning difficulties. Reliance upon rural transport networks is common, and in recent years such services have been subject to considerable cutbacks (Herne, 1995). Many rural locations lack large-scale food retailers in their immediate proximity and transport to such retailers results in additional costs (Hare, 2003). Therefore, older adults in rural locations rely upon independent local outlets for their food provisioning. Such retailers have been identified as supplying limited ranges of products and, in some cases, no fresh fruit or vegetables (Herne, 1995). In a study examining the possible association between cases of human listeriosis and deprivation, it was found that people tended to shop for food in convenience or local stores and it was identified that such stores do not have the same access to food safety expertise as the larger stores might (Gillespie *et al.* 2010). Additionally, for those lacking access to larger stores, cost can be presented as an additional barrier to access in terms of food choice (McKie, 1999). For example, independent retailers often charge a premium

price for fresh foods which have also been identified as being lower quality in comparison to supermarket produce (Hare, 2003).

Furthermore, McKie (1995) notes that older adults who rely upon public transport to reach food retailers have the added difficulty of carrying items, often resulting in bulky or heavy grocery items being omitted from shopping lists. Thus, for older adults, access can be considered a difficulty not only in terms of reaching food retail sites but also in relation to internal store design and environments. In a study looking at the food-shopping experiences of older adults, Hare (2003) identified that older adults face obstacles throughout the store, making their shopping experiences increasingly difficult and acting as a further constraint upon food choice. Such difficulties are associated with reaching up and down for items on shelves, deep trolleys and freezer units, queues at checkouts, changing locations of stock, the packaging size and food labelling information. Consensus within the literature highlights that in order to harness the spending potential of the older consumer; retailers must acknowledge their diverse consumption needs (Meneely, 2009; Hare, 2003 and Leighton and Seaman, 1997). What is more, it is suggested that the needs of the older consumer are commonly shared by all consumers. Therefore, store design adaptations will be of benefit not only to the older consumer specifically, but will enhance the shopping experience of consumers generally (TiKI, 2011; Hare *et al.* 1999).

ii. Retirement

Retirement from the workforce is an inevitable stage of later life and has been considered to constitute a major transitional life event (Sobal and Bisogni, 2009; Darnton, 2005; Falk *et al.* 1996 and Furst *et al.* 1996; Minkler, 1981) the realities of which have previously been considered in Section 3.5.8. Nevertheless, a study looking at the present behaviours and future expectations of the older food consumer found that older adults facing retirement anticipated making changes to their current food provisioning habits, predicting that in retirement they would

purchase less speciality foods and fewer treats and luxuries (Hunter and Worsley, 2009).

The financial constraint of retirement experienced by many older adults means that often prioritisation of resources shapes their everyday lives. Utility bills are of primary importance and shown often to be the greatest household expense. As a result, expenditure on food is considered to be flexible, resulting in food items being the first to be omitted from the shopping list if budgets were constrained (Herne, 1995). In addition, Herne (1995) reports on the monotony of older adults' diets as a result of the financial constraints of later life. Low income groups, to which many older adults belong, have been described as adopting a 'tunnel vision' approach to food, whereby food provisioning is characterised by repeat purchase of familiar food items. However, McKie (1999) rejects this, arguing that when possible older consumers prefer and would purchase fresh fruit and vegetables, although in times of constraint, reliance on tinned products acts as a compromise.

iii. Food costs

Older food consumers have been found to be price sensitive, valuing '*fair*' prices but not necessarily '*cheap*' (Johnson-Hillery *et al.* 1997, cited in Hare, 2003 p. 246). In terms of branded produce, older consumers have been shown to prefer such products over own-brand alternatives, owing to the quality such products infer (Hare, 2003). An important marketing tool for larger retailers has been to offer price discounts, including larger pack sizes and multi-buy promotions. However, such offers disadvantage older consumers, who have reported feeling that promotional discounts are inappropriate and that they would rather have the option of smaller packets which are proportionately priced (Hare, *et al.* 1999). Larger pack sizes, most notably of meat products, have been highlighted as negatively affecting nutritional intakes of older adults, particularly for those shopping and cooking for one and for those with reduced appetites, where such promotions act to encourage waste (Milne, 2011; Meneely *et al.* 2009; Hare, 2003). From a microbiological food safety perspective, consumers may feel when

purchasing in bulk, inclined to retain products even when they have exceeded their UBD, thus increasing the likelihood of ingesting spoiled foods (Gillespie *et al.* 2010; Gettings, 2009).

Financial resources are considered to be a stressor that can have considerable negative effects upon diet and nutritional behaviour (McIntosh, *et al.* 1989). Those with reduced levels of finance are associated with greater risk of nutritional insufficiency, with low levels of income significantly impacting upon the nutritional quality and quantity of food available (Quinn, *et al.* 1997, cited in Dean, 2009). Moreover, it has been shown that stress relating to concern over financial resources negatively affects appetite and dietary intake (McIntosh, 1989).

3.6.1 Food Handling and Cooking

Research indicates there to be a strong gendered division to food preparation practices of older adults, with females commonly assuming responsibility for food preparation and allied tasks; this is reported to be retained into later life (Meah and Jackson, *in Press*; Davidson, Arber and Marshall, 2009; Fischer and Frewer, 2008; Hank and Jürges, 2007; Brennan *et al.* 2007; Herne, 1995; Carrigan, Szmigin and Leek, 2006; Lake *et al.* 2006; McKie *et al.* 2000 and McKie, 1999). However, Mason (1987, in Dean, Raats and Grunert, 2009) reports that when male partners retire they are, for the first time, in a position to share domestic chores, although males have been characterised as impulsive shoppers that do not cook on daily basis, they do get involved with cooking for special occasions (Dean, Raats and Grunert, 2009).

In recent years, convenience foods have become a prominent feature of the food retailing landscape; although it has been shown that older adults in comparison to their younger counterparts are less likely to consume convenience and take-away products (Hunter & Worsley, 2009; Pfau, 2009). Older consumers are seen to reject convenience products and take-away foods on the basis that they are '*junk*' (McKie, 1999, p.532) and have been shown to prefer cooking meals from 'scratch' using raw ingredients (Pfau, 2009). However, it can be argued that the definition of

'convenience' food is broad and does not distinguish fully between RTE, ready-meals and take-away foods, (FSA, 2009; Pfau, 2009; Carrigan, Szmingin and Leek, 2006). Convenience meals such as ready-made meals have been viewed by older adults with some cynicism (Pfau, 2009) and cooking from first principles is considered superior, with ready-meals purchased and often kept in reserve '*just in case*' (FSA, 2009, p.18). Convenience foods are shown to be more warmly regarded by older single and widowed women (Hunter & Worsley, 2009) and Mintel (2009) has highlighted that as consumers' age, they will require foods that are more convenient and easier to handle and prepare. The FSA (2009) found those reporting cooking from first principles to be more confident in their cooking abilities and tended to be female. In addition, it was found that amongst this cohort there was little variation in the foods eaten and a preference for cooking familiar foods that are part of meal repertoires that have always been eaten.

i. Physiological Changes

Physiological changes act to further disadvantage this cohort in relation to their ability to prepare food and conform to domestic food safety best practice. These changes relate to the physical health conditions and deterioration that inevitably occurs as a result of the ageing process (Rowe and Khan, 1987) which is also noted to weaken immune functionality, particularly conditions such as hypochlorhydria, malnutrition, diabetes and some cancers, that reduce the effectiveness of the body to fight infection. As a result older adults are noted to have heightened vulnerability to foodborne disease (ACMSF, 2009; Cates *et al.* 2007; Hummel and Nordin, 2005; Kendall *et al.* 2003; Smith, 1998 and Gerba, Rose and Haas, 1996). Deterioration also includes chronic and acute conditions that may impede an individual's ability to prepare meals and adhere to domestic food safety best practice guidelines. This can include cognitive, physical and sensory conditions or combinations of them including osteoporosis, rheumatoid arthritis, onset dementia, olfactory deterioration and dysfunction, visual deterioration and problems relating to oral dentition (ACMSF, 2009; Hummel and Nordin, 2005).

Conditions affecting physical mobility such as arthritis and osteoporosis can affect individual's ability to procure, prepare food as well as conform to domestic food safety best practice guidelines. In addition to the aforementioned concern relating to the ability of older adults to carry purchased food items, it has been identified that often the act of preparing food and the time needed to stand to do this is tiring (Briley, 1989, cited in Mayo and Rainey, 2001). In terms of food safety, this finding links to the notion of time identified by Brennan *et al.* (2007) and it may be argued that when an individual has difficulty in standing for extended periods, adhering to food safety guidelines may lack priority over preparing a meal at all. Additionally conditions such as arthritis may impair fine motor skills of affected older adults such as gripping objects, making everyday domestic practices onerous, thereby exacerbating the problem of practising food safety best guidelines (Maguire, 2011).

Cognitive impairment, most frequently as a consequence of Alzheimer's disease or dementia can be highly detrimental to an individual's quality of life and increases dependence significantly (Abellan van Kan and Vellas, 2009). In terms of food preparation and safety, food management problems can arise which can increase the likelihood of ingesting spoilt food as a consequence of forgetting the length of time it has been stored before preparation and consumption (Milne, 2011; SSRC 2009).

ii. Widowhood, Divorce and Separation

For many, loss of a life partner can be one of the most traumatic life experiences, (Lopata, 1996, cited in Davidson, Arber and Marshall, 2009; Darnton, 2009) and in addition to the pain of the grieving process. This is exacerbated by the fact that they have to learn to adjust to the forced domestic roles that they are confronted by. For older generations, domestic chores have traditionally been characterised as highly gendered with females being responsible for the majority of food provisioning tasks (Meah and Jackson, in press; Hank and Jürges, 2007; McKie *et al.* 2000 and Herne, 1995). For males especially, the loss of a spouse can mean that for the first time in their lives they are faced with the task of food preparation. For

females, the loss of a male partner can present obstacles in terms of portioning and the need for adaptation, getting used to cooking for one, as well as being confronted with their own food preferences (Sidenvall, *et al.* 2000). This is presented as result of women tending to cook food that would please their partners over their own individual preference, thus avoiding making dishes he would not like (Davidson, Arber and Marshall 2009; Sidenval *et al.* 2000). In addition and specifically in relation to food safety, it is suggested that those living alone exhibit less safe cooking practices than those living in multiple occupancy settings (Fischer and Frewer, 2008).

For some it has been suggested that this allows the opportunity to cook for their own preferences, which can be liberating and although they may well be unsatisfied with their quality of life generally, they report becoming more satisfied with their life in the food domain (Dean, 2009). However, McKie, *et al.* (2000) identified that widowed women struggled to establish an eating routine following the loss of a partner and as a result tended to eat less often. Meals were characteristically lighter and snacking on bread and biscuits as a substitute for meals was reported.

In contrast for males, widowhood can lead to a loss of freedom as they are forced to fulfil the domestic roles once conducted by their wives. Males have been shown to demonstrate a lack of *'motivation, knowledge and skills for meal preparation, resulting in less healthy food choices and narrow diets'* (Dean, Raats and Grunert, 2009, p.9). However, Davidson, Arber and Marshall (2009, pp.120) suggest that this is not universal and identified two distinctly different male attitudes towards food preparation, belonging to either the *'enthusiastic'* or the *'reluctant'*. The *'enthusiastic'* male adapts to the role of food preparation and takes pride in it. They demonstrate their independence and their ability to *'cope'* through preparing their own food. For the *'reluctant'* male, food serves as a poignant reminder of the changes that they have experienced and the loss of their partner (Davidson, Arber and Marshall, 2009, pp.120). Emphasis is placed on food preparation as a chore that they find difficult and uninspiring. It is further noted that males, when

adopting new roles in food preparation often require or seek assistance from female friends or relatives, and this is developed as a coping mechanism (Herne, 1995).

3.6.2 Eating

It has been indicated that older adults typically consume light breakfasts and the main meal of the day is typically consumed at midday (FSA, 2009). In a Scottish study of older people and food, McKie (1999, p.531) found that healthy eating was conceptualised as eating '*proper meals*', which typically consisted of two courses (Fjellström, 2009). Despite this it has been reported that older consumers are more likely than others to consume cold foods that do not require cooking (FSA, 2010).

Many older adults rely upon home delivered meal programs for the provision of their food. Although celebrated for the independence it facilitates, such delivered meals may present concerns from a microbiological food safety perspective (Almanza, *et al.* 2007). It is reported that often meals are eaten the same day as delivery, but not immediately, and the large portion sizes of meals meant that leftovers were often re-heated for a subsequent meal (Almanza *et al.* 2007; FSA, 2010). Almanza *et al.* (2007) found a combination of time delay and temperature abuse to be problematic for home delivered meals, with only 12% of clients reporting to have eaten their meal immediately after receiving it and a third of respondents reporting keeping the meals out of refrigerators and on kitchen counters before eating.

i. Social Isolation and Loneliness

Older adults are considered increasingly vulnerable to depression and social isolation and these can be regarded as conditions that impede independence in terms of food provisioning (Herne, 1995). Advancing age can be seen to present a number of emotional challenges and depression is identified as being one of the most common mental health disorders in later life (Abu-Rayya, 2006). This is often

linked to other illnesses and medical conditions such as cancer, heart disease, diabetes and Parkinson's disease. Additionally, social factors can act to worsen experienced psychological conditions in old age. Moreover, social isolation is exacerbated by health deterioration such as a decline in vision, hearing and mobility and results in a tendency towards living and eating alone (Dean, Raats, and Grunert, 2009). Social factors that can be the precursor to depression and feelings of loneliness and isolation can include, bereavement of partners, friends or relatives and changes in working situations (Lopata, 1996, cited in Davidson, Arber and Marshall, 2009; Darnton, 2009). Additionally, social isolation and the absence of social involvement can further compound depressive symptoms such as loneliness. In terms of food and dietary intake, research shows that strong social bonds have positive effects upon having a good and varied diet and nutritional status and consequentially the greater number of bonds the more superior the diet (McIntosh, *et al.* 1989).

The link between age and feelings of loneliness is well established and loneliness is reported most frequently by adults aged 80+ (Demankakos, Nunn and Nazaroo, 2006). A gendered dynamic to loneliness and depression in old age has been identified, with men appearing to be less prone to feelings of loneliness than women across all age cohorts, although this difference appears to diminish at the age of 75 when women and men are seen to suffer equally (Demankakos, Nunn and Nazaroo, 2006). The social isolation of living alone, which is most pronounced in advanced old age, increases the likelihood of eating alone. Research shows that this leads to eating less, through reduced regularity and not sticking to scheduled meals times, eating convenience foods and a general reduction in the type and amount of foods eaten (McIntosh *et al.* 1989).

There are strong causal links between those suffering from the anorexia of ageing and those that are socially isolated and living alone (McIntosh *et al.* 1989). Moreover, widowed individuals are consistently reported to suffer the greatest feeling of loneliness and this is considered to be particularly pronounced immediately following the loss of a life partner (Dean, Raats and Grunert, 2009;

Darnton, 2005; Lopata, 1996, cited in Davidson, Arber and Marshall, 2009). Widowhood is considered to be a '*vulnerable and volatile*' period, where the quantity and the variety of foods eaten may reduce and consequently diet and health may suffer (Dean, Raats and Grunert, 2009, p. 7).

Contact with others is essential for allowing the sharing of thoughts, feelings and emotions and can be considered as providing purpose to older adults' lives (Abu-Rayya, 2006). The lack of social contact and thus social isolation is considered to be a motivating factor of depression and feelings of loneliness. In terms of food provisioning, decreased mobility reduces individuals' abilities to access food retailing sites and can significantly impact upon diet, nutrition and the foods available. Often this requires increased dependence on others, which can be argued to compound feelings of stress and depression (McIntosh *et al.* 1989).

ii. Chemosensory Changes

Changes in sensory perception reduce the ability to prepare food safely. Sensory perception of food is a complex issue, which includes the consideration of a number of factors including olfaction, gustation, skin senses, vision and audition (Nordin, 2009). The combination of these provides the individual with all the necessary information to paint a picture of a food's flavour, temperature, look and texture. As we age changes in our sensory perceptions are likely to occur (Morais, Afonso and Almeida, 2010). The loss of chemosensory perceptions which are primary reinforcers of eating, results in poor appreciation of food, decreased levels of food intake and an increased likelihood to consume foods that have spoiled (Nordin, 2009; Donini *et al.* 2009 and Hummel and Nordin, 2005). This is clearly a concern from a microbiological food safety perspective and research indicates that older adults are more likely to ingest foods with unpleasant odours than their younger counterparts (Pelchat, 2000). The gradual decline in olfactory functions often goes unnoticed by sufferers and as a result may aggravate the risk of eating spoiled food, as research shows that some people in older age groups over-rely on the look and smell of foods as an indication of freshness (Cates *et al.* 2007; Hudson and Hartwell,

2002 and Johnson *et al.* 1999). It is therefore possible to suggest that the sensory precautions taken in relation to food safety by older adults suffering from olfactory dysfunction may be misplaced and should not be relied upon as a measure of edibility.

Dentition and oral health also play a significant role in the enjoyment and selection of food. In the UK as many as 58% of adults aged 75+ are edentulous and consequently rely on dentures (Stanner *et al.* 2009). For some older adults, ill-fitting dentures and partial edentulism have been shown to have significant impacts upon nutritional status and quality of life (Donini *et al.* 2009; Stanner *et al.* 2009). Sufferers are shown to have difficulty eating certain hard and fibrous foods, as well as fresh fruits and vegetables and show a preference for softer foods. Despite improvements to the fit of dentures making chewing easier, it is suggested that many wearers are reluctant to change their habits and try harder foods (Stanner *et al.* 2009). In terms of food safety, edentulism can cause reduced interest and pleasure in food and it could potentially be argued that it reduces the significance of food and consequently food safety guidelines for some individuals.

3.6.3 Storage and Disposal

Johnson *et al.* (1998) report older adults own the poorest functioning kitchen equipment, including refrigerators and freezers. Despite this, the FSA (2009) report that older adults understood the importance of getting food shopping home as swiftly as possible and followed the supermarket suggested storage advice for the majority of foods. Eggs were the highlighted to be the exception to this and some confusion was shown, with some reporting storage within refrigerator compartments, although they were aware that this was not how they were stored in retail stores (FSA, 2009).

Research shows that temperature abuse of refrigerators is self-reported within this cohort (Brennan, *et al.* 2007). For example, Johnson *et al.* (1998) report that 70% of their sample who were aged 60+ kept their fridge at a temperature that was

considered too high and at levels that would support the growth of the microbiological bacterium *L.mono*. Confusion relating to appropriate fridge temperatures was common and respondents struggled to know exact temperatures, other than that they should be 'cold' (FSA, 2009, p.16; Cates *et al.* 2007; Hudson and Hartwell, 2002). This confusion over temperatures has been shown to extend to freezers, where consumers are reportedly 'baffled' by the idea that one should monitor their temperatures, with the resounding belief that once in the freezer, food was protected from microbiological deterioration (Brennan *et al.* 2007, p.417). In defence of this, the introduction of refrigerators and freezers reflects technological innovation and signifies significant changes in the food landscape (Milne, 2011; Shove and Southerton, 2000). The FSA (2009) suggest that for the oldest-old specifically, these appliances have not always been a prominent feature of the domestic kitchen and often the prevailing belief was that once food items are in the fridge they are safe.

Freezers have commonly been cited as the predominant means of food storage for the 60+. Milne (2011) highlights that freezers reduce the frequency of shopping activity to weekly, fortnightly or monthly visits, without which individuals would be required to shop daily (Hand and Shove, 2007). This is of particular benefit to older consumers faced with mobility and transport difficulties. They are also used as a food reserve option, for example if consumers are unable to get out or were to receive unexpected guests. They are regarded as useful in the storage of excess items and as a way of coping with food manufactures' multi-buy offers and alleviating food waste (Hand and Shove, 2007). Smaller kitchens were identified as being responsible for some older adults making inventive food storage choices, for example keeping milk and cheese outside in colder months (FSA, 2009).

i. *The Non-waste Mentality*

The social changes that occur as we progress through the life-course are likely to impact upon the significance of food for older individuals (Sobal and Bisogni, 2009; Dean, Raats and Grunert, 2009; Devine, 2005 and Falk, *et al.* 1996). Common

stereotypes of attitudinal and behavioural characteristics of older consumers prevail; one of which is older consumers' reluctance to waste (Milne, 2011; WRAP, 2008). It is recognised that the majority of adults aged 75+ in the UK have lived through a number of significant developments in society generally and food production specifically (FSA, 2009; McKie *et al.* 2000 and McKie, 1999). Those reaching the age of 75 will have lived through the depression of the 1930s, the war years and their consequent rationing periods, and witnessed the remarkable changes in food production methods and the steady increase in the cost of food, over recent years (Defra, 2012; McKie, 1999).

Older food consumers carry attitudes and behaviours formed in earlier life into old age (Intel, 2008; Devine, 2005; Falk *et al.* 1996). Devine (2005) highlights that for many of the oldest old, who were brought up during the war years, food rationing was commonplace, and the lasting effects of this acted to instil values of not wasting and being '*accepting*' and '*flexible*' of the food available (Falk, *et al.* 1996, p.257). This is supported by Mennell (1985 cited in Warde, 1997, p.27) who highlighted the lasting effects the war years had upon the nature of the English diet, which contained more '*tinned and processed food*' as well as '*leftovers [being] a prominent foodstuffs*'. From a behavioural perspective Sidenvall *et al.* (2000, p.419) examined the meaning of cooking to older widowed women and found that there was '*considerable value attached to preparing from leftovers*' or '*next to nothing*'.

In a report produced by the FSA (2009, p.14) older adults felt that wasting food was '*morally wrong*', and made efforts including purchasing smaller pack sizes, freezing individual portions, keeping and cooking with leftovers to avoid this (FSA, 2009). Additionally, it was reported that keeping and using food past its UBD was commonplace. Tsiros and Heilman (2005) demonstrated that there was a level of confusion amongst consumers with regards to BBD and UBD and hypothesised that in some instances food may unintentionally be kept longer than recommended (Hudson and Hartwell, 2002; Johnson *et al.* 1998). Research conducted on the island of Ireland by Brennan *et al.* (2007) identified that their sample (18-65+)

regularly engaged with everyday products that had passed their UBD and BBD, a behaviour that was compounded by *'habit'* and a lack of ill-effects of consuming foods past their recommended dates. It was also highlighted that this mentality towards food was argued to have implications for the success of food safety communication messages, with older adults tending to be less receptive to messages that instructed the disposal of food beyond its UBD and to change behaviour that had seemingly caused them no harm (FSA, 2009; Cates *et al.* 2007 and Miles and Scaife, 2003).

3.7 Summary

The UK has an ageing population, with those aged 60+ predicted to continue to rise (UN, 2008). Within this, the fastest growing subgroup is those aged 80+, which corresponds with the increased vulnerability to contracting listeriosis (ACMSF, 2009). However, the definition of what it is to be old is contested with various numerical and descriptive frames of reference used which accounts for the lack of consistency in the data presented thus far. Moreover, several attempts at segmenting this cohort were identified, although none were considered to be sufficient to account for the heterogeneity in attitudes, knowledge and behaviours in a domestic food safety context. The challenge for this research was to undertake a robust segmentation analysis of the 60+ in the North East, based on their lifestyle, attitudes, knowledge and behaviours in relation to food and domestic food safety. This chapter provided the contextual platform on which this could be performed, and identified a number of factors for inclusion and consideration in the design of a questionnaire for this purpose (see *Chapter 5*). This included a number of factors that were considered in understanding lifestyles and relationships with food including demographics, marital status, income, living arrangements and a range of cohort specific food and lifestyle factors spanning across the food provisioning process (Marshall, 1995). These factors are incorporated into the questionnaire design of Phase 1 of the research (*Chapter 5*) which is preceded by a full description of the research design and the methodological and theoretical approach.

Chapter 4 : Theoretical and Methodological Approach

4.1 Introduction

As established in *Chapter 1*, this research is situated in the discipline of marketing. Marketing is a young and derivative discipline which can be considered to embrace the traditionally opposing epistemological positions of positivism and interpretivism, in order to pragmatically approach the mainstay of marketing research, understanding what consumers do and why. It is this pragmatism that has permitted this thesis to occupy the 'middle ground' between paradigms and take a problem-focused orientation by adopting a mixed methods approach (Johnson and Onwuegbuzie, 2004). The pragmatic position allowed by the marketing discipline and the epistemological 'middle ground', has further permitted the selection of two theories to provide theoretical and methodological structure, particularly to Phase 2 of the research. This chapter will begin by defining the epistemological positions and the methodological contributions of positivism and interpretivism and will evaluate the benefits of mixed methods in the context of this research. Consideration will then be given to the theories underpinning the research, the Food Choice Process Model (FCPM) and Social Practice Theory (SPT) and will conclude by providing a methodological 'route-map' of the mixed method approach adopted.

4.2 Epistemological Pragmatism

Within research two distinctly different paradigms, quantitative and qualitative, have emerged in stark contrast to one another, with purists populating each position (Johnson and Onwuegbuzie, 2004). Quantitative purists are advocates of a position that is consistent with positivism (Cresswell, 2009; Johnson and Onwuegbuzie, 2004). Epistemologically, positivism advocates the application of methods from the natural sciences, treating social observations as objects that can be tested, in much the same way that a physical scientist tests a phenomenon (Johnson and Onwuegbuzie, 2004). In this sense it can also be considered

reductionistic, in that it promotes that enquiries of social science should be objective, allowing for generalizations to whole populations to be made (Cresswell, 2009; Johnson and Onwuegbuzie, 2004). Qualitative purists, also known as interpretivists, occupy a contrasting epistemological position, holding the view that the concern of social science, people and their institutions, are fundamentally different from the natural sciences, whereby the social world is investigated at a level of subjective experiences and thus is concerned with the '*lived experience*' of consumers (Tadajewski, 2008, p. 92). They develop multiple subjective meanings from their experiences and the objects around them. Therefore, researchers are required to understand complexity rather than reducing narrowing ideas into categories that can be tested (Cresswell, 2009; Bryman, 2004). Figure 4.1 outlines the main characteristics of the positivist and interpretivists paradigms and in so doing, illuminates their differences.

Figure 4.1: Characteristics of Positivist and Interpretivist Research Paradigms

Basic Assumptions	Quantitative Research Paradigm (Positivist)	Qualitative Research Paradigm (Interpretivist)
Axiological		
Assumptions (overriding goal)	“Explanation” – <i>via</i> subsumption under general laws; prediction	“Understanding” – <i>via</i> interpretation but not necessarily in order to confirm hypothesis
Ontological		
Nature of reality	Reality is objective, tangible and static where phenomena are fragmentable and divisible and single causal factors can be isolated	Reality is socially constructed with multiple factors shaping reality, where phenomena are investigated from a holistic perspective and within their contextual environment
Nature of Social being	Deterministic and reactive	Voluntaristic and proactive
Epistemological		
Knowledge generated	Nomothetic, time free and context independent	Idiographic, time-bound and context dependent
View of Causality	Real causes exist	Multiple, simultaneous shaping
Relationship between theory/concepts and research	Confirmatory, verification oriented, inferential, hypothetico-deductive	Emergent, grounded, discovery oriented, exploratory, expansionist, descriptive and inductive
Research Relationship	The researcher is objective, with an ‘outsider’ perspective distanced and separated from the data, conducting the research from a privileged point of observation	The researcher is subjective with an interactive or co-operative ‘insider’ perspective and close to data, conducting the research from no privileged point of observation
Methodological		
Research techniques	Suited to quantitative methods	Suited to qualitative methods
Research strategy	Structured, outcome oriented	Unstructured, process oriented
Nature of data	Hard and reliable	Rich and deep

(Source: Adapted from, Kuznesof, 2010; Tadajewski and Brownlie, 2008)

Figure 4.1 illustrates these opposing epistemological positions can be considered as a continuum with positivism occupying one end and interpretivism at the other (Johnson and Onwuebuze, 2004). Based on these fundamental epistemological differences, researchers affiliated with each opposing paradigm are required to apply different research logics and methodological approaches. Positivism is traditionally associated with and suited to quantitative methods of enquiry including laboratory experiments and large scale surveys, whilst interpretivism is aligned to qualitative data generation approaches, which seek deep, rich and thick explanation of phenomena and are typically aligned with participant observations and in-depth interviews (Tadajewski, 2008).

Marketing is a relatively young and derivative discipline and relatively theoretically impoverished, when compared to more traditional disciplines such as Psychology, Sociology and Anthropology (Tadajewski, 2008). A lack of strong theoretical basis underpinned epistemological challenges to marketing theory during the 1980s which led to the domination of positivism (Anderson, 1983; Calder and Tybout, 1987; Hudson and Ozanne, 1988; Hunt, 1983; Lutz 1989), that were strongly associated with quantitative methods that primarily sought to understand 'what' consumers do (Tadajewski, 2008). In recognition of the heterogeneity of consumers and the variation in attitudes, needs and wants, the fundamental concern of marketing at this time was to segment populations into smaller consumer groups on this basis. However, during the 1980s marketing research recognized that it was not possible to reduce consumer behaviour to this and in order to address the additional questions of 'why' consumers behave in the way that they do, it was necessary to give consideration to the complexity of influences upon it (Holbrook and Hirschman, 1982). It was this realization that signified the 'interpretivist turn' in marketing and permitted the inclusion of methods that aimed at generating rich, detailed and nuanced understandings of consumer behaviour, which are not readily explained by experiments, surveys or through modelling (Sherry, 1991; Arnould and Thompson, 2005). Marketing research therefore, adopted qualitative methods to broaden their view of the '*neglected experiential, social, and cultural dimensions of consumption in context*'; a paradigm shift was recently branded Consumer Culture Theory (CCT) (Arnould and Thompson, 2005, p.869; Tadajewski, 2008). CCT is therefore, at the interpretivist end of the positivist/interpretivist continuum, being concerned with macro influences at the social and cultural level. Figure 4.2, presents the paradigm continuum and the old and new perspectives in marketing and consumer behaviour research and the characteristics associated with each.

Figure 4.2: Characteristics of New and Old Perspectives in Consumer Behaviour

Old Perspective	New Perspective
Positivist	Interpretivist
Experiments/Surveys	Ethnographies
Quantitative	Qualitative
<i>A priori</i> theory	Emergent theory
Economic/Psychological	Sociological/Anthropological
Micro/Managerial	Macro/Cultural
Focus on buying	Focus on consuming
Emphasis on cognitions	Emphasis on emotions
American	Multicultural

(Source: Belk, 1995)

Having presented the positions offered by the epistemological perspectives within the marketing discipline, one is left to consider where within this continuum this research is positioned. As acknowledged, traditionally research conformed to either epistemological position. However, it is increasingly accepted for research to adopt a pragmatic position, based upon the approach best suited to answering the research questions, with methods chosen that are ‘needs-based’ (Johnson and Onwuebuze, 2004, p.17). Moreover, the pragmatic problem-orientated perspective that is promoted by the marketing discipline supports this. With this in mind, one is inclined to consult the research questions (see *Chapter 1*). In response to research objective 3, this research was required to conduct a segmentation analysis of the older food consumer, based on lifestyles, knowledge of and attitudes towards food and domestic food safety best practice recommendations. The need to provide baseline information on the older population group was inherently suited to the adoption of a positivist perspective and quantitative methods. However Phase 2, consistent with research objectives 5 and 6 required rich, thick description and observation of the everyday ‘lived experiences’ and food handling practices of the cohort, which is unmistakably situated at the opposite end of the continuum and consistent with interpretive approaches. However, the EIS being situated at the level of the household made the adoption of CCT and the consideration of the macro environment inappropriate. Therefore, this research occupies the ‘middle ground’ between positivism and interpretivism and adopts a mixed methods approach.

The combination of quantitative and qualitative methods within the one research study is the '*fundamental principle of mixed method research*' allowing data to be collected through multiple methods, the combination of which results in '*complimentary strengths and nonoverlapping weaknesses*' (Johnson and Onwuegbuzie, 2004, p.18).

4.3 Epistemological Positioning of Domestic Food Safety Research

Having considered of the position of this research, it is prudent to consider the epistemological positions of domestic food safety research to-date and the body of literature to which this research belongs. Much food safety research, which has been conducted outside of the home, has traditionally adopted a positivist approach. The central concern of this research has been assessing food safety knowledge, attitudes and behaviours through exclusive focus on the individual and a reliance on self-reported methods, typically surveys and questionnaires (Brennan, 2010; Brennan *et al.* 2007; McCarthy *et al.* 2007; Redmond and Griffith, 2004; Wilcock *et al.* 2004; Alkertruse *et al.* 1999; Bruhn and Schutz, 1999 and Rabb and Woodburn, 1997). However, it is recognised that this fails to appreciate the complexity of food choices, the lack of consideration of actual behaviours and the habitual and unconscious nature of food provisioning and handling practices (Milne, 2011; Meah and Watson, 2011; Brennan, 2010; Connors *et al.* 2001; Falk, *et al.* 1996). Mirroring the 'interpretivists turn' in marketing research (Sherry, 1991), food safety research, has also begun to recognise the need for more nuanced understandings of domestic food safety behaviours (Milne, 2011, Meah and Watson, 2011 and Brennan, 2010). Although anchored at the positivist end of the continuum, to-date research situated in the home has taken two distinctly different approaches. The first, adopting a social psychological perspective that problematizes domestic food safety by auditing the competence of consumers and establishing what they are doing right and wrong in terms of food handling (typically taking a HACCAP inspired approach) (see for example Milne, 2011; Kennedy *et al.* 2011; Fisher and De Vries, 2008; Fisher and Frewer, 2008; Jackson *et*

al. 2007; Redmond and Griffith, 2005; Kennedy *et al.* 2005; Terpstra, *et al.* 2005; Griffith, Worsfold and Mitchell, 1998). By contrast the second, adopts a more fluid approach to understanding the way that life is lived in the kitchen and therefore, provides a more holistic account of how consumer domestic food safety behaviour fits within this (Meah and Watson, 2011; TiKL, 2011; KITLIFE, 2012). The former has dominated the domestic food safety research landscape to-date and has focused on the individual as the rational choice agent who is cognitively able to make safe food handling decisions and translate this into practice (Brennan, 2010). However, following the recent recognition that knowledge does not necessarily translate into good practice, there has been a noticeable shift towards more societal and contextual theoretical approaches, which offer significant advances and alternative perspectives on social psychological contributions. It is within the latter body of research that Phase 2 is situated (Brennan, 2010; Hargreaves, 2008). Within the food safety discourse, interpretivist approaches permit researchers to enter the field differently and offer a means of looking beyond the individual, focusing on the wider influences that shape and reproduce domestic food handling behaviours. This allows for a more nuanced understanding of the domestic environment and the way that life is lived in this sphere. It is therefore possible to understand how food safety practices fit within this, but can also provide valuable insights into the social significance of the space, the usage of the space and how it is negotiated, as well as the way users interact with technology within it. The latter is argued to be of value to a number of stakeholders (TIKL, 2011). The remainder of this chapter is dedicated to the specific consideration of the theoretical frameworks that will underpin this research across both Phase 1 and 2; each of which will be considered in turn.

4.3.1 Social Psychological Approaches to Domestic Food Safety

Fascination with human behaviour and what motivates it has generated a plethora of theories that can be drawn upon to explain both individual and group action and how behaviours may be modified and changed. These theories can be further segmented into groups of theories concerned with behaviour at the level of the

individual and society, theories of change and applied models and frameworks (Darnton, 2008).

Psychosocial approaches can be considered to fall into one of two categories, those at the level of the individual and those that also consider the role of context in shaping action. The dominance of psychosocial approaches in behavioural and attitudinal food safety research to-date warrants consideration of their merits for use in this thesis.

i. Individual models of behaviour

Models of behaviour at the level of the individual are predominantly drawn from social psychology and are based on the standard economic and psychological assumption that human behaviour is rational and linear, where behavioural action is based on consideration and evaluation of the cost *versus* benefit of engaging with a given behaviour (Darnton, 2008). In the main, attitudinal food safety research conducted outside of the home has relied heavily on such theoretical assumptions and therefore has been required to adopt quantitative methodologies (typically using self-completed questionnaires). The commitment to such approaches is arguably symptomatic of the reluctance of researchers and funding bodies to cross the threshold and situate research in the domestic environment, viewing this as an '*intrusion into private lives/intimate spaces*' (Evans, 2012, p.43). Where research has stepped into the domestic sphere, the approach to understanding food safety practices has been to mirror commercial practice and adopt HACCAP style approaches in the home, through highly structured, task orientated observation (Kennedy *et al.* 2011; Fisher and Frewer, 2008; Kennedy *et al.* 2005). This has however, been argued to neglect the fluidity of real-life food preparation scenarios (Brennan, 2010). The communality between both these approaches lies in their assumption that there should be a positive correlation between the two variables (attitude and behaviour). However, in reality this is not always the case (Hargreaves, 2008). The identification of variables that impact upon attitudes allows multiple regression models to be used, which according to Hargreaves (2008,

p.30), *'mirror the thought processes through which attitudes progressed, eventually translating into behaviour'*.

Although there have been several models developed in order to do this, the Theory of Planned Behavior (TPB) (Ajzen, 1991) is the most well-recognised and widely applied, celebrated for the capacity it has to predict behaviour (Hargreaves, 2008; Conner and Armitage, 2006). TPB is also most closely aligned with the individual focus of the majority of domestic food safety research to-date (although these studies do not frequently state their alliance to this model, nor do they replicate a TPB directly) (see for example, Brennan, 2010; Brennan *et al.* 2007; McCarthy *et al.* 2007; Redmond and Griffith, 2004; Wilcock *et al.* 2004; Alkertruse *et al.* 1999; Bruhn and Schutz, 1999 and Rabb and Woodburn, 1997).

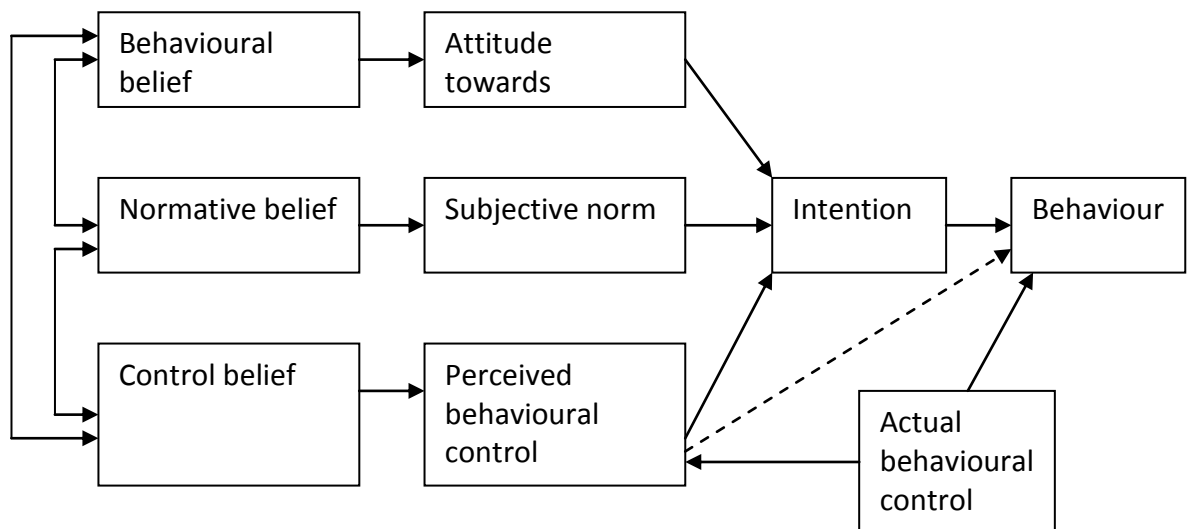
The TPB is developed from the seminal work of Fishbein and Ajzen (1975; Ajzen's and Fishbein, 1980) emerging as a result of the shortcomings of the Theory of Reasoned Action (TRA) (Ajzen, 1991). The central premise of the TRA model is that *'human beings are quite rational and make systematic use of the information that is available to them'* and the authors contend that individuals *'consider the implications of their actions before they decide to engage or not engage in a given behavior'* (Ajzen and Fishbein, 1980 p.5). The TRA is an adjusted Expectancy Value Theory (EV) (Darnton, 2008). EV theories are the most basic social-psychological models of behaviour and they are based on the premise that attitudes are the result of a calculation between beliefs about behaviour with the value attached to it (Darnton, 2008), as well as the assumption that *'individuals are motivated to maximize the chances of desirable outcomes occurring and minimize the chances of an undesirable action occurring'* (Conner and Armitage, 2006, p.42). EV is a rational choice theory, and although it explores the factors that contribute to action, Fishbein (1967 in Conner and Armitage, 2006) argues that individuals will possess a wide range of beliefs about objects and behaviours and only a small subset of these will be salient at any one time. However, the primary shortcoming of this approach is the lack of consideration that this gives to the decision-making process underpinning attitudes towards certain objects or behaviours (Conner and

Armatige, 2006). Therefore, the TRA is an extension of EV and bridges the gap between attitudes and behaviour through the inclusion of intention (Darnton, 2008). In brief, the TRA holds that consumer behaviour is determined by intention, which includes feelings either favourable or unfavourable towards the object or behaviour, as well as motivational factors, an individual's willingness to behave in a given way and effort or exertion to achieve a given behaviour; it is the best predictor of behaviour and the immediate precursor of behavioural action (Ajzen, 1991; Hansen *et al.* 2004). However, the TRA also appreciates that other factors influence behaviour, accounting for this through the inclusion of the 'subjective norm', which is the perception of how others will view the behaviour in question (Darnton, 2008; Conner and Armitage, 2006; Hansen *et al.* 2004 and Ajzen, 1991). Underpinning subjective norms are normative beliefs; which are the perceived social pressures from key social influencers and where compliance with the given behaviour is weighted by the individual's desire to comply with them (Conner and Armitage, 2006). The inclusion of subjective norms makes the TRA an adjusted EV model and has been embraced for its predictive potential and applied to general and specific food choices (Darnton, 2008; Conner and Armitage, 2006).

Despite the predictive potential of this model, it was only developed to predict relatively simple behaviours where performance was directly linked to intention and dependant on the individual acting in a rational manner. It did not therefore consider control over the behaviour or external influences such as resources (Conner and Armitage, 2006). The TPB was proposed in order to address this shortcoming and is a further extension of the TRA, or as Darnton (2008) suggests, a more adjusted model in that it includes the additional factor of perceived behavioural control. Thus, intention to behave is determined by three factors, 1) attitude, 2) subjective norm and 3) perceived behavioural control (PBC) (Darnton, 2008; Conner and Armitage, 2006; Hansen *et al.* 2004 and Ajzen, 1991). The TPB first holds that only specific attitudes towards a given behaviour can be said to predict its occurrence. Second, subjective norms play a role, as knowing these beliefs can be said to be as important as knowing the individual's attitude. Finally, perceived control refers to an individual's perception of his or her own ability to

perform a given behaviour. PBC in this sense relates to the individual's subjective belief about how difficult a given behaviour will be for them to achieve (Hansen *et al.* 2004). The inclusion of PCB is considered to increase the likelihood that the performance of a behaviour will be successful. These three factors constitute intention, such that the more favourable the attitude towards the behaviour and the subjective norm, the greater the perceived behavioural control, the stronger the behavioural intention and the more likely it is that the individual will execute the given behaviour (Ajzen, 1991). The inclusion of PBC in the TPB is argued to be the third determinant of behavioural intention and to have increased the predictive capacity over previous models, the EV and the TRA from which the TPB was developed (Darnton, 2008; Conner and Armitage, 2006). Figure 4.3 presents the diagrammatic model of TPB.

Figure 4.3: Theory of Planned Behaviour



(Source: Adapted from Ajzen, 2006)

This model has been extensively used in understanding food choice behaviours (see for example Hansen *et al.* 2004; Armitage and Christian, 2003 Povey *et al.* 2000, and Nguyen *et al.* 1996) and within food safety research (Clayton *et al.* 2010; Lobb *et al.* 2007). It is the only predictive model within food consumer research (Conner and Armitage, 2006). The theoretical and methodological contributions of the TPB were thus considered as a theoretical framework for Phase 1 (in response to

objective 3) of this research. However, Phase 1 was explicitly concerned with segmenting the older consumer on the basis of their attitudes towards and knowledge of food and food safety best practice, for which this model was considered deficient. Moreover, considering its application to Phase 2 of the research, the TPB is regarded as an imperfect means of predicting food choice and food handling behaviour as the distance between behavioural intention and behaviour is large, and the model lacks the capacity to account for habitual behaviours (Conner and Armatige, 2006). Observation within food safety research supports this shortcoming with discrepancies between attitudes and knowledge and actual behaviour widely acknowledged (Brennan *et al.* 2007; McCarthy *et al.* 2007). Whilst essential to providing baseline understandings of the cohort in relation to their lifestyles, attitudes and knowledge of food and food safety best practice, correlating attitudes with specific food handling behaviours is misdirected (Hargreaves, 2008). It is arguably this blinkered focus on knowledge and attitude that has caused domestic food safety research to reach an impasse when trying to explain why individuals demonstrate unsafe practices whilst appearing to hold adequate levels of knowledge (Brennan, 2010; Brennan *et al.* 2007; McCarthy *et al.* 2007). The recognition that many food handling practices conducted in the domestic kitchen are done with little conscious thought and are mundane in nature, is a crucial step forward, with supporters acknowledging that intention alone is not the best indicator of actual behaviour in this context. What is required is a more holistic account of food provisioning behaviours and a greater understanding of the multidimensionality of the spheres in which they are performed and re-produced (Meah and Watson, 2011; Milne, 2011 and Brennan, 2010). It is on this basis that inclusion and application of this approach was dismissed and the search for theoretical and methodological frameworks, particularly for Phase 2, continued.

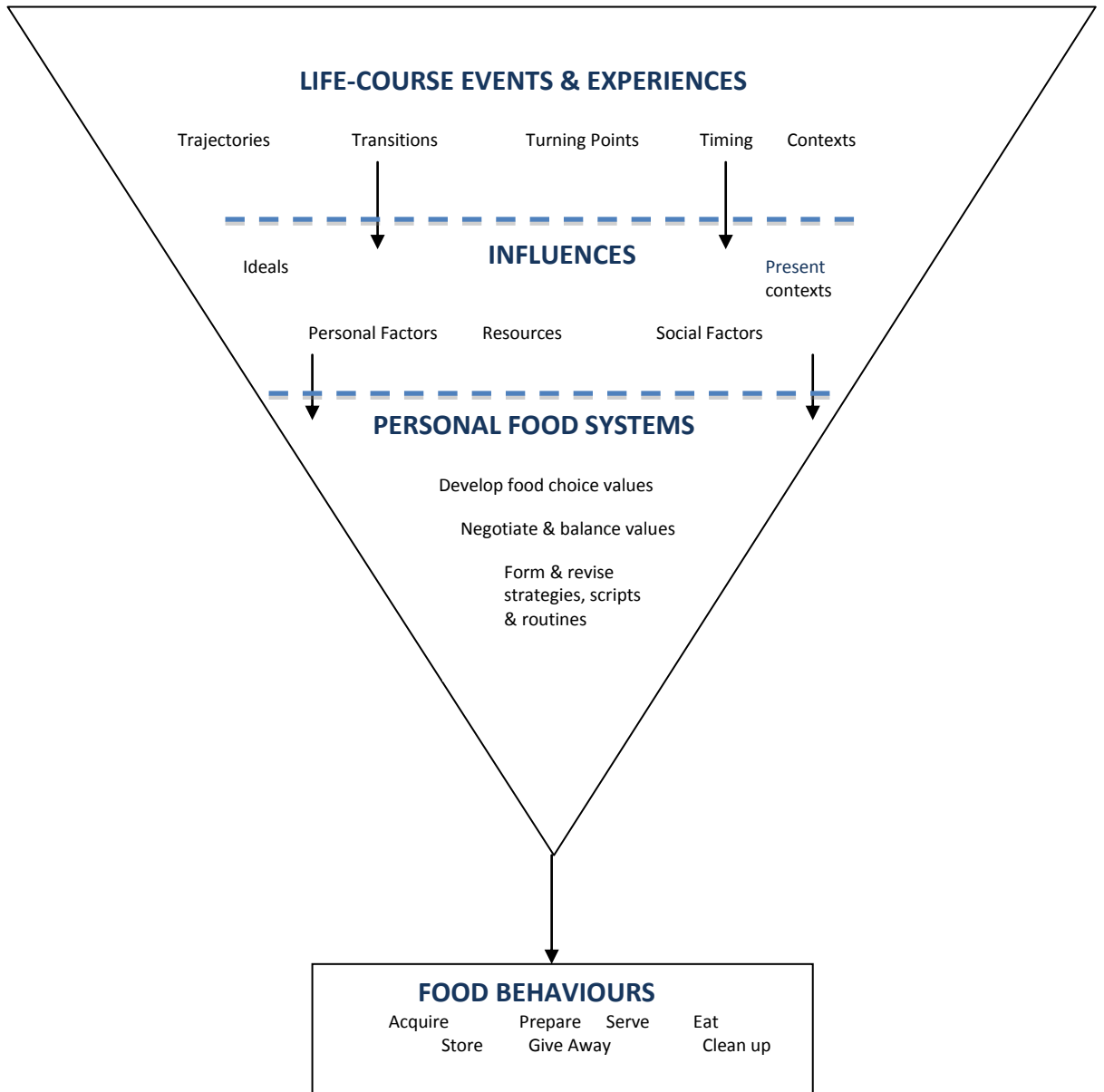
ii. Societal models of behaviour

Food provisioning and specifically food handling practices are produced and reproduced in the domestic kitchen, are embedded in everyday life and are grounded in social meaning (Williams, 1995). Practical logic would therefore suggest the need to move away from explicit focus on the individual and readjust the research lens to consider the wider context and social factors across the life-course that have shaped the way in which these are performed (Falk *et al.*, 1996). The consideration of the life-course holds particular resonance given the thesis' exclusive focus on the 60+ (Milne, 2011; Brennan, 2010).

Societal models of behaviour enable the researcher to extend focus beyond the individual, incorporating additional factors that influence behaviour such as the life-course, the economy and available technology. Such models are considered important from a policy perspective as they allow for consideration of the wider influences that may be acting upon an individual's behaviour. Moreover, they hold the ability to focus more specifically upon the contextual factors that facilitate or inhibit behavioural change, rather than narrowly considering individual attitudes and beliefs, which are not considered conducive to sustained behavioural change (Shove 2009; Darnton, 2008).

The Food Choice Process Model (FCPM) introduced by Furst *et al.* (1996) is an example of a psychosocial model. It holds that events and experiences over the life-course shape food choices through the tiers of factors influencing behaviour (Connors *et al.* 2001). Developed by the Cornell Food Choice Research Group, the FCPM is an inductively developed psychological model, which outlines the range of factors that are involved in making food choice decisions (Sobal and Bisogni, 2009). The model takes a layering approach to categorizing the components that are involved in individual food choice behaviours and has three main components: the life-course, influences and personal systems. Figure 4.4 presents the FCPM, the components of which are considered in turn.

Figure 4.4: Food Choice Process Model



(Source: Author constructed from Sobal and Biogni, 2006)

The life-course is important when considering food choices, with influences from individuals' pasts emerging as a salient factor when asking people about their current food choices. Thus food choice is considered to be dynamic and evolves over time. Therefore, the life-course includes events and experiences of the individual prior to making food choice decisions (Sobal *et al.* 2006). This therefore, in addition, extends beyond development, maturation and ageing to the life stages of the individual i.e. childhood and adolescence, the FCPM considers the impacts of

life trajectories, consequential transitions, subsequent turning points, the timing of these events and the context in which they occur (Sobal and Bisogni, 2009; Sobal *et al.* 2006).

- Life trajectories

Constructed and developed throughout life, life trajectories gather momentum providing expectations and shaping future food choice decisions. These trajectories are considered to be the individuals' *'food roots'*, and the basis for the formation of future food identities (Devine *et al.* 1998, p.364). Trajectories lead ultimately to habitual food choices, and can affect how an individual adjusts to life-course transitions. Choices made within trajectories are developed over the life-course and are shaped by contexts encountered and the past transitions that they have made (Sobal *et al.* 2006; Shepherd and Raats, 2006).

- Transitions

Transitions are turning points in the individual's life that impact upon food trajectories and can lead to change. As discussed in *Chapter 3*, the most prominent transitions typically include retirement, ill health, relocation, widowhood and divorce (Darnton, 2005). However, this can also include less salient factors particularly within the 60+ cohort, such as giving up work and driving (Darnton, 2005; Gilhooly *et al.* 2002). The impact of these leads to re-orientation of food choices and change in food choice trajectories.

- Timing

Timing refers to the point at which the transition occurs within the person's life and has profound effects upon the ability of the individual to adjust and re-orientate. Sobal and Bisogni (2009) highlight that because of age associated norms regarding the expected order of life events, a life event that occurs out of synchronisation with these norms can have implications for successful adjustment of food choices.

For example, divorce or unexpected death of a spouse can significantly alter the meaning of food for the individual and increase the potential for depression and isolation (Sidenvall, *et al.* 2000; McKie, *et al.* 2000; Herne, 1995).

- Context

Context refers to the environments in which a food choice decision is made and is the most consistent factor with societal models. This includes economic, political and social conditions in which the individual is immersed, for example, older consumers holding a strong 'no food waste' ethos owing to experiences over the life-course relating to food shortages and rationing (Milne, 2011; FSA, 2009; WRAP, 2008; McKie *et al.* 2000, McKie, 1999 and Falk *et al.* 1996).

- Influences

Influences are situated within the life-course and act to shape food choice decisions and include ideals, personal factors, resources, social factors and contexts (Sobal and Bisogni, 2009).

- Ideals

Ideals are the reference points learned through the process of socialization that are used as the gauge to decide what and how individuals should eat and are learned through families and institutions (Sobal *et al.* 2006). They allow individuals to determine what is '*right*' and '*wrong*' in terms of food decisions. Within the 60+ cohort, this is characterized by the value they ascribe to traditional meals and the commensality that they attach to this (Fjellström, 2009; Pfau, 2009; Sidenvall *et al.* 2000 and McKie, 1999).

- Personal factors

Personal factors refers to individual characteristics that affect food choices and includes physiological factors such as physical ability, physiological conditions as well as psychological factors such as taste preferences. It is widely recognized that physiological changes and deterioration are inherent to the ageing process (Rowe and Khan, 1987). Deterioration increases the cohort's vulnerability in terms of health and reduced mobility. From a domestic food safety perspective, decline in immune function, cognition and olfactory changes compounds vulnerability and increases susceptibility to foodborne illness (ACMSF, 2009; Cates *et al.* 2007; Hummel and Nordin, 2005; Kendall *et al.* 2003; Smith, 1998 and Gerba, Rose and Haas, 1996).

- Resources

Resources encompass assets that individuals consider when making food choices and include financial, mental, material, human and social capital (Sobal and Bisogni, 2009). Particularly for older consumers available financial resources are known to impact significantly upon food choice (Pfau and Saba, 2009). Retirement plays a critical role in determining this and is known to restrict the variety of foods purchased, the amount that food is eaten outside of the home and leads to concerns of monotonous diets and reduced nutritional status (Hunter and Worsley, 2009; Herne, 1995; McIntosh, *et al.* 1989).

- Social factors

Social factors are the networks of individuals that facilitate or indeed constrain food choices. This can include families, social groups, organization and friends that in turn require negotiations to be made in order to manage their own food choices and those of others. Fjellström (2009) highlights the social significance of food in later life and the intrinsic role that this plays in the meaning of food and the nutritional status of older adults (Pfau, 2009; Sidenvall *et al.* 2000 and McKie,

1999). Moreover, Falk *et al.* (1996) highlighted the significant role played by senior centres and lunch clubs in providing companionship and broadening diets.

- Contexts

Contexts are the environments in which food choices are made and relate to physical surroundings, such as the availability and seasonality of food. This can be extended to include access to food, which can be constrained in later life due to reduced mobility and access to transport (Milne, 2011; Wilson *et al.* 2004; Hare, 2003; Leighton and Seaman, 1997 and McKie, 1995).

- Personal food systems

Personal food systems are cognitively developed as a process that that guides eating decisions in differing situations. They are characterized by negotiations, the balancing of food values, trade-offs, classifications of foods and the creation of strategies that enable the development of routines that facilitate repeat food decisions (Sobal and Bisogni, 2009; Sobal *et al.* 2006 and Connors *et al.* 2001). Food choice values are dynamic and change over time, as experience over the life-course changes and modifies food choices (Sobal *et al.* 2007). Research from Connors *et al.* (2001) highlights five salient values that consistently emerge across all populations, these include taste, convenience, cost, health and managing relationships. However, it is noted there may be other cohort specific variations in values (Sobal *et al.* 2006).

The merits of this model above others that have been applied to the understanding of food choice decision-making, is its multiple perspective and inclusion of a range of factors that are implicated in decisions of this nature. The broad consideration of the factors involved in food choice decisions, makes this model a useful road-map for the identification of and personal factors involved in food choice decisions and the way that they are constructed (Sobal *et al.* 2006). Although ultimately a model that is focused on the individual as a rational choice agent (Darnton, 2008), it

is valued for its consideration of the way that external factors interact over the life-course resulting in the development of social relationships, resources, preferences, knowledge and rules of thumb (Meah and Watson, 2011; Green *et al.* 2003) which can explain both conscious and habitual food related choices (Connors *et al.* 2001).

The inclusion of life-course considerations within this model has particular resonance for this research, given the specific focus on the 60+ and the previous application of this model to this cohort by Falk *et al.* (1996). The findings of this research were consistent with the original model, although a number of additional cohort specific factors and some categories were expanded to take on broader meanings. For example, 'ideals' were shown to be of particular significance in shaping food choice decisions in later life, as were social frameworks for creating companionship and improving dietary intake. In a study focused specifically upon the value negotiations made, although not exclusively by this cohort, salient issues that were shown to be significant for some but not all, included variety, symbolism, food safety, quality and limiting waste (Connors *et al.* 2001). However, specifically within the 60+ cohort, value negotiations when devising food strategies, were shown to include the consideration of context, sensory perception, monetary considerations, convenience and physical wellbeing (Falk *et al.* 1996).

However, as with all models of behaviour, this model is not without its limitations. First, the focus on the multiple factors that influence behaviour can be criticized for neglecting to explicitly explore each of these in-depth. Moreover, the model is an individual model therefore it does not account for collective food choices, for example in families or communal living situations. Given the explicit focus on the household in Phase 2, this is a considerable limitation of the framework in this context. Important, but less so in the context of this research, is that this model was developed in post-industrial western society, therefore it may require considerable adaptation if it is to be applied to other cultures and contexts. Additionally, it is noted to lack relevance if food choice is heavily constrained, for example in care home settings (Sobal *et al.* 2006).

Thus, societal models have greater congruence with more holistic accounts of domestic food choices in their appreciation of the '*socially, historically and spatially embedded nature of food [safety] practices*' (Milne, 2011, p. 485; Meah and Watson, 2011). Moreover, their ability not only to uncover attitudes and knowledge, but also to establish food provisioning strategies is a key strength. The qualitative nature of the methodological approach advocated by this theoretical perspective (life-course interviews and narrative interviews) is valued for the richness of understanding it can generate. It is the aforementioned benefits of this model that have warranted the inclusion of this as a theoretical framework to contribute to research objectives 4, 5 and 6 and specifically Phase 2 of the research.

However, it is this same advantage that also acts as its primary limitation. Whilst situated in the qualitative paradigm and advocating a multiple-perspective approach, the FCPM aligns with self-reported methods. Despite recognition of context in the broader sense, societal theories ultimately retain focus on the individual. An over-reliance on self-reported methods and a lack of consideration of actual behaviours is typical of research located within the positivist paradigm and can create '*blind spots*' (Stern cited in Strengers, 2010 p.5; Hargreaves, 2008). The specific '*blind spot*' for this thesis is the lack of consideration these psychosocial theories have for understanding actual, observed food provisioning and safety practices as opposed to those that are self-reported.

4.4 Alternative Approaches: Social Practice Theory

The aforementioned theoretical contributions are distinctly psychosocial in nature. As noted within food safety research, there have been notable rumblings of discontent as to the explanatory potential of these approaches for understanding actual consumer food provisioning and handling practices in the domestic environment. This deficiency has roused interest from a sociological perspective, drawing on concepts such as a '*habitus*'²¹ (Bourdieu, 1984) to account for the deficit

²¹ In crude terms '*habitus*' is the socialised norms or tendencies that guide behaviour. The concept of '*habitus*' has three key components. First, it is created through social rather than individual

between knowledge and practice and to understand the ordinary, mundane and tacit nature of domestic food handling practices. Specifically, there has been growing interest and application of SPT, for the removal of a focus from the individual to practices and the reproduction of these within everyday life in order for them to be sustained over time. Adopting this position allows practices to be viewed as part of an intricate web of action, rather than as isolated activities of shopping, cooking and cleaning for example.

SPT is a '*mature ontology*' in sociology (Birtchnell, 2012, p.497) which has developed in two distinct waves, first, in the work of Giddens (1984; 1991) and Bourdieu (1984; 1990). Bourdieu, (1984) did not, however, establish a theory of practice in his work. His central thesis related to '*habitus*', suggesting that socially inscribed practices act as a '*practical logic*' giving individuals a '*feel for the game*' around which their daily life ebbs and flows (Bourdieu, 1984 cited in Wills and Brennan, 2012). This work was successful in bringing practices to the fore and generated interest from social theorists which led to the emergence of the second wave of practice theorists during the 1980s, including scholars such as Reckwitz (2002) Schatzki (1996; 2001; 2002) and Warde (2004; 2005). Evolving from cultural theories, SPT diverges in that it is neither '*individualistic nor holist*', (Schatzki, 1996, in Warde, 2005, p.132). In this sense SPT is aligned with Giddens (1984) Structuration Theory, that presented an account of how practice theories may transcend the dualism of structure and agency (Shove, Pantzar and Watson, 2012). Giddens holds that:

'The basic domain of study of the social sciences, according to the theory of structuration, is neither the experience of the individual actor; nor the existence of any form of social totality, but social

process, which allows it to endure across space and time. Second, Bourdieu introduces the concept of 'capital' that extends beyond material assets and is accumulated and transferred from one area to another. Third, 'fields' are important to the concept and are the social and institutional arenas within which individuals express and reproduce their dispositions and compete for capital. '*Habitus*' is central to Bourdieu's concept of structuralist constructivism, which is an attempt to transcend the dualisms of agency-structure, objective-subjective and the micro-macro. '*Habitus*' is the conceptual tool within the methodological framework of the aforementioned concept, and is an attempt to address the associated dualisms, (for a review see Reay, 2004; Participation, Power and Social Change Team, 2012)

practices ordered across space and time'. (Giddens, 1984, p.2 cited in Shove, Pantzar and Watson, 2010, p.3)

SPT can thus be regarded to occupy the middle ground between emphasis on the rational individual on the one hand and structure; the social rules, resources and landscapes in which they are embedded, at the expense of the individual, on the other (Hargreaves, 2008). Moreover, where TPB and FCPM focus exclusively on intention and context at the level of the individual and neglect situated actions, SPT is concerned with both *'doings and sayings'*, which as Warde argues, allows for analysis that is *'concerned with both practical activity and its representations'* (Warde, 2005, p.134). Translated to domestic food safety research, Halikier and Jensen (2011) identify SPT to have two key advantages. The first is that food consumption is part of a web of social change and reproduction in everyday life, and it therefore allows attention to be given to the complexities of food provisioning and handling, rather than the individual interpretation of shopping, cooking and eating. The second is the recognition that food practices are continually reproduced in order to be sustained. This recognition allows the food researcher to see elements of practices as critical moments in the reproduction of social practices, rather than as isolated behaviours (Milne, 2011). Specifically for this research, SPT allows the researcher to adopt a different tack when entering the field, by de-centring and going beyond what consumers tell us they know and do and observing what they actually do, within the sphere in which it is performed i.e. the domestic kitchen, which has been highlighted as so crucially needed (Brennan, 2010; ACMSF, 2009; SSRC, 2009; and Murcott, 2000).

4.4.1 Defining Practices

Despite considerable use and development of SPT *'there is no unified practice approach'* (Schatzki, 2001, p.2 cited in Hargreaves 2011; Warde, 2005), with each theorist advocating their own similar, but inevitably different interpretation. Any interpretation however, must acknowledge the distinction between practice and practices (Warde, 2005). Reckwitz concisely makes this point:

'Practice (Praxis) in the singular represents merely an emphatic term to describe the whole of human action... 'Practices' in the sense of the theory of social practices, however, is something else. A 'practice' (Praktik) is a routinized type of behaviour which consists of several elements, interconnected to one another: forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understandings, know-how, states of emotion and motivational knowledge' (Reckwitz, 2002, p.249).

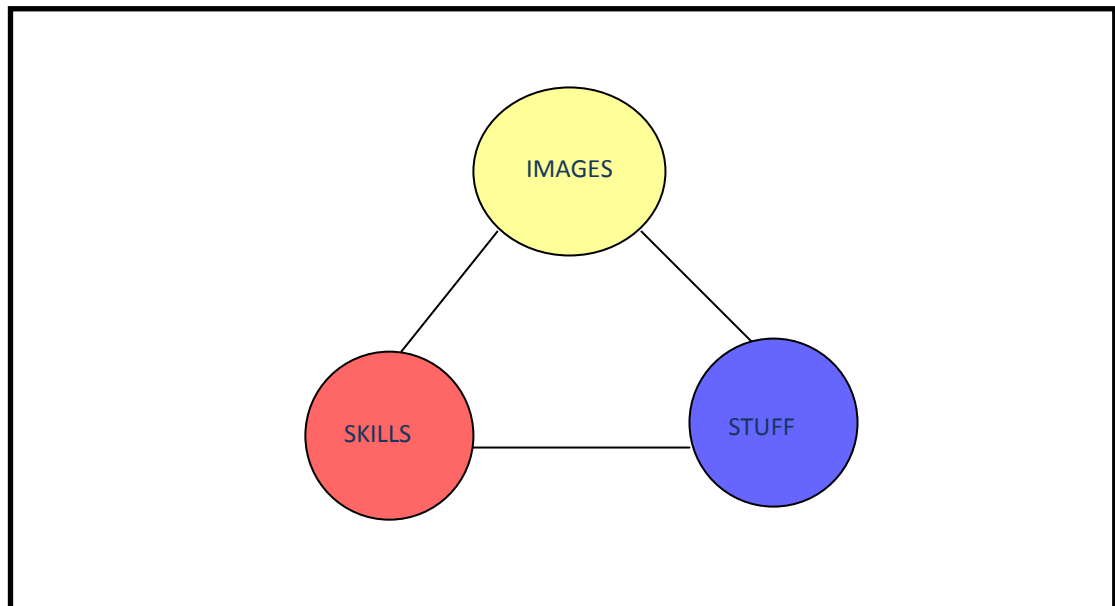
A simplified version of SPT is used throughout this thesis; and is drawn from the empirically useful understandings provided by Shove and Pantzar (2005), assembled by Hargreaves (2011):

'Practices (are) assemblages of images (meanings, symbols), skills (forms of competence, procedures) and stuff (materials and technology) that are dynamically integrated by skilled practitioners through regular and repeated performance' (Hargreaves, 2011, p. 83).

It is these rules that shape behaviour and enable individuals to reproduce specialist forms of practice, of which food provisioning is an example, at different times and in different places, that are consistent with the rules that govern it (Warde, 2005 and Reckwitz, 2002).

4.4.2 Ingredients of Practice

Figure 4.5: Ingredients of Practice



(Source: Shove, 2012; Scott *et al.* 2012; Shove and Pantzar, 2005)

Figure 4.5 is a diagrammatic representation of practice and although a simplification of the process, it highlights its interconnected nature as a bundle of the three key elements that Shove and Pantzar (2005) term, 1) images, 2) skills and 3) stuff. More recent work by Shove, Pantzar and Watson (2012)²² has adapted this terminology referring to the same set of elements as 1) meaning, 2) competencies and 3) materials, respectively. The solid connections represent the linkages between these three essential elements. The following section of the chapter will provide a detailed account of each of the elements required to form a practice, it will consider the way that practices are co-ordinated through linkages and the way they are continually maintained and challenged through skilled performance.

²² It is acknowledged that Shove, Pantzar and Watson (2012) is referenced repeatedly throughout this chapter, and it is recognized that this work was published after the conception and design of this research. However, this work consolidates previous work conducted (see for example Shove and Southerton (2000), Shove (2003), Shove and Pantzar (2005) and Shove and Watson (2010)) and it was these that guided the research approach.

i. Images (meaning and knowledge)

Although adopting different terminology, all practice theorists accept the contribution of knowledge, as a '*submersed layer of information and understanding which informs everyday action*' (Strengers, 2010, p.8). Reckwitz (2002, p.254) holds that knowledge is the '*background understanding on the part of the agent*' which explains why individual action is often consistent with what they have always done, as they draw on their own practical knowledge to provide an action solution. Reckwitz (2002) explains that:

'Every practice implies a particular routinized mode of intentionality, i.e. wanting or desiring certain things and avoiding others...every practice contains a certain practice-specific emotionality...wants and emotions thus don't belong to the individual but in form of knowledge –to practices' (Reckwitz, 2002, p.254).

Central to this is the notion that knowledge does not wholly belong to the individual, rather it belongs to the practice that the individual carries (more detailed explanation of this is provided in Section 4.4.5). Taking, the practical example of checking whether a chicken is properly cooked, the individual practitioner will draw on practical knowledge to assess whether it is ready to serve. This could include looking at it, cutting into it with a knife, checking the colour of the juices, and/or using a temperature probe (as per the domestic food safety best practice recommendations, outlined in *Chapter 2*). Knowledge is not something that is innate; rather knowledge is accumulated through everyday experiences, education or through socialisation. For example, reverting to the example of cooking chicken, checking if the juices run clear, because '*this is something that my mother always did*'. It is through repeated '*doing*' and repetition of practice that a small level of the collective practice knowledge becomes embodied by the practitioner and, as noted, results in the individual conducting themselves in ways that are consistent with what they have always done (Strengers, 2010).

ii. *Skills (Competence)*

A certain know-how and level of skill on behalf of the practitioner is a requirement in a practice and can range from simple acts to more complex combinations of bodily-mental competencies (Hargreaves, 2008). As Warde (2005) acknowledges:

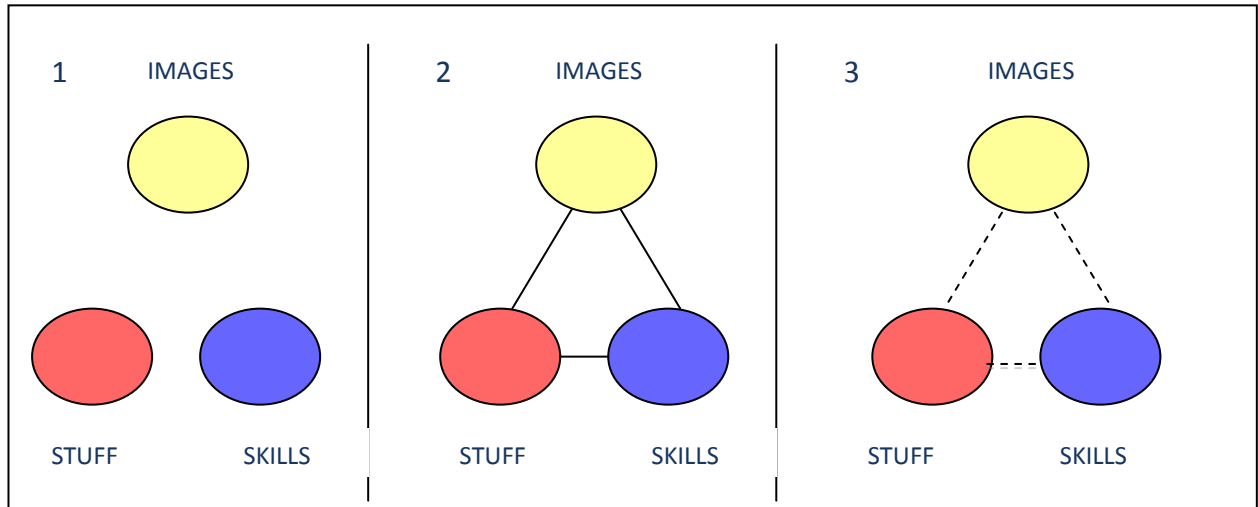
'Considering agents' capacities we might differentiate between long-standing participants and novitiates, theorists, technicians, generalists and specialists, conservatives and radicals, visionaries and followers, the highly knowledgeable and the relatively ignorant, and the professional and the amateur' (Warde, 2005, p.138).

If we take cooking as an example, a plethora of individual performance skills are evident. This variation in skill and competency level is dependent upon a range of factors including, past experience, education, technical knowledge, opportunities, available resources and encouragement from others. In addition, this variation presents itself in the commitment of a given agent to the practice in question, which in turn influences their level of investment in it. Shove, Pantzar and Watson (2012) show that as individuals become more or less committed to a practice their status within that practices changes and thus a practice is populated by varying skill levels. Moreover, the sustainability of a given practice relies on the continued recruitment of practitioners. Warde (2002) goes on to present empirical evidence to suggest that there are differences between groups and in different places. In presenting the practice of motoring, Warde (2002) argues that meaning can vary between groups of practitioners and place. Using this example, he argues that in the UK this signifies a story of class differentiation, beginning as an upper-class activity and diffusing into the middle classes post war. By contrast, the author notes that in the US, motoring also began as an exclusive activity but now is driven more by sub-culture or lifestyle than class distinctions.

iii. Stuff (Materials)

Objects are involved in most if not all practices. This is acknowledged by Reckwitz (2002) in the emphasis he places on *'things and their use'* whilst Schatzki *et al.* (2001, p.3 in Shove, Pantzar and Watson, 2012, p.9) assert that *'understanding specific practices always involves apprehending material configurations'*, and therefore things and their role in everyday life play a central role in any theory of practice. Schatzki (2001) presents the simple example of football, drawing attention to the indispensable role that the ball plays. If we again relate this to our area of interest and take the example of cooking, it is littered with examples of the indispensability of material objects from shopping which requires transport and the use of bags; to storage which involves the use of fridges, freezers, containers; and cooking which incorporates the use of utensils, pans, ovens, grills, microwaves etc. to disposal and the requirement for bins. As the example illustrates and as Strengers (2010, p.13) acknowledges, material objects are indispensable to the *'doing' of a practice and are not merely 'passive bystanders' it is the 'objects [that] shape the practice itself'*. Moreover, materiality is inherently linked to consumption. Warde (2005) makes this connection highlighting that it is embedded within all practices, and arguing that consumption is not a practice in its own right, but is a moment within all practice. Furthermore, Hargreaves (2008) recognises that practices are constrained by the stuff and the materials that are available. This in turn can be seen to link back directly to competency, commitment and investment into a practice, which is arguably shaped by the material availability. Practices rather than individuals can then be seen to create needs for new stuff, and *vice versa* new stuff can also generate new practices, or as Shove and Pantzar (2005) highlight in their account of Nordic walking, alternative performances of existing practices are possible. Practices are also not defined by the *'stuff'* (material objects) that facilitates them and substitutions can be made. The simple example of this given by Hargreaves (2008) is the use of jumpers as goal posts in a game of football. In relation to food handling, an example of this could be the use of a knife to peel a potato in lieu of a peeler.

Figure 4.6: Proto-Practices, Practice and Ex-Practice



(Source: Shove, Pantzar and Watson, 2012, p.25)

Practices should be thought of as an integrated and dynamic whole. They can be considered as consisting of elements identified in Section 4.3.2 that are ‘*out there*’ in the world waiting to be connected (Shove, Pantzar and Watson, 2012, p.24) (see Figure 4.6, image 1). As Reckwitz (2002, p.250) contests, practices are a “‘*block*’ whose existence necessarily depends on the existence and specific interconnectedness of these elements” (illustrated in Figure 4.6, by image 2). Thinking of practices in this way allows for the examination of how they emerge, stabilise and then ultimately die out (see Figure 4.6, image 3). This process is illustrated in Figure 4.6 by the elements of practice and the connections made between the elements, images, skills and stuff that are integrated through action. Action and ‘*doing*’ (Warde, 2005, p. 134) of practices transforms these from individual elements to entities that can be spoken about, such as cooking, cleaning, shopping and eating (Shove, Pantzar and Watson, 2012). Again taking the example of cooking, the elements required to make this practice includes the kitchen, the skilled practitioner to prepare the meal, the rules and norms that define how the food should be prepared and its meaning to the practitioner and to outsiders. It is through performance that the practice as an entity is established and reproduced, and through repeated performance they are sustained over time. Renewal is not linear, it should be considered as a constant process, ‘*in which similar elements are*

repeatedly linked together in similar ways' (Shove, Pantzar and Watson, 2012, p.24). Moreover, elements are shown to be mutually shaping by contributing to the development of the practice as a whole.

4.4.3 Practice Performance, Maintenance and Change

The carrier of a practice is central to its maintenance over time, it is through performance and '*doing*' that a practice as an entity is sustained and legitimized, thus practices are '*coordinated entities but also require performance for their existence*' (Warde, 2005, p.134). As Strengers (2010) acknowledges, everyday practice which include food provisioning and cooking, are repetitive occurrences and it is the repetitious nature of these that allows us to establish liveable everyday lives and prevents us from becoming overwhelmed by the acts we engage in. Looking specifically at domestic food provisioning, such everyday routines encompass all elements of Marshall's (1995) food provisioning process. We have routines for shopping, storage, preparation, eating and disposal of food. Changing established practice requires the links and elements between existing practices to be challenged and broken, then remade (Hargreaves, 2010). Thus to encourage safer food practices the links binding existing practices need to be broken and re-amalgamated into new and '*safer*' ways of handling food (Hargreaves, 2008, p.83). Taking the disposal of food as an example, the introduction of recycling bins and worktop composters for use in the domestic home, where previously they had been located in community based sites (i.e. supermarkets), and the structured collection of both landfill and recyclable waste by service providers has overhauled domestic waste management practices, making the separation of domestic waste into recyclable and non-recyclable a '*normal*' everyday practice (Birtchnell, 2012, p. 498; Chappells and Shove, 1999).

Through repeated '*doing*', practices may also be changed. The consistent reproduction allows practitioners the opportunity to challenge the practices with which they engage. Although they are relatively stable over time, change can happen from inside the practice as practitioners contest, challenge, adapt,

improvise and experiment (Strengers, 2010; Warde, 2005). It can also occur when different practices come into contact with one another. New practices can also develop through the implementation of new norms/rules or new material structures, as in the aforementioned example of domestic recycling. Southerton *et al.* (2004) provide a further case in point, with their example of showering, which emerged as an everyday practice after common understandings of speed, efficiency, personal health and hygiene became associated with it. Shove and Pantzar's (2005) example of Nordic walking shows how links between practices are made and they are transformed, with Nordic walking emerging as a normal extension or alternative to skiing, during the summer, with health benefits. Strengers (2010) highlights that they may also occur *via* breaks in routines or as Reckwitz (2002, cited in Strenger, 2010, p.16) claims '*crises of routines*'. For example, if individuals encounter illness as a result of foodborne disease, this may result in reconfiguration of food handling practice in order to avoid future occurrence. However, this may only result in a temporary adoption of practices, although this may well be more permanent if material changes are also adopted, for example, the introduction of a new fridge or different or new dish cloths. This ability to change is indicative of the dynamic nature of practices, which have the potential to form, stabilize and die out through reproduction. Shove, Pantzar and Watson (2012, p.24), take the view that practices are '*out there*', and suggest that they lie dormant waiting for the connections to be re-made, or incorporated as part of a different practice. Where bonds are broken, there is an opportunity to influence and change, although this first requires an overall understanding of the variety of everyday practices.

4.4.4 Promoting Change: The Top-Down Approach

Practices are in constant flux, and thus policy intervention may help to bring about practices that, from a food safety perspective, are more rather than less '*safe*' (Hargreaves, 2008, p.83). However, this may be more complex than first assumed and, as Shove Pantzar and Watson (2012) acknowledge, the transient nature of practice means there is little point in making practice change targets, which does

not necessarily align well with policy makers and governments. Nevertheless, a top down (policy) approach may achieve behavioural change, influencing first, the range of elements in circulation; second, the way that practices relate to each other; third, the careers and trajectories of practices and those that carry them; and finally the circuits of reproduction. The example of comfort practices is given as a way that policy makers in Japan were successfully able to intervene and redefine common practice. This was achieved by adopting a top-down approach to reduce CO₂ emissions. The government stopped the cooling and heating of government buildings between 20-28°C in an effort to change meaning (*Images*). The result was the successful change in the configuration of practice, for example, workers adapted their clothing accordingly, removing jackets and ties in warmer weather and wearing more layers in winter months. Essentially this had positive impacts, by changing the meaning of work wear and achieving positive environmental gains. From a social perspective, it permitted Asian workers to wear clothing that was suited to their climate, rather than conventions of '*appropriate*' work wear (Shove, Pantzar and Watson, 2012, p.24). The changes in domestic waste practices in the UK and the prominence of recycling as a '*normal*' practice in domestic waste management, is another example of this top-down approach and structural change to bring about lasting behavioural change (Birtchnell, 2012, p.498; Chapples and Shove, 1999).

Material change may also help in resurrecting abandoned practices where the bonds between have all but broken. Shove, Pantzar and Watson (2012) highlight that in some instances bonds may have broken temporarily and therefore, pulling them back together is a less onerous task. However, in instances where they have disappeared, this is more difficult and requires the links to be built from scratch. The authors present the case of cycling in the UK, which was once the dominant mode of transport but had nearly disappeared by the 1970s in favour of automotive modes. The resurrection of this practice to increase uptake as a '*normal*' thing to do (Birtchnell, 2012, p.498), has in part been a consequence of the top-down approach. Initiatives such as congestion zoning in London, and more widespread pay-to-park schemes that are now a common feature of UK cities demonstrate this.

Birtchnell (2012, p.498) however, argues that people do not adapt well to new practices and they are particularly hard to influence if the said practice is not viewed as *'normal'*, suggesting that leaders or elites play a prominent role in the formation of a *'new normal'*. In the example given by Shove, Pantzar and Watson (2012) of comfort practices the success of the initiative was in-part attributable to the demonstration of the cool work wear by the then Prime Minister and cabinet members of Japan. Birtchnell (2012) argues that elites promoting practice are essential to achieving change, being seen to practise what they preach. Moreover, he suggests that *'what start off as theories held by a few people come to infiltrate the social imagery, first of elites, perhaps and then of the whole society'* (Taylor 2004, in Birtchnell, 2012, p.481). In this way SPT is shown to have the potential to analyse scales that go beyond *'local and everyday'* practices that have dominated the practical application of SPT to date (Birtchnell, 2012, p.481).

4.4.5 Intersecting Practice

Part of what constitutes everyday life is the doing of multiple and often intersecting practices. As substantiated by the eclectic case studies of practice, not all of them are equal and everyday life revolves around what is termed the prioritisation of *'dominant projects'* (Shove, Pantzar and Watson, 2012, p.76; Hargreaves, 2008). Practices are interconnected, although it is this explanation that allows us to understand why although we partake in most everyday practices to some degree, some are given more time, effort and energy by practitioners than others. Again using the example of making a meal, this can be seen to account for why for some people, this means planning, following recipes, sourcing fresh ingredient etc., whilst for others this is a case of re-heating a pre-prepared meal. Again this links back to the commitment of the practitioner of the practice, but ultimately it should be acknowledged that *'dominant projects'* will be upheld, which in turn has consequences for the development of skills of those practices that are not as prominent.

4.4.6 Significance of Practice in Understanding Everyday Food Provisioning

By its very definition everyday life is mundane. Strengers (2010) argues it is the ordinary and unremarkable nature of everyday life that results in it generating little research interest. The author goes on to suggest that it is the everydayness of practices, which makes them retreat from conscious consideration of performers and researchers alike. Food provisioning and handling practices can be considered to be an essential part of everyday life, and are recognized to be conducted with little conscious thought. Therefore, getting to the crux of understanding why consumers handle food in the way they do, requires us to look at behaviours that may otherwise be dismissed as ordinary and unexceptional (the use of the fridge for example) (Brennan, 2010). SPT brings these to the fore for forensic examination by, as Warde (2005, p.136) argues, *'both observing the role of routine on the one hand, and emotion, embodiment and desire on the other'*. Making practices the core unit of analysis and shifting focus from the individual avoids the temptation to treat individuals as passive *'dupes'* (Strengers, 2009, p.37), and celebrates them as skilled practitioners who negotiate and perform a wide range of practices in the course of their everyday life (Hargreaves, 2010). Moreover, SPT can be positioned as a more sensitive analysis of everyday practices. This is particularly valuable when situating research in the domestic home, and when the focus of the research is *'problematizing'* a practice that is likely to be considered everyday and routine by the individual.

4.4.7 Problems with Practice

Although considerable conceptual work has been achieved, SPT can be considered as in its infancy when compared with other models and theories of behaviour (Strengers, 2009; Hargreaves, 2009). Thus in its development it has encountered some methodological challenges and contentions. In the main, this has centred around the concern that practice theory is too philosophical and difficult to transpose into empirical analyses. As Hargreaves (2008) notes, applied studies of practice to date have relied on examples from an eclectic range of practices to

provide case studies, that he argues represent very narrow slices of everyday life, such as Nordic walking (Shove and Pantzar, 2012), comfort and cleanliness practices (Shove, 2003; Watson and Pantzar, 2012; Strengers, 2010), do-it-yourself practices (Shove *et al.* 2007) and freezing practices (Shove and Southerton, 2000). This has been highlighted as contributing to the argument of scale, and the ability of practice theory to go beyond the local scale to which it has predominantly concerned its self and to help explain larger societal issues (Birtchnell, 2012). However, more recent accounts of practice theory have looked at broader everyday challenges, although the concentration has been on sustainability and pro-environmental issues. One of the main prohibiting factors to the adoption of SPT is the lack of practical advice the theory offers as to how the researcher should study practices (Strengers, 2009). Despite this, diffusion of innovation is occurring, and SPT has been used as the theoretical underpinning in research concerned with food generally and the food provisioning process more specifically (Milne, 2011). Theoretical inspiration for the inclusion of this approach has been taken from the successful application of SPT for understanding the entire food provisioning process, (Milne, 2011; Marshall, 1995), from shopping (Everts and Jackson, 2009), cooking (Meah and Watson, 2011), nutrition (Halkier and Jensen, 2011) and waste (Evans, 2012), and it is to this body of empirical work that this research associates itself.

4.5 How Do We Study Practices?

Understanding behaviour requires consideration of both '*doings and sayings*' (Warde, 2005, p.134) and the requirement for research to be conducted '*in situ*' aligns well with qualitative methodologies and specifically ethnographic research methods and is thus aligned with the interpretivist paradigm (Halkier and Jensen, 2012; Hargreaves 2011). Generalizability is consistently a concern raised when qualitative methods are adopted, and this is compounded when using ethnographic methods, owing to the small sample sizes (Bryman, 2004). In accordance with research objectives (4 and 5) it was necessary to observe the domestic lives of these households and, as Brennan (2010) advocates, cross the

threshold and enquire behind kitchen doors. As Strengers (2009) appreciates, this creates breadth and depth of data and understanding, although at the expense of generalizability of findings. However, the richness of the data generated by this method goes above and beyond any insights that could be gained by taking a quantitative approach, or by limiting the research to self-reported methods, which has been identified as the limitation of much research conducted in this field to-date.

In light of the limited practical advice on how we should study practice, the researcher needs to turn to literature and other research studies situated in the domestic environment and with older consumers for methodological inspiration (Strengers, 2009). This methodological freedom can be regarded as one of SPT's main attractions as the lack of such recommendations or boundaries permits the inclusion of creative and interdisciplinary methodological approaches.

4.5.1 Applying Practice to Everyday Food Provisioning

By taking inspiration from the notion of practice outlined in section 4.4.1 and the adoption of an ethnographically inspired approach, the application of practice theory promotes (Halkier and Jensen, 2011; Hargreaves, 2011) a 'toolkit' of data generation methods. For this thesis, the methods included were representative of both the '*sayings*' and '*doings*' (Warde, 2005, p.134) of food provisioning practice, details of which are provided in *Chapter 6*. These provided the researcher a lens through which to observe everyday life within the domestic kitchen. The interdisciplinary combination of methods was intended to avoid the methodological pitfall identified by Atkinson and Coffey (2003), which warned against privileging one data generation method (traditionally participant observation) as the only means of obtaining access to action. The assemblage of methods was therefore action focused, but sensitive to the vulnerabilities of the study cohort. The intention was that each technique provided insight from differing methodological perspectives in order to understand the complexity of lived experience and the interrelated factors that drive, and subsequently reproduce, certain kitchen

practices. Each method was also chosen to acknowledge the elements of practice being *'images, skills and stuff'*. This included the collation of data that was visual, verbal, technological and microbiological and aimed to reveal what older adults actually do in their domestic kitchens. The guidance of SPT removed focus from the individual and redirected gaze to the household as the primary unit of analysis.

4.5.2 Theory Contribution

Thus far this chapter has identified the different theoretical orientations that have been drawn upon to assist and enable the primary research question of what older food consumers do in terms of domestic food provisioning and safety and why. Owing to the lack of prior research in this field and the need to provide baseline understanding of the food provisioning and handling practices of those aged 60+ (ACMSF, 2009; SSRC, 2009), prior to conducting a more in-depth qualitative study, a mixed method approach using the explanatory design was considered the most appropriate. It is acknowledged that taking a mixed method approach is regarded as being *'intrinsically 'a good thing' to do'* (Mason, 2006, p.9). Although slow to be recognised, this *'third research paradigm'* (Johnson and Onwuegbuzie, 2004, p.14) is appreciated for a number of reasons. First it negates the limitations of singular methods and allows the researcher to select theoretical and methodological frameworks pragmatically. Second, mixed methods transcend macro-micro scales and encourage researchers to see things differently and be creative with the methods employed in order to address research problems pragmatically. This also has value for appreciating the multi-dimensionality of lived experience (Johnson and Onwuegbuzie, 2004). Finally, the power offered by mixed methods facilitated the aforementioned *'breadth'* and *'depth'* approach (Cresswell and Clark, 2011; Tiddie and Tashakkori, 2009; Brannen, 2005; Mason, 2005 and Tashakkori and Tiddie, 2003). The explanatory design advocates the adoption of a sequential two-phase approach whereby a quantitative stage is first implemented and followed up by a second qualitative phase, the purpose of which is to provide more detailed explanations of the initial phase (Cresswell and Clark, 2011).

Therefore, this research has been forced to consider and draws upon two theories (FCPM and SPT) that contribute to answering the research problem. Figure 4.7 documents the contribution of each of the theories chosen to the methodological framework or 'route-map' for this research.

Figure 4.7: Theoretical and Methodological ‘Route-Map’

PHASE 1					PHASE 2				
Objective No.	Objective	Theory	Method	Data analysis	Objective No.	Objective	Theory	Method	Data analysis
3	To provide a sampling framework for the observational component of the research by segmenting the 60+ population in the North East of England, based on lifestyle, attitudes towards food and attitudes towards and knowledge of domestic food safety practices	-	Quantitative: Questionnaire	Multivariate analysis: PCA and Cluster analysis	4.	To provide nuanced understandings of domestic kitchen practices by performing an ethnographically inspired study of ten households identified as being ‘at-risk’ of contracting foodborne illness from the segmentation analysis	FCPM SPT	Qualitative: Ethnographically Inspired Observation Including: Life-course and narrative interviewing Kitchen ‘go-along’ Food Purchase history Fridge audit/ microbiological sampling Activity recognition Video documentation	Grounded Theory analytical procedures (Glaser and Strauss, 1967, Spiggle, 1994)
					5.	To provide rich understandings of the everyday food provisioning process (including purchase, storage, cooking, eating and disposal) and practices of 60+ individuals			

(Source: Author compiled)

Deficient baseline understandings of the food provisioning and safety practices of the 60+, is reflected in research objective 3. This made generating baseline understandings of the older consumer, their lifestyles, their attitudes towards food and their attitudes and knowledge of food safety an essential requirement of this research. The study therefore, required a quantitative component to enable a segmentation analysis of those aged 60+, *via* a face-to-face administered questionnaire. The results derived from Phase 1 provided the basis for sampling participants for the ethnographically inspired study in Phase 2 (Creswell and Clark, 2011).

Phase 2 of this research, the empirical qualitative study, was designed to complement Phase 1 and contrast self-reported attitudes and behavioural intention with observed and actual domestic food provisioning and handling practices. Situating the research in the domestic homes of participants acknowledges that that:

'Food practices are embodied and embedded in social relations and social processes, they are not necessarily easily accessible to reflection or amenable to textual representation' (O'Connell, 2012, p.1).

Phase 2 also used an interdisciplinary complement of both traditional and contemporary methods. This was consistent with the successes of O'Connell (2012) in her study of family food practices and the Transition in Kitchen Living (TiKL) project (Peace *et al.* 2011), that aimed to understand the role, function and design of kitchens within the lives of older adults (60-90+). This included a variety of multi-methods that were interdisciplinary and comprised the methodological 'toolkit' for Phase 2 of the research discussed in *Chapter 6*.

4.6 Summary

Chapter 4 has provided a critical justification for the pragmatic mixed method position adopted by this research. The chapter began by providing an evaluation of opposing epistemological positions of positivism and interpretivism. In addressing

the strengths and weaknesses of these approaches and the methodological approaches associated with each, attention was drawn to the pragmatic 'middle ground' offered by the '*third research paradigm*' of mixed methods (Johnson and Onwuegbuzie, 2004, p.14). The disciplinary background of marketing was considered in order to clarify the suitability of this approach. Consideration of the theoretical positions adopted by food safety research to-date were reviewed, the limitations of which further justified the pragmatic position adopted by this research. Consideration was then given to the theoretical models of TPB, FCPM and SPT. The TPB was rejected on the grounds that intention to behave does not necessarily result in a desired behaviour being performed, which has been highlighted by the impasse reached by food safety research to-date. This would therefore, have made adoption of this theory counterintuitive. The FCPM was selected for the theoretical and methodological appreciation of the role of the life-course and experiences over this in shaping food choices and practice outcomes. Given the focus of this research on those aged 60+ this approach held resonance. However, the FCPM's conformity with self-reported methods (life-course interviews) neglected consideration of the influence of the household in defining food choices. Social Practice Theory addressed this shortcoming by provided a framework for going beyond '*sayings*' and permitted the observation of domestic food handling and food safety '*doings*' (Warde, 2005, P.134). This chapter has aimed to demonstrate that by approaching the whats and whys of the 60+ food provisioning and handling practices, researchers are not constrained by the use of singular models and theoretical positions. Rather in order to address the problem, methods are selected that best address the research question and objectives. Section 2 presents the empirical quantitative research that is Phase 1 of the thesis.

Section 2

Chapter 5 : Segmentation and Household Selection²³

5.1 Introduction

This chapter addresses research objective 3 of this research, which was to:

To conduct a segmentation analysis of the over 60s in the North East of England, based on life-style, attitudes towards food and attitudes towards and knowledge of domestic food safety practices, using multivariate analysis techniques to provide a sampling framework for the observational component of the research.

This chapter provides a detailed account of the design of the empirical quantitative research conducted in Phase 1, that was used to provide baseline understandings of the 60+ in the North East of England in respect to their lifestyle, attitudes, knowledge and behaviours in relation to food and domestic food safety and segment them on this basis. Following extensive review of the literature and consultation from a number of old age advocacy groups, a face-to-face administered questionnaire was developed as the chosen research method. The insights gained from this informed and provided the sampling framework for Phase 2, the EIS. Validity of quantitative research rests on the ability for it to be replicated, therefore this chapter will provide a step-by-step account of how Phase 1 was conducted, and a full account of the results gained.

²³ The findings from this chapter have been published and publicly presented as follows:

'Kendall, H.E., Kuznesof, S., Seal, C., Dobson, S. and Brennan, M. (2012) 'Domestic food safety and the older consumer: A segmentation analysis', *Food Quality and Preference*, 28 (1), pp.396-406.

'Food Provisioning and The Domestic Food Handling Practices of the Over 60s in the North East of England', Human Nutrition Research Centre Annual Conference: Newcastle University, 10th October 2012, Newcastle upon-Tyne.

'Domestic Food Safety and the Older Consumer: A segmental analysis', 8th International Sociological Association: Research Committee on Logic and Methodology in Sociology, 9-13th July 2012, University of Sydney, Australia.

'Domestic Food Safety and the Older Consumer: a segmentation analysis', Ageing and Society Conference: University of California, 5th -7th November 2011, Berkeley.

5.2 Empirical Quantitative Research

Asking questions is one of the most direct forms of generating data. In the social sciences, questionnaires are an established quantitative data collection tool that allows researchers to gain insights into what people think (Bell, 2005; Bird, 2009; Ammerworth *et al.* 2003). Questionnaires are valued for their ability to acquire *'information on participant social characteristics, present and past behaviour, standards of behaviour or attitudes and their beliefs and reasons for action with respect to the topic under investigation'* (Bulmer, 2004, in Bird, 2009 p. 1037). Moreover, they can be used to refine areas of interest and inform future research methods (Trochim, 2006). Additionally, they allow information to be collected from large numbers of individuals that are representative of the population of interest in a manner that is both time efficient and inexpensive. (Bryman, 2004; Bell, 2005).

Chapter 1 identified a distinct gap in knowledge relating to the domestic food handling practices of the 60+. *Chapter 3* acknowledged there to be disagreement in the definition of old age, and despite attempts made to segment the cohort, none were considered adequate to account for the heterogeneity in attitudes, knowledge and behaviours in a food safety context. Thus research objective 3 sought to address this gap in the literature to generate understanding of attitudes, beliefs, behaviours and motivations of a representative sample of the 60+; a structured face-to-face administered questionnaire was selected as the most appropriate research instrument.

5.3 Questionnaire Design

Questionnaires are acknowledged to be notoriously difficult to design, and there are a number of factors that must be considered and pitfalls to avoid, which include: question selection, writing, design, piloting, distribution and critically, how the data will be analysed (Bell, 2005). Essential to the development of any questionnaire is its grounding in relevant literature; therefore, the questionnaire was developed following an in-depth review of the literature, which generated a

number of hypotheses for testing (Table 5.1). Dividing the questions into topic areas, allows for the logical flow and a smooth transition from one topic to the next. It adds clarity for participants, ensuring that they understand the purpose of the research and the question context (Bird, 2009). Therefore, the questionnaire was divided into three broad sections aimed at assessing:

- 1) Demographics and lifestyle; eliciting data on respondents' socio-demographic characteristics, household composition, social networks and social isolation.
- 2) Attitudes towards food; including statement-based attitudinal questions relating to relationships with food.
- 3) Attitudes and behaviours relating to food safety, through the assessment of knowledge associated with the 4 Cs of food safety (namely cooking, cleaning, chilling and cross contamination).

Although wanting to establish baseline understandings of the sample's knowledge of correct food handling practices, questions relating to food safety had a distinct focus on listeria and its associated risk behaviours. Table 5.1 outlines these hypotheses and presents the affiliation of each of them with the corresponding section of the questionnaire.

Table 5.1: Literature Derived Hypothesis

Hypothesis No.	Hypothesis	Literature (references)	Questionnaire section
1	The over 60s are a heterogeneous group with increased age impacting upon their ability to handle and prepare food	Nordin, (2009) Brennan <i>et al.</i> (2007) Hudson and Hartwell, (2002) Johnson <i>et al.</i> (1998)	1, 2, and 3
2	Gender influences adherence to food safety recommendations in the 60+ cohort	Davison, Arber and Marshall, (2009) Brennan <i>et al.</i> (2007) Thompson, (1996)	1, 2, and 3
3	Adults aged 60+ will demonstrate less personal culpability and exhibit an illusion of control in relation to domestic food safety	Jevsnik, <i>et al.</i> (2008) Macdonald and Hunter, (2008) Unusan, (2007) Kennedy <i>et al.</i> (2005) Terpstra <i>et al.</i> (2005) Clayton and Griffith, (2004) Redmond and Griffith, (2003) Brennan <i>et al.</i> (2007) McCarthy & Brennan, (2007)	2 and 3
4	The cohort will demonstrate discrepancies between knowledge and practice of food safety recommendations	Jevsnik <i>et al.</i> (2008) Brennan <i>et al.</i> (2007) Jackson <i>et al.</i> (2007) McCarthy <i>et al.</i> (2007) Kennedy, <i>et al.</i> (2005) Redmond and Griffith, (2005) Wilcock <i>et al.</i> (2004) Miles and Frewer, (2001) And Schutz, (1999) Henson and Caswell, (1999) Miles, Braxton and Frewer, (1999) Griffith, Worsfold and Mitchell, (1998)	2 and 3
5	Being aged 60+ increases the likelihood of engaging with unsafe kitchen practices and owning poorly functioning kitchen equipment	Brennan <i>et al.</i> (2007) McCarthy <i>et al.</i> (2007) McCarthy <i>et al.</i> (2005) Gettings and Kiernan, (2001) Johnson <i>et al.</i> (1998)	2 and 3

(Source: Author compiled)

In total the questionnaire consisted of 122 questions (see Appendix 2 for the full questionnaire). Figure 5.1 maps the sequential flow of the questionnaire, the question types included and its structure.

Figure 5.1: Questionnaire Design

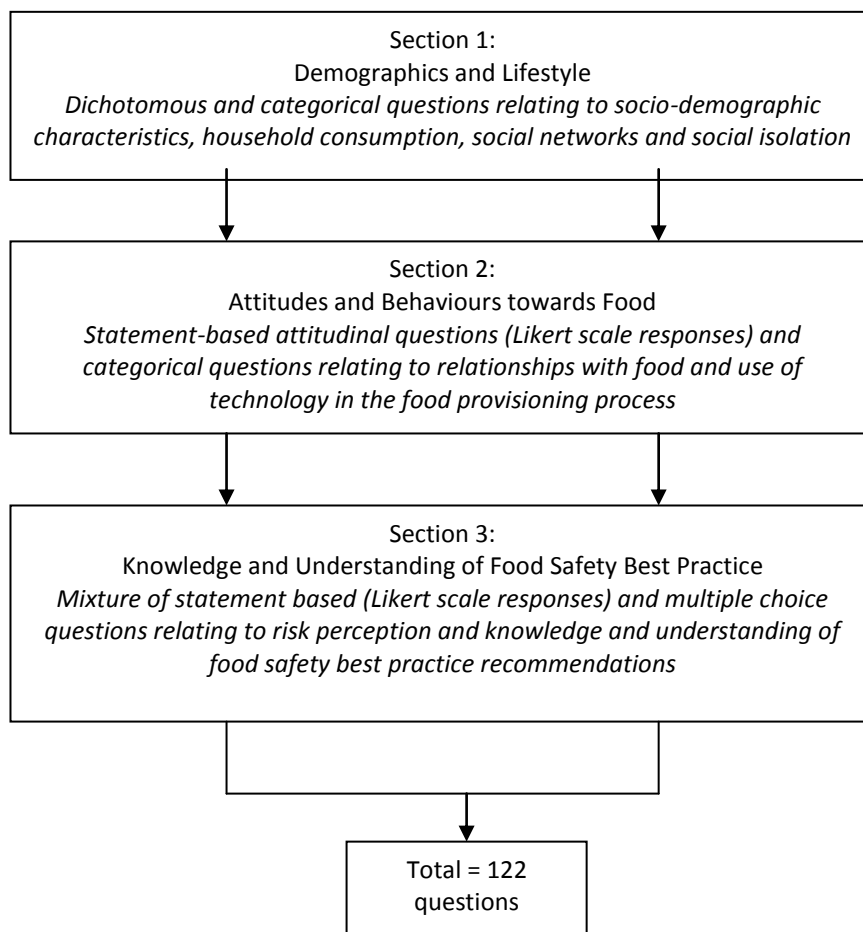


Table 5.2 presents the main question theme areas, identifies the questions included within the section and the type of question asked.

Table 5.2: Questionnaire Format

Questionnaire Section	Question Area	Questions Included	Question Type
1	Demographics and Lifestyle	Age Gender Marital status Household composition Wider social networks Retirement age Retirement reason Income Benefits	Dichotomous Category List List List Dichotomous Category and open List List
1	Health and Self-Perceptions	Health status Medical conditions Management	Category Dichotomous 5 point Likert Scale
2	Attitudes and Behaviours Towards Food	Relationship with food Risk perception Food quality assessment	5 point Likert Scale Dichotomous 5 point Likert Scale
3	Knowledge and Understanding of Food Safety Best Practice.	Listeria 'high-risk' foods purchased Food safety best practice behaviours	List Category

(Source: Author constructed; Bell, 2005)

Section one was primarily focused on assessing lifestyle and traditional demographic characteristics identified in *Chapter 3*, such as marital status, living arrangements, ability to drive and income. Therefore, response to these questions was measured using a mixture of dichotomous yes/no responses, categorical and grid questions that allowed for the recording of answers to more than one question simultaneously (Bell, 2005). Although it is acknowledged that individuals' food safety practices are differentiated from biological risk factors (Gerba, Rose and Haas, 1996), as the preoccupation of this thesis is listeria and its contraction, questions were included throughout all three sections to assess this. Within section one, questions were included that sought to understand participants' perceived health status, through questions that provided indicators of medical conditions related to listeria and their perceived level of severity. The purpose of this was to gain an understanding of potential physical susceptibility to listeriosis and immune functioning.

Within section 2, questions aimed to measure the propensity, number and frequency of 'high-risk' listeria foods purchased or eaten, drawn from Table 2.6, with responses measured using categorical questions. This section also included questions relating to respondents' perceptions of food risks and an assessment of their personal risk of foodborne illness informed by past food safety risk research (Brennan *et al.* 2007; McCarthy *et al.* 2007) with responses measured on a 1-5 Likert scale. In addition, this section included questions to test respondents' knowledge of food safety best practice. Although this section was informed by Brennan *et al.* (2007) and McCarthy *et al.* (2007), modifications were made to reflect current UK²⁴ guidelines (DirectGov, 2012) (see Section 2.6). These questions were presented in the form of a knowledge and deviating practice test, whereby respondents were presented with three multiple-choice responses (correct, incorrect and don't know) for each option (see Appendix 2 questions 92-104).

Food quality assessment related particularly to consumer understanding of and adherence to manufacturers' UBD recommendations. Statements were included in section 3 of the questionnaire and were developed exclusively for this research. These statements were specifically intended to relate to listeria risk behaviours (such as the identification of high-risk foods purchased and consumed, refrigerator temperatures) and focused specifically on generating insight into participants' understandings and level of adherence to manufacturers' UBD recommendations (Milne, 2011; ACMSF, 2009; Brennan *et al.* 2007, McCarthy *et al.* 2007 and Hudson and Hartwell, 2002). Statement construction was informed by both the literature and the FSA's domestic food safety best practice recommendations (see Section 2.6 and Table 2.10), with responses being measured on a 1-5 Likert scale, where 1=strongly disagree and 5=strongly agree.

²⁴ Brennan *et al.* (2007) and McCarthy *et al.* (2007)'s research was conducted on the Island of Ireland, the sample consisted of n= 1025 aged 18-65+

5.4 Sample Considerations

In line with evidence presented by the ACMSF (2009) on the potential causes of the sustained increase in cases of listeria (outlined in *Chapters 1 and 2*), a sampling framework was established which required that all respondents be:

1. Aged 60+, as vulnerability to listeria has been shown in this age group (ACMSF, 2009; SSRC, 2009; Gillespie *et al.*, 2006)
2. Living independently and not in any form of social-care facility

The latter was intended to ensure that the respondents had some level of responsibility for food preparation, even if they were not the sole food preparer in their household. Intentional over-sampling of the 76+ segments was considered prudent owing to the associations made between increased age and vulnerability to listeria (ACMSF, 2009; Gillespie *et al.*, 2006). Consultation with a number of stakeholder groups for the 60+ in the North East of England was sought during the design stages of the questionnaire. These included the Institute for Ageing and Health (Newcastle University), the Elders Council and Years-Ahead. Advice given related to how to interact with the target audience, recruitment strategies and how to present the questionnaire aesthetically (e.g. font size) as response rates to self-completion questionnaires can often be low (Bryman, 2004; Milne 1999). Therefore there was a potential for this to be compounded by the age and sensitivities of the research cohort. Such age group sensitivities could include the potential for physical limitations, visual deterioration and reduced fine motors skills, all of which could lead to reluctance to participate and participant fatigue. The questionnaire was designed in such a way that it could be administered face-to-face by the researcher. This ensured response rates were met and addressed any potential for question ambiguity. Adapting the presentation of the questionnaire and ensuring that the typeface was both enlarged and clear, allowed for the questionnaire to be completed collaboratively. Thus the researcher was able to read out questions and note response, but the respondent was also able to read questions and point out responses. This increased the quality of response and

allowed for more qualitative explanations of responses to be gained. The researcher annotated the questionnaire, making note of anecdotal insights about the home and the individual as background knowledge and expanded on the insights gained through direct question response (Bryman, 2004). Additional scale response charts were made and given to respondents which helped them to focus on the questions and improved the quality of the responses and the speed of administration.

Self-completion was permitted in cases where requested by the respondent, although in order to elicit more detailed responses, avoid potential ambiguity of questions, and ensure high completion rates it was discouraged. Additional benefits of administering the questionnaire face-to-face included reducing sample bias by including those with visual deterioration and supported the establishment of good rapport with participants, which aided the recruitment of households for Phase 2 of the research. This approach had the additional benefit of immersing the researcher in and engaging with this age cohort, which provided valuable first hand insights into the breadth of these lifestyles and lived experiences.

A mix of quota and snowball sampling techniques were used to recruit respondents. Quota sampling, although not a random method, allows for a basic sampling framework to be implemented (Bryman, 2004). It assures that the sample mirrors the proportions of individuals to those of the sample population, with respect to known characteristics, traits or the focus of the research (Castillio, 2009). In this instance, age and gender quotas were in line with national population statistics, the aims of the research and the inclusion criteria outlined above. The inclusion criteria were intentionally loose and the framework was purposely designed to draw on an eclectic demographic mix of older consumers in order to reflect the heterogeneity of those aged 60+.

National statistics for the North East indicated a quota sample of 40 % adults aged 60-64 years, 31% aged 65-75 years and, in line with increases in adults reaching age 80+, 29% of respondents were required to be over 75. An inevitable female bias in

the sample was anticipated, although in-line with national statistics, a female to male response ratio of 1:1.2 was desired (ONS, 2001²⁵).

Although quota sampling provided the primary sampling framework, snowballing sampling was also encouraged. Snowball sampling, is typically reserved for research whose focus is on hard-to-reach populations. This method works in chain referral where the researcher asks research participants to identify people with similar traits and interests (Castillio, 2009). However, owing to concerns relating to representativeness, this was kept to a minimum although occurred as the questionnaire process progressed and respondents' word-of-mouth encouraged participation of others in friendship networks and within households²⁶.

5.4.1 Recruitment and Incentives

To assist with the recruitment process and ensure diversity within the sample, contact was made with a number of age-related organisations across the North East region. First the research was advertised in the Elders Council newsletter, aimed at the 60+ in the North East of England with the subscription of 2,300. The advert ran for two editions, circulated in November and December 2010 (see Appendix 3). Further links were established with sheltered accommodation homes in the Newcastle and Tyne and Wear area, day centres in Newcastle city centre and Wallsend, and U3A organisations in Newcastle and Sunderland districts. Table 5.3, documents the organisations that assisted with the recruitment process, identifying the position of the gatekeeper, their organisational affiliation and location.

²⁵ It is acknowledged that this data is out-dated, however, at the questionnaire pre-dates the 2011 census and this data was therefore, unavailable.

²⁶ It is acknowledged that Snowball sampling can affect the generalizability of results and therefore, the number of participants recruited via this sampling method was kept to a minimum.

Table 5.3: Gatekeepers, Organisations and Location

Position	Organisation	Address
Centre manager	Cedar Grove Day Centre (Age UK)	Cedar Grove Wallsend NE28 6PR
Café manager	Age UK Café (Mia House)	Mia House Newcastle upon Tyne
Manager	Woodland Mews (sheltered accommodation)	Reid Park Road Jesmond Newcastle upon Tyne
Manager	Rowan Croft Day Centre	Goodwood Killingworth Tyne and Wear
Activities manager	Linskill Park (sheltered housing accommodation)	Rowan Croft Day Centre Goodwood Killingworth Tyne and Wear
Manager	Methodist Homes (sheltered housing accommodation)	Eslington Terrace Jesmond Newcastle upon Tyne
Manager	Mary Magdalene Bungalows and Holy Jesus Trust (sheltered housing accommodation)	Mary Magdalene Bungalows and Holy Jesus Trust, Claremont Rd, Newcastle upon Tyne NE2 4NN
Group convenor	Sunderland U3A	38 The Mowbray, Brough Road Sunderland SR1 1PS
Centre manager	The Grove Centre (day center)	Grange Welfare Association, The Grange Centre, Newburn Road, Throckley, Newcastle upon Tyne. NE15 9AF

Recruitment within these organisations required telephone and email contact to be established with key gatekeepers (managers of sheltered accommodation and day centres and heads of the U3A organisations in the respective districts). Contact was also made with a number of respondents from an existing university database, which included individuals aged 60+ who had expressed an interest in partaking in future food related research. In this instance, contacts were sent details of the study and an invitation to participate, by letter (see Appendix 4).

Acting on advice gained from the period of stakeholder consultation, all participants were remunerated with £10 on completion of the questionnaire. This was in-line with recommendations of Voice North (dedicated database of individuals aged 60+ with an interest in participating in research) and was considered to improve participants' propensity to continue their contribution to the research. Although it is typical for participant remuneration to be given in the form of shopping vouchers, in this instance, it was envisaged that some of the respondents would have mobility problems, therefore making the use of vouchers difficult. Additionally, in the case of day centres where not all service users were able to participate, monetary remuneration allowed a donation to the centre to be made on behalf of the participating service users.

5.4.2 Piloting

Following ethical approval (documentation in Appendix 6), the questionnaire was piloted during September 2010 on a mixed gender convenience sample of 20 respondents. Prior to piloting, the questionnaire was circulated amongst local age-related advocacy group 'Years Ahead' the North East's Regional Forum on Ageing, and advisory stakeholders including social gerontologists at Newcastle University's Institute for Ageing and Health and microbiologists from Geneius Microbiology Laboratory (Newcastle University). Questions were then revised *post-hoc* on the basis of results and insights gained as well as peer review. Piloting reinforced the face-to-face administration approach and allowed for question clarity to be verified and approximate interview times to be gauged.

5.4.3 Questionnaire Procedure

Owing to the diversity of the potential sample, researcher flexibility when administering the questionnaire was essential. This included offering to meet with respondents in a place and at a time that was most convenient to them. This included a range of locations, for example, respondents' homes, libraries, coffee shops, resident lounges and lunch clubs. Newcastle University's 'lone worker'

guidelines required that the researcher be accompanied when visiting participants' homes. Accommodating the scheduling of an additional person into the interview appointments significantly extended the data collection period²⁷. In addition, consultation in the design stages of the research prompted further precautions to be taken through the subscription to a personal monitoring system Guardian 24²⁸. It was not judged that the presence of an additional person affected participants' responses. The questionnaire process typically lasted approximately 60-90 minutes and extended to a maximum of 2.5 hours, depending on the interviewee's health status, social networks and general engagement with food and the data collection process.

Respondents were first informed of the purpose of the questionnaire and given an overview of its structure. Respondent confidentiality, data anonymity and the participant's right to withdraw from the research without prejudice was then discussed. All respondents were asked to sign a participation consent form and answer two screening questions to verify eligibility criteria outlined in Section 5.4 (which was initially ascertained prior to confirming the interview appointment). Following completion of the questionnaire, respondents were given a debrief pack. This included a leaflet from the FSA about listeria and listeriosis prevention, a temperature monitor for the fridge, a researcher contact card and their remuneration. Respondents were also asked to indicate whether they would be happy to be contacted again should their profile meet the criteria for Phase 2 of the research.

5.4.4 Sample Composition and Fit

The final sample contained 213 participants, of which 157 were female and 56 were male, giving a female to male ratio of 1:2.8. This was not representative of the

²⁷ The data collection occurred during a particularly severe winter (October 2010-February 2011) when interviewees and sometimes interviewer had to reschedule meetings due to inclement weather.

²⁸ Guardian 24 is a personal monitoring system activated through mobile telephones and is extensively used by medical workers conducting home visits.

national average (1:1.2). However, it was consistent with difficulties experienced by other researchers (Terpstra *et al.*, 2005; Clayton, Griffith and Price, 2003; Hudson and Heartwell, 2002; Miles and Frewer, 2000; Altekruise, 1999; Griffith, Worsfold and Mitchell, 1998; Rabb and Woodburn, 1997) of the prominence of female food handlers in the home, engaging older males in research of this nature and demographic trends (females outliving males). Table 5.4 shows the sample profile compared to national statistics for the North East (ONS, Census, 2001²⁹).

Table 5.4: Sample Composition

Age Study Cohort (n=213)	Age National Statistics	Female (n)	Male (n)	Frequency (n)	Percentage %	N=213 (% by Nat Stat age category)	Nat Stat (% for NE by age category)
60-65	60-64	44	22	66	31	31	40
66-70	65-75	18	8	26	12.2	26.2	31
71-75		21	9	30	14		
76-80	75 +	23	3	26	12.2	42.8	29
81-85		24	5	29	13.6		
86-90		20	8	28	13.1		
91-95		6	1	7	3.3		
96-100		1	0	1	0.5		
Total		157	56	213	100	100	100

(Source: adapted from ONS, Census 2001)

The fit of the sample with national statistics is of importance as it dictates the extent to which these findings are representative. National statistics categorise age into three categories and although this research used a greater number of age groupings, comparisons may still be drawn. Thus, the sample is consistent with the North East percentage for those aged 65-75. Under representation in the 60-64 category was justified by intentional over-sampling in the 75+ due to evidence that there is a direct association of increased risk of listeriosis, particularly in the 80+ age group, as outlined in Section 2.4.5 (ACMSF, 2009; Gillespie *et al.*, 2006).

²⁹ The questionnaire pre-dates the 2011 census and therefore this data was used as it was all that was available at the time.

5.5 Results

Table 5.5, provides the demographic composition of the 213 sample.

Table 5.5: Demographic Composition of the Sample

Factor	Level	Number (n=)	% of Sample
Gender	Male	56	26.29
	Female	157	73.71
Age			
Age	60-65	66	31
	66-70	26	12.2
	71-75	30	14.1
	76-80	26	12.2
	81-85	29	13.6
	86-90	28	13.1
	91-95	7	3.3
	96-100	1	0.5
Marital Status			
Marital Status	Married/Living as	74	34.7
	Single (never married)	23	10.8
	Widowed	94	44.1
	Divorced	22	10.3
Living Arrangements			
Living Arrangements	Own Property	113	53.1
	Own property with mortgage or loan	9	4.2
	Pay part rent part mortgage	4	1.9
	Rent property	81	38
	Live in home rent free	3	1.4
	Other	3	1.4
Income			
Income	5,000-9,999	53	26.6
	10,000-19,999	54	27.1
	20,000-29,999	38	14.1
	30,000-39,999	13	6.5
	40,000-49,999	5	2.5
	50,000 +	6	3
	Don't Know	54	26.7
Ability To Drive			
Ability To Drive	Yes	105	49.3
	No	108	50.7

5.5.1 Data Analysis

The data were analysed using SPSS 18.0 (Statistical Package for Social Science, Mac Ed) conducted in three stages, principal component analysis (PCA), hierarchical cluster analysis, K-Means cluster analysis and cluster profiling were performed.

PCA was applied in order to identify the underlying structure across the three key subsections of the questionnaire: i) relationship with food, ii) perceived risk of illness and iii) assessment of food quality. Data were explored to identify correlations amongst variables as well as a means of prioritizing and reducing the data to determine interrelated factors that represented dimensions in terms of the above (Hair, *et al.*, 2010). Each set of variables examined using PCA contained 20, 20 and 18 statements respectively and response was tested using a 5-point Likert scale, where 1= strongly agree and 5= strongly disagree.

The 15 factors derived from the PCA analysis were subsequently used as the basis for the cluster analysis. A two-stage clustering process was applied. First, a hierarchical cluster analysis was employed to provide an indication of the optimum number of clusters for the data set (Hibbert, *et al.*, 2004) and to avoid estimation (Everitt *et al.*, 2011 in Balding *et al.*, 2011). This indicated a 2-5 cluster solution was optimum for this data set. Second, the K-Means optimization method was employed to derive a solution with the specified number of clusters. Cluster profiling allowed depth and description to the collective attitudes and behaviours contained within each of the derived clusters. The cluster profiles were established on the basis of average factor scores and the target variables of the cluster analysis. Third, the Pearson's Chi-Squared test and comparison of means was subsequently applied in order to further develop the clusters on the basis of demographic variables, for which there were statistically significant differences at the 5% significance level.

The results using this three-stage analytical approach informed and provided the basis for the construction of three narrative typologies. These descriptively explored the lifestyles of each of the clusters, their relationships with food and the characteristics that place them 'at risk' from a food safety perspective. This allowed for narrative representations of the quantitative profile of each of the three clusters that collectively accounted for the attitudes and behaviours held by each, and provided an informed platform on which future ethnographic observations could be situated.

Further analysis was conducted, on the data in order to sample from within the clusters, using the assessment of knowledge and propensity to deviate from domestic food safety best practice recommendations (McCarthy *et al.*, 2006). This categorized the cohort on the basis of 'high-risk', whereby individuals deemed as 'high-risk' had low levels of knowledge and high levels of deviation from domestic food safety best practice recommendations. This provided a framework from which individuals, who were also representative of each of the clusters, could be re-recruited for Phase 2 of the study.

5.5.2 Factor Analysis

PCA (factor analysis) is a generic term given to a range of multivariate techniques whose '*primary purpose is to define the underlying structure among the variables in the analysis*' (Hair *et al.* 2010, p34). It is employed as means of reducing data by identifying smaller sets of underlying dimensions (factors) that can explain the inter-relationships (covariance or correlation) between an original or large set of variables, with the least amount of information lost (Variance Explained) (Hair *et al.* 2010). Factor analysis is recognised as playing an important role in the adoption of other multivariate techniques and was therefore used to reduce and prioritise this data set. However, it does not allow conclusions to be drawn on which associated attitudes or behaviours belong to which participants or groups of participants.

Adherence to Kaiser normalisation was used to simplify the interpretation of the factors and only those with an Eigenvalue greater than 1 were retained, with those falling below this level being considered insignificant and therefore discarded (Hair *et al.* 2010). Additional boundaries were established and only those with a coefficient value of ≥ 0.6 were taken forward to subsequent Varimax and Kaiser normalisation cycles. High negative loadings (> -0.6) were accepted and interpreted as reflecting the opposite of the test variable being true for the factor. The Kaiser-Meyer-Olkin Index of Sampling Adequacy (KMO) (Kaiser, 1974) and Bartlett's Test of Sphericity were used as a measure of sample significance with all data falling

within the ‘*middling*’ and ‘*meritorious*’³⁰ range. In addition, factor mean scores were calculated for each variable in each of the three cycles, allowing for the interpretation of each of the factors against the original Likert scale values, to be made.

1. Relationship With Food (PCA)

Table 5.6, shows the final loading scores after the first Varimax rotation with Kaiser normalisation of the cycle assessing respondents’ relationship with food. This shows that the 20 original variables were reduced to 6 factors that accounted for 70% of total variance explained. Looking for the h^2 value to be as close to 1 (unity) as possible and no less than 0.6, it was clear that, with the exception of variables 16 and 20, all variables were respectable and fell above the 0.6 communality threshold. The cycle was re-run with variables 16 and 20 omitted to establish the significance of the factors with these variables removed. The removal of variables 16 and 20 reduced the KMO value to .689 accounting for 68% of the variance and therefore, increased the percentage of information loss to 32%. This is lower than with all 20 variables present; it also reduced the number of significant variables associated with each factor, and therefore reduced the amount of information for each factor. Therefore, the decision to revert to the results of the first cycle was made, retaining variables 16 and 20.

³⁰ KMO is a measure of sampling adequacy, that predicts whether data collected will factor well, the KMO should be greater than 0.5 for a satisfactory factor analysis to proceed. The KMO index, degree of covariance table:

KMO value	Degree of common variance
0.90-1.0	Marvellous
0.80-0.89	Meritorious
0.70-0.79	Middling
0.60-0.69	Mediocre
0.50-0.59	Miserable
0.00-0.49	Don’t factor

(Source: Philips, 2012)

Table 5.6: Rotated Component Matrix: Attitudes Towards Food

		Factors							
Variable No	Chapter 1 Variable	Chapter 2 1	2	3	4	5	6	h ²³¹	
1	Chapter 3 Feel lonely	Chapter 4 0.124	Chapter 5 0.681	Chapter 6 0.101	Chapter 7 0.032	Chapter 8 -0.072	Chapter 9 0.24	Chapter 10	
Chapter 11 2	Chapter 12 Purchase food	Chapter 13 0.001	Chapter 14 -0.051	Chapter 15 0.848	Chapter 16 0.001	Chapter 17 -0.064	Chapter 18 -0.105	Chapter 19	
Chapter 20 3	Chapter 21 Don't enjoy eating	Chapter 22 0.247	Chapter 23 0.614	Chapter 24 0.274	Chapter 25 -0.025	Chapter 26 0.068	Chapter 27 -0.181	Chapter 28	
Chapter 29 4	Chapter 30 Find the shops easy to access	Chapter 31 -0.063	Chapter 32 -0.655	Chapter 33 0.026	Chapter 34 0.251	Chapter 35 -0.347	Chapter 36 -0.046	Chapter 37	
Chapter 38 5	Chapter 39 Shop for food as and when	Chapter 40 0.006	Chapter 41 -0.22	Chapter 42 0.189	Chapter 43 -0.058	Chapter 44 -0.773	Chapter 45 0.2	Chapter 46	
Chapter 47 6	Chapter 48 Purchase from supermarkets	Chapter 49 0.342	Chapter 50 -0.065	Chapter 51 0.233	Chapter 52 -0.195	Chapter 53 0.549	Chapter 54 0.309	Chapter 55	
Chapter 56 7	Chapter 57 Like to experiment with food	Chapter 58 -0.814	Chapter 59 -0.069	Chapter 60 -0.089	Chapter 61 0.071	Chapter 62 -0.111	Chapter 63 -0.061	Chapter 64	
Chapter 65 8	Chapter 66 Enjoy cooking	Chapter 67 -0.837	Chapter 68 -0.158	Chapter 69 -0.062	Chapter 70 0.073	Chapter 71 0.072	Chapter 72 -0.025	Chapter 73	
Chapter 74 9	Chapter 75 Prepare food	Chapter 76 -0.046	Chapter 77 0.204	Chapter 78 0.826	Chapter 79 -0.117	Chapter 80 0.097	Chapter 81 0.049	Chapter 82	
Chapter 83 10	Chapter 84 Food shopping is a social activity	Chapter 85 -0.009	Chapter 86 0.089	Chapter 87 0.009	Chapter 88 0.066	Chapter 89 -0.008	Chapter 90 0.827	Chapter 91	
Chapter 92 11	Chapter 93 Socializing involves food	Chapter 94 -0.139	Chapter 95 0.098	Chapter 96 0.007	Chapter 97 0.558	Chapter 98 0.069	Chapter 99 0.48	Chapter 100	
Chapter 101 12	Chapter 102 Cook my meal from scratch	Chapter 103 -0.726	Chapter 104 -0.132	Chapter 105 0.184	Chapter 106 -0.016	Chapter 107 -0.096	Chapter 108 0.029	Chapter 109	
Chapter 110 13	Chapter 111 Eat alone	Chapter 112 0.197	Chapter 113 0.335	Chapter 114 0.591	Chapter 115 -0.048	Chapter 116 0.093	Chapter 117 0.221	Chapter 118	
Chapter 119 14	Chapter 120 Eat out often	Chapter 121 0.027	Chapter 122 -0.128	Chapter 123 -0.066	Chapter 124 0.808	Chapter 125 0.067	Chapter 126 -0.048	Chapter 127	
Chapter 128 15	Chapter 129 See food as fuel	Chapter 130 0.338	Chapter 131 0.419	Chapter 132 0.343	Chapter 133 0.204	Chapter 134 0.008	Chapter 135 -0.262	Chapter 136	
Chapter 137 16	Chapter 138 Eat meals that don't require cooking	Chapter 139 0.271	Chapter 140 0.582	Chapter 141 0.047	Chapter 142 0.017	Chapter 143 0.038	Chapter 144 0.055	Chapter 145	
Chapter 146 17	Chapter 147 Shop for food once a week	Chapter 148 0.071	Chapter 149 0.013	Chapter 150 0.154	Chapter 151 0.115	Chapter 152 0.835	Chapter 153 0.084	Chapter 154	
Chapter 155 18	Chapter 156 See cooking as a means to an end	Chapter 157 0.733	Chapter 158 0.245	Chapter 159 0.219	Chapter 160 -0.031	Chapter 161 -0.029	Chapter 162 -0.075	Chapter 163	
Chapter 164 19	Chapter 165 Enjoy eating out	Chapter 166 0.006	Chapter 167 0.011	Chapter 168 -0.047	Chapter 169 0.843	Chapter 170 -0.024	Chapter 171 0.057	Chapter 172	
Chapter 173 20	Chapter 174 Purchase ready-made meals	Chapter 175 0.552	Chapter 176 0.274	Chapter 177 -0.027	Chapter 178 0.192	Chapter 179 0.238	Chapter 180 -0.074	Chapter 181	
31 h ²	Chapter 182 Eigenvalue	Chapter 183 3.182	Chapter 184 2.209	Chapter 185 2.172	Chapter 186 1.905	Chapter 187 1.843	Chapter 188 1.305		

31 h² communalities

	Chapter 189 % Variance	Chapter 190 15.91	Chapter 191 11.045	Chapter 192 10.858	Chapter 193 9.526	Chapter 194 9.215	Chapter 195 6.523	
	Chapter 196 % Cumulative Variance	Chapter 197 15.91	Chapter 198 26.954	Chapter 199 37.813	Chapter 200 47.338	Chapter 201 56.554	Chapter 202 63.077	

Table 5.7 presents the final factor loadings; factor mean scores and loading interpretations for this cycle. The variables loading onto factor 1.1 can be interpreted as an unenthusiastic and utilitarian approach towards food and its preparation. Measures of loneliness and isolation, loaded onto factor 1.2, whilst the variables loading onto factor 1.3 denotes independent food procurement and preparation and solitary meal occasions. Factor 1.4 recognises enjoyment of food and its use as a vehicle for socialisation and interaction with others and factor 1.5 is synonymous with methodical food procurement approaches. Finally, factor 1.6, which accounted for the least percentage of total variance explained, highlights the role of food shopping. Aggregate mean factor scores across this factor rotation are recognisably low; nevertheless, factor 1.3 was shown to be the strongest ($\mu= 3.14$) with ambivalence to factor 1.1 ($\mu=2.91$) being interpreted as representative of the decline in interest in food preparation as chronological age increases.

Table 5.7: PCA, Relationship with Food

Factor number	Associated variables No.	Associated Variables	Coefficient (h^2)	Variance Explained (%)	Factor Mean (μ)	Interpretation
1.1	8 7 18 20	Enjoy cooking Like to experiment with new recipes See cooking as a means to an end Purchase ready-made meals for convenience	-.837 -.814 .733 .552	15.91	2.91	Utilitarian Traditionalists
1.2	1 4 16	Feel lonely Find the shops in my area easy to access Eat meals that do not require cooking	.681 -.655 .582	11.045	2.74	Minimalist Isolationism
1.3	2 9 14	Only person that purchase food eaten Only person that prepares the food eaten Often eat alone	.848 .826 .591	10.858	3.41	Contented Individualism
1.4	19 14 11	Enjoy eating out Eat out often Socializing involves food	.843 .808 .558	9.526	2.94	Social Eating
1.5	17 5 6	Shops for food once a week Shops for food as and when Only purchases food from supermarkets	.835 -0.773 .549	9.215	3.08	Structured Planning
1.6	10	Shopping for food is a social activity	.827	6.523	2.69	Social Shopping

2. Perceived Risk of Illness

Table 5.8, presents the final loading scores after the second Varimax rotation with Kaiser normalisation, showing reduction of the initial 19 variables assessing perceived risk of illness from food related concerns to four factors. Due to communalities falling significantly below the 0.6 threshold, variables 7: '*saturated fats*', and 18: '*food handling practices of others*', were removed from the analysis. Removal of these factors increased the percentage total variance explained. This rotation accounted for 86% of the total variance. Originally perceived risk of illness contained 20 variables. However, due to a considerable lack of awareness of *Campylobacter* identified during the data collection process and non-response to this question, which was further verified when looking at the descriptive statistics, this variable was removed from the analysis to avoid distorting the results.

Table 5.8: Rotated Component Matrix: Risk of Illness

		Rotated Component Matrix: Risk of Illness				
Variable No.	Chapter 204 Variable	Chapter 205 1	Chapter 203 Factor Chapter 206 2	Chapter 207 3	Chapter 208 4	Chapter 209 5
Chapter 210 1	Chapter 211 Food additives	Chapter 212 -0.003	Chapter 213 0.672	Chapter 214 0.013	Chapter 215 -0.142	Chapter 216 0.000
Chapter 217 2	Chapter 218 Salmonella	Chapter 219 0.752	Chapter 220 0.17	Chapter 221 -0.098	Chapter 222 0.045	Chapter 223 0.000
Chapter 224 3	Chapter 225 High salt concentrations	Chapter 226 0.409	Chapter 227 0.522	Chapter 228 0.143	Chapter 229 -0.101	Chapter 230 0.000
Chapter 231 4	Chapter 232 Re-heating food at home	Chapter 233 0.698	Chapter 234 -0.072	Chapter 235 0.265	Chapter 236 -0.331	Chapter 237 0.000
Chapter 238 5	Chapter 239 BSE	Chapter 240 0.517	Chapter 241 0.431	Chapter 242 0.2	Chapter 243 0.19	Chapter 244 0.000
Chapter 245 6	Chapter 246 Ecoli	Chapter 247 0.756	Chapter 248 0.384	Chapter 249 -0.01	Chapter 250 0.209	Chapter 251 0.000
Chapter 252 8	Chapter 253 Unhealthy diet	Chapter 254 0.59	Chapter 255 0.182	Chapter 256 -0.061	Chapter 257 0.372	Chapter 258 0.000
Chapter 259 9	Chapter 260 Own food handling practices at home	Chapter 261 0.174	Chapter 262 -0.008	Chapter 263 0.095	Chapter 264 0.692	Chapter 265 0.000
Chapter 266 10	Chapter 267 Mould on food	Chapter 268 0.514	Chapter 269 0.261	Chapter 270 0.252	Chapter 271 -0.308	Chapter 272 0.000
Chapter 273 11	Chapter 274 Pesticide residues	Chapter 275 0.305	Chapter 276 0.657	Chapter 277 -0.016	Chapter 278 -0.053	Chapter 279 0.000
Chapter 280 12	Chapter 281 Probiotics in food	Chapter 282 0.013	Chapter 283 0.008	Chapter 284 0.748	Chapter 285 -0.058	Chapter 286 0.000
Chapter 287 13	Chapter 288 Organic food	Chapter 289 0.031	Chapter 290 0.088	Chapter 291 0.746	Chapter 292 0.35	Chapter 293 0.000
Chapter 294 14	Chapter 295 GM foods	Chapter 296 0.145	Chapter 297 0.397	Chapter 298 0.507	Chapter 299 -0.345	Chapter 300 0.000
Chapter 301 15	Chapter 302 Listeria bacteria	Chapter 303 0.753	Chapter 304 0.221	Chapter 305 0.023	Chapter 306 0.261	Chapter 307 0.000
Chapter 308 16	Chapter 309 Antibiotic residues	Chapter 310 0.279	Chapter 311 0.706	Chapter 312 0.032	Chapter 313 0.175	Chapter 314 0.000
Chapter 315 17	Chapter 316 Viruses in food	Chapter 317 0.549	Chapter 318 0.484	Chapter 319 0.122	Chapter 320 0.053	Chapter 321 0.000
Chapter 322 19	Chapter 323 Hormone residues	Chapter 324 0.156	Chapter 325 0.741	Chapter 326 0.139	Chapter 327 0.134	Chapter 328 0.000
	Chapter 329 Eigenvalue	Chapter 330 3.787	Chapter 331 3.121	Chapter 332 1.626	Chapter 333 1.302	Chapter 334 0.000
	Chapter 334 % Variance	Chapter 335 22.277	Chapter 336 18.36	Chapter 337 9.567	Chapter 338 7.658	Chapter 339 0.000
	Chapter 339 % Cumulative Variance	Chapter 340 22.277	Chapter 341 40.637	Chapter 342 50.204	Chapter 343 57.861	Chapter 344 0.000

Table 5.9 presents the final factor loadings and aggregated factor mean scores for each of the derived factors and shows evident distinctions between food risks, with factor 1.1 obtaining the highest mean score ($\mu=3.25$) and factor 1.4 the least ($\mu=1.79$). The variables loading onto factor 1.1, led to it being associated with microbiological pathogens, whilst the loadings of factor 1.2 were interpreted as being predominantly food production risks. The grouping of '*Organic food*', '*Probiotics*' and '*GM*' was loaded onto factor 1.3, and positioned this factor as representative of publicly debated food-related concerns. Finally, only one variable '*own food handling*' loaded onto factor 1.4 and highlighted the importance of personal control within the cohort.

Table 5.9: PCA- Risk of Illness

Factor Number	Associated Variables No	Associated Variables	Coefficient (h ²)	Variance Explained (%)	Factor Mean (μ)	Interpretation
1.1	6	Ecoli	.756	22.277	3.25	Microbial Knowns
	14	Listeria	.753			
	2	Salmonella	.752			
	4	Reheating food	.698			
	16	Viruses	.549			
	9	Mould	.514			
1.2	17	Hormone residues	.741	18.36	2.92	Production Risks
	15	Antibiotic residues	.706			
	1	Food additives	.672			
	10	Pesticide residues	.657			
1.3	11	Organic food	.812	9.56	2.17	Publicly Debated
	12	Probiotics	.702			
	13	GM	.507			
1.4	8	Own food handling	.692	9.567	1.79	Personal Control

3. Assessment of Food Quality

Table 5.10 shows the final loading scores and interpretation after the third Varimax rotation with Kaiser normalisation, and the reduction from 18 original variables to 6 factors. The first iteration showed variables to fall below the 0.6 threshold and subsequently three variables were removed from the analysis. These included, '*I rely on use-by dates as an indication of freshness*', '*I often cook using leftover food*' and '*I don't like to waste food*'. Following the removal of the aforementioned variables, this left one variable that did not load onto any of the factors and had a h^2 that is significantly lower than the lowest 0.6 threshold. The variable, '*I use surface cleaners when cleaning my kitchen*', was therefore removed from the analysis. This did however reduce total variance, although it allowed for greater variable loading onto the five factors. Total variance explained by this factor loading cycle was 75%.

Table 5.10: Rotated Component Matrix: Food Quality

		Rotated Component Matrix(a) Food Quality						
				Chapter 344 Fac tor				
Variable No.	Chapter 345 Variable	Chapter 346 1	Chapter 347 2	Chapter 348 3	Chapter 349	Chapter 350	Chapter 351	
Chapter 35	Chapter 353 I rely on the look of food as an indication of freshness	Chapter 354 0 .012	Chapter 355 0 .223	Chapter 356 0.1 98	Chapter 357 .011	Chapter 358 .736	Chapter 359 .631	
Chapter 36	Chapter 361 I would eat cheese that has past the use-by date	Chapter 362 0 .807	Chapter 363 - 0.013	Chapter 364 0.1 82	Chapter 365 0.044	Chapter 366 0.04	Chapter 367 .689	
Chapter 36	Chapter 369 I would use raw meat that has past its use-by date when cooking a meal	Chapter 370 0 .352	Chapter 371 - 0.06	Chapter 372 0.6 84	Chapter 373 .232	Chapter 374 .04	Chapter 375 .651	
Chapter 37	Chapter 377 I rely on the smell of food as an indication of freshness	Chapter 378 0 .106	Chapter 379 - 0.219	Chapter 380 - 0.025	Chapter 381 .056	Chapter 382 .777	Chapter 383 .667	
Chapter 38	Chapter 385 I would eat cooked meats that have past their use-by date	Chapter 386 0 .376	Chapter 387 - 0.143	Chapter 388 0.6 56	Chapter 389 .154	Chapter 390 .033	Chapter 391 .617	
Chapter 39	Chapter 393 In order not to waste food, I will cook food that has past its use-by date	Chapter 394 0 .76	Chapter 395 - 0.172	Chapter 396 0.4 03	Chapter 397 .037	Chapter 398 .029	Chapter 399 .772	
Chapter 40	Chapter 401 I find use-by dates difficult to read	Chapter 402 0 .178	Chapter 403 - 0.125	Chapter 404 - 0.609	Chapter 405 .467	Chapter 406 0.271	Chapter 407 .71	
Chapter 40	Chapter 409 The food I eat at home is safer than any I could eat outside of the home	Chapter 410 - 0.036	Chapter 411 0 .884	Chapter 412 - 0.048	Chapter 413 0.056	Chapter 414 .01	Chapter 415 .788	
Chapter 41	Chapter 417 There is no difference between a use-by and a best-before date	Chapter 418 - 0.17	Chapter 419 0 .06	Chapter 420 - 0.027	Chapter 421 .779	Chapter 422 .088	Chapter 423 .647	
Chapter 42 0	Chapter 425 I do not check the use-by dates on foods that I eat from my fridge	Chapter 426 0 .201	Chapter 427 - 0.036	Chapter 428 0.2 64	Chapter 429 .706	Chapter 430 .023	Chapter 431 .609	
Chapter 43 1	Chapter 433 I would use milk that has past its use-by date	Chapter 434 0 .753	Chapter 435 - 0.039	Chapter 436 0.0 84	Chapter 437 0.132	Chapter 438 0.002	Chapter 439 .593	
Chapter 44 2	Chapter 441 Use-buy dates are set by food manufacturers to cover their own backs	Chapter 442 0 .551	Chapter 443 0 .201	Chapter 444 - 0.188	Chapter 445 .264	Chapter 446 .323	Chapter 447 .553	
Chapter 44 3	Chapter 449 The food I eat at home is safer than any that I could eat from restaurant	Chapter 450 0 .021	Chapter 451 0 .905	Chapter 452 - 0.05	Chapter 453 .072	Chapter 454 Chapter 455	Chapter 456 .827	
Chapter 45 4	Chapter 457 Food manufacturers build in extra time when setting use-by dates	Chapter 458 0 .707	Chapter 459 0 .05	Chapter 460 0.1	Chapter 461 .142	Chapter 462 .101	Chapter 463 .542	
	Chapter 464 Eigenvalue	Chapter 465 2	Chapter 466 1	Chapter 467 1.6	Chapter 468	Chapter 469		

		.979	.817	32	.521	.348	
	Chapter 470 % Variance	Chapter 471 2 1.275	Chapter 472 1 2.975	Chapter 473 11. 659	Chapter 474 0.867	Chapter 47 .625	
	Chapter 476 % Cumulative Variance	Chapter 477 2 1.275	Chapter 478 3 4.251	Chapter 479 45. 91	Chapter 480 6.777	Chapter 48 6.402	

Table 5.11 presents the final factor loading and factor mean values for the assessment of food quality rotation. Participant willingness to disobey manufacturers' UBD recommendations and consume products that had exceeded these guidelines was loaded onto factor 1.1. Similar variables were also loaded onto factor 1.3, highlighting the product dependent nature of this and the sample's refusal to comply with best-practice recommendations. Variables loaded onto factor 1.4 highlighted consumer confusion over the meaning and instructions given by manufacturers' food safety labels, with factor 1.5 depicting consumer reliance on sensory indicators as a measure of food-quality and safety assessment. Consideration of the mean score calculated for this rotation shows greatest significance for factor 1.2, domestic overconfidence ($\mu=3.87$).

Table 5.11: PCA- Food Quality

Factor Number	Associated Variables No	Associated Variables	Coefficient (h^2)	Variance Explained (%)	Factor Mean (μ)	Interpretation
1.1	2	I would eat cheese past the Use-by date	.807	21.275	3.05	Cautious dairy consumption
	6	In order not to waste food I will eat food that has past the use-by date	.76			
	11	I would use milk use milk past the use-by date	.753			
	14	Food manufacturers build in extra time when setting use-by dates	.707			
	12	Use-by dates are set by food manufacturers to cover their own backs	.551			
1.2	13	The food I eat at home is safer than any that I could eat from restaurant	.905	12.975	3.87	Domestic Overconfidence
	8	The food I eat at home is safer than any I could eat outside of the home	.884			
1.3	3	I would use raw meat that has past its use-by date when cooking a meal	.684	11.659	2.39	Carnivorous Risk Taking
	5	I would eat cooked meats that have past their use-by date	.656			
	7	I find use-by dates difficult to read	-.609			
1.4	9	There is no difference between a use-by and a best-before date	.779	10.867	2.33	Label Confusion
	10	I do not check the use-by dates on foods that I eat from my fridge	.706			
1.5	4	I rely on the smell of food as an indication of freshness	.777	9.625	3.69	Sensory Reliance
	1	I rely on the look of food as an indication of freshness	.736			

5.5.3 HCA and K-Means

Cluster analysis was conducted using the procedure 'Cluster' in SPSS (SPSS, 2010) and applied in a two-stage approach to the 15 derived factors identified in Section 5.5.2. Hierarchical cluster analysis and the information from the agglomeration schedule reported a two and five-cluster solution as optimal for this data set. The K-Means optimization method was employed to obtain a solution with the specified number of clusters. Profiling analysis was conducted for each, the two, three, four and five cluster solutions. However, consideration of relative cluster size, the desire for simplicity and concurrence with anecdotal insights gained whilst collecting data (face-to-face), led to the choice of a three-cluster solution. 211 of the participants were clustered; two were omitted from the analysis owing to the poor quality of their data. Table 5.12 presents the derived clusters' composition.

Table 5.12: Cluster Composition

Cluster	Number	% of Sample
1	65	31
2	69	33
3	77	36

i. Cluster Profiling

Pearson's Chi-squared tests were conducted on fifty dichotomous social demographic variables to test significance in order to add descriptive depth to the cluster profiles. 25 of these were shown to be significant at the 5% level, shown in Table 5.13 and were used as the initial basis for cluster differentiation.

Table 5.13: Cluster Identity, Demographic Characteristics

Variable No	Demographic Characteristic	Chi-square Statistic and Significance
1	Organization	$\chi^2(3)= 73.29$, Sig = .000
2	Age	$\chi^2(3)= 27.13$, Sig= 0.18
3	Marital status	$\chi^2(3)= 35.79$, Sig = .000
4	Living arrangements	$\chi^2(3)= 43.84$, Sig = .000
5	Driving	$\chi^2(3)= 16.83$, Sig = .000
6	WSN	$\chi^2(3)= 19.38$, Sig = .001
7	Retirement status	$\chi^2(3)= 11.32$, Sig, = .003
8	Income: state pension	$\chi^2(3)=6.55$, Sig = .038
9	Income: private pension	$\chi^2(3)= 8.35$, Sig = .015
10	Income: investments	$\chi^2(3)=8.92$, Sig = .012
11	Income: savings	$\chi^2(3)=18.01$, Sig, =.000
12	Income: Salary	$\chi^2(3)= 8.18$, Sig, =.017
13	Attendance allowance	$\chi^2(3)= 16.07$, Sig =.003
14	Housing benefits	$\chi^2(3)= 24.132$, Sig = .000
15	Council tax benefits	$\chi^2(3)= 15.97$, Sig, =.003
16	How old do you feel	$\chi^2(3)= 20.67$, Sig, =.008
17	Alcohol	$\chi^2(3)= 8.31$, Sig, =.016
18	Arthritis	$\chi^2(3)=24.94$, Sig, =.005
19	CHD	$\chi^2(3)= 19.25$, Sig,=.014
20	Bowel conditions	$\chi^2(3)=19.56$, Sig,=.034
21	Visual impairment	$\chi^2(3)= 26.55$, Sig,=.003
22	Soft cheese	$\chi^2(3)=3.94$, Sig,=.051
23	Food poisoning	$\chi^2(3)=10.52$, Sig,=.003
24	Dishwasher ownership	$\chi^2(3)=20.31$, Sig, =.000
25	Continuous hot water	$\chi^2(3)=8.63$, Sig, =.013

In addition, comparison of means across the scale response questions was also conducted and aimed at identifying differences between clusters on the basis of distance from the overall sample mean. This was undertaken on all four sets of scale response questions included within the questionnaire, which provided the basis of the PCA analysis. A small set of variables testing respondents' attitudes

towards leisure, travel and technology, was not included within the factor analysis as in order to perform a factor analysis, a minimum of 12 variables is required (Hair *et al.* 2010). This analysis contributed further to cluster differentiation. Variables that were shown to be significant at the 0.05 level were included and are summarised in Tables 5.14, 5.15, 5.16 and 5.17. Additionally, tabulation of results in this manner allowed for clear identification of the points on which the clusters differ most (greatest distance from μ).

Table 5.14: Cluster Identity: Attitudes Towards Food

Measure	Average for Cluster			Overall Mean	Sig Stat ²
	1	2	3		
Feel Lonely	1.74	2.19	2.69	2.23	.000
Only person that purchases food	3.13	3.75	2.87	3.25	.001
Enjoy eating	1.86	2.40	2.75	2.36	.000
Shop Access	4.20	3.96	2.90	3.64	.000
I prefer to shop for food as and when I need it	3.25	3.69	2.70	3.19	.000
Supermarkets	2.80	2.51	3.61	3.00	.000
Experiment with new recipes	3.38	2.81	2.49	2.87	.000
Enjoy cooking and preparing food	3.89	2.81	2.49	3.24	.000
Shopping social	2.43	2.52	3.08	2.69	.005
Make meals from scratch	4.01	3.33	3.15	3.48	.000
Eat alone	2.63	3.62	3.96	3.44	.000
Eat out often	3.21	2.95	2.47	2.85	.005
I see food as fuel rather than something that I enjoy	2.01	2.20	2.79	2.36	.038
No cook	2.01	2.68	3.54	3.08	.000
Shop for food once a week	2.95	2.68	3.55	3.08	.000
Cooking is a means to an end	2.31	3.11	3.16	2.88	.000
Enjoy eating out	4.08	3.91	3.49	3.81	.007
Purchase ready-meals for convenience	2.17	2.77	3.09	2.70	.001

Table 5.15: Cluster Identity: Risk of Illness

Measure	Average for Cluster			Overall Mean	Sig Stat ²
	1	2	3		
Additives	2.81	2.14	2.45	2.46	.002
Salmonella	4.27	2.71	3.68	3.53	.000
High Salt	3.87	2.69	3.68	3.40	.000
Re-heating food	3.11	2.10	3.59	2.93	.000
Campylobacter	3.71	2.92	3.24	3.28	.000
BSE	3.22	2.02	2.67	2.62	.000
Ecoli	4.22	2.52	3.36	3.34	.000
Saturated fats	3.59	2.68	3.58	3.27	.000
GM	2.33	2.17	2.89	2.47	.000
Unhealthy diets	3.77	2.72	3.09	3.18	.000
Listeria	3.86	2.69	3.36	3.29	.000
Antibiotic residues	3.52	2.55	3.04	3.02	.000
Viruses	3.68	2.59	3.25	3.16	.000
Food handling practices of others	4.00	3.04	4.01	3.68	.000
Hormone residues	3.23	2.55	2.92	2.89	.000
Pesticide residues	3.98	2.71	3.33	3.32	.000
Mould	3.33	2.42	4.04	3.26	.000
Probiotics	1.97	2.28	2.85	2.38	.000
Organic	1.42	1.69	1.85	1.66	.004

Table 5.16: Cluster Identity: Food Quality

Measure	Average for Cluster			Overall Mean	Sig Stat ²
	1	2	3		
Look of food	3.80	3.69	3.33	3.59	.010
Eat cheese past UBD	3.34	3.84	2.50	3.20	.000
Waste food	4.22	4.53	3.95	4.23	.007
Eat raw meat past UBD	1.94	2.93	1.65	2.16	.000
Rely on UBDs	3.85	4.42	3.75	3.67	.034
Cooked meat past UBD	1.80	2.90	1.76	2.20	.000
Leftovers	2.86	3.29	2.38	2.83	.000
Will eat food past the UBD to avoid waste	2.77	3.61	2.03	2.78	.000
Find UBD difficult to read	2.43	2.56	3.45	2.84	.000
Food at home is safer than any outside the home	3.88	3.72	3.92	3.84	.435
No difference between UBD and BBD	1.74	2.64	3.04	2.50	.000
Do not check the UBD on food from the fridge	1.66	2.61	2.16	2.15	.000
Milk past the UBD	2.69	3.01	1.92	2.52	.000
Food manufacturers build in extra time when setting UBD	3.15	3.69	2.72	3.17	.000
Surface cleaners	3.89	3.58	4.24	3.91	.001

Comparisons of means were then conducted on the final set of scale variables as outlined, with Table 5.17 showing the results from this analysis.

Table 5.17: Cluster Identity: Attitudes Towards Travel and Technology

Measure	Average for Cluster			Overall Mean	Sig Stat ²
	1	2	3		
Holiday often	3.48	3.31	2.54	3.08	.000
Travel abroad	3.43	3.33	1.95	2.86	.000
Use the internet regularly	3.81	3.09	1.88	2.87	.000
Use technology in my kitchen	2.98	2.76	2.22	2.63	.003

Table 5.18 presents the consolidated results of the Chi-Squared and comparison of means across the scale variables.

Table 5.18: Consolidated Summary of Profiles

	Cluster 1	Cluster 2	Cluster 3
Demographics			
Organisation	Advert/ U3A/	Advert/ Sheltered accommodation	Sheltered Acc/ Day centres
Age	High young	Middle old age	High older
Marital status	High married	Married/ widowed	High widowed
Living arrangements	Own property	Own/rent	Rent property
Driving	Have a driving licence	Have a driving licence	No driving licence
WSN	Yes- not currently called upon	Yes- do call upon/not currently called upon	Yes- call upon
Retirement	Employed/retired	Employed/retired	Retired
Income	Medium-high income	Low-medium income	Low income
Income state pension	Some receiving a state pension	Receive state pension	Receive state pension
Income private pension	Not receiving private pension	Some receiving a private pension	Not receiving private pension
Savings	Savings	Savings	No Savings
Investments	Some investments	Some investments	No investments
Salary	Some receiving a salary	No	No
Attendance allowance	Do not receive attendance allowance	Do not receive attendance allowance	Some receiving attendance allowance
Housing benefits	Do not receive housing benefits	Do not receive housing benefits	Some receiving housing benefits
Council tax benefits	Do not receive council tax benefits	Do not receive council tax benefits	Some receiving council tax benefits
How old do you feel	Younger	Younger/ feel age	Younger/ feel age
Health status	Very good/ good	Very good/ good/ fair	Good/fair
Alcohol consumption	Consuming some	Consuming some	None

	alcohol	alcohol	
Arthritis	Do not suffer/ mild	Do not suffer/ mild	Do not suffer/ moderate/ sever
CHD	Do not suffer	Do not suffer	Do not suffer/ sever/ mild
Bowel related conditions	Do not suffer	Do not suffer/ mild	Middling
Visual impairment	Do not suffer	Middling	Mild
Food poisoning	Suffered food poisoning	Suffered food poisoning	No
Dishwasher ownership	Some owing a dishwasher	Do not own a dishwasher	Do not own dishwashers
Continuous hot water available in kitchen	Yes	Yes	Neither
Travel and Technology			
I holiday as often as I can	Neither	Neither	Disagree
I travel abroad on holiday	Neither	Neither	Disagree
I regularly use the internet	Agree	Neither	Disagree
I regularly use technology in the kitchen	Neither	Neither	Disagree
Food and Food Safety			
Lonely	Strongly disagree	Disagree	Neither
Only person that purchases food	Neither	Agree	Neither
Do not enjoy eating as much as used too	Disagree	Disagree	Neither
Access to food shops	Agree	Agree	Neither
Supermarket shopping	Disagree	Disagree	Agree
Experiment with new recipes	Neither	Neither	Disagree
Enjoy cooking	Agree	Neither	Disagree
Shopping for food is a social activity	Disagree	Disagree	Neither
Make meals from scratch	Agree	Neither	Neither
Eat alone	Disagree	Agree	Agree
Eat out often	Neither	Neither	Neither
I see food as fuel rather than something that I enjoy	Disagree	Disagree	Neither
I eat meals that do not require cooking	Disagree	Neither	Agree
Shop for food once a week	Neither	Neither	Agree
Cooking is a means to an end	Disagree	Neither	Neither
Enjoy eating out	Agree-	Agree	Neither
Purchase ready-made meals for convenience	Disagree	Neither	Neither

Risk of Illness			
Additives	Neither	Unlikely	Unlikely
Salmonella	Likely	Neither	Likely
High Salt	Likely	Neither	Likely
Reheating foods at home	Neither	Unlikely	Likely
Campylobacter	Likely	Neither	Neither
Ecoli	Likely	Neither	Neither
Saturated Fats	Likely	Neither	Likely
GM	Unlikely	Unlikely	Neither
Unhealthy Diets	Likely	Neither	Neither
Listeria	Likely	Neither	Likely
Antibiotics	Likely	Neither	Likely
Viruses	Likely	Neither	Neither
Food handling practices of others	Likely	Neither	Likely
Hormone residues	Neither	Neither	Neither
Pesticide residues	Likely	Neither	Neither
Mould	Neither	Neither	Likely
Probiotics	Unlikely	Unlikely	Neither
Organic	Extremely Unlikely	Unlikely	Unlikely
Food Quality			
Rely on the look of food	Agree	Agree	Neither
Would eat cheese past UBD	Neither	Agree	Disagree
I don't like to waste food	Agree	Strongly agree	Agree
Rely on UBD as an indication of freshness	Agree	Agree	Agree
Would eat raw meat past UBD	Disagree	Neither	Disagree
Would eat cooked meat past UBD	Disagree	Neither	Disagree
Often cook using left over foods	Neither	Neither	Disagree
Will eat food past the UBD to avoid waste	Neither	Agree	Disagree
I find UBDs difficult to read	Disagree	Neither	Disagree
There is no difference between a UBD and a BBD	Disagree	Neither	Neither
I do not check the UBD on foods that I eat from my fridge	Disagree	Neither	Disagree
I would use milk that has past the UBD	Neither	Neither	Disagree

Table 5.18 provided the basis for the creation of narrative typologies that were grounded in the statistically derived results and were symbolic of the disparate

nature of each of the three clusters. The cluster labels were developed to reflect the nature of the membership with respect to their behaviours associated with food safety, such that Cluster 1's *'independent Self-assessor'* is actively engaged with food provisioning and relies on sensory evaluations to judge food safety. Cluster 2' *'experienced dismitter'* defers to personal experience in judging the safety of food and is rationalising the effort expended in buying and preparing food. Cluster 3's *'compliant minimalist'* adheres to food safety cues such as BBDs and sometimes requires assistance in buying and preparing food. The merits of the creation of descriptive typologies were that they provided a platform for the creation of narrative representations of the quantitative profile of the three clusters, bringing to life the attitudes, behaviours, knowledge and beliefs of the sample cohort and segmenting them on this basis. The following section presents the narrative typologies that were grounded in the preceding results.

5.6 Narrative Typologies

i. Independent Self-Assessor (C1, n=61)

Mr Williams is 62 and lives in a four bedroom family property that he owns outright with his wife. He married 38 years ago and has lived in his present home for the last ten years, moving there to gain a garden. He has two daughters both of whom live away from home. One daughter is married, whilst the other is in her final year of university returning home occasionally at weekends and during holiday periods. Living with his wife and having plenty of family and friends around him Mr Williams would never regard himself as feeling lonely and although he would not consider calling on friends for assistance, he knows that he is well supported should he need anything. Mr Williams is approaching retirement and although his wife took early retirement a year ago, being self-employed he has continued to work and is planning to withdraw from work gradually. Mr Williams is not suffering from any major medical conditions and therefore, regards his health as being very good. He feels younger than his age and is keen to take advantage of this in his retirement.

Mr Williams does not yet receive his state pension and because he is still working relies primarily on his salary and his wife's occupational pension. He also has a number of investments and savings, receives no form of benefits or living allowances and considers himself to be in a comfortable position financially. Mr Williams enjoys travelling and tries to go on holiday as often as possible. He holds a driving licence and has done so since he was a teenager; he relies heavily on his car for work purposes and uses it nearly every day.

Mr Williams enjoys holidaying and is looking forward to retiring so that he can take advantage of having free time to get away more often and for longer than the usual two weeks during the summer. He is confident in his ability to use computers, having done so at work for many years and regularly uses the internet. He no longer uses it to shop for food as he has been disappointed by the quality of the fresh produce that has been sent to him when he has used it. As a household the Williams' prefer to shop for food as and when it is needed rather than on a weekly basis. Mr Williams has recently begun to take more interest in cooking and preparing food. In the past it had mainly been his wife that prepared the food that they ate, but Mr Williams reports to have taken a shared interest in food preparation lately. He enjoys shopping for food, preferring smaller shops to the supermarkets. Occasionally he experiments with recipes when entertaining visitors and would always prefer to prepare meals from scratch, avoiding purchasing readymade meals. Although he has a kitchen full of gadgets, he tends to leave those to his wife and would not often use them. Mr Williams' evening meals are always cooked by and shared with his wife. They view this meal as a time for them to catch up with one another. Since his children have left home he and his wife enjoy going out for meals and would do this at least once a fortnight.

Mr Williams is guarded when it comes to assessing the potential risks associated with food and its preparation. He considers a range of food handling, dietary and production methods to hold potential risks for him. He is careful to avoid foods that contain high levels of salt and fat although he admits that he could take more care and is aware of their contribution to potential health problems. Food

production and microbiological concerns also worry him, mainly due to the lack of control that he has over this and the portrayal of these issues in the media. Despite this, he feels comfortable with GM foods, probiotics and organic farming methods; the latter of which he feels have health benefits.

Despite his scepticism, Mr Williams is pragmatic about the way in which he assesses the quality of the food he eats, disliking food waste and occasionally eating food that was past the UBD providing that it looked okay. However, he would draw the line at consuming meat products that had passed their UBD as he considers it the clearest indication of a product's freshness; understanding that there is a difference between a product's UBD and BBD. He finds no difficulty in reading UBDs on products and would ensure that he checked these on food that he takes from his fridge.

ii. *Experienced Dismissal (C2, n=69)*

Mrs Thompson is 76 and has been widowed for one year. She lives in the three bedroomed terraced home that she and her husband bought 47 years ago, shortly after they were married, and in which she raised her son. Her son now lives in the south of England with his wife and two teenage children. She is well supported locally with many of her female friends available to call upon for assistance if required. Although her immediate family live some distance away, they are very close and visit each other regularly. Due to her close links with others, Mrs Thompson rarely feels lonely. She worked as a shop assistant for many years and in addition to this had always taken care of shopping and preparing food for her family, admitting that she usually prepared meals that catered for their tastes rather than her own. Mrs Thompson took early retirement at the age of 57 due to health complaints. Although she is fully recovered from her illness (breast cancer) she suffers from arthritis, and has bowel problems. Mrs Thompson considers herself to feel her age but despite this she believes that she is maintaining good health. She is fully dependent on her state pension, which is supplemented by her

husband's pension and a small amount of savings. No form of living allowance or means tested benefits supplement her income.

Mrs Thompson is able to drive and has a small car that she uses a couple of times a week, usually for local trips and to access the local supermarket. She usually makes a weekly supermarket-shopping trip to get the basics, but would top up throughout the week from other food outlets depending on where she was and what she fancied. Since her husband died, Mrs Thompson generally eats alone unless she is meeting with friends. Due to this she has found herself not to be as experimental with the food that she prepares, sticking to dishes that are easy to prepare and those that she knows her family will enjoy when they visit. She likes to keep her freezer stocked with convenience foods, quiches and deserts, in case she has visitors to cater for, otherwise she would not use these foods. Mrs Thompson generally prefers to eat at home; if she does go out to eat this would usually be at lunchtime rather than for an evening meal. She does however, enjoy going out for meals when she visits her family or they come home to visit her.

Mrs Thompson has not been abroad on holiday since her husband died and despite this not affecting her interest in travelling, it is difficult to find company to go with. Mrs Thompson has a computer and uses the internet occasionally, although admits that she can find it daunting and usually only uses it to keep in touch with her son and grandchildren *via* email. She would never consider using it to purchase anything, as she is distrustful that her orders will arrive.

Mrs Thompson is aware of the illness risks that can be associated with the preparation of food. She is confident in her own ability to control these risks, being of the opinion that she has survived this long without any problems and sees little reason to change what she has done for many years. She protects herself by taking precautions when preparing food at home, making sure that any food she re-heats is piping hot, purposely avoids foods with high fat contents and never adds salt when cooking. Through newspapers and television Mrs Thompson is aware of many recent food-related scares, and is particularly concerned about the effects of

new food production methods such as pesticide, hormone and antibiotic residues in food and microbiological risks. However, having only ever suffered what she considered to be food poisoning once many years ago, she is sceptical of the actual risk from these to her own health.

This self-optimism extends to Mrs Thompson's food quality attitudes and behaviours, having lived through the inter war years she is acutely aware of not wasting food and making the most out of the food she has. This attitude has extended into the way that she views manufactures' UBD recommendations. She reports that sometimes the positioning of UBDs and BBDs makes them difficult to read and this can result in her not checking the dates on the foods that she takes from her fridge. She sees no differences between UBDs and BBDs and although she would rely on the dates of foods as an indication of freshness, she would overlook this to avoid waste, providing that the product looked suitable for consumption.

iii. Compliant Minimalist (C3, n=77)

Mrs Campbell is 88 and has lived alone since her husband died eight years ago. Following the loss of her husband she downsized and moved into sheltered accommodation. Her rented one-bedroom flat is more manageable for her and benefits from having similarly aged neighbours and a concierge service at her disposal. As she relies wholly on her state pension, pension credits and receives a small amount from her husband's war widow's pension, her rent and council tax payments are supplemented and she receives winter fuel allowance to assist with energy and fuel costs. In addition to this, she receives attendance allowance to help with basic care costs. Although a widow, Mrs Campbell has three children; a daughter who lives locally and two sons who live further afield. She receives regular support from the agency from whom she rents her property that assists her with housework, primarily cleaning once a week. Despite being well supported by her children and wider support networks after losing her husband, she has felt increasingly lonely and no longer manages to see her friends as often as she used to, some of whom have also died.

In spite of suffering from arthritis, Mrs Campbell regards herself to be in good general health, and feels younger than her 88 years. As well as the pain that Mrs Campbell reports to 'put up with', arthritis in her hands and knees has made it more difficult for her to get out to do things she used to, although she regularly attends a local day centre run by Age UK, where she has made some new friends and enjoys having lunch. Mrs Campbell had never learnt to drive and relies heavily on others for transport. She uses the mini bus collection service to attend the day centre and relies heavily on her daughter to take her shopping. She occasionally uses the shopping bus service provided by her housing management if her daughter is unable to take her. Although she would rather go with her daughter, she enjoys the social elements that the shopping bus service provides, which usually allows time for shopping and lunch before returning to drop her at her door. On occasions when Mrs Campbell has been unwell, her daughter would bring shopping to her, as she knows the products that Mrs Campbell would regularly purchase and likes. In the past she would have purchased the majority of her food freshly from the local market. However, relying heavily on others to assist her with shopping has restricted how often she can shop for food and means that she now purchases the majority of her food from supermarkets.

Mrs Campbell had always enjoyed cooking and preparing food for her husband and family, but now that she lives alone and is only preparing food for herself she sees cooking as a chore and admits that she does not enjoy eating as much as she used to. She has never been an adventurous cook, preferring to cook dishes that she would be confident that her children would like, and now that she is living alone and generally eats alone, Mrs Campbell sees little reason to be experimental or try new recipes. She has always had to make meals with what was available to her, given the experiences of being raised during periods of food rationing, and has always been used to cooking meals from scratch. However, since she has lived alone she has been more inclined to purchase readymade convenience meals or eat something that is cold, making the task of food preparation easier for her and reducing the likelihood of having any waste.

Mrs Campbell understands that there are risks associated with food and its preparation, she sees this particularly in the way other people handle and prepare food and feels more in control of this when she prepares her own. She has more confidence in her own ability to prepare food than she does in others'. This is in part one of the reasons why Mrs Campbell prefers to eat at home and not visit restaurants. She studied home economics at school and considers herself to know the basic food safety principles, for example, taking care when re-heating. She is concerned about things that go beyond her personal control; particularly relating to the way that food is now produced. Food scares in the media over the years and a lack of understanding of the issues has fostered Mrs Campbell's sense of distrust and increased her feelings of personal risk, particularly from microbiological pathogens campylobacter, salmonella and *E.coli*, some of which she admits to not being familiar with, which has acted to increased her uncertainly about them.

Mrs Campbell is careful to look after herself, and sees importance in following UBDs as a means of protecting herself from illness as much as she is able. In so doing she is careful to adhere to UBDs on products, she would not consume products that had past this date and because she is only catering for herself, is careful to avoid having leftovers. Although she is not fully clear on the differences between UBDs and BBDs on products, she would avoid eating any foods that had passed their UBD, being happier to throw food away than eat it if it has exceeded the date stated. She would also make sure that she checked the dates on foods that she took from her fridge.

5.7 Baseline Understandings

Phase 1 has segmented the older consumer in terms of lifestyle, attitude and behaviours towards food and food safety and makes a significant contribution to the baseline understandings of the older consumer and their food handling practices. Three key clusters were identified, all of which are shown to demonstrate 'risk' and susceptibility to foodborne illness at some level. However,

the way in which the clusters experience risk is the basis on which they diverge. The strength of this phase lies in the identification of the diversity and heterogeneity of the 60+ and their experiences and knowledge of food and domestic food safety best practice recommendations. In addition, it has illuminated a number of issues for further investigation that will be used as a basis to inform the design of the EIS in Phase 2. Specifically the analysis of the data has generated the following questions that Phase 2 will seek to answer:

1. Do the 60+ demonstrate discrepancies between knowledge and practice irrespective of age?
2. Does gender influence adherence to domestic food safety best practice recommendations in the 60+ cohort?
3. Do households in C1 demonstrate less personal culpability and exhibit an illusion of control in relation to domestic food safety?
4. Do households in C2 demonstrate less personal culpability and exhibit an illusion of control in relation to domestic food safety?
5. Do households in C3 demonstrate high levels of personal culpability but fail to exhibit illusion of control?
6. Do households in C2 have a no waste mentality?
7. Do households in C3 consume the most RTE food products?
8. Do all households lack knowledge of safe fridge temperatures?

Notwithstanding the success of Phase 1 in segmenting the older consumer on the basis of demographics and lifestyle, attitude and behaviours towards food and knowledge and understanding of domestic food safety best practice recommendations and the identification of divergent risk profiles amongst each of the three derived clusters, they remained large. The clusters comprise of 65 (31%) (Cluster 1) 69 (33%) (Cluster 2) and 77 (36%) (Cluster 3) respectively. Consequently a framework was devised to sample individuals deemed to be at most 'risk' from within these clusters. The framework was based on assessment of individual knowledge of domestic food safety best practice and their potential for deviating

from this. The final section of this chapter introduces the sampling framework used to identify households for participation in Phase 2.

5.8 Sampling Framework

The variables generated through the PCA analysis were subsequently used as the basis for clustering, although they did not include an objective measure of participants' level of food safety knowledge generally, or potential for deviating from domestic food safety best practice recommendations. Therefore, inspired by the approach taken by the Safe Food Ireland study (Brennan *et al.* 2007; McCarthy *et al.* 2007) a knowledge and deviating practice matrix was developed. The purpose of this approach was first, to highlight individuals with low knowledge and high propensity to deviate from food safety best practice recommendations; by implication identifying those who were 'high-risk' candidates. Second, this was used as a means of purposive sampling (Patton, 1990), in order to select individuals for Phase 2 of the research, as these participants were directly recruited from the Phase 1 sample.

5.8.1 Knowledge and Deviating Practice

Questions 103-115 were included within the questionnaire as a measure of participant knowledge and potential for deviation from domestic food safety best practice recommendations. The format was influenced by the Safe Food Ireland questionnaire, although adapted to conform to UK consumer recommendations (Livewell, 2011). Thirteen multiple-choice questions were developed to assess knowledge of best practice. In response to these questions there was one correct answer that was consistent with domestic food safety best practice recommendations (13 in total) and a number of deviating options (35 in total) that ranged in severity. Respondents were required to give a yes, no, or don't know response to all 48 (13 correct +35 incorrect) options. Assessment of knowledge and deviating practice is a crude assessment, and whilst it is acknowledged that domestic food safety practices range in risk severity, within this study they were

not given any priority ranking. Although this fails to recognise the ‘degrees’ of deviating practice (i.e. some being more risky than others) the FSA currently has no methods or framework established for this purpose, although this has been suggested as a possible agency objective. SPSS was used to create a new variable that calculated the total number of correct answers given by all respondents (number out of 13). The variable was assigned the label KNOWSCORE. The process was repeated for deviating practice and each respondent was assigned a deviation score out of 35, with 22 being the maximum number of deviating practice answers that could also be identified as being correct. This variable was then labelled DEVIATESCORE. Response was categorised into the number of correctly and incorrectly identified best practices. Table 5.19 presents the segmentation categorisation adopted.

Table 5.19: Knowledge and Deviation Segmentation

No. of questions correct	Status level given
Knowledge	
1-6	Low knowledge
7-9	Medium knowledge
10+	High knowledge
Deviation	
1-6	Low deviation
7-12	Medium deviation
13-22	High deviation

(Source, Author compiled)

Table 5.20 indicates the number of knowledge and deviance questions; the number of respondents falling into each of the three, low, medium and high knowledge and deviation categories.

Table 5.20: Knowledge and Deviating Practice Categorisation

No. of questions	Status level	Status number	No. of respondents
Knowledge			
1-6	Low knowledge	1	17
7-9	Medium knowledge	2	108
10+	High knowledge	3	79
Deviation			
1-6	Low deviation	1	75
7-12	Medium deviation	2	107
13-22	High deviation	3	20

(Source, Author compiled)

Cross-tabulation using SPSS was then performed against the knowledge and deviating practice variables and ‘high-risk’ individuals were identified. Table 5.21 has been constructed to show the number of participants and the percentage of individuals falling into each category. The categories were first, low knowledge with low deviation, medium and high deviation; second, medium knowledge with low, medium and high deviation; and finally high knowledge with low, medium and high deviation.

Table 5.21: Knowledge and Deviating Practice Comparison Matrix

	Deviating Score			
		Low	Med	High
Knowledge Score		FQ	FQ	FQ
	High	27 (13.5%)	43 (21.5%)	9 (4.5%)
	Med	39(19.5%)	57 (28.5)	11 (5.5%)
	Low	8 (4%)	6 (3%)	0 (0%)
Total		74	106	20

(Source, Author compiled)

Table 5.21 has been colour coded to assist with interpretation, red highlighting high-risk, yellow medium and green low. In this way it is possible to surmise that those with a low knowledge score and high deviating practice score (Table 5.21, knowledge score 1 + deviating score 3) would be classified as being the most ‘at risk’ as they are demonstrating both a lack of knowledge and a high propensity for deviation from best practice recommendations. No respondents fell into this

category and therefore, it was not possible to sample from this group. Despite this being deemed the highest potential risk, those obtaining a medium knowledge score and a high deviating score (Table 5.21 2+3, n=11) are also deemed to be falling within the highly 'at risk' confines. Additionally, those with a high knowledge score but a high deviating score (Table 5.21 3+3, n=9) are also considered to be falling within the boundaries of risk; this narrowed the participant selection process. A decision to select individuals based upon medium knowledge and high deviation score made intuitive sense and were the first sub-groups to be considered for recruitment in Phase 2.

After reviewing the profile of these respondents, recruitment of these individuals proved problematic. First, the majority of these individuals had not agreed to participate in Phase 2 of the research, and those who had were predominantly living in sheltered housing accommodation and had initially been recruited through day centres. Second, stakeholders for older adults (Voice North and the Institute of Ageing and Health) raised concerns about the possible physical and mental vulnerability of these adults, leading to their potential inability to give informed consent and likelihood of them experiencing participation fatigue, given the demands of the research. Moreover, they highlighted that when conducting observational research in the homes of individuals in sheltered housing accommodation, ethical approval from both the institution and the Social Care Research Ethics Committee UK (Social Care REC) must be sought. In addition to the cohort concerns raised, this was a process which was considered beyond the remit of this research, although useful, in that it had uncovered a sub-sample of the 60+ population that would benefit from being considered in further research. Therefore, the next most suitable category for recruitment for Phase 2 was to select consumers from the 57 participants falling into the medium knowledge and medium deviation category who were representative of all three clusters.

5.9 Summary

The empirical quantitative research, Phase 1, based upon an administered face-to-face questionnaire (n=213) identified three clusters, the '*Independent Self-Assessor*', the '*Experienced Dismissal*' and the '*Compliant Minimalist*', that were heterogeneous with respects to their attitudes and knowledge of behaviours towards food safety. The risk of illness as a consequence of foodborne illness was shown not to be linear, and not all adults aged 60+ will suffer the same levels of vulnerability to it. However, the way in which they encounter risk was shown to diverge. The use of knowledge and deviation matrices further profiled the sample and highlighted those within the clusters that could be considered to be most 'at risk'. This allowed for purposeful selection of 10 households for the empirical qualitative research, Phase 2 of the research, the EIS. The methodological approach for Phase 2 is outlined in *Chapter 6* with the results presented in *Chapter 7*.

Section 3

Chapter 6 : Phase 2: Methods

6.1 Introduction

This chapter focuses exclusively on describing the methods used in Phase 2, the ethnographically inspired study (EIS). Ethnographic and observational methodologies are complementary to studies adopting STP as a theoretical framework (Haliker and Jensen, 2011; Hargreaves, 2011; Brennan, 2010; Strengers, 2009 and Hargreaves, 2008). They allow for the collection of data that capture both ‘sayings’ and ‘doings’ (Warde, 2005, p.134) of everyday life and supports the researcher in developing a broad and deep perspective on the phenomenon of interest. By definition, ethnography is the ‘*observation of people’s natural behaviour in their own environment*’ (Banks, 2007, p.58). However, within anthropology the discipline from which it emerged, ethnography is taken to mean more than this, requiring researchers to engage with an interested population for extended periods (lifelong in some instances) to form understandings and appreciations of the complexities and multidimensionality of their lived experience. Debates circulate as to what constitutes and deserves the badge of being an ethnographic study. Mindful of this and given the social sensitivities and logistical challenges associated with conducting a full anthropological ethnographic study in the domestic setting of an older cohort, an ethnographically inspired approach was considered and selected as a valid compromise, using a mix of traditional and novel research methods (Bryman, 2004). Linderson (2010, p.4) outlined the benefits of adopting a multi-method approach as follows:

‘[Multi-methods] enables the researcher with a broad and deep perspective. Rather than digging in singular spots, finding more of the same, the multi-method approach opens the ethnological gaze to new and unexplored terrains’ (Linderson, 2010, p.4).

Phase 2 of this research was designed to incorporate multiple methods in order to address some of the limitations identified with previous research into domestic food safety practices, as outlined in *Chapter 4*. The methods chosen contributed to the development of an interdisciplinary ‘toolkit’ of methods designed to support

research into the older food consumer and their domestic food handling practices that were both sensitive and rigorous in nature.

This chapter begins by outlining the Phase 2 sample (drawn from Phase 1 respondents). The chapter is then structured according to the sequence of the data generation procedures deployed in each household visit. The contribution of each technique as part of the interdisciplinary ‘toolkit’ is also critically evaluated. A summary of the data collection procedure and the subsequent analytical approach taken to handle the multiple streams of data captured is also presented.

6.2 The Sample

Phase 1 of this research, in addition to developing baseline understandings of the 60+ provided a sampling framework for Phase 2 through the identification of ‘high-risk’ individuals. The final sample selected for the EIS comprised of 10 households. Participants from all three clusters types identified in *Chapter 5* (5.8.1) as ‘high-risk’ and were selected from the pool of participants with medium knowledge and medium deviating practice (see Table. 5.21). Table 6.1 provides an overview of the sample composition for Phase 2 of the research.

Table 6.1: Phase 2 Sample Composition

Household (HH)	Assigned pseudonym	Age	Gender	Marital status	Living a
HH1	Chapter 482 Joan	Chapter 483 76	Chapter 484 Female	Chapter 485 Married	Chapter
Chapter 488 HH2	Chapter 489 Peter	Chapter 490 69	Chapter 491 Male	Chapter 492 Single	Chapter
Chapter 495 HH3	Chapter 496 Gill	Chapter 497 63	Chapter 498 Female	Chapter 499 Single	Chapter
Chapter 502 HH4	Chapter 503 Sandra	Chapter 504 68	Chapter 505 Female	Chapter 506 Divorced	Chapter
<i>Chapter 509 HH5</i> **	<i>Chapter 510 Kathy</i>	<i>Chapter 511 75</i>	<i>Chapter 512 Female</i>	<i>Chapter 513 Widowed</i>	<i>Chapter</i>
Chapter 516 HH6	Chapter 517 Annie	Chapter 518 82	Chapter 519 Female	Chapter 520 Widowed	Chapter
Chapter 523 HH7	Chapter 524 Jack	Chapter 525 73	Chapter 526 Male	Chapter 527 Single	Chapter
Chapter 530 HH8	Chapter 531 Burt	Chapter 532 88	Chapter 533 Male	Chapter 534 Widowed	Chapter
Chapter 537 HH9	Chapter 538 Martha	Chapter 539 92	Chapter 540 Female	Chapter 541 Widowed	Chapter
Chapter 544 HH10	Chapter 545 Evelyn	Chapter 546 63	Chapter 547 Female	Chapter 548 Married	Chapter

** Married during Phase 1, widowed and living alone in Phase 2

The age of the EIS sample ranged from 63 to 92 years old. Seven of the sample were female and 3 were male. Two of the households (Joan and Evelyn) comprised

of 2 or more co-habiting mixed gender couples in which the female householder was primarily responsible for food provisioning and handling. In acknowledgement of past research that has been biased towards female homemakers (Brennan *et al.* 2007; Hudson and Hartwell, 2002 and Johnson, 1998), the researcher intended to converse with both members of these households. However, a female bias naturally occurred, as the female householders were predominantly responsible for food provisioning. In co-habiting households, the input of male householders was primarily isolated to the more interactive stages of data collection, namely the kitchen 'go-along', meal preparation videoing and AR(T) monitoring.

Despite Phase 1 identifying those living in sheltered accommodation to be 'high-risk' and an interesting subgroup for investigation in Phase 2, the pragmatic decision not to include this subgroup was taken owing to time limitations of the research and ethical concerns relating to vulnerability and ability to give informed consent (explained in Section 5.8.1). However, 2 households residing in sheltered accommodation flats were included as they had self-selected to participate (*via* Elders council advert) in Phase 1 and therefore this sampling held no concerns in regard to the aforementioned.

Changes occurred in household composition during the data collection process. Kathy was widowed between Phases 1 and 2 and was living alone in Phase 2. The data collection process for Phase 2 was conducted over a 6-month period between November 2011 and April 2012. Section 6.3 describes and justifies each of individual research methods that collectively made up the 'toolkit' of methods used to investigate the food provisioning and the domestic food safety practices of the households within this sample. It provides details relating to theoretical considerations and the piloting of the data collection process, each method is presented in the order in which it was deployed within the 4-week data collection period per household.

6.3 The Study of Practice Through Qualitative Methods

As noted in *Chapter 4*, the lack of practical guidance on how we understand 'practice' can present both methodological problems and opportunities (Strengers, 2009). However, the prescription of SPT for shifting focus from the individual and making the practices the inherent focus of the research gaze, was a significant contribution and meant that the unit of analysis used in Phase 2 was the household, regardless of the increased likelihood of living alone in later life (see *Chapter 2*). When designing the methodological approach to Phase 2, the lack of methodological guidance offered by SPT, forced the researcher to consider pragmatically methods that would best help answer the research aim (see *Chapter 4*) (Johnson and Onwuebuze, 2004). The problem-based nature of the research aim enabled the consideration of a pragmatic mixed methods approach which permitted the incorporation of methods from a diverse range of disciplines. This allowed the researcher to include innovative technologies (AR devices) that had been specifically adapted for the study of domestic food safety practices as part of the 'toolkit'.

Using SPT as the theoretical framework for the exploration of actual domestic food provisioning practices and the associated recommendations made by Brennan (2010) in her '*route-map*' for domestic practice based research, a diverse multi-method 'toolkit' was assembled. Institutionally imposed restrictions³² and the potential sensitivities of the cohort (identified in *Chapters 2* and *3*) limited the choice of methods that could be used and drawn upon for this phase (Wiles *et al.* 2012). However, the benefit of this methodological dilemma was greater creativity in the selection and design of the methods chosen. The lack of theoretical prescription as to how practices should be empirically investigated and the limited body of applied, empirical, practice-based research, facilitated the methodological freedom adopted by this study (Hargreaves, 2008; Strengers, 2009).

³² In order to comply with Newcastle University's ethical approval and risk assessment the researcher was required to be accompanied to all home visits, and that research visits be conducted within business hours (Monday-Friday 9am-5pm).

Consultation during the planning stages of this phase was sought from a number of stakeholders³³, who advised on a range of issues from ethical considerations to technical planning. The data generation techniques were adopted on the basis that they:

1. Drew out understandings that were consistent with the elements that were identified as interrelated components of 'practice' defined by Shove and Pantzar (2005).
2. Were sympathetic to the challenges and sensitivities of the sample population.
3. Allowed the researcher to go '*behind the kitchen doors*' and reveal actual, everyday mundane kitchen behaviours (Brennan, 2010), incorporating both the '*sayings*' and '*doings*' of food provisioning behaviours (Warde, 2005, p.134).

In their own right these methods are not novel, however, their combination and use in domestic food safety research was. The diverse streams of complementary data produced allowed for unique insights into the everyday food provisioning practices of the 60+. Moreover, Phase 2 was also a demonstration of interdisciplinary collaborative working between the researcher, Newcastle University Culture Lab and Geneius labs. Table 6.2 presents a summary of how each methodological approach was deployed, the visit during which the method was conducted and the equipment that was used at each stage.

³³ Institute of Ageing and Health, Geneius Labs, and Newcastle Universities Digital Interaction Group.

Table 6.2: Phase 2 Methods, Procedure and Equipment

Visit No.	Method	Equipment	Appendix	Leave	Collect
1	Chapter 551 Informed Consent & Life-course interview	<ul style="list-style-type: none"> • Research information • Consent forms x2 • Interview schedule • Dictaphone • Research journal 	Chapter 552 , 7 & 8	Chapter 553 Participant information sheet	Chapter 554 Consent form
Chapter 555 2	Chapter 556 Kitchen 'go-along' Kitchen architecture mapping** ³⁴ Fridge audit ** Microbiological sampling Activity recognition	<ul style="list-style-type: none"> • Digital camera • Disposable cameras • Protocol • Sketch pad • Tape measure • Microbiological testing kit (cool bag, swabs, latex free gloves) • Sensors • Laptop • Stage tape • Research journal 	Chapter 557 & 10	Chapter 558 Sensors	Chapter 559 -
Chapter 560 3	Chapter 561 Food purchase history Visual documentation	<ul style="list-style-type: none"> • Video camera • Tri pod(s) • Stage tape • User guide • Research journal 	Chapter 562 1	Chapter 563 Video cameras	Chapter 564 Shopping receipts
Chapter 565 4	Chapter 566 Narrative interview	<ul style="list-style-type: none"> • Interview discussion guide • Dictaphone • Research journal 	Chapter 567 2	Chapter 568 -	Chapter 569 Video cameras Sensors Disposable camera
Chapter 570 5 <i>(Subsequent visit made 1 month after completion of data collection)</i>	Chapter 571 Debrief interview Remuneration	<ul style="list-style-type: none"> • Interview discussion guide • Household data summary • Laptop • Research journal 	Chapter 572 3	Chapter 573 Debrief pack	Chapter 574 -

(Source: Author compiled)

The EIS study was designed so that data could be collected over a 4-week period, with the debrief interview conducted one month after the main data collection

³⁴ ** data generation technique developed exclusively for the study

phase to allow for participant and researcher reflection on the data collection process. However, owing to the sensitivities of the study cohort, flexibility on the part of the researcher was essential and the visits were planned with the respondent to fit around their existing commitments. This meant that, in some instances, the data collection period exceeded 4-weeks.

6.4 Ethics

Ethical approval for this phase was granted in September 2011. Notwithstanding the ethical concerns surrounding the use of ethnographic methods generally (Bryman, 2004), situating research in the home and the multi-method approach adopted here carried significant ethical considerations. These were extensively deliberated prior to entering the field. Ethical concerns were raised at a general level and more specifically in relation to the methods adopted as part of the Phase 2 methodological 'toolkit'. Here general ethical concerns will be discussed, with the more specific methodological concerns woven into the independent evaluation of each of the methods.

As referred to in Section 6.2 and 3, institutional constraints were placed on the research, the outcome of which meant that primary data collection could only be conducted during business hours (9am-5pm). In response to personal safety concerns of University postgraduates, it was also necessary for the researcher to be accompanied on any participant home visit. The ramification of this was that the data collection process, as with Phase 1, was time and resource intensive. During Phase 1, in addition to being accompanied by a member of university staff when conducting home visits, a personal monitoring system Guardian 24, was used, (see Section 5.4.3). For Phase 2, the measures taken to address this included the continued use of Guardian 24, and the appointment of an undergraduate placement student to assist with the multiple data collection visits³⁵. This highlights

³⁵ A second year undergraduate student was employed by the project for the 6-month duration of the data collection. Their primary role was to accompany the researcher on all home visits. Following visits they also conducted administrative tasks such as the collation of forms and

and contributes to the debate surrounding the inhibiting nature of ethics processes upon qualitative research, which is recognised to place '*unnecessary and unhelpful limitations on research practice*' (Wiles, et al. 2012, p.2). This is particularly problematic for postgraduate students who are not classed by their institutions as competent to undertake such research on their own.

A further ethical concern related to the food safety topic of interest. The ethics associated with observing and potentially identifying practices that could have negative health implications for those that participate were considered at length. The issues related to the dilemma of how the observation of mal-practice³⁶ should be treated, and the obligation of the researcher to inform participants of practices that could jeopardise their health. Furthermore, it was necessary to consider how, if 'unsafe' practices were observed, at what point/if at all, the researcher should intervene and who should be informed if this was required. Given that the researcher is a social scientist and the primary focus of the research was on the everyday kitchen practices of this cohort, interventions were considered beyond the remit and competencies of this study and the researcher involved, although they can be appropriate in action research and with a suitably qualified researcher (Smith, 2007). Generalised advice was offered in line with the FSA/DOH's recommendations through the LiveWell (2010) portal, when sought by participants. In addition, participants were fully debriefed following the completion of the primary data collection phase and left with a debrief pack which included the researcher's contact details and the FSA's '*listeria awareness in the over 60s*' leaflet.

The consent process for Phase 2 revealed a number of ethical considerations in relation to participant selection. In Phase 1, participants included those residing in sheltered accommodation. Access to these individuals was arranged through gatekeepers. The research was fully explained to each participant and consent was obtained. For Phase 1, ethical concerns were raised with respect to this approach.

equipment for subsequent visits and the formatting of raw data (primarily inputting of food purchase and fridge audit data into Excel databases).

³⁶ Mal-practice here relates to any practice that contravenes the recommendations given to consumers by the FSA/DOH through the NHS Livewell portal, (2010).

However, during consultations with the Institute for Ageing and Health during the design stages of Phase 2, it was noted that for a study using observational techniques, which is situated in the home of respondents, the recruitment of participants should be carried out *via* gatekeepers who resided in sheltered accommodation and this would have required ethical approval from the Social Care Research Ethics Council (Social Care REC) (see Section 5.8.1). Due to the anticipated lengthy time period for seeking such ethical approval, participants recruited *via* gatekeepers who resided in sheltered accommodation were excluded from selection for Phase 2. However, respondents who resided in sheltered accommodation and who self-selected to participate in Phase 1 in response to published advertisements of the research, were eligible for recruitment into Phase 2.

A further limitation of the selection process related to participant consent. 'Vulnerable' older adults whose consent was derogated to either next of kin and/or care providers were also excluded from Phase 2. However, it is worth recognising that these individuals were primarily falling into cluster three (see *Chapter 5*) and were receiving significant help with food provisioning. Although beyond the scope of this research to investigate, this would provide an important segment for future domestic food safety research to consider.

Data protection measures were taken throughout with all households anonymised and given a code for identification, which was used throughout the data collection and analysis processes and thesis write-up. All data collected were securely stored in a locked filing cabinet within the researcher's office. In addition to this, the researcher's office, when not occupied, was also locked. Personal details were stored on an external hard drive separate from the researcher's personal computer; these were also stored in a locked filing cabinet separate from the main data.

6.4.1 Piloting

Piloting of the methods was essential in order to test and refine those chosen and their associated protocols for Phase 2. Whilst the more innovative methods used in this project (microbiological sampling and AR(T) sensor deployment) had been rigorously tested in a laboratory setting, they were new to the researcher. The pilot testing assisted in developing researcher competencies in the new methods and allowed for refinements to be made to the design of the protocols and to develop insights into how each method would be received by this specific cohort. Piloting of the data collection methods was conducted in October 2011 with HH1 (Joan). The data collected from HH1 (Joan) was analysed and incorporated into the main Phase 2 study.

Following analysis of the pilot data and after the researcher had undertaken a period of reflection; a number of slight alterations to the methodological mix were made. These included:

1. Reduction of the number of interviews from 3 to 2 in order to balance the amount of self-reporting data with other data generation types and reduce the potential for repetition with interview 1 and the kitchen 'go-along'.
2. Confirmation of the use of latex free gloves when conducting the fridge audit as something that instilled confidence when entering the participant's fridge.
3. Selection of the set-up and shoot approach to filming of meal preparation occasions. Pilot feedback indicated that, compared to the on the shoulder approach, the set-up and shoot approach was viewed as less intrusive, less daunting, in terms of having to concentrate on cooking and interacting with the researcher. From a researcher perspective, this was more appropriate given the space limitations of the kitchens and the importance placed on reducing the influence of socially desirable behaviours.

Following ethical approval (see Appendix 6) and piloting of the methodological approach adopted for the investigation of the everyday domestic food provisioning and handling practices of the 60+, the main data collection phase occurred from November 2011 to April 2012, and is detailed in Table 6.3.

Table 6.3: Data Generation Techniques

Technique	Reference	Application	Visit (weeks)	Images	Skills	Stuff
Interviewing (Life-course and In-depth)	Bertaux and Kohli (1984) Elder (1994) Humphrey (1993) Moen, Dempster-McClain and Williams (1995) Falk <i>et al.</i> , (1996)	Life-course interview as an introduction to the research informed by responses gained during P1. In-depth with focus specifically upon methods of food provisioning and cleaning.	1-3	✓	✓	
Kitchen 'go-along'	Carpiano (2009) Kusenbach (2003)	Participant-led tour of the kitchen, looking specifically at what is contained within the kitchen, looking behind the cupboard doors, who uses the kitchen. Other uses, modifications and positive and negative aspects of the kitchen space and its design.	2	✓	✓	✓
Kitchen architecture mapping** ³⁷	N/A	Kitchen floor plan and measurements.	2			✓
Food purchase history	Ransley <i>et al.</i> (2001) Ransley <i>et al.</i> (2003)	Collection of food shopping receipts for first two weeks of study, shopping routines, how frequently, where and what foods are purchased and why. <i>i.e. are high-risk listeria products and reduced price items purchased?</i>	3		✓	
Fridge audit **	N/A	Fridge condition, age, foods stored within the fridge, shelf positioning of products, use-by dates.	2		✓	✓
Microbiological sampling	Kennedy <i>et al.</i> , (2005) Kennedy <i>et al.</i> , (2010) Kennedy <i>et al.</i> , (2011) James, Evans and James (2007) Haysom and Sharp (2005)	Is <i>Listeria spp.</i> present in the fridge?	2		✓	✓

³⁷ ** data generation technique developed exclusively for the study

	Redmond <i>et al.</i> , (2004)					
Activity recognition	Hoey <i>et al.</i> , (2011) Plotz, <i>et al.</i> , (2011) Hammerla <i>et al.</i> , (2011) Pham and Olivier, (2009) Oliver <i>et al.</i> , (2009)	Unobtrusive observation of kitchen activity, kitchen peak usage times, fridge efficiency.	3		✓	✓
Visual documentation	Pink (2009) Gibson (2005) Rostvall and West (2005) O'Connell (2012) Sweetman (2009)	Photographic documentation widely used throughout the 4-week data collection, video documentation of meal occasions capturing the activity of food preparation.	2-4	✓	✓	✓
De-brief interview	Bertaux and Kohli (1981) Elder (1994) Humphrey (1993) Moen, Dempster-McClain and Williams (1992)	In-depth interview technique adopted, opportunity to gain participant reflections of partaking in the research. Share preliminary findings and elicit further insights based on the feedback of data collected (photographic, video and AR to conclude and de-brief.	5 <i>(Subsequent visit made 1 month after completion of data collection)</i>	✓	✓	✓

Consistent with the ethnographically inspired approach, the researcher also kept a research journal throughout the course of the data collection period (Bryman, 2004). This provided an outlet to record thoughts and ideas, which were then referred to and used to assist with analysis. The subsequent sections of this chapter are dedicated to the description and critical evaluations of each of the data collection methods employed, and are presented in the order in which they occurred (as outlined in Table 6.2 and Table 6.3).

6.5 Household Visit 1

6.5.1 Informed Consent

Informed consent was sought from each participant in the study. Prior to the first research visit, participants were sent an information sheet that outlined the requirements of this study and highlighted some frequently asked questions (see Appendix 5). During the initial visit, the researcher reiterated the research process, and went through the participant information sheet with each household member, and the participant(s) were required to sign to give their informed consent before progressing on to data collection (see Appendix 7). At this stage participants were informed of their right to withdraw from the research at any stage without reason or prejudice, and were left with full contact details of the research team, should they have any concerns during the data collection period or after. However, all participants recruited to Phase 2 completed the study.

6.5.2 Life-Course Interviews

Life-course interviews provide participants with the opportunity to verbalise their personal accounts of their lifestyle and present their own meanings and understandings of their relationships with food (Sobal and Bisogni, 2009; Wills *et al.* 2008 and Falk *et al.* 1996). Such interviews benefit the researcher by allowing them the opportunity to '*make sense*' (Wills and Brennan, 2012, p.6) of the participants' relationship with food and the identify points of transition during their life-course to

explore how and why, if at all, individuals' relationships with food and food provisioning practices have changed over time (Devine, (2005). The interview was designed to consider participants' early experiences with food, the development of their cooking knowledge, and guide them through their life-course to the present, reflecting upon the role of food in this journey.

The life-course interview was intentionally chosen as the first data collection technique, to provide both contextual data on household participants and to generate a rapport with them before more 'intrusive' methods were deployed (Evans, 2012). The interviews took place in the location that was most comfortable for the participants, which was not always in the kitchen. All members of the household were encouraged to take part in both the life-course interview, to avoid the over reliance on response from the primary food provisioner, and help to explore transitions from a household perspective (Brennan *et al.* 2007; Hudson and Hartwell, 2002 and Johnson *et al.* 1998). Semi-structured interview schedules (used as prompts) were developed for the life-course interviews (see Appendix 8), and after obtaining participant consent; the interviews were digitally recorded and transcribed verbatim.

6.6 Household Visit 2

6.6.1 The Kitchen 'Go-Along'

The 'go-along' approach has been popularised within health and neighbourhood studies (Carpiano, 2009; Kusenbach, 2003) and more recently has been adopted in a domestic kitchen context (Meah and Watson, 2011). The 'go-along' is a form of in-depth qualitative interview, which is conducted by the researcher accompanying their participants in their own familiar environments (the household's kitchen) (Carpiano, 2009). The central premise of this approach is to understand how '*individuals comprehend and engage with their physical and social environments in everyday life*' (Kusenbach, 2003, p.456). This approach allowed the researcher physically to look behind the kitchen doors of the households (Brennan, 2010). The

participant-led nature of the tour reduces intrusion by giving participants autonomy over the exercise. This method required the householder to take the researcher on a guided tour of their kitchen. The brief given to householders was to talk the researcher through the design of the kitchen, explaining elements that they liked, disliked, had changed or would like to change. It also allowed them to demonstrate how they used the space, for example, what they kept in kitchen cupboards and drawers and where food was typically prepared. This tour, while open in nature, involved a focus on specific material objects within the kitchen such as: key items of kitchen equipment and appliances, the consideration of the available floor space; lighting (TiKL, 2012); the position of key kitchen technology (i.e. white goods and boilers and sinks); internal/external doors and windows; eating areas and pet feeding areas. The householder was encouraged to guide the researcher through the use of the space and the objects that were contained within it. The benefit of being *in situ* enabled the researcher to draw material objects into the discussion, which in turn facilitated a practice-based dialogue. Moreover, the explanatory nature of this method facilitated participants' recollection and verbalisation of the mundane (Power, 2000).

8.1.1.1 Kitchen Architecture Mapping

As part of the kitchen 'go-along' process, the researcher took photographs and drew maps (including measurements) of each household's kitchen. This included for example, the positioning of key kitchen appliances, boilers, windows, doors, food storage and disposal and pet feeding areas. These maps were later used for participant elicitation (Banks, 2007), as well as acting as an aide memoir for the researcher. Photographic images were later used to prompt discussions during the data collection period and specifically within the narrative and de-brief interviews. Field notes were made by the researcher throughout to support retrospective corroboration of the data collected. Lastly, participants were provided with a disposable camera and encouraged to photograph things they felt to be of interest within their kitchen environment over the course of the 4-week data collection period. This acted as a bridging activity for the researcher during householder visits

and allowed all householders to engage with the research to the extent to which they felt comfortable (O’Connell, 2012). A potential criticism of this method is that participants require a reasonable level of physical ability and this method had potential to overburden or cause them fatigue. Taking these concerns into consideration, it was decided that this research would provide an opportunity to assess the appropriateness of using the ‘kitchen go-along’ method for research involving older people.

6.6.2 Fridge Audit

The fridge has been identified as a ‘high-risk’ storage location for foods that act as the carriers of foodborne pathogens (Kennedy *et al.* 2011; Kennedy *et al.* 2010; ACMSF, 2009; James, Evans and James, 2007; Kennedy *et al.* 2005; Redmond *et al.* 2004). It was thus selected as a key site of analysis. Existing food safety research has previously considered the role of the domestic fridge; however, work so far has focused primarily on attempting to record internal fridge temperatures (Gilbert *et al.*, 2007; James, Evans and James, 2007; Hudson and Hartwell, 2002 and Johnson *et al.* 1998). Although this was of interest to this study, it was also important to extend beyond temperature to record: the types of foods stored within the fridge and more specifically how ‘high-risk’ listeria foods were stored (i.e. removed from original packaging), UBDs of food within the fridge, how food was being stored; and the condition of the fridge, including age, model and whether it had an integrated or added temperature monitoring facility (Haysom and Sharp, 2005). Householders were encouraged to assist in the completion of the fridge audit, though it was not a requirement.

A protocol for conducting the fridge audit was developed specifically for this research (Appendix 9). The audit was conducted during visit 2 and consisted of four steps:

1. Photographs of the fridge were taken to capture fridge brand and condition (fridge seals constitute a key indicator of its ability to maintain and regulate temperature).
2. Photographs of the foods stored within the fridge were taken. The researcher was conscious of the amount of time that the fridge door was opened for and products out of the fridge (ACMSF, 2009) and as such removed the food items from the fridge beginning with the top shelf and working down, to photograph individually. The brand, condition, UBD and shelf position of each item was logged. All items were then returned to the fridge in their original positions.
3. The temperature of the fridge at the time of the audit was also recorded using digital temperature loggers. This was consistent with those used by Gilbert *et al.* (2007) (see James, Evans and James, 2007, for a review of methods).
4. Microbiological samples were taken from the fridge during the audit process. For further details on the microbiological sampling see Section 6.6.4.

Care was taken when interpreting this data, as households may provide favourable representations of themselves or their practices (Wills and Brennan, 2012; Housley and Smith, 2010). In this instance there was potential for households to clean or order their fridges prior to the audit. Whilst this is difficult to avoid, households were specifically asked, both before and after the audit, if they had made any changes prior to the researcher's visits.

6.6.3 Microbiological Testing

Microbiological testing allowed for a picture of the microbiological status of each household to be developed. It is not possible to establish direct causal associations between household practices and the microbiological results gained. However, listeria is a known environmental pathogen and the detection of any of the *Listeria spp.* outlined in Section 2.4 could be indicative of an environment that could support the growth of *L.mono*. Microbiological testing in the domestic environment is

consistent with approaches adopted by studies taking a HACCP inspired approach to understand domestic food safety (Evans *et al.* 2012; Kennedy *et al.* 2011; Fischer *et al.* 2007; Jackson *et al.* 2007; Kennedy *et al.* 2005; Redmond *et al.* 2004). These studies required participants to prepare a recipe selected by the research team. This process was observed and the microbiological status and competence was assessed. However, in line with the ethnographically inspired nature of this research, this approach was not used. Rather, samples were taken from pre-defined sites identified as key to the survival and growth of *Listeria spp.* (Haysom and Sharp, 2005; Hilton and Austin, 2000). In addition, the microbiological testing of fridges was used as an indicator of the unseen condition of households' fridges, and thus provided a cross check against participant desirability characteristics referred to above. Microbiological sampling took place during the fridge audit process in visit 2.

Newcastle University's Geneius Laboratory was required provided advice and training on microbiological sampling and analysed the collected samples. Following consultation with Geneius, it was decided that three key sites in the kitchen would be sampled exclusively for *Listeria spp.* These were used to detect the presence of *Listeria spp.* and if it was, detected to identify what species of listeria was present. *Listeria spp.*, was tested for, as it is a well accepted proxy measure for the detection of *L.mono.* The sites chosen for sampling were the fridge drain; the fridge salad/fruit and vegetable drawer and the kitchen sink drain. The rationale for selecting these sites was that the *L.mono.* survives and grows in damp environments both commercial and domestic such as drains and within fridges. Moreover, in domestic environments there is potential for cross-contamination from drains to other areas of the kitchen. Within the fridge, the fridge drain was indicated to be the most likely site for detection. The rationale for the inclusion of the salad draw was that *Listeria spp.* is prevalent in soils which are a commonly accepted environment for the growth of the microbe and can be attached to vegetables (Farber and Peterkin, 1991) which are stored in the fridge.

Ethical concerns relating to this method were raised and particularly related to how, if at all, participants should be informed about the presence of potentially dangerous

pathogens that could jeopardize their health. In this instance, specific consent to undertake microbiological testing for foodborne pathogens was obtained and the ethical approval process required that participants were informed that they would be made aware of the results of the microbiological tests. Prior to conducting these tests contact was made with Newcastle City Council, Environmental Health (EH) Team. They were made aware of the study and contact details of a named officer within the EH team was given to participants for reassurance and assistance with eradication, should *Listeria spp.* be detected. It was discussed that in the first instance, participants would be made aware of a positive result; and second, if they so wished the Environmental Health officer would be contacted on their behalf by the researcher.

The microbiological samples were analysed by Geneius laboratory. All data handling and reporting used the standard conventions within the laboratory. At no point were Geneius given any personal contact details for the participants.

6.6.4 Activity Recognition and Temperature Monitoring

There has been an increased interest in capturing and analysing social and technical data simultaneously in kitchens (Hoey *et al.* 2011; Plotz, *et al.* 2011; Brennan, 2010; Hammerla *et al.* 2011; Pham and Olivier, 2009; Oliver *et al.* 2009). The tools used have focused on the use of pervasive sensors and activity recognition (AR). Combined, these have permitted a more quantifiable picture of what kitchen activity is being performed and have enabled metrics of skill level in food preparation to be assessed. Such metrics are beginning to be shown to be very useful within the field of health and wellbeing and, more specifically, in rehabilitation training or assistive living interventions (Hammerlea, *et al.* 2011). Although the techniques and methodologies used in AR and unsupervised skill assessment are well established, their application in domestic food safety research is novel.

The use of AR sensors was not included as part of the original research design. However, collaborative links with the Culture Lab team in the planning stages of EIS, highlighted the merits of this technology for providing a behavioural ‘ground truth’ of activity³⁸ (Olivier, *et al.* 2009). To date, sensing technologies have relied on sensors being worn by participants. The core benefit of embedded devices over body-worn or even video documentation alternatives, is that activity can be captured without unduly encroaching into private domestic spaces or being an unwelcome encumbrance to participants (Plotz *et al.* 2011).

One of the central challenges of Phase 2 was the institutionally imposed ethical restrictions and the heterogeneity of the cohort, making adopting a traditional ethnographic approach inappropriate. Originally video documentation was the method favoured to negate these challenges. However the ubiquitous nature of these pervasive sensors (size of a 50 pence piece), coupled with their ability to record activity over extended periods without the need for the researcher’s presence and the relative inexpensiveness of the technology warranted their inclusion (Olivier *et al.* 2009). The ‘ground truth’ objective activity data that such devices capture held value for negating the drawbacks associated with participants reporting socially desirable behaviours, rather than what is actually happening in their kitchen. Moreover, these sensors were also capable of measuring temperature which made them even more valuable from a food safety perspective.

The constituent elements of the sensors used in the study were: a triaxial accelerometer, a micro-controller, a memory chip, a temperature sensor and a real time clock. The sensors referred to as AR(T)’s³⁹ (Openmovement, 2011) were developed by Ladha *et al.* (2011). The embodiment of the AR(T)s consisted of overmolded electronics in a food safe thermoplastic (macromeltTM), making them suitable for use within the kitchen environment. Sensors were configured to

³⁸ Although AR techniques are not unique (research facilities world-wide are developing AR approaches), the Culture Lab’s Ambient Kitchen has pioneered the embedded use of these devices to understand kitchen practices.

³⁹ Triaxial Accelerometers permit Activity Recognition (AR), for the purposes of this research the accelerometers also measured temperature data and therefore, throughout this thesis are referred to as AR(T)’s.

continuously log tri-axial acceleration and temperature and were strategically positioned in 4 predefined locations within each household's kitchen (see Figure 6.1). Predefining the location of the sensors was essential in order for the sensors to be trained to recognise location specific activity. To make use of the accelerometer output successfully a Principle Component Analysis (PCA) was used to identify features correlating to activity. This representation was then subjected to a KNN (K-nearest neighbour) filter highlight events (such as drawer/fridge/cupboard open/closes). To validate this approach, an annotated video ELAN (LAT, 2008) was used and was compared to a 10-fold stratified KNN filter output. Results from the process indicate a sensitivity of 96%, a specificity of 100% and an accuracy of 98% (Hammerla, *et al.* 2011). This meant with 96% confidence, the sensors were able to detect activity precisely. In addition, it was 100% sure that when there was no activity to detect, the sensors would accurately identify this, and finally, 98% sure that the sensors measured the activity that they had been trained to detect.

The AR(T) device selected for this study was specifically based on an accelerometer. Accelerometers have the ability to measure a range of activities, where in contrast, a single mode light, temperature or humidity sensor would not be as suitable. Moreover, the granularity of the data from accelerometer-based sensors permit slight idiosyncrasies to also be identified. For example Hammerla *et al.* (2011) were able to distinguish between activities performed with the dominant hand and those that were not.

As listeriosis is the central concern of the study, the fridge was selected as the primary location for the sensors. Their positioning within the fridge allowed for open and close event data to be captured and longitudinal temperature surveillance. However, owing to the proof of principle of this approach, spot check temperature measurements were also taken, for means of comparison. This included the use of three digital temperature sensors, which consistent with the approach taken by Johnson *et al.* (1998), were placed on three shelf locations (top,

middle and bottom) within the fridge and left for one hour (during visit 3 and the narrative interview).

Sensors were also placed on the tap, kettle and main cutlery drawer, and these measured on/off, lift/fill/boil/pour and open/close activity respectively. The rationale behind the selection of these locations was the likelihood that all kitchens would have these appliances, and thus would provide a comparable metric for kitchen activity (sensor deployment is shown in Figure 6.1). These locations were also considered central to the performance of key domestic food safety practices including those associated with cleaning, meal/snack preparation and eating. The devices were installed by the researcher during visit 3 and remained in place for a 14-day period. Data was captured 24 hours a day for this 14-day period. All devices were time synchronised with each other and installed using non-marking tape.

Figure 6.1: AR(T) Devices and Deployment



(Source: Author)

The output of the AR(T) analysis was a multi-stream, time stamped data set that contained the recorded events relating to each sensor site. Most significantly for this research, it was possible to calculate fridge usage patterns through the number of open and close events. It was then possible to map this on to the temperature data, showing how this fluctuated in line with activity where each open/close event had a corresponding temporary increase in temperature, with high frequencies of activity resulting in a prolonged cool-down period. The granularity of the temperature data collected also provides evidence of the temperature boundaries

that each household fridge was operating between, which is an indication of the condition and performance efficiency of the fridge. Such temperature insights can allow for comparisons to be made between recorded fridge temperatures (using the AR(T) devices and the FSA domestic food safety best practice recommendations, outlined in *Chapter 2*.

On a more general level it was possible to provide an overview of kitchen activity indicating peak usage times, where appliance usage times were used as a proxy measure. In addition to the stand alone insights gained from the AR(T) data, the activity data also provided an objective baseline upon which self-reported mundane kitchen practices of each household could be cross referenced. This goes some way to addressing the concerns detailed in *Chapter 2* about the use of self-reported techniques in exploring mundane, habitual practices, particularly given the age and diminishing cognitive capacity of this ageing cohort (Giles, 2009).

6.7 Household Visit 3

6.7.1 Food Purchase History

Studies of food provisioning have typically included food purchase ‘go-along’ (Watson and Meah, 2011, Marshall and Anderson, 2011; Rayner, Boaz and Higginson, 2001), and are an established approach within nutritional research. Originally this was the favoured approach for this study, although following a consultation with key stakeholders, primarily Newcastle University Institute for Ageing and Health, ethical concerns were raised with respect to the potential for participant fatigue and logistical⁴⁰ concerns about the appropriateness of this method for this older cohort. Despite this, food procuring practices were of central importance to the study and therefore alternative approaches were required. Participants were asked to retain their shopping receipts, for the first two weeks of the study to build up a purchase history for each household (Ransley *et al.* 2001).

⁴⁰ Concerns were raised during the ethical approval process and the risk assessment concerning the extent to which the research could assist in the shopping visit, particularly whether it was permissible for the researchers to transport participant to food outlets.

The receipts provided store locations details, gave date and time stamps on shopping occasions, provided an itemised list of food purchases and identified reduced priced items. Specific attention was given to the purchase of 'high-risk' products (see *Chapter 2*). The data provided was used as an alternative to accompanied shopping trips and as a basis for elicitation within the subsequent shopping interviews.

Although accompanied shopping visits did not form part of the methods used in this study, it is acknowledged that they may offer a number of the potential advantages. They can provide a richer understanding of the processes that households undertake when they provision food including those associated with: planning, transport, food choices, in-store influences (i.e. promotional activity; store layout), and the time taken to transport food home and unpack. However, the issue of participants adapting practices in order to present a favourable impression of their behaviours to researcher can be of concern when accompanying visits, and whilst the collation of shopping receipts does not negate this issue entirely, it is argued that it may provide a more accurate and realistic account of food provisioning practices.

6.7.2 Video Documentation

In line with the prerequisite of practice theory to go beyond '*sayings*' and include '*doings*' (Warde, 2005, p.134; Martens, 2012), it was decided that video documentation would be used to capture meal preparation occasions. The capturing of video data was intentionally limited to between 1-4 meal preparations, as this was considered reasonable to avoid participant fatigue while also long enough to capture potential variance in practices during meal preparation. This limit also ensured that the amount of video data captured was of a reasonable volume to permit proper analysis given the project time frame, and to avoid over-saturation of data (Martens, 2012).

Everyday food provisioning is habitual, routine and mundane. This means that it is very difficult for householders to verbalise such practices as they give them very little cognitive consideration and appreciation of the skills required to conduct such practices. Video documentation can therefore help to reveal how a practice is routinely performed to both the researcher and the householder and can be a very useful elicitation method (Martens, 2012; Sweetman, 2009 and Power, 2000). The fine-grained analysis that video analysis permits through continuous action capture, playback and slow motion facilities allows this method to go above and beyond what can be captured through static images and journal notes and avoids information loss (Creswell, 2007 and Martens, 2012).

It is acknowledged that there are a number of ways to capture video footage. Two such approaches are the camera on the shoulder (Pink, 2007) and participant-led filming (Martens, 2012 and Gibson, 2005). The camera on the shoulder approach, referred to by Pink (2007, pg.101) as the '*video tour*', involves the researcher being present in the homes of the participants and working collaboratively with them to represent their everyday life. The participant-led filming approach, such as Marten's (2012) use of CCTV within her 'Domestic Kitchen Practices Study' required the participant to take an active role in the filming process. Video equipment is set up by the researcher and left for the participant to operate in their absence. Following data collection, the participant is given the opportunity to review it with the researcher. For this study, the participant-led approach was adopted. Video cameras were temporarily fitted and left for participants to turn on when they prepared their meals, thereby creating 'participant-produced' footage (Muir and Mason, 2012). Using a fixed camera negated the necessity for participants to hold it whilst cooking.

The filming requirements were discussed with each household and a co-produced filming plan agreed. This ensured that participants were comfortable with the filming process and the equipment. Where participants were not confident using the technology, strategies were put in place to overcome this. For example, in one case (HH9) the researcher turned on the cameras and left the householder to

prepare their meal. The researcher returned when meal preparation was finished and turned off the camera. The approach to video data collection was favoured as this facilitated participant involvement in the study and gave the households autonomy over the filming process. In addition, participant-led filming helped the researcher overcome institutionally imposed boundaries that required her to be present within a household only during the working day (9am-5pm). As such it was possible to collect data outside the 9am-5pm timeframe and ensured that actions were captured that may otherwise have been missed. Additionally, this approach was also favoured as the compact size of some of the participating kitchens was such that it would not be possible to use the camera on the shoulder approach, as this requires both the researcher and participant to be present during filming.

Although, for many sub-groups of the population, video documentation technology has become a near ubiquitous part of everyday life, for older consumers the evidence suggests this not to be the case. However, 'silver surfer' discourse recognises the heterogeneity of experience of older consumers, which extends to use and acceptance of technology (Selwyn, *et al.* 2003). With this in mind, care was taken when choosing video equipment as an essential criterion was that it should be very easy to use. Newcastle University Culture Lab., who as part of the SiDE project have extensive experience in the use of pervasive computing for health and wellbeing applications, with specific interest in older adults (Hoey *et al.* 2011; Olivier, *et al.* 2009 and Blunsden *et al.* 2009), were consulted during the selection of appropriate videoing technology. A number of cameras were trialled and from this the Flip Video ultra HD™ was selected, due to its ease of use, compact size, image quality, battery life and ability to be positioned using 'anywhere mount' tripods™ and non-marking stage tape. Householders were taken through the process of using the cameras and left with a simple user guide (see Appendix 10).

The use of visual methods including photography and video documentation raised specific ethical concerns, particularly relating to participant anonymity, consent and confidentiality (Wiles *et al.* 2012). There is no code of ethics or established set of rules to follow when conducting ethical video research and the issues arising are

likely to be case specific (Wiles *et al.* 2012). The central concerns in this instance related to the sharing of images, the length of time such data are, used, stored and disposed of. In line with the project proposal, the photographic and video data were stored securely on a drive to which only the research team had access and will be kept for up to three years after the project has finished. With regards to the sharing of images, this is only permitted within the confines of the immediate research team, (the researcher and the supervision team). The sharing of images beyond the primary research team would require additional consent to be gained from participants and this was clearly stipulated within the consent form for Phase 2 (Wiles *et al.* 2012; Meah and Watson, 2011). The presence of unexpected others whilst filming (i.e. a visitor/other household members) was an additional concern. To guard against this, consent was sought from all household members in multiple occupancy households, irrespective of their level of contribution to the research. However, it was difficult to eliminate un-consenting external others unexpectedly being present when filming, although giving the respondents control over the choice of when they filmed was another measure taken to manage the ethical concerns associated with this. It is worth noting that no additional others were captured in any of the video cases.

6.8 Household Visit 4

6.8.1 Narrative Interviews

In addition to life-course interviewing, the narrative interviewing technique was used in order to explore more specifically and forensically the performative aspects of the participants' food provisioning practices, specifically shopping and cleaning (Housley and Smith, 2010). Unlike the ice-breaker life-course interview, conducting narrative interviews in the kitchen was preferable to facilitate and prompt participant recall. To assist the researcher, materials, objects and kitchen design were used to help the participant verbalise routine kitchen practices (Carpiano, 2009; Kusenbach, 2003 and Power, 2000). This supported the participants recalling their experiences in their own language and terminology in a way that was relevant

to their own practices and which was consistent with the observational/GT analytical procedures adopted by the research. Having predetermined the focus of the narrative interviews gave structure to the discussion and allowed the researcher to give consideration to domestic kitchen practices in their entirety. However, it is acknowledged that to be fully consistent with the GT approach it would be preferable that interviews did not focus specifically on topics such as shopping and cleaning in order to avoid value judgements being made which could predetermine the importance of these tasks within households (Wills and Brennan, 2012). In this instance, given the sensitivities of the cohort, anticipating changes in routines and potential for not being able to situate interviews in the domestic kitchen (owing to size and physicality constraints), interviews specifically concentrated on these topics, in order to focus discussions. Narrative interview schedules were developed to prompt discussion and can be seen in Appendix 11.

6.9 Household Visit 5

6.9.1 Debrief

It is imperative that participants are de-briefed following participation within any study, as debriefing provides both the researcher and participant with the opportunity to reflect on the data collection process. In this study, debriefing also took the form of a narrative interview, which was conducted in an additional research visit (see Table 6.2) that was intentionally scheduled to be conducted one month after completion of the main data collection. Giving a break between the data collection and the de-brief interview allowed the researcher to conduct the first layer of data analysis and, in line with the GT analytical approach, theoretically sample whether any gaps in understanding emerged (Chamaz, 2006; Glaser and Strauss, 1999). This also gave the participants distance from the research and thus the opportunity to reflect on the process prior to interview.

Owing to the diversity of the mixed methods used, which had not been used in this context previously, the central concern of the debrief interview was to gauge

participant response to the methods and the research process, in order to ascertain their suitability for the study of the 60+ cohort (see Appendix 12).

6.9.2 Incentives

Following consultation with stakeholders (Newcastle University Institute of Ageing and Health and the Elders council) and in line with similarly demanding studies, remuneration for fully completing the data collection requirements was set at £80 in high street gift vouchers. This was given to each participant when they had completed the data collection process and was issued during visit 5 (de-brief interview, see Appendix 13). High-street shopping vouchers were given as opposed to cash remuneration as it was highlighted that giving cash could be problematic in that it can negatively impact low-income households in terms of the benefits that they receive and their declaration of income.

The following sections of the chapter focus specifically on the approach to analysing the eclectic mix of data generated by Phase 2 and the EIS.

The interdisciplinary 'toolkit' adopted to understand the domestic food provisioning practices of the 60+ resulted in the generation of a variety of different data streams. Whilst methods were selected that ensured '*complementary strengths and no overlapping weaknesses*' (Johnson and Turner, 2003 p.299), the complexity of the different types of data generated (verbal, technical, visual and scientific) meant that it was neither appropriate nor advisable to attempt to triangulate. Instead, the multiple streams supported a detailed case analysis of each household, and across households, which supported the elaboration, confirmation and illustration of everyday domestic food provisioning practices (Onwuegbuzie and Teddie, 2003).

The lack of guidance on how practice should be investigated inherently means that there is a lack of direction or empirical examples upon which to guide such analysis. As a consequence, it was necessary to turn to a broader literature for analytical

inspiration and structure (Strengers, 2009). Through this qualitative data analysis procedures suggested by Glaser and Strauss (1967) and Spiggle (1994) were identified to have a contribution to make from an analytical perspective that could be suitable for handling the range of data collected in a manner that was congruent with the principles of ethnography that had inspired the research design. In their seminal text, *'The Discovery of Grounded Theory'*, Glaser and Strauss (1967) presented GT as a new research method and methodology, the central premise being that it begins with a topic of interest from which a substantive theory is developed, by essentially letting the data speak for itself. Unlike other approaches, GT does not advocate the use of a predefined theory or hypothesis that it attempts to prove, rather theory develops out of simultaneous data collection and analysis with each stage informing and focusing the other through the research process. Whilst the aforementioned is a pure account of GT, this was not adopted by this research; rather GT analytical procedures were used as a tool to guide the analysis. Therefore from herein the use of GT will refer to the analytical procedures used to guide Phase 2 of the research.

6.10 Data Analysis

Adopting GT analytical procedures to the analysis of the EIS data allowed the researcher the freedom to work from the ground up, and to direct their gaze to whatever was found to be of interest (Chamaz, 2006; Glaser and Strauss, 1999). Moreover, the analytical procedures promoted by GT are well aligned with SPT, giving priority to the study of phenomena rather than a description of the setting (Chamaz, 2006). Thus, adopting GT analytical procedures allowed for open-minded observation whilst also giving rigour to the observation by building in systematic checks during the data collection and analysis. The GT analytical approach encourages the researcher to look back at the data and forward to the analysis, without structure in this way the temptation for the researcher is to: collect data for the sake of collecting data; make unnecessary data collections visits and fall back on *'stock concepts from their disciplinary shelves'* (Chamaz, 2006, p.23).

GT analytical protocol provides a systematic set of principles upon which to structure analysis, the two central concepts of which are comparative analysis and theoretical sampling (Glaser and Strauss, 1999, Spiggle, 1994). In brief, the stages involved in generating theory from data, and used as the basic analytical framework in this instance are (Chamaz, 2006):

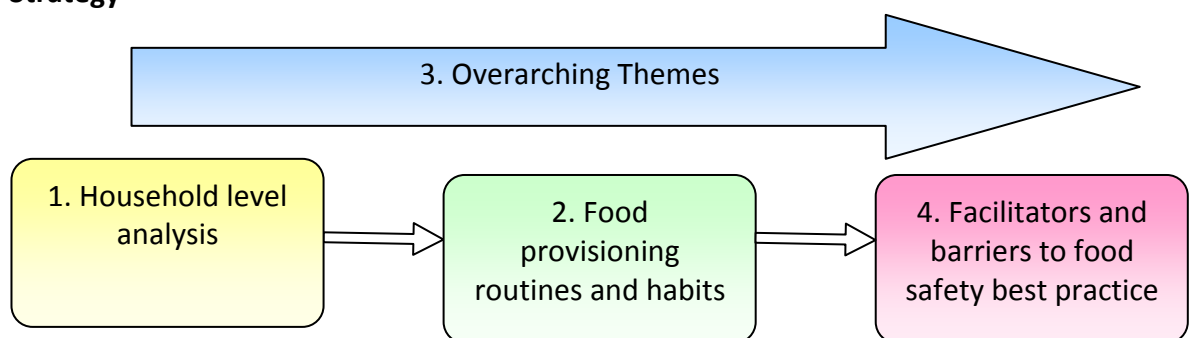
1. Initial Data Collection: Rich data, getting beneath the surface of social and subjective life
2. Coding: Select, sort and separate data and begin the analytical account
3. Memo Writing: Ideas, thoughts and feelings, develop ideas in narrative form and add to the fullness of the early analytical process
4. Constant Comparison: Comparison at every level of the analytical work, comparing similarities, differences and incidents; when, where and how
5. Theoretical Sampling: seeking pertinent data to develop theory, or finding negative cases and asking why. Elaborate and refine the categories in the emerging theory
6. Theoretical Saturation: Knowing when to stop! When collecting data no longer sparks new insights
7. Framework Integration: Tying together concepts and creating theory through '*selective coding*' selecting core concepts, relating these to other concepts, validating relationships and filling in categories that are '*thin*' (Glaser and Strauss, 1999, cited in Chamaz, 2006, p.23).

It is recognised that the data analysis process is not linear and whilst this approach provides the framework for the analysis of the data generated by the EIS, the principles outlined above are merely acting as a guide for the stages of analysis. Importance is given to some elements over others based on the research questions outlined; coding was more general and did not strictly adhere to the word-by-word or line-by-line coding approach advocated by a pure application of GT (Chamaz, 2006).

As previously discussed, Phase 2 involved significant collaborative efforts between the researcher, Newcastle University Culture Lab and Geneius Laboratory. While these collaborative partners supported the analysis of their associated raw data, the interpretation of these and the job of integrating the technical results with the qualitative data remained the responsibility of the researcher.

In line with the GT analytical procedures, analysis was conducted throughout the data collection process (Chamaz, 2006). This was in order to immerse the researcher in the process and to act as a platform for questioning, observations and elicitation at each visit. However, it was imperative to have frameworks to collate and format prior to data collection. Spreadsheets were designed and used to extract raw data, (such as the fridge audit and shopping receipts). PowerPoint was used to collate data from the kitchen ‘go-along’ and subsequent observational photos taken. Over the course of the data analysis and to assist with the cross-case analysis, further spreadsheets were designed to support the interrogation of the data. Constant inter household comparison and researcher reflection during data collection ensured consistency in the data collected from each. The data analysis process can be represented as four key stages shown in Figure 6.2.

Figure 6.2: Analytical Strategy



1. Stage 1

The first stage of analysis was at the level of the household and was consistent with the ‘coding’ process identified by Chamaz (2006). This stage aimed to produce a

rich contextual description of the range of influences on the domestic food provisioning practices of each household, how these have developed over time and how they had given rise to the current practices performed. Knowledge, education, life-style and relationship(s) with food were explored in relation to the meaning element of practice (Shove, Pantzar and Watson, 2012). This involved careful consideration of all data from across the different methods employed. From this key individual household themes emerged and these were used to generate mind maps that described each household.

2. Stage 2

Cross-case comparative analysis across the households was undertaken in order to identify emergent food provisioning routines and practices. Specific attention was paid to the '*doings*' (Warde, 2005, p.134) of these routines and practices and from these rich descriptions of the daily food provisioning practices emerged that related to shopping, cooking, eating and cleaning. Spreadsheets were used as the framework for this analysis and were populated with data from the multiple data streams.

3. Stage 3

Stage 3 involved looking at the overarching themes that were emerging across the identified food provisioning routines and practices. Again spreadsheets were used as a means of identifying common practices across the households. Theoretical sampling was used as a means of identifying pertinent cases within the data to illustrate the identified practices. Negative cases were also identified and questions were then asked as to why these were observed, and further analysis conducted to provide explanation.

4. Stage 4

The final stage of analysis involved the consideration of how/if food safety fits within the identified practices. Here intersecting practices to which the observed practices belonged were identified, and the web of everyday domestic practices explored. This analysis was conducted again using spreadsheets to develop intersecting practice matrices. It was through these that it was possible to identify the potential barriers and facilitators for the 60+ with respect to adoption and sustained performance of best practice domestic food safety recommendations.

6.11 Summary

In response to research objectives 4 and 5, this chapter has provided a methodological account of Phase 2 of the multiple research methods employed in the EIS. Justification of the use of a range of traditional and innovative methods, and a detailed account of the application of each has been given. Consideration of the procedure in which these methods were administered and the analytical approach taken to the complex range of data streams generated by Phase 2 were outlined to provide the basis on which the EIS data generation techniques could be replicated. *Chapter 7* reports the empirical findings of Phase 2 and the EIS.

Chapter 7 : Phase Two Results

7.1 Introduction

Chapter 7 presents the empirical findings of Phase 2, the EIS, and follows the analytical strategy outlined in *Chapter 6*. It begins by providing a narrative introduction (vignette) to each of the households as a means 'getting to know' the sample (Wills *et al.* 2008). These narratives focus primarily on each household's life-course experiences and how these have shaped their relationship with food. Based upon the cross household comparative analysis of the food provisioning practices of this cohort, an overarching model describing the core concept of '*Independence Transitioning*' is presented. The central premise of this conceptual model is that the life-course is a dynamic process, which requires households to adapt to changes faced by this process, by making both subtle and major alterations to their lives and consequently their food provisioning practices in order to maintain independence. It details the dynamic, complex and often conflicting food provisioning and handling practices of the 60+. The specific food safety implications arising from these practices are considered in *Chapter 8*.

7.2 The Sample: Transitions, Turning Points and Now

The following vignettes have been constructed primarily from analysis of the life-course interview data and are supported by a detailed review of the researcher's field notes developed over the EIS data collection period. Each reviews the meaning of food to each household across the life-course, by considering the transitions and turning points encountered on the journey from childhood to the present and how these have shaped the householder's relationship with food. Owing to the qualitative nature of the EIS, each household has been assigned a pseudonym⁴¹. This will be used to identify the households from this point forward.

⁴¹ All quotes are coded in accordance with the interview in which they were given, I1 is the life-course interview, I2 is the narrative interview focused on shopping and cleaning and DI was the debrief interview.

- *Household 1: Female aged 76 (Joan)*

Joan is 75 and lives with her husband (76) in the two bedroomed bungalow that they own in a suburb of Newcastle. They have lived there for 15 years, having relocated shortly after taking early retirement to be closer to their family. Joan has always assumed the role of primary food purchaser and preparer in the home, having learnt how to cook and bake from her mother as a child. Joan and her husband were married at 19 and they have two children who both live locally. Joan's husband worked as a police officer and did not take any role in food purchasing or preparation. His work demanded that they frequently relocated and that he worked shift patterns. Despite these uncertainties, Joan was careful to ensure that the family had eating routines and took pride in being a 'homemaker'. This extended to the way in which food was prepared and eaten. Foods purchased and prepared were traditional, consistent with those she was taught to cook by her mother and were also to the taste of her husband. Joan continues to enjoy food preparation, viewing it as one of her pastimes. Routine continues to play an important role in their lives, they shop regularly once a week for essential store cupboard items and do daily 'top-up' shopping. They enjoy this and see it as an activity that they do together. Joan determines what food they purchase and her husband assists with carrying heavy items while they shop around different supermarkets for specific products and price offers. Their collective view on value has led to her cooking in larger quantities in order to make the most of larger value packs from the supermarket. The meals that Joan prepares are in accordance with the types they have always eaten and are made from scratch. That said, they are also happy to try new dishes and the choice of evening meal is often made daily in accordance with her husband's preferences. Meals continue to be eaten at regular times in keeping with what they have always done. Breakfast eaten in their kitchen, light lunch eaten as and where and dinner (their main meal of the day) is eaten in their dining room. Joan's husband suffers from Type 2 diabetes and has heart related problems and as a result they are adhering to a reduced fat and reduced sugar diet; nevertheless, Joan now receives assistance from her husband when preparing a meal. She gains comfort in routine and this is further evident in

the way she addresses cleaning. This occurs once a week on a Thursday morning to a cleaning schedule, again in accordance with the way Joan was taught by her mother. Although prior to retirement this had always been Joan's role, her husband now assists.

- *Household 2: Male aged 69 (Peter)*

Peter faced economic hardship as a child and was brought up in the North East as an only child, leaving school age 15 to become an engineering apprentice. He joined the army when he was 22 and served for 22 years, retiring in 1987 and returning to the North East where he owned a three-bedroom property. Now aged 69, Peter is single and lives alone in his rented one bedroom ground floor terraced home, where he has lived for the last 5 years after downsizing. This move prompted him to streamline his material possessions. This is particularly evident in the kitchen where he replaced his cooker with a microwave and an electric two-hob plate, while cupboards now contain only basic crockery and cutlery (2 of each). In addition he does not own a pair of oven gloves or a chopping board. As a child economic pressures meant food was basic and restricted to what could be afforded. Meals were therefore simple and small, with a weekly treat of fish and chips that was shared with his parents. For the mid sections of his life, his lifestyle was dominated by the institutional order, regularity and routine provided by the Army. Food played a solely functional role, to provide energy and sustenance until the next meal. Whilst in the Army, all Peter's food was prepared for him. Despite him now assuming the role of main food preparer, the meaning of food is emphasised by functionality and simplicity with the occasional food 'treat'. Following his retirement some small changes have occurred. Food has begun to hold more social significance with an increase in 'treat' and snack foods consumed. However, having experienced heart health problems he has been forced to reduce his intake of these foods. Peter's drive for simplicity and the importance of routine is further demonstrated in the way he procures food, which involves shopping once a week, on Wednesday mornings, sticking to a list and using local independent stores as much as possible. Although financial constraints are no longer an issue, alternative

mechanisms to himself for procuring food are exploited. For example, Peter draws upon his social network to assist him with food provisioning through mutual gifting of food. Peter prepares variations of the same meal each evening. The limited array of kitchen equipment means it often takes on multiple functions. For example: the tea towel is used to dry hands, wipe surfaces and remove hot items from the microwave; the butter dish is used to heat vegetables and plates are used in lieu of chopping boards. The notion of simplicity and routine is further exhibited in Peter's cleaning routines. Since retiring he has employed a cleaner, in part owing to his health but also because he can afford to, and it offers him peace of mind that the house is cleaned regularly. As a result Peter engages little with the cleaning of his home, which is limited to washing dishes, although not every day in order to save hot water, and to cleaning the inside of the microwave or fridge in response to spillage.

- *Household 3: Female aged 63 (Gill)*

Gill is single and lives alone in the two bedroomed flat that she owns, having lived there for the past 26 years. She is currently phasing out employment having worked as a nurse since the age of 18 and more recently as a nursing sister. For the early part of her career until the age of 36, she 'lived in', receiving board and lodgings as part of her role. A combination of this and her experiences of food preparation as a child have contributed to her lack of interest in preparing and cooking food. As a local GP, Gill's father was not actively involved in the food preparation in the home, a role left to her. When she was a child (under 10), her mother was diagnosed as suffering from cancer, during which time a housekeeper was employed to prepare food for the family. Gill's mother died when she was 11. Her father re-married and her stepmother, who was not an experienced cook, assumed the role of primary food preparer. As a household, they were not financial constrained and were accustomed to having good food. Gill did not take an active interest in food preparation and would not assist her mother, stepmother or housekeeper with food preparation. She left home aged 18 to train where she 'lived in', receiving board and lodgings and all her meals were prepared for her.

She relied heavily on the institutional meals provided and purchased very little food in addition to this. For the latter part of her career, Gill did not receive board and lodgings and for the first time was expected to shop and prepare food for herself. She did however, continue to do little in the way of food preparation and ate predominantly in staff canteens. On moving to her flat Gill was for the first time responsible for food provisioning. She does not consider herself to be a 'cook' and does not prepare meals from scratch, favouring ready-meals that she can heat in the microwave or the oven, or cold meals. She is highly active, playing sport including tennis, badminton and swimming most days, as well as socialising frequently with friends. This high level of activity means that she regularly eats her main meals late at night. Consequently, food plays a secondary role in her life, and is something that she fits in around her other activities.

This is also evident in the way she shops for food, purchasing little and often, en-route to other commitments. Her preparation of food is not labour intensive, she spends as little time as possible in the kitchen preparing and cleaning up. She avoids the use of unnecessary equipment, for example food is chopped on the plate she will eat from rather than using a chopping board, which reduces the amount of cleaning necessary. Gill is not financially constrained, however, she is very careful with money and prides herself on her ability to be thrifty. In terms of food this thrift has manifested itself in her purposefully seeking out 'bargains', shopping around for products and purchasing foods in bulk. A high proportion of the foods she purchases have been reduced in price. Gill has accepted her lack of ability to 'cook', and is content that this is something that she will not now learn. However, her thrift in terms of food procurement is something that she considers herself to have mastered.

- *Household 4: Female aged 69 (Sandra)*

Sandra is 69 years old and lives alone in her rented 2 bedroomed flat, in a high-rise block in a suburb of Newcastle. She has 2 adult children neither of which live locally and was divorced from her husband fifteen years ago. Her Burmese immigrant

parents raised both her and her 2 siblings in the North East of England where they experienced considerable financial hardship. This meant that the availability of food was limited and was influenced by her mother's background with meals that generally were based on rice or lentils. She married at 20 and had two children. Once married, Sandra took on the responsibility for food purchasing and preparation despite never having done it before. The household income was low and meals had to be prepared from a very limited budget with Sandra shopping around to buy the cheapest ingredients. Sandra's husband gained employment on the Isle of Wight and the family relocated. This move meant that money was less restricted and Sandra was able to train and work as a P.E. teacher while continuing to assume the primary food purchaser and preparer role. Food shopping was conducted locally and meals prepared were predominantly to her husband's taste, with most meals being meat-based. Following the breakdown of her marriage and their divorce fifteen years ago, Sandra relocated to the North East. She is now the sole food purchaser and preparer in the home. She no longer enjoys this task finding it to be a constant source of anxiety. She suffers from depression that manifests itself in a lack motivation to conduct everyday tasks, of which food provision and other domestic jobs such as cleaning are all part. She is therefore, only able to engage in these tasks when she has the energy and motivation. This results in a lack of consistency and routine in how she provisions food and completes regular domestic tasks. To cope with this, and reduce the anxiety associated with food provisioning, she attempts to prepare large quantities of food, when she has the energy and motivation, which can be stored in the fridge and eaten over subsequent days.

The location of her home is an additional source of anxiety for her as there are no food retailers within close proximity and no convenience stores within walking distance. Therefore, in order to shop for food she relies solely on her car, driving to nearest supermarket, which is 3 miles away. Sandra strongly dislikes shopping for food, and avoids food shopping as much as she can. Her strategy to reduce the amount of food shopping events is clearly demonstrated in her practice of hoarding food within her home. She stores throughout the home (in the bedroom

wardrobes and behind the sofa in the living room) as a means of ensuring food is available. She also opts for long life products such as milk and tinned and dried foods. This struggle with food provisioning is evident within her kitchen although it is well-equipped and she has purchased appliances that she feels will help to inspire her to cook more and be healthy. However, instead of inspiring her, she has found that this has only confounded her negative relationship with food and its preparation and despite all the cooking paraphernalia she owns, she often migrates towards unhealthy, ready-made foods and those that require little involvement in preparation and cooking.

- *Household 5: Female aged 77 (Kathy)*

Kathy is 77 years old, and after caring for her husband who had suffered from Alzheimer's for past ten years she was widowed earlier this year. She now lives alone in the four bedroomed family home where she has lived since 1984. Although adjusting to this, she is happy in her home and would not consider downsizing, if anything 'upsizing' to accommodate her large family network, including her three children, grandchildren and great grandchildren that despite not living in the area, frequently visit. She also regularly travels to stay with them. Kathy was a child brought up during the war and experienced extended periods of rationing and limited food availability; wasting food was therefore unacceptable. Her mother was the main food preparer in the home, although she suffered from asthma and hired help to assist with food preparation and housework. Kathy did not learn to cook as a youngster and only beginning when she first married. She learnt to cook by following a recipe book she was given as a wedding present and was responsible for food provisioning in the home, until her husband reached retirement, 10 years before she stopped working. Between his and her retirement, her husband took on the responsibility for preparing meals whilst she was at work. However, shortly after her retirement, her husband's health began to deteriorate and she became his primary carer, a role that reinstated her as the household's primary food provisioner. Her husband's condition impacted significantly upon their lives, making it difficult for her to engage with activities outside of the home

as she had previously done. During the latter stages of his illness they received assistance and periods of respite care. Carers assisted with her husband's personal care and occasionally cleaned her home, although she maintained responsibility for all food provisioning activities. The experience of being a long-term carer has meant that she takes a practical approach to food preparation, preparing in larger quantities than are required to feed herself, storing the 'leftovers' in either the fridge or the freezer and consuming them over subsequent days. Frequent visits from family mean that she is regularly entertaining and preparing meals, with her guests often using the kitchen space in addition to her. Kathy demonstrates her flexibility and ability to cope with change in the way that she accommodates visitors, often at short notice, and through her frequent trips away. This, however, contributes to her feeling that she does not have a 'routine life', with food and domestic chores (cleaning) fitting in around her activities and visits rather than shaping them. When preparing food for herself she ensures that she eats at least one 'proper meal' a day, valuing quality foods and preferring to purchase meat that is organic or free range. This quality preference means that she often uses a range of food outlets including farm shops, supermarkets, her local convenience and specialist shops. She tries to avoid using her car for shopping, especially when using local shops, and takes a rucksack to carry items. Although, this does constrain the amount that she is able purchase to what she is able to carry.

- *Household 6: Female aged 82 (Annie)*

Annie is 82 and an only child; she grew up with her mother and father in London until the outbreak of WWII when aged 11, she was evacuated to live with her aunt. Her mother and aunt were both experienced food handlers, although, due to rationing she was not encouraged to cook, as she was not 'trusted'. Annie returned to London following the war and married aged 21. She taught herself to cook, taking advice from experts (shopkeepers) and had to learn quickly as her husband's work meant that she often entertained visitors at very short notice, in addition to providing for her husband and 4 children. Annie was unexpectedly widowed during her thirties and she was left to look after her family and her large home. They

experienced financial difficulties and, as a result, she took in lodgers providing them with bed and board. As a result she continued to be responsible for preparing food for large numbers each mealtime. She remarried and relocated her family to Scotland, continuing to provide bed and board, because she enjoyed the communality and atmosphere it created in her home. Following her retirement, herself and her husband relocated to Greece, where they lived for 25 years, food was very much at the heart of all social occasions, with people dropping in to be fed frequently. Annie had to adapt her cooking skills and learned new dishes inspired by the local cuisine. Annie and her husband returned to the UK because of her husband's failing health and settled in the North East to be closer to her daughter. Following the death of her husband two years ago, she now lives alone in her two-bedroom flat within a sheltered housing accommodation block that she has lived in for 7 years. The way that she now provisions food has been influenced by her experiences of living in Greece, shopping for food locally and relying on her freezer more than the fridge. Her 'do it or lose it' attitude extends to food purchasing. As she does not drive she is restricted in the amounts of food she can purchase by the weight she is able to carry. Annie not only shops for herself but also several neighbours who rely on her to buy food on their behalf. She uses a rucksack to carry the groceries of others and occasionally a shopping trolley for larger or heavier items. Annie is very active and thrives on being socially involved. She is a member of the Newcastle Elders Council, is part of a walking group, attends a lunch club once a week and arranges social activities for her accommodation block. She also provides informal support for friends and neighbours, taking a gentleman friend to the lunch club each week, assisting neighbours with household chores (hanging-up washing) and shopping for various neighbours. Although fiercely independent she is becoming aware of her limitations and is cautious not to take on too much, especially in the help she offers to others. Having always enjoyed cooking and preparing food for her family and friends, Annie is starting to face fatigue when it comes to preparing food for herself. She employs strategies and short cuts to reduce the effort required to cook using ready-meals for convenience. This strategy also involves reducing the amount of waste as she only purchases amounts that she knows she will be able to consume. She is aware of price and

purchases foods in bulk, is happy to store foods if it offers a saving and looks for and purchases reduce priced items.

- *Household 7: Male aged 73 (Jack)*

Jack is 73 years old; he is single having never married and lives alone in his two bedroom second floor apartment in a council owned high-rise block. He has lived in his home since moving there in 1962. He originally shared his home with his mother and father until they passed away, his mother in 1965 and his father more recently in 1992. Jack's mother suffered severely from arthritis and was wheelchair bound. He and his father were her primary carers and took on food provisioning responsibilities as part of this, a task that they received assistance with from his aunts who lived close by. Jack left school aged 14 and went to work as a grocer, a profession to which he attributes much of his knowledge and understanding of food. Despite experiencing a degree of financial hardship as a child and food availability constraints because of rationing, his role as a grocer ensured that he and his family ate well and food was available to them, meaning the effects of rationing were not as profoundly felt. Jack left his role as a grocer and went to work as a telephone engineer. This increased the amount of income coming into the household and changed his working patterns. It also facilitated himself and his father to manage the care responsibilities for his mother better. It was at this time that Jack began to cook, preparing simple straightforward meals in accordance with his mother's instruction and meal suggestions. He is now solely responsible for food provisioning and he prepares a combination of traditional style meals and convenience-type foods including ready-meals. He relies on canned meat products and vegetables, as he owns a small fridge that only contains a small freezer compartment. When cooking he often prepares more than is needed for a single meal occasion and will use the remainder over subsequent days in various ways. Although sensitive to the price, Jack is more concerned with the quality of the food he eats, preferring to purchase brands and will look for price reductions on branded foods, rarely purchasing reduced price fresh items unless he knows he will use it the same day. As he is unable to drive, he always carries home his shopping

himself, occasionally making extra trips to the supermarket if items were too heavy or he spotted a price offer. Socializing plays an important role in his life and food plays a role in this. He attends a lunch club weekly as well as being a member of several Working Men's Clubs. He enjoys going on holiday once a month for five nights where food is provided (bed and breakfast) and he ensures that he runs down the fridge and turns it off before he goes away.

- *Household 8: Male aged 89 (Burt)*

Burt is 89 years old and lives alone in his two bedroomed flat in a sheltered accommodation block. He downsized 5 years ago, after selling his large five-bedroom family home and owns his flat. Burt retired from being a dentist in his mid-sixties and at first enjoyed the freedom this allowed for him to pursue fishing and golf. However, after the initial novelty he missed the sense purpose and companionship working gave him, therefore, he volunteered at a local hospice in order to give him back this sense of purpose. This was further confounded when he was widowed unexpectedly 12 years ago (his wife dying from *E.coli*). During his working life and before his wife died she was responsible for all food preparation in the home. Food provisioning was not something that interested Burt or was allowed to (reporting to being 'shooed' out of the kitchen). Following the loss of his wife, he was forced into the role of primary food purchaser and preparer in the home. He embraced this and saw it as a means of giving him purpose and learned how to cook by using recipes and taking guidance from female neighbours and his family. Initially he was adventurous in the types of food he prepared, in particular enjoying baking. He has retained this interest in food preparation and continues to make meals from scratch; often making large quantities of meals such as stew that can be portioned and frozen. Despite enjoying food preparation he has begun to struggle with fatigue and is increasingly tempted by ready-meals. He now has a partner whom he met through his voluntary work though they do not formally cohabit. They provide each other with companionship, going out for day trips, meals and holidaying. Burt continues to be responsible for food shopping and his desire for companionship extends to the way in which he purchases food and

despite finding the shops to be 'further and further away', getting out and shopping for food is important to him as it provides an opportunity to socialize, gives structure and routine to his day and provides him with purpose. In order to do this he relies on his car and uses his disabled parking permit to park as close to the shops as possible. Purchasing for one he is not financially constrained and purchases food to his taste preferences. Despite having a partner, Burt spends considerable amounts of time alone, usually eating alone and preferring to eat his main meal in the middle of the day rather than in the evening. His sociability extends to his choice of dining location, although his kitchen is too small to accommodate eating, he prefers to eat his meals at the dining table, purposefully positioned in the window to allow him to look out and feel connected and further fill the need for social interaction.

- *Household 9: Female aged 92 (Martha)*

Martha is 92 years old and was raised in London as one of seven children; she is the only surviving sibling. Her mother was an excellent but messy cook. Martha was not involved in cooking as a child owing to the shortages and when she left home she vowed that she would be as good a cook as her mother, though not as messy. Martha married and had two children, leaving work to raise them. She was solely responsible for food provisioning in the home, valuing good quality ingredients and making meals to suit her husband's taste preferences. Dishes were traditional and always made from scratch. Her husband took early retirement and they moved away from London to Shropshire. After being widowed 11 years ago, she re-located to the North East to be closer to her daughter with whom she lived for the first 7 years. She now lives alone in her 2 bedroomed, sheltered housing bungalow that is monitored through a help system that she can activate using a panic button that she wears. She has lived in her current home for 4 years. After settling in the North East Martha felt ready to move into her own home, regaining her independence and also her daughter's, who works full time and is a single parent. She maintains primary responsibility for food procurement, although employs strategies to access food owing to her reduced mobility and because she does not

drive. She shops for food fortnightly using a community shopping bus scheme that takes her to supermarkets (differing each time) and assists her in bringing her shopping into her kitchen. Martha is however, responsible for unpacking her food shopping. Although she has a preference for preparing meals from scratch, she has found herself becoming increasingly weary of this and has had to develop strategies to make food preparation easier for her. She now uses the Wiltshire Farm Foods meal delivery programme, receiving meals that are delivered to her door that she can freeze. When cooking food herself she now prepares it in batches that she also portions and freezes and which she defrosts and heats before eating. She is gradually finding kitchen tasks such as food preparation and cleaning more and more difficult, which is in part hindered by the design of the kitchen, but also her reduced physical ability. She finds it increasingly difficult to reach up to cupboards and has to use a footstool to do this, which is very risky for her as she relies on a walking stick for balance and therefore something that she is now reluctant to do. Bending down to reach into cupboards, the microwave and the oven is also difficult. As a result, she is now primarily using the small top oven of her cooker as it is more appropriately positioned. She also acknowledges that her memory is not as good as it was and she has noticed that she can sometimes forget what food she has defrosted in the fridge and how long it has been there for. Although she is the main person responsible for food preparation in the home, she is not the only person that uses her kitchen. Her daughter also prepares meals in her kitchen as well as her grandson when he visits. Martha is currently treading the balance between independence and relinquishing control, with her thoughts increasingly turning to the next stage and whether she will be able to continue living independently.

- *Household 10: Female aged 63 (Evelyn)*

Evelyn originates from the North East and was brought up by her mother and father alongside her sister. Her mother was not a keen cook, who instead made simple everyday dishes; her father however, was a keen cook and enjoyed making more elaborate meals. She took little interest in food preparation when she was younger

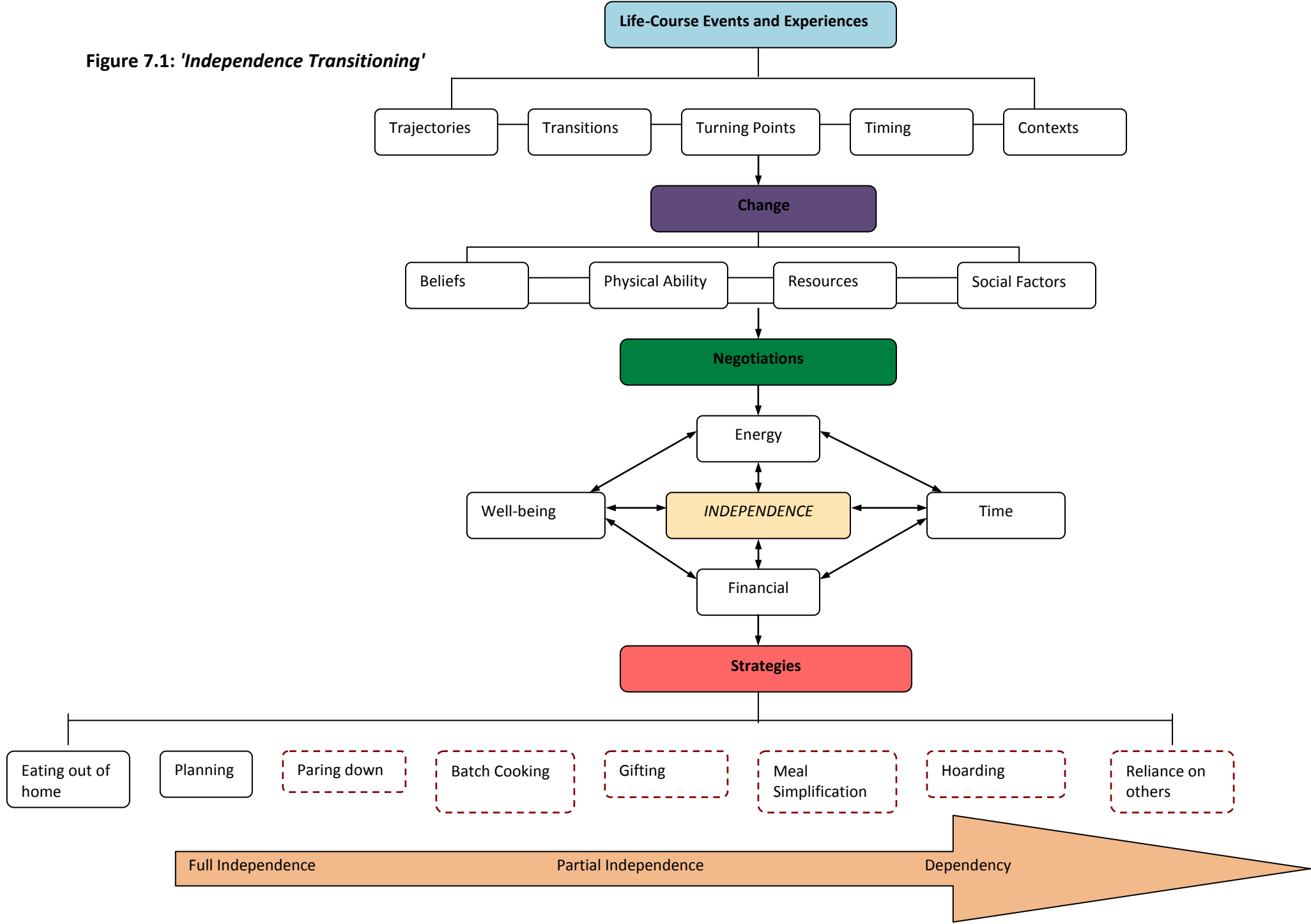
and left home when she was 19 to study at university. Being in Halls of Residence she did not purchase or prepare food, having all her meals provided for her. She returned to the North East following the completion of her studies, married and became the main food provisioner in the home. She made meals from scratch when she could, having to juggle family and work commitments and used convenience foods to make this easier for her and to ensure that the children ate. Her husband was self employed and this meant that he spent more time at home than she did. As a result he, under her direction, often prepared basic meals for his family. Now 61, she has recently retired from work and shares her four bedrooled semi-detached home with her husband and a temporary lodger, as well as their pet dog. Since her retirement she prepares all meals in the home. She is the primary user of their large kitchen, although her husband will make himself snacks. Their lodger also uses the kitchen also, although, this is to a very limited extent and primarily involves heating food in the microwave. Evelyn is a traditional cook who takes pleasure in preparing food. She is happy to try new dishes and gathers cooking knowledge from a range of sources including; television, magazines and the cookery books that she often receives as Christmas and birthday gifts. Their kitchen not only functions as a place for food storage and preparation, but also where their dog is fed and sleeps. Being keen gardeners, the kitchen is used to store gardening equipment and to grow seedlings. Although the kitchen is large, structural constraints (beam in the centre) do not allow space for an eating area. She and her husband share the majority of their meals together, with breakfast and lunch being less formal eating occasions, which would be eaten in the lounge area, whilst dinner is served at the dining table. Evelyn is the sole food purchaser in the home, having always shopped for food once a week on her way home from work in the car. She is now visiting the supermarket for food less frequently, shopping for food fortnightly instead of weekly in order to use less petrol and take advantage of food offers. Although sensitive to price, Evelyn values 'quality' particularly in relation to meat products which are bought at a monthly farmers' market.

7.3 'Independence Transitioning'

As the vignettes highlight, life-course experiences shape each households' everyday relationships with food, and early experiences can have lasting implications for the way in which the households now provision and handle it. Over the course of their lives, householders were observed to have experienced a range of transitions on both a micro and macro level that had been the precursors to food provisioning changes. These include: social changes such as war, rationing and women being educated at a tertiary level and entering the workplace; technological changes; marriage; having children; divorce; retirement; bereavement, through to the loss of parents and or spouse; downsizing from their family home; giving up driving; and ill-health. All of these transitions were observed to have affected the food provisioning process within these households. They adapted to the changes experienced as part of the ageing process and made both subtle and major alterations to their lives and consequently their food provisioning practices in order to cope with the changes associated with the onset of old age. A significant part of this process of adaptation was developing strategies and choosing solutions to help them deal with them. This often required that households made value negotiations (Connors *et al.* 2001). *Chapter 4* highlighted the common negotiations made in the process of making food choices and developing personal food systems, and noted these factors to be cohort dependent (Falk *et al.* 1996). These households were observed to make multiple negotiations in making food choice decisions. The most frequently negotiated factors were between energy, time, finance and wellbeing. Any food provisioning practice outcome was intended to satisfy all of the respective criteria, it was intended to be energy, time and financially efficient, and it was also to maintain their wellbeing. Although, it was favoured that any solution would fulfil all of the respective factors, in some instances it was permissible that the negotiation neglected one or more of them (thus a value negotiation was made). For example, for those that were physically limited, buying in assistance with cleaning was valued, despite the financial cost; using ready-made meals was valued for their convenience despite it being more expensive than cooking by first principles. However, at the heart of the negotiations made and the food

provisioning strategies employed, was the desire of householders to maintain independent living. Independence was the most salient theme to emerge from the analysis. All the value negotiations and food provisioning strategies discussed were clearly associated with their desire to maintain their independence as long as possible. This emerging continuum between full independence and dependency on others, was observed across the households and was visible in their approach to food provisioning and the strategies they adopted in practising food provisioning within the home. This continuum has been termed '*Independence Transitioning*'. The concept of '*Independence Transitioning*' is presented in Figure 7.1. and contains the three key factors important in defining the food provisioning practice outcomes of this cohort. These are; 1) life-course 2) change and 3) independence. Each component is discussed in turn, drawing on illustrative examples from the data.

Figure 7.1: 'Independence Transitioning'



7.4 The Life-course

For the households studied, their food choice, tastes and preferences appeared to have been shaped significantly by their experiences over their life-course. This included: early childhood experiences of food; changes in marital and employment status; and experience of illness. These events shaped their beliefs about how food and food provisioning should be structured, and influenced the relationship they developed with food across their life-course, up to the present day. This was illustrated by Peter's accounts of childhood deprivation. The notion of food as a treat started in his childhood when he and his parents would share a bag of fish and chips.

'we ate just what all poor people ate. You know, just pretty basic stuff, there was nothing fancy or anything like that. A treat for us was a bag of fish and chips from the local fish shop. Which cost in those days, I remember this, it cost eight pence in old money, which is about five pence in new money for a bag of fish and chips, and we would get one bag between the three of us' (Peter:11)

Shaped significantly by his childhood experience, Peter goes on to recall, the central role this food 'treat' has played throughout his life and describes how he continues to be attracted by it.

'On a winter's night to stumble along the road and to smell the air coming out of the pub door and the fish and chip shop across the road there, that was heaven to me, in those days the beer came in wooden barrels and the cellar was at street level, and the kind of beer that it was you could smell it two hundred yards away and you would walk down the street and it was the same at the fish and chip shop, there was none of these extractor fans or anything like that, so if the window was open or anything like that you could smell it, the fish and chips and that, so on a cold winter's day that used to blow my mind and I am still like that now' (Peter:11)

Childhood experiences also led to the avoidance of certain foods. Sandra highlighted this point when talking about eating meat:

'I probably was yes, I couldn't eat meat because it was always full of gristle and it was all fatty and you had to eat big chunks and it was awful, so I remember stews and that, erm school dinners I remember having that...Errm, now I don't care much for meat, I tend to prefer vegetables, I am not a vegetarian, you know, I would like to you know, but it is just the inconvenience of cooking, you know' (Sandra:11)

Changes precipitated by individuals moving from one role to another, such as getting married and becoming a 'homemaker' or retiring from employment also clearly influenced their relationship with food. Intergenerational knowledge transfer did not appear as a significant theme across these households (although it was recognised as important in Joan's case). This was particularly lacking amongst the older households within the sample. The experiences of food shortages and limited availability as a consequence of rationing during and after WWII meant that there was little room for error and food preparation and handling in the home was primarily controlled by experts (usually the mother). This meant that many of the women had little or no food provisioning experience on leaving home, with many having to learn how to cook very quickly once married, using their mother's dishes and acquired cookery books for inspiration.

'You couldn't make a mess, this is really why I couldn't cook, because you know, my mother didn't trust, my mother was a very good cook. Erm, but erm again you know, we had such little food really. It was amazing' (Annie: 11)

Cooking and learning how to provision and handle food was done on the job, through asking experts, reading books, sharing knowledge with friends and through undertaking formal training.

'I married when I was just 21. We were still rationed, and I knew nothing about cooking, but the butcher was lovely to me. He would say you know, I'll give you 2 ounces, of I can't remember,

it was terribly little he had. And I would say, what do you do with it? Because I had no idea! (Annie: I1)

'Erm, well when I first got married, before I got married I went to evening classes because I had no idea how to cook' (Martha: I2)

Sandra and Kathy echoed this:

'Erm, mainly it was a catastrophe really. It was really bad...I just cooked very simple meals really. We lived on mince really, because that was the easiest to cook' (Sandra: DI)

'When I was first married all I could make was scrambled egg. I couldn't make anything! But I had a recipe book and I didn't know anybody round about so I just made stuff....I suppose the stuff my mother had made and then I got a bit more adventurous' (Kathy: DI)

For those that had never married and were single, employment and their past professional history played a significant role in shaping their relationships with food, developing their confidence in their own cooking competency and establishing provisioning routines.

'When I went nursing, you had your board and lodging and paid nothing because you got board and lodging and of course the food was classic sort of hospital food, sort of mince and dumplings and steamed rolley pudding... I know very spoilt...I have been very lazy about it all my life' (Gill: I1)

Being cooked for, for the majority of her life, meant that Gill had developed limited interest in cooking and lacked confidence in her ability to cook, whilst for Peter, the institutional order he experienced in the army, contributed to his need for routine in all aspects of his life.

'you were well fed in the army...you didn't pay for it meal by meal, what you got was your weekly pay and before you got it arrr they had taken an amount of money off you for your food and accommodation, so you could eat as much as you liked' (Peter: I1)

He goes on to explain how this has shaped his relationship with food.

'I can eat a three course meal very, very, very quickly, I can still do that from now, because you went to some places where you would just grab something to eat...I was in the army for 22 year so that stuck with me and I can eat food very, very quickly and I am not picky about my food, there are some things that I don't like but I will eat them if I have to, but you ate quickly and you ate as much as you could and that has stuck with me' (Peter: I1)

On the other hand, for Jack his early employment experiences as a green grocer had shaped his food shopping routines. He explained that he continues to use the stock rotation and replenishment strategies that he learnt when he worked in the fresh produce department of the Co-op:

'back to my early life... working at the Co-op...if you used a tin of peas you put one back. You know, you always had one in' (Jack: I1)

Changes precipitated by widowhood and/or retirement from the workforce, led to changes in food provisioning practices. Many practices showed a distinctly gendered division. For female householders who had assumed the role of primary food provisioner across the life-course, widowhood left some participants questioning their identity and role as a food provider. In line with the literature (Davidson, Arber and Marshall 2009; Dean, 2009; McKie, *et al.* 2000 and Falk, *et al.* 1996), the female householders who lived alone were observed to be less interested in food provisioning following the death of their partner. Having done 'food provisioning' for many years, some reported feeling fatigued by its demands, stating it was less important now that they were only providing food for themselves. They reported changing the types of meals that they cooked; preparing less complicated and simpler meals for their own tastes. As illustrated by the vignettes and consistent with the literature (Sidenvall *et al.* 2000), meals were typically produced for their families and in particular their husbands and were largely dictated by their

husband's preferences rather than their own. This was concisely summarised by Kathy and Annie.

'I still have a nice dinner just more simple for my own tastes really; umm less meat and fish I suppose I don't have that nearly every night' (Kathy: I1)

Annie talked specifically about how the way that she shopped for and prepares food has changed, particularly now that she is living alone.

P: 'Well I, in my life, I've very often had to cook for lots of people, because erm, my sort of social life was like that. Particularly when I lived in Greece, because people would just appear... at 82 I'm getting much more lazy and buy ready-made food very often'

R: 'Is that a lot more often than you would have done previously?'

P: 'I would never have done that, well within the last four years. I think this is partially because I'm only cooking for myself, and really to make lasagne or something like that, is an awful lot of work, and to try and do a portion for one, it's just impossible. I suppose I could do larger portions and shove it in the deep freeze, but it's much easier to go round to the supermarket' (Kathy: I1).

However, for Burt, the death of his wife prompted him to embrace food provisioning, viewing it as a hobby and giving him a 'purpose' (Burt:I1). The gendered division of labour in the home had prohibited his involvement in food provisioning while his wife was alive, his role being to go out to work and if he took an interest in food preparation and the kitchen he was 'shooed' away (Burt: I1). As the quote illustrates, his interest in food provisioning developed as a strategy to help him cope with the death of his wife. However, and similar to the female householders discussed above, preparing for one and not having anyone to appreciate his efforts has taken its toll on his enthusiasm and he noted that his interest in cooking has waned.

'I don't have a great purpose in life so I do interest myself in food. I do less cooking, my wife died 12 years ago and one of the things I did to occupy myself was I did baking and things like that. I made

various cakes and things. But in the end, I had to eat the stuff, and when you're on your own, you get rather fed up with it' (Burt: I1)

7.4.1 Timing

The timing of a role change appeared to be significant in terms of a householder's ability to make the adaptations and negotiations required to maintain independence and can be seen in the combination of food provisioning practices adopted. This was particularly significant for Sandra, who consistently reported a negative relationship with food and the food provisioning process, referring to her relationship with it as 'awful', 'terrible' and 'erratic' (Sandra, I1, I2, DB). The GT analytical approach highlighted there to be a range of experiences across the households, and as such this household required further investigation to understand better why this was the case. To achieve this, additional theoretical sampling data collection visits were undertaken in order to refine emerging theoretical understandings (Chamaz, 2006). For Sandra, the timing of events in her life-course appeared to be significant (Sobal and Bisogni, 2006), with the breakdown of her marriage and subsequent divorce occurring during the mid sections of her life. Unlike bereavement and widowhood, which are regarded as one of the most significant and traumatic life events (Lopata, 1996, cited in Davidson, Arber and Marshall, 2009), divorce also appears to have lasting emotional effects. For Sandra, this was consistent with the findings of Sobal and Bisogni, (2006, p.41), and it occurred out of synchrony with the expected order of life events (widowhood, typically occurring in later life), leading to her feeling 'out of step'. The result has been that she has struggled to adapt to being on her own and has found it difficult to make the changes required to maintain her independence. The importance of the timing of significant life-events was further reinforced by the experiences of Annie. After she lost her first husband unexpectedly when she was in her mid 30s, she reported experiencing difficulties in adjusting to her new circumstances and this negatively affected her relationship with food.

P: We all ate together in the... you know, I had a big kitchen which... with a big table in, erm, that was good because I found

it very difficult to swallow and I wasn't quite sure whether this was psychosomatic. I thought it probably was. Erm, or it could be something else so I went to see my doctor and it was psychosomatic. And once he said to me, yes, you know, there is no blockage there at all the I... that obviously eased my mind, you know? And erm... but cooking for other people I had to eat...though I lost masses of weight. I went right down to about 7 stone...

R: 'OK. Was this... was this shortly after your husband died?'

P: 'Yeah'

R: 'So it was all linked... to grieving...?'

P: 'It was all... oh absolutely. This was all linked. And when I... when I married then erm, again, you know, I put on weight'
(Annie: I1)

7.4.2 Context

The households identified considerable changes in the food environment over their lifetime. The resounding feeling expressed was that there had been significant increases in the choice and availability of food over their life-course and that this had altered the way in which they purchased it.

'I can't believe it, I mean now there's so many supermarkets it's unbelievable. I would shop everyday up in the village' (Annie: I1)

'Well hugely... if you take from your childhood there is so much more available it is unbelievable, and out of season stuff and so on' (Kathy: I1)

'I mean in regards to meals, erm take-aways and meals that you can buy, well being honest we didn't have them in my younger days. When I was your age, there was nothing like that, you know what I mean? It was all bacon, and pieces of bacon, making soup and all that sort of thing. But it has changed; it has to be for the better of course' (Jack: I2)

Most notable of all was the reduction in the frequency in which households needed to shop for food with all describing a reduction in how often they shop for food.

While in the past most householders would have shopped daily, they now find themselves shopping once or twice a week with 'top up' visits only made where necessary.

'I suppose [now] about twice a week probably' (Annie: I2)

There was evidence that the increased choice and changes in the food shopping landscape had made food provisioning a much more complicated and confusing task.

'supermarkets confuse me, because you go through the door and there is lights everywhere, there is row after row and you go for a simple thing, well I do, like some tea and you get to the aisle that sells tea and there is million different makes of tea, different blends and so it goes on, and then you get used to the supermarket and you go in a month later and you think ahhhhh and they have moved' (Peter: I1)

'when they change it round in Tesco's, oh I said, I can't find anything now. Well of course, they do this on purpose' (Annie: I2)

Change was also highlighted in relation to advice and guidelines about food and in particular, in relation to domestic food safety best practice guidelines. Specifically, this was observed in relation to safe practice for handling raw meat, especially chicken, and in relation to the interpretation of UBDs and BBDs, particularly on eggs. The changing nature of domestic food safety best practice guidelines in response to new food products and technological innovation was also found to leave householders confused about what was 'safe' practice. The consequence of these changes in guidelines and the resulting confusion saw them revert back to their original knowledge base. This was illustrated by discussions relating to washing chicken (Figure 7.2), a practice explained by Jack:

'I erm... I put the tap inside as well. I mean nine times out of ten we don't get giblets now so I just... yes, I wash inside and outside to clean it. And then... sometimes I used to stuff them with me own... but I was told this was wrong... but I don't know what your

opinion is again of this but I used to erm... years ago when I used to do it before, me mam and I, we used to have sage and onion stuffing' (Jack: DB)

Figure 7.2: Washing Chicken



(Martha)

In the case of storing eggs, householders were aware of the changes in the domestic food safety guidelines relating to egg storage, and it being acceptable to consume these beyond the BBD. There was also confusion as to where eggs should be stored, with households observed to have a preference for storing eggs out of the fridge, which they felt was consistent with the way that they are stored in supermarkets.

7.5 Change

Adjustments were made in response to changes in beliefs, physicality, available resources and social factors. Evidence of each will now be presented.

7.5.1 Beliefs

Across the households beliefs about food and food safety appear to influence and guide their food provisioning and handling practices. However, their beliefs were highlighted as not static and whilst used by many as a benchmark for what they considered acceptable, the ageing process required them constantly to re-negotiate and compromise. In this process, it was considered essential that any adaptation or solution considered and/or adopted was consistent with the household's beliefs about food. For example, for some households their beliefs about where food should come from and how this linked to its quality was demonstrated in their preference to avoid supermarkets and instead to shop frequently and locally in specialist shops where they could purchase quality ingredients, consistent with the way shopping used to be (see Figure 7.3). This was summarised by Peter.

'Two main reasons, one, I like, I like to support the little man, the little shop keeper, two I don't, I like to be able, I know it sounds strange but I like to be able to go to a little shop and play with the stuff...instead of going down to a supermarket, supermarkets confuse me... if I go along the road to the local shop, nice little shop, simple, I can go and potter about, pick things up, put them in my bag get to the till and say I don't want that and put stuff back, it's much easier, it is much nicer it is friendlier. Then you go on to the bit about the socialising and the interrelationship between you as the customer and the person who is behind the till or running it, the person behind the till owns it, it is theirs so if you whinge to them about something, you are whinging to the top man' (Peter: 11)

Figure 7.3: Non-Supermarket 'Big-Shop'



(Peter)

Despite this there was a resignation among the householders to the fact that the supermarkets now dominated the food purchasing landscape, and that they could not avoid using them.

'I definitely do spend more money when I go to a big supermarket, and I don't buy like vegetables because they go off, I don't buy many vegetables because they go off if I buy them from Morrison's, whereas I'd like to be able to go every day and shop and get fresh fruit and stuff like that, which I can't'
(Sandra:12)

Across the households there was an acceptance that they conducted the majority of their 'basic' food purchasing at supermarkets with 'quality' or specialist items being sought from independent food retailers.

'I suppose I go to a supermarket about once a week maybe a bit less and stock up, because it is usually a bit cheaper there and I suppose about once a week I would walk up to Acorn Road which has a very good fish shop and a small Tesco and just opened a small Waitrose... and farm shops, I like a farm shop I go maybe every three weeks perhaps' (Kathy:11)

When talking about her preference for good quality meat, Evelyn reinforces this:

'Well, what I do is once a month I go to a farmers' market and I get a lot of meat and put it in the freezer...I'm going to go to Marks and Spencer's today too, because I've got some coupons that I'm going to use. I usually go there for my chicken, because I like the chicken from there' (Evelyn: I1)

For others this same sentiment was expressed in terms of brand loyalty.

'On the whole I buy branded... you always think they're better' (Joan: I1)

P: 'You know, if I was to get a loaf of bread that was 49p or something, or savers stuff, you know, I know in my own mind, that... that that would go green and mouldy before I used it'

R: So you buy brands because you think the quality is going to be better?

P: The quality is better. But I also know, some other brands, like that are just as good' (Jack:I2)

Beliefs relating to 'proper meals' were evident, with a preference for traditional meals made using first principle cooking and where possible, the avoidance of ready prepared foods in order to be consistent with the types of food they had been raised on.

'No ready-meals... You couldn't buy...Junk like you can now. So we weren't brought up with that, we were brought up with decent food' (Joan: I1)

Convenience foods were found to be inferior to homemade or first principle cooking. Despite this being a shared belief across the households, there was the increasing acceptance of ready-made meals as a substitute, and whilst they were once '*looked down upon*', their inclusion was justified on the basis that the quality had improved and they were now '*quite satisfactory*' (Burt: I1). Moreover, the inclusion and acceptance of these meals was observed to be in response to their reduced physical abilities and motivation. The consumption of ready-made meals

allowed them to maintain some consistency with their beliefs around 'proper food' and what constituted a meal.

The cohort effect of being children during the war and the experiences they had of rationing, both during and after, had instilled a negative attitude towards wasting food, which they have carried right through their life-course.

'Well I've grown up not to waste food. Don't forget I was cooking during the war. We didn't waste food at all, and well sometimes I think well this has been the fridge for long enough, and I do throw it away, but not very often' (Martha: 12)

Not wasting food was a strongly held belief that was shared across the cohort, though it was more frequently voiced by female householders owing to their earlier exposure to food preparation and their experiences of having to 'make do' with very little (Martha: 12). The householders had developed a range of provisioning strategies to help them avoid food waste including: meal planning, reliance on the freezer, taking advantage of the oven being on by cooking multiple different meals at once and consuming food past its UBD and BBD recommendations.

7.5.2 Physical Ability

It is widely accepted that the ageing process reduces an individual's physical ability, and Phase 1 indicated that the severity of this was likely to increase with age (Lumbers and Raats, 2006; Rowe and Khan, 1987). During Phase 2 this was substantiated. The cohort suffered from a range of acute and chronic health conditions, which compromised their physical ability to perform particular domestic duties (cleaning), and was particularly evident in the lone male households. Their health and associated physical ability was clearly influenced their food provisioning practices and food choices. Many had made adaptations to accommodate this in terms of: diet through the omission of certain foods from their diets; changing their procurement solutions, including the use of community shopping buses, cars and disabled parking badges, and shopping trolleys. In multi-person households, where

one member suffered from acute health problems, changes in food choice and provisioning practices affected the whole household.

'Health really, has altered... a lot of things; we cut the red meat out, because his cholesterol is high. You see things like that were never, ever mentioned' (Joan: I1)

She goes on to say:

'No, it's, especially now, it's the you know, health, it's got to be health...certainly cut down on salt and everything, which makes food a bit tasteless' (Joan: I1)

Health problems led to dietary alterations and omissions of certain foods. This occurred in Peter and Jack's households where heart problems had led to the reduction of fat in the diet and the increased consumption of oily fish.

'I suffered from heart failure last year so Dr Bob at the hospital said I had to change my diet and I nearly cried because all the things ... I'm addicted to... Like crisps, I like erm plain crisps, I like fish and chips... cheese... But I like kippers. And because of my dicky heart apparently its oily fish and it's supposed to do you good...so that's my excuse for eating kippers' (Peter: I1)

Changes in digestive health were evident and led to alterations in meal times being made, with main meals of the day being eaten in the middle of the day rather than in the evening. This also limited the types of food that could be consumed despite households having other taste preferences.

'I normally try and eat about lunchtime and have a lighter meal in the evening. Erm, because I have got surprise, surprise, a slight high hernia. But only slight, curries unfortunately are no good to me anymore. Erm, Chinese food is alright, but I do have to watch eating late' (Annie: I1)

A householder's physical ability was shown to dictate their choice of food purchase outlets and their frequency of shopping. While the majority of households were shown to shop once a week and top-up in between, those whose mobility and

access were restricted to shopping less frequently and had to purchase their foods from the supermarkets. This was particularly evident for Martha, who relied on community transport and a shopping bus to access food outlets, shopped for food fortnightly and received Wiltshire Farm Food (meal delivery program).

For others, changes in their physical ability meant that they found food retailers to be growing increasingly *'further away'* (Burt: 12) and thus imposed constraints on what could be purchased, in particular for those who relied on carrying their shopping home themselves. This is described by Gill who was limited by what she could physically carry home.

'I used to like the Co-op, I wouldn't shop there because I would have to lug it all up here, yep, I mean maybe at twenty I would do it but I wouldn't at sixty four' (Gill: 12)

Solutions were sought to facilitate carrying groceries and these included: the use of cars if owned, the use of shopping trolleys, rucksacks, lifts, dividing shopping and increasing the number of visits made and returning for heavier items.

'I try and do evenly sized shops now... when I'm getting orange juice or tomato juice and milk. I do have a pusher, it has four wheels and it has a seat, and underneath you can put your shopping' (Annie: 11)

'lately I've found I haven't been able to walk to Tesco, particularly if I'm bring potatoes back. So I usually drive there these days, I feel guilty about it, but it's the only way I can get there' (Burt: 12)

'I[also] have a wonderful thing from New Zealand which is a bag, which folds up into nothing, and it's very large. And I can put it on my shoulder' (Annie: 11)

'I would walk... but it means carrying everything back which is quite tiring you know even if you take a haversack by the time you have got a few things in it is quite heavy' (Kathy: 11)

'I always use the stairs, but that's the only time that I get the lift [but] when I've got a few bags coming in, and its only 30 steps,

but I use the lift, I mean, 9 times out of 10, I erm, what I buy I carry' (Jack: 11)

Within the older households, shopping visits were timed in order to ensure that they avoided busy periods (usually early morning), which reduced the time taken to shop. Additionally, supermarkets were chosen that had facilities for sitting down and toilets.

7.5.3 Resources

While available financial resources did influence the food provisioning practices of the households, these were not considered to dictate food choice; although, there was some variation observed across the households. Many of the householders showed a preference for quality over cost and were willing to pay more for better quality produce.

'I'm getting some veg. in I think oh asparagus would be nice, and then I see it's a stupid price and I don't get it. But erm, I do still tend to pay more for nicer quality food. But not if it's not going to be worthwhile' (Kathy: 12)

'Well I sometimes go for offers. Yes. I'm a bit wary of offers...I won't always go for the cheapest' (Martha: 12)

However, thrift was a salient theme across all households, which for many related back to their earlier life experiences of financial restrictions and food rationing. The extent to which thrift influenced the food provisioning practices varied across the cohort. As illustrated below, thrift is important to Gill and is something that she is very conscious of when buying food (see Figure 7.4).

'Well you know how thrifty I am, but unfortunately like everyone that shops you sort of go to the bargain counter and you think ohhhh look at that Shepherd's Pie reduced from four pounds to £1.99 oh I will have that, that will go in the freezer, so I do tend to eat the same sort of things and I often pick up what's a bargain, I will pick up something like a Beef Wellington that I wouldn't normally think about because it is

six pounds and it is pastry which I tend not to have very much of, so I tend to be a bit of an impulse shopper if I am in the bargain counter' (Gill: 12)

Figure 7.4: Reduced Price Items



(Gill)

Gill's attitude towards thrift was further observed in her home and extends to how she prepares drinks. She makes hot drinks early in the day and then re-heats them using the microwave when she requires them (see Figure 7.5).

Figure 7.5: Thrift - Drinks Preparation



(Gill)

Whilst all the households remarked on the cost of food and the benefits of price promotions, these were consistently reported not to be of benefit to lone person households, as the quantities were too large. The use of smaller local retailers, markets and delicatessen counters allowed them to scale down their shopping to accommodate lone living.

'The supermarkets, the quantities to get any sort of a bargain are very big...when I go round the shop, there's an offer, I might look at that and think oh that's good, get it. But they tend to be less use to me now, they tend to be two for the price of one, which I sometimes get, but sometimes it's just too much' (Kathy: 12)

'I think what they should do is, they don't seem to consider single people, old people on their own very much. They always seem to cater for one to five, you know why don't they make it a bit cheaper or one thing instead of making it buy one get one free' (Jack: 12)

'Oh, my chief objection to the supermarket is that the quantities are not small enough. And then, very annoying when you buy one and the next is half price, because you don't want two lots of it, you only want one. They do that a lot, all the supermarkets. And that's not very convenient for old people, because we don't eat so much anyway...very often I've had to take the one, you pay £3 for one, but for two you pay £4, which is very annoying. But I haven't bought the two because by the time I come to use it; it wouldn't be at all fresh' (Martha: 12)

The drive for thrift appeared most acute in younger and cohabiting households. The older householders were less physically able to visit multiple retailers and seek out promotions, rather taking advantage of such offers only if it was something that they could use. In addition, lone person households appeared to be less financially constrained due to only having to cater for one. Cohabiting householders and those that were more mobile, through car ownership, were able to *'shop around'* (Joan: 12) and look for promotions and were more inclined to buy in bulk.

'But cost is the main thing isn't it...If you can find something cheaper at say Asda than Tesco, you'd go to Asda wouldn't you?' (Joan: 12)

'During the week [I go] to Tesco, Sainsbury's, and Morrison's... Just for a change, and then you see the different offers' (Joan: I2)

'I mean I enjoy finding a bargain. So for example, butter has gone up in price, I noticed in Waitrose, they had butter for £1.19 and it was £1.50 in Tesco's. So I bought 4 of those, because they were in the use by date' (Evelyn: I1)

'kind of impulse buy, but they [biscuits] were down to 75p in Morrison's so I bought two packets of those' (Gill: I2)

This was highlighted by the number of shopping visits conducted by households over the food purchase history period, with Gill being observed to make 17 food shopping visits over the two week data collection period.

The purchase of foods that had past their UBD was observed to be opportunistic, and only occurred if the household knew that they could use the item. This was linked to their reluctance to waste food.

'I don't buy it because it's cheap; I buy it because I think oh I can use that' (Jack: I2)

'I do look at the out of date things...so I might buy something from there, and use it' (Annie: I1)

'Well like all other pensioners we fight over the reduced counter...But we only buy things that we can eat that day from reduced counters don't we?' (Joan: I2)

Although the householders acknowledged that foods past their UBD were not safe to eat, under some circumstances the households were prepared to do this in order to avoid waste (see Table 7.4).

7.6 Social Factors

Householders showed a preference for sharing meals and all households, irrespective of living arrangements, attempted to make meals social. This was

achieved in various ways across households. For those that were married and cohabiting this meant that the main meal of the day was differentiated from others, formalised and shared with their spouse.

'If we're at home I'll just make a sandwich or something on toast...Sometimes if he's out with the dog, and I can't wait I might have mine first...[but] we have that [dinner] in the dining room...It's usually about 7 o'clock' (Evelyn: 11)

For those living alone, commensality continued to play an important role, for some this linked back to beliefs that meals should be eaten at a table. For example, Burt positioned his table near to the window so that it was in view of passersby. This gave him a sense of belonging and companionship, as shown in Figure 7.6 and explained in the quote below.

Figure 7.6: Commensality (Table)



(Burt)

'It's strategically placed there, because living on one's own; it's nice to have the company passing in the street. And quite a lot of people I recognise by their body language, which I don't know what they look like, they may be crossed eyed and black teeth, I have no idea. But they're familiar this way you

see. Some of them I just recognise by their dogs. But it's better than just staring at a wall' (Burt: 11)

Whilst for Jack, eating at the table was consistent with his family traditions and his ideals of what constituted a proper meal, and is shown in Figure 7.7.

Figure 7.7: Commensality (Table)



(Jack)

For others the dining table was not central to ensuring commensality, rather this was viewed as bringing isolation into focus, which was summarised by Peter.

'I don't have table and chairs... I can't sit down and have a meal. I thought about getting that, but living by myself, and putting like a half table into the kitchen, I would have thought it would have been scary. If I put a bowl of flowers in, and I sit down and I'm looking at the walls and thinking who shall I talk to now? ...It does increase the awareness of loneliness, to sit in a small room; it's like a prisoner in a cell. Whereas if you sit in the living room, with the patio door, the TV and other things like that, it doesn't seem so claustrophobic or enclosed' (Peter: DB)

Although not in line with beliefs about how meals should be eaten, eating meals in the living room with the television for company was common. The use of trays in the serving of meals was intentionally sympathetic to the belief of what constitutes a proper meal and the importance of the table for eating meals as the tray acted as an acceptable substitute for a dining table (shown in Figure 7.8).

Figure 7.8: Commensality (Tray)



(Annie)

7.7 Negotiations

In order to be successful at '*Independence Transitioning*' and to cope with the changes that were an inevitable part of life and specifically of the ageing process, households were observed to make small incremental changes to their food provisioning practices. In the process of devising strategies to cope with change, households were observed to make value negotiations. Four factors were considered salient for this cohort, and the strategic food provisioning outcomes were indicative of trade-offs between their available energy; finance; health and well-being and time resources. The ultimate aim of any provisioning solution was that it was as resource efficient as possible in relation to the aforementioned factors and that in adopting such a solution(s) it enabled householders to remain as independent food provisioners.

Although there were variations in the extent to which the households independently managed the food provisioning process, with some buying in assistance such as cleaners, the householders emphasised the importance of maintaining as much autonomy as possible over this aspect. The strategies adopted were primarily designed to protect this autonomy and independence and thus the acceptance of assistance was not favoured or sought and was regarded by many as an option of last resort.

'No, nobody helps me carry, nobody helps me pack them nobody wheels me around in a wheel chair' (Gill: 12)

'No. I do it all myself, yeah. My irregular shopping is Sainsbury's supermarket down the road' (Peter: 12)

'I have the car. But you know, if you've got a bag of tatties, and a few other things, the killer bit is getting up the stairs. I come in the back way, Oh I'm not going to ask for help, once you do that, you know, you're going down' (Burt: 12)

'No except for when the roads are icy, it got a bit of a problem last winter, it got sort of so I wouldn't take the car out and then it got so I was scared to walk on the pavements, but neighbours were very good' (Kathy: 11)

'Oh occasionally my daughter will come down and bring something. But by and large I don't ask for it. I can't rely on it, anybody that way' (Martha: 12)

'No, and when they ask you about your packing, I just say no I don't...I don't think I would ever want help' (Jack: 12)

Not only was preservation of independence very important to the households personally, but they also recognised the role they could play facilitating others (their friends/peers) in maintaining their independence, for example by grocery shopping for others.

'Well yes, I have been walking along with Betty because she's rather frail and she uses my four wheeler to shop, so she can hold on, and also she can sit on it if she's feeling giddy, she is

really quite poorly really. She didn't ask for any help with shopping because I would do it for her. So I have a very big rucksack, not just the rucksack I take for walking but I have a larger one. So I used to go round to Tesco's and shop' (Annie: 12)

'I would do shopping for them, but I wouldn't take them shopping' (Peter: 12)

'Not big stuff, but if I'm going for something I'll do that. And as I said earlier, I bring the newspapers in for Sylvia downstairs, and for Anna over the road there, she had erm, bowel cancer operation on Christmas Eve, so she's not too mobile at the moment you see. So I do things like that' (Burt: 12)

The households investigated were not future orientated and found it difficult to verbalise anticipated future changes that they might have to consider in relation to their current food provisioning practices, expressing the ability to 'deal', 'manage' and 'cope' with these if or when they occurred. It was also evident that negotiations and solutions did not always manage to balance these salient factors. In some instances conflicts in values were evident where one factor was valued over another. For example, households were shown to value their health and wellbeing, time and energy and were willing to pay for assistance, valuing the aforementioned factors over the associated financial costs. However, financial cost also prohibited certain outcomes, with some households financially unable to buy in assistance with cleaning, for example. The requirement to become efficient in how they used their limited resources was shown to encompass the whole food provisioning process. Examples of the households making negotiations and being 'resource efficient' were observed across all of them and are considered in terms of each of the food provisioning practice outcomes identified. However, first consideration of the kitchen space and available technology contained within it, is considered in terms of how these facilitated or inhibited their food provisioning practices.

7.8 The Kitchens

Analysis of the kitchen space and materiality (stuff) contained within was conducted in order to assess how suitable their kitchen spaces were at meeting the changing needs of the householders, and the extent to which they facilitated independence and/or household's adherence to domestic food safety best practice guidelines. There was considerable variation observed in kitchen types, age, design, usage and the equipment (stuff) contained within across the sample. The choice of kitchen designs and the layout of appliances were influenced by both the available space and aesthetic preferences. The primary influences were found to be the housing type and tenure, with those renting from the local authority or from sheltered housing providers being most limited in their available kitchen space. Variations in the age of kitchens were observed, with those in their own homes having the oldest kitchens (Joan, Kathy and Martha). All households highlighted elements of their kitchen and the equipment (*stuff*) contained within that did not adequately cater for their needs. For example, the height of worktops, the depth of cupboards, height of cupboards, amount of work surface, lack of doors, eating space, lighting the position and size of fridge, ovens and freezers were all found to impede the householders' use of the kitchen. Households demonstrated how they have made temporary modifications in an attempt to address these shortcomings. These include: the use of kitchen islands as worktops due to their more appropriate heights (Kathy), lining of windowsills for use as work surfaces (Jack), the storage of non-essential items in deep cupboards (Peter, Kathy, Martha), the use of step-ladders to reach ingredients/equipment (Kathy and Martha), the storage of essential items on work surfaces and the use of smaller top ovens (Martha). Despite the obvious problems the householders were encountering with their kitchen space, they were not interested in investing in and undertaking significant modifications to the kitchen's design as they did not consider it to be worthwhile given their age. This is well illustrated by Martha.

'No, not at my age. I mean if I moved here 10 years ago I would have done, but not now. My daughter wanted me to,

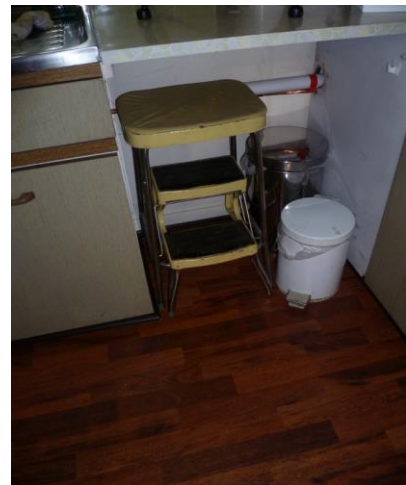
because she thought that was a terrible kitchen, but it suits me fine' (Martha: 11)

Martha found a number of aspects of her kitchen unsuitable for her needs. These included: worktops that were too high; wall-mounted cupboards that were too high to reach into, cupboards and freezer draws that were too deep; pans and appliances that were too heavy. Rather than making the modifications required to enable the space to suit her needs better, she had made small temporary modifications to the space, appliances and to her practices. These are illustrated in Figure 7.9 and included the use of a travel kettle, as when full it was lighter than an ordinary kettle, the storage of items not often used were placed in the lower, difficult to reach cupboards, and the use of the countertop breadbin for storage of frequently used food items.

Figure 7.9: Modifications



(Martha)

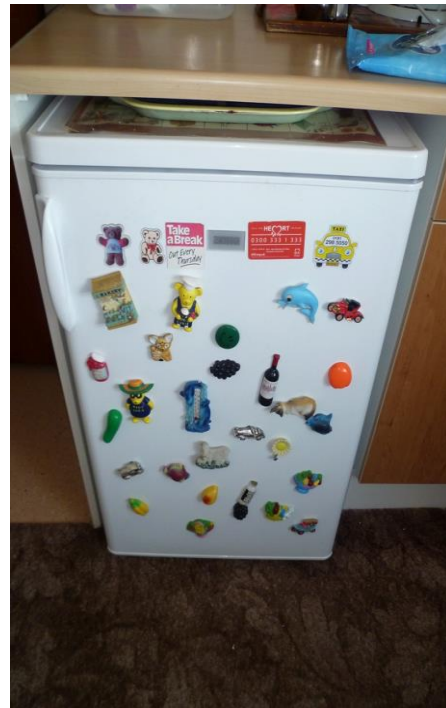


All households had made aesthetic modifications to the space, which included the display of ornaments, pictures and fridge magnets, and was reflective of their engagement and personalisation of the space. This is represented in Figure 7.10.

Figure 7.10: Personalisation



(Joan)



(Jack)

7.8.1 Functionality

The modern kitchen is reported to be a multifunctional space that extends beyond the storage and preparation of food, being a dynamic social space at the heart of the home, within which a diverse array of practices are performed as part of everyday life (Wills & Brennan, 2012; Meah and Watson, 2011; Redmond and Griffith 2009a). However, this was not observed to be the case within the households in this study. Instead, the kitchen played a much more functional role within the home and was reserved primarily for food storage and meal preparation activities. This was most pronounced in the lone person households and in those where the householders had downsized and/or lived in rented accommodation. The limited space available in some households meant that some kitchens had a lack of food preparation surfaces, inadequate lighting and extraction infrastructure and no eating space. Space limitations also restricted the way some kitchens were laid out and how sociable the space could be, as there was a limit on the number of people that could be catered for and that could be accommodated in the kitchen at

any one time. Moreover, those living in rented accommodation had limited opportunities, if any at all, to influence the design of their kitchen spaces, beyond aesthetics. Figure 7.11, presents two kitchens that typified the functional role the kitchen played in some households.

Figure 7.11: Functional Kitchen Usage



(Peter)



(Annie)

Within other households, the kitchen was more representative of the multifunctional space argued by Wills & Brennan (2012) Meah and Watson (2011) and Redmond and Griffith (2009a). There was evidence of a broader use of the kitchen space by these households, although not to the extent that is argued in the literature. These kitchens were considerably larger and their use had been extended to being a space for; socializing, that acts as a conduit between the house and the back garden; that connects with other rooms within the home; that divides the internal from the external parts of the home (home to garden); for eating; and for performing a range of more eclectic activities such as: hair washing, painting, bathing, feeding and as a sleeping place for pets and a store for gardening equipment. This is illustrated in Figure 7.12.

Figure 7.12: Multi Functional Kitchen Usage



(Joan)

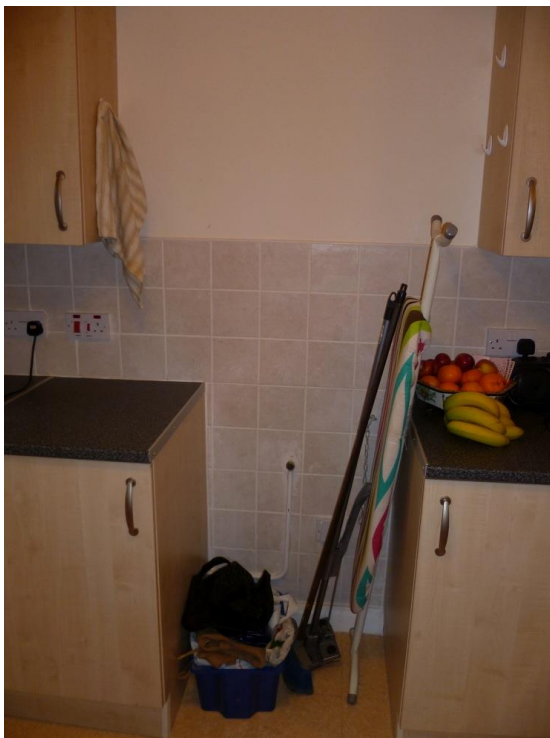


(Evelyn)

The amount of kitchen equipment contained within the kitchens varied between households. With the exception of one, all kitchens contained at least a fridge, freezer, cooker and microwave. Three households did not own washing machines; 2 owned dishwashers (Sandra and Kathy). Kathy used her dishwasher

often as she found it to be a convenient and time saving device, and one which was of particular value to her when she was caring for her terminally ill husband. However, Sandra did not use hers, as living alone she found it to be expensive to run. All households had access to continuous hot running water. Although, the temperature of the water coming from their hot taps and the lack of mixer taps, particularly in households in sheltered accommodation, made it very difficult for them to tolerate the water temperature as it was considered to be excessively hot and there was a danger that it may scald them. This resulted in householders washing their hands in cold water. The age of their kitchen equipment appeared to relate to how long they had been living in their home and the space they had available to them in the kitchen, with those living alone typically streamlining their kitchen equipment to fit their needs and the available kitchen space. This reduction in equipment in their kitchen did not relate to cooking competency, rather it was associated with their desire to simplify the process of meal preparation for themselves, which consequently reduced the need to own certain kitchen items. This was most evident in Peter's kitchen, where he had removed his cooker, as illustrated in Figure 7.13.

Figure 7.13: Simplification



(Peter)

Whilst kitchens were found to vary in age, from 2 up to 40 years old (Kathy), key kitchen equipment across the households were found to be fit-for-purpose and, with the exception of one household (Burt), the key appliances (cooker, fridge and freezer) were reported to be less than 10 years old. However, particularly within households that had downsized and had moved into rented accommodation, certain appliances in their kitchens, such as cookers and ovens but most notably for this study, fridges were inherited from previous residents. Despite in some instances the equipment not being at all suited to their needs or specification preference (i.e. electric cooker instead of gas) items were not replaced, the rationale again stemmed from a 'not at my age' attitude and an unwillingness to invest.

7.8.2 Usage Patterns

Collated analysis of the AR(T) data from each deployed site (fridge, kettle, utensil drawer and tap) further emphasised the functional nature of the kitchen space for these household as illustrated in Figure 7.14.

Figure 7.14: AR(T) Data Households 1, 3 and 6

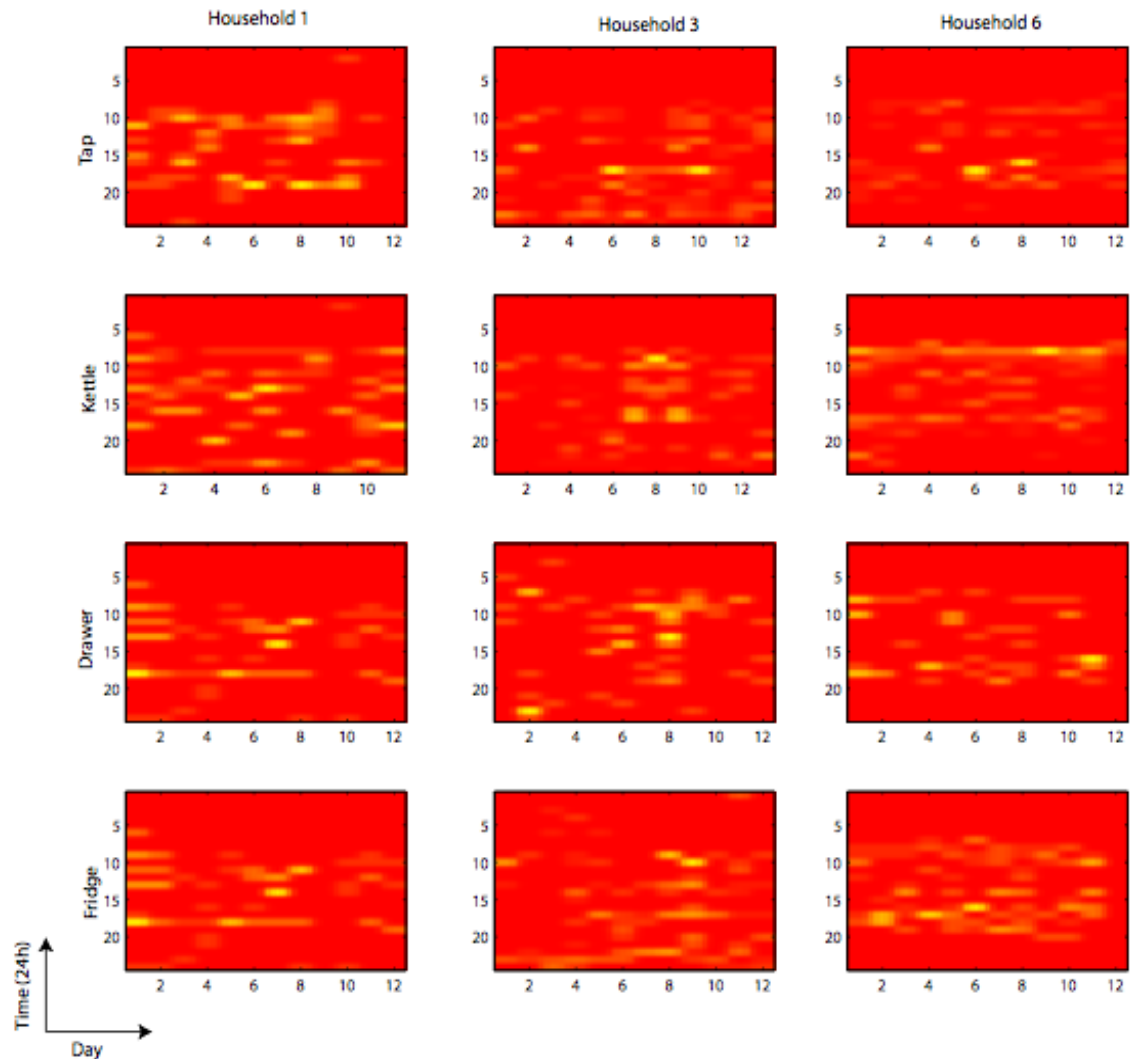


Figure 7.14, depicts data from the four AR(T) devices deployed in Joan (Household 1), Gill (Household 3) and Annie’s (household 6) kitchens. The graphs represent time (24hours) on the Y-axis and the day of the week (12 day deployment period) on the X-axis. Red is indicative of no activity whilst yellow is indicative of high intensity activity.

Peak usage patterns were shown to be linear and clustered around the traditional meal occasions of breakfast, lunch and dinner. The routinised patterns of their kitchen usage were highlighted, with households showing distinct timeframes in which usage was concentrated (for example, breakfast usage between 8-9 am,

although this did vary across households) and which were shown to be consistent across the deployment period (between 10 and 12 days). Living arrangements again played a role and the least amount of time and usage was shown in older and single occupancy and sheltered accommodation households. Those that had not downsized, or were cohabiting, were shown to have greater engagement with the kitchen space and demonstrated greater levels of usage than those living alone or in rented accommodation (see Figure 7.14, household 1). This is likely to be explained by both multiple householders using the space and the more complex role that the kitchen played in their lives. Changes in eating times were also apparent, particularly within the oldest of the households. Here activity was more concentrated earlier in the day, which acted to verify the self-reported accounts of activity that recognised the shift to eating larger meals earlier in the day and lighter meals in the evenings, due to changes in health and physical ability as reported in Section 7.5.2.

In addition to the merits of this method for providing a 'ground truth' of activity and kitchen usage patterns across the households, it also provided a verification of the householders' ability to self-report practices and verbalise the mundane (Olivier *et al.* 2009). Whilst care was taken to ensure that households were not included that were considered 'vulnerable' (physically or mentally), consideration had to be given to the potential for this cohort to suffer some expected reduced cognitive function (memory loss). However, the results from the AR(T) data showed that confidence could be placed in the cohort's ability to verbalise ordinary everyday domestic kitchen practice. This is best represented by a quote taken from the life-course interview with Gill who provides verbal justification for the late night observed usage of the kitchen (see Figure 7.14 household 3).

'Tuesday, I would do exactly the same, go to nifty at fifty, I would then come back and have something to eat at lunch time, which would be more 12.30 -1pm and that would be bread, cheese or cold meat, tomatoes, I eat loads of tomatoes, I love tomatoes, errrm, packet soup, I might have a packet soup, that might be all that I have, it depends what I am doing in the afternoon, Wednesday we go to Whistlers,

every other Wednesday for coffee, they all have things like toasted tea cakes or gateaux, I don't have anything, err I come back and I might have Weetabix at lunchtime, so Weetabix before I go and play tennis, but this is a morning sort of pattern, I would then almost certainly have something at 5 o'clock, and that again could be bread and cheese, or bread and cold meat, you know, what I do, do is eat in the evening, I have my main meal in the evening, and that could be ten o'clock and that would be a lot' (Gill: I1)

The above was taken from the interview where the householder explains that she typically misses breakfast, has a late lunch and eats her main meal of the day late in the evenings after she has played tennis. This pattern is reflected in the AR(T) devices, showing concentrated levels of activity at these key points during the day. Annie discussed having a much more linear pattern of kitchen usage and socialising patterns which were again confirmed by the AR(T) data (see Figure 7.14 household 6).

'I normally try and eat about lunchtime and have a lighter meal in the evening. Erm, because I have got surprise surprise, a slight hernia, but only slight' (Annie: I1)

'I do go round to Age UK, and it is just round the corner. I take somebody of ninety who is a little bit absent minded. So we go round together, and that's generally on a Wednesday. And we have a lovely meal there and chat. The meals are wonderful. Erm, and that's very social again. That's every Wednesday, and nearly every Sunday evening, I go round to my daughter, who is living on St George's Terrace after I've been walking. So I generally walk every Sunday with a group, and so I don't have to cook when I come home' (Annie: I1)

'On a general evening I probably wouldn't cook at all. I would have erm a salad, and cheese or I might have an egg, scrambled egg. But it's light and erm yoghurt and fruit' (Annie: I1)

7.9 The Fridge

Multiple streams of data were collected from the fridge owing to its importance as a site where *L.mono* can grow (ACMSF, 2009; Gillespie *et al.* 2006; Farber and Peterkin, 1991). All households within the sample owned a fridge although the condition, size, age and level of use varied across the sample. Despite those in rented accommodation (Sandra, Annie, and Burt) being unsure of the exact age of their fridge as they were inherited, the reported ages ranged from approximately 1-7 years.

During Phase 1, respondents were asked about what was the ‘safe’⁴² internal temperature range for a fridge to operate at. Table 7.1 reports the answers extracted from Phase 1 of the research from each of the households who participated in Phase 2, thus allowing comparisons to be drawn between self-reported and observed practice.

Table 7.1: Phase 1: Fridge Temperature Responses

Household	Answer			
	0-5 degrees	Below 0 degrees	5-10 degrees	Doesn't matter
Joan	Y	Y	N	N
Peter	Y	N	N	N
Gill	Y	N	N	N
Sandra	D/N	N	D/N	Y
Annie	D/N	N	D/N	N
Kathy	N	N	Y	N
Jack	Y	N	N	N
Burt	D/N	D/N	Y	D/N
Martha	N	N	N	N
Evelyn	Y	N	N	N

(Source: Author compiled)

Table 7.1 shows mixed response to the correct temperature the fridge should be set at according to domestic food safety best practice guidelines. Half of the households correctly identified the ‘safe’ temperature for fridges to operate to be between 0-5°C. However, some had a propensity also to answer that it was safe to have the fridge at temperatures that were above those recommended. For

⁴² Consistent with food safety best practice recommendations see The 4-Cs Section 2.6.

example, 4 of the households thought that it was also 'safe' to have the fridge operating at a temperature of between 5 and 10°C and 2 thought that fridge temperature did not matter. This confusion warranted further investigation in the EIS.

Observations made were consistent with the findings of Phase 1 and revealed that fridge temperatures were not monitored. One householder was the exception to this (Gill). She noted that the monitoring of fridge temperatures had played an important part of her job role as a nursing sister and she was observed to monitor the temperature of her fridge within her home. However, investigation of how established a practice this was, revealed that she had purchased the fridge thermometer between Phase 1 and 2 of this study.

The dominant rationale behind the lack of monitoring of fridge temperatures across the households was the belief that once set in accordance with the manufacturer's recommendations it '*just works*' (Joan: D1). Peter summarises this attitude:

'No, I have it set at one, it has been at one since the day it arrived...if something works and it just goes on and goes on and goes on I am happy with that' (Peter: I2)

The householders used visual cues to assess the condition of foods when they came out of the fridge. This practice and the householders' attitudes towards food quality assessment, in their minds superseded the need for regular alterations to be made to the temperature setting of their fridge.

'Now and then look at it if I think things are getting too cold at the top. I haven't looked at it recently. It seems to be about right... Because food in it is the same, and it's supposed to keep your food at that temperature' (Kathy: I2)

'No, it is set on 4, it's always been on that setting.'
(Martha:I2)

The lack of means and motivation to monitor temperature was further compounded by the fact that they had not, to their knowledge, experienced any problems with adopting their current approach. However, it was observed that some households did appear to make some changes in accordance with seasonality. Sandra illustrated this when she said:

'Oh I haven't got a clue. Just whatever I think. I don't know. I just turn it up and down according to the season you know?'
(Sandra: DB)

However, as Table 7.1 shows, this self-report was undertaken without knowledge of what the temperature of the fridge was or should be.

In the main, the visual condition of the fridges was good. Two fridges are shown in Figure 7.15, 1 has visible wear with a missing handle and internal rusting and the second is missing its vegetable and meat trays.

Figure 7.15: Fridge Type, Condition and Use



(Evelyn)



(Sandra)

However, the visual appearance of the fridges tells only part of the story of their working condition. Using the microbiological and temperature data, it was possible to construct a more holistic and objective account of this. Microbiological data were collected from each household and were intended to give an indication of the unseen condition of the households' fridges and their potential to harbour the pathogen *L.mono*. Table 7.2 provides a collated summary of the microbiological data collected from the households.

Table 7.2: Collated Microbiological Results

Household	Site (Swab taken)			Detection	Enumeration
	Drain	Fridge Drain	Salad Draw		
Joan	✓	✓	✓	Not Detected	N/A
Peter	✓	✓	✓	Not Detected	N/A
Gill	✓	✓	✓	Not Detected	N/A
Sandra	✓	✓	✓	Not Detected	N/A
Kathy	✓	✓	✓	Not Detected	N/A
Annie	✓	✓	✓	Not Detected	N/A
Jack	✓	✓	✓	Not Detected	N/A
Burt	✓	✓	✓	Not Detected	N/A
Martha	✓	✓	✓	Not Detected	N/A
Evelyn	✓	✓	✓	Not Detected	N/A

(Source: Author compiled) ** See Appendix 14 for an example of a full lab report.

No *Listeria spp.* was detected in any of the locations tested in the households. However, it should be noted that this test was only intended to detect *L.mono* and does not necessarily establish the presence or lack of other pathogens.

7.9.1 Temperature

Temperature was monitored in one of two ways, by taking spot check measurements and using the AR(T) devices. As outlined in *Chapter 6* the inclusion of AR(T)s within this study was as a proof of principle and therefore, in addition to the temperature readings of these devices, spot check readings were also taken for comparison and cross-verification. Originally, pre-existing AR(T) sensors were used that had been developed for and used by the Digital Interaction Group. However, it became apparent during the early stages of the data collection that the heavy over moulding of these devices may have affected their accuracy. The primary concern was that the heavy over moulding which encased the processor was acting as an insulator and thus preventing the device from accurately measuring the fridge temperature. To address this, second generation devices were commissioned specifically for the study, which had lighter over moulding and the addition of a thermocouple (used in Sandra's, Annie's, Jack and Martha's fridges). These modifications were all designed to improve the sensitivity and accuracy of the temperature monitoring capacity. The result of the temperature monitoring of these fridges is shown in Table 7.3.

Table 7.3: Fridge Temperatures

Household	Fridge age (years)	Household monitor? (Y/N)	Spot check				AR(T)			
			S1	S2	S3	Mean	Deployment period (days)	Min	Max	Mean
Joan	2	No	11.4	9.7	8.4	9.8	12	6.50	9.43	7.79
Peter	5	No	7.3	8.0	7.3	7.5	14	0.40	5.15	2.67
Gill	1	Yes	4.9	5.5	5.5	5.3	12	-2.52	3.90	0.61
Sandra*	4	No	11.2	12.4	14.4	12.6	10	9.12	33.41	13.46
Kathy	5	No	6.8	7.3	7.4	7.1	14	1.01	9.48	2.87
Annie*	7 (approx)	No	7.9	7.8	6.3	7.3	11	1.94	9.13	5.43
Jack*	2	No	5.9	5.7	8.4	6.6	13	0.27	5.17	1.64
Burt	6.5 (approx)	Yes	10.5	10.2	8.5	9.7	14	0.41	3.91	2.09
Martha (**)	4 (approx)	No	9.5	9.1	8.5	9.0	-	-	-	-
Evelyn	5	No	8.7	9.1	8.1	8.6	13	14.09	51.61	18.23

(Source: Author compiled)

*Second generation sensor used

(approx: fridge inherited not certain of exact age)

**AR(T) failed to record temperature for this household

Spot temperature readings were taken from three locations within the fridge; the top shelf, the middle shelf and the lower shelf or drawer (S1, 2 and 3 respectively), these readings were used to calculate a mean fridge temperature for the household. Although 50% of the sample reported to know that fridges should operate between 0 and 5 degree, the spot-check measurements identified that all households' fridge temperatures exceeded this temperature range, with one household's (Sandra) fridge being shown to operate considerably above the recommended range with a mean temperature recorded of 12.6 degrees. It is important to note that due the spot check nature of approach it is not without problems as, although the temperature sensors were left within the fridge for one hour before a reading was taken to ensure the reading represented the fridge's resting temperature (consistent with the approach taken by Johnson *et al.* 1998), it was not evident to the researcher what point in the fridge's cooling cycle this was. Therefore, the accuracy of such readings is a concern. To validate the spot check readings, continuous readings would have been required. This was not possible for all households due to the evolution of the AR(T) devices over the course of the data collection period.

Cross comparisons of the spot check readings with those taken by the AR(T) devices identified that the fridges monitored were operating closer to the temperature bounds considered safe. The continuous monitoring of temperature (up to 14 days) by the AR(T) devices allowed for a more accurate temperature assessment to be calculated that used all the readings recorded (25 readings per second) across the deployment period (up to 14 days). This generated an aggregated mean temperature reading for the fridge under investigation (up to 14 days). By cross comparing the temperature data with those of the visual observations, it was possible to establish that those fridges highlighted in Figure 7.15, as having visual deterioration, were also those shown to be functioning least well in terms of temperature and were found to have mean temperature readings (13.46 and 18.23 degrees) that fell considerably outside of the recommended range. The mean temperature of Evelyn and Sandra's fridges was considerably higher than those of other households. This appears to be an anomaly when compared to the other

households. This probable inaccuracy could have been a result of the crude start/stop recording mechanisms of these devices, which in the first and second generation devices relied on the researcher signalling activity through intense action (clapping with the device). The high temperatures recorded could have been an artefact associated with the removal of the devices from the fridge and the maximum temperature recorded representing ambient temperatures⁴³. The reading could have been confounded further by a number of additional factors including: an extended period of opening, which was not observed, or a hot item being placed in the fridge. It is also worth noting that none of the householders reported that their food goes off quicker than they would expect and none had concerns about the performance of their fridges.

By plotting the temperature data against the open and close events using histograms, it was also possible to establish clear trends in open events and how these led to increases in fridge temperature. Daily histograms were produced plotting each household's fridge open and close events and temperature to establish fridge condition and operating responses. In those fridges that were shown to be operating within the recommended temperature bounds (using Gill and Jack as examples Figure 7.16 and Figure 7.17) the fridge is shown to be more responsive to the opening events and more efficient at recovering to its pre-opening temperature on completion of the open/close event (see Figure 7.16).

⁴³ Following this research, the third generation devices developed by the Digital Interaction Group as part of the FSA funded Kitchen Life research have been modified so that the researcher can turn on and off the devices at the site of deployment to reduce the potential of ambient temperatures biasing the results.

Figure 7.16: Household 3, Fridge Open/Close Events and Temperature

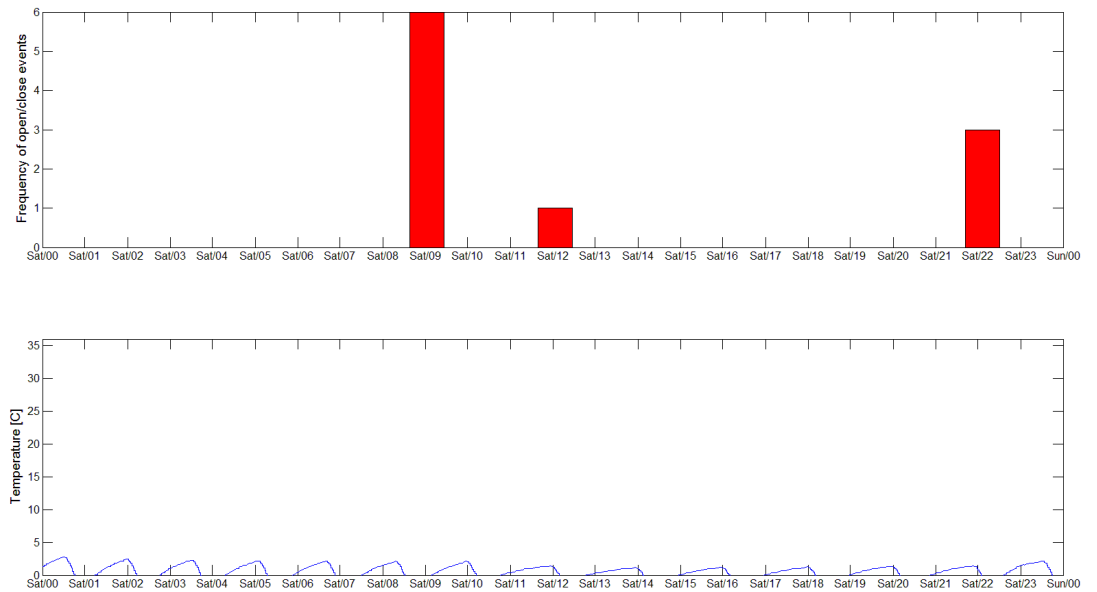
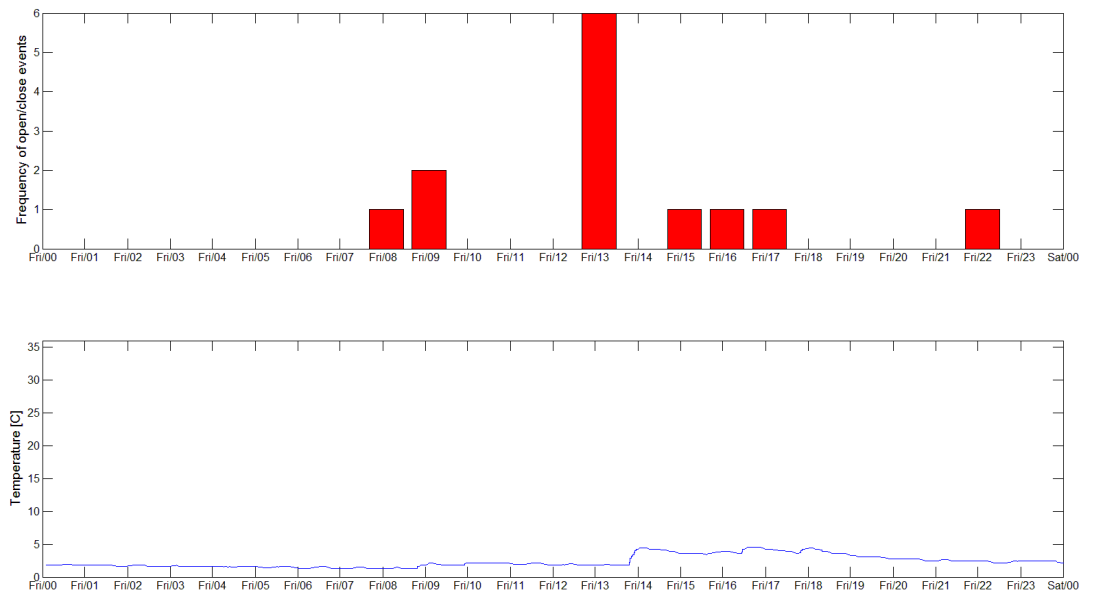


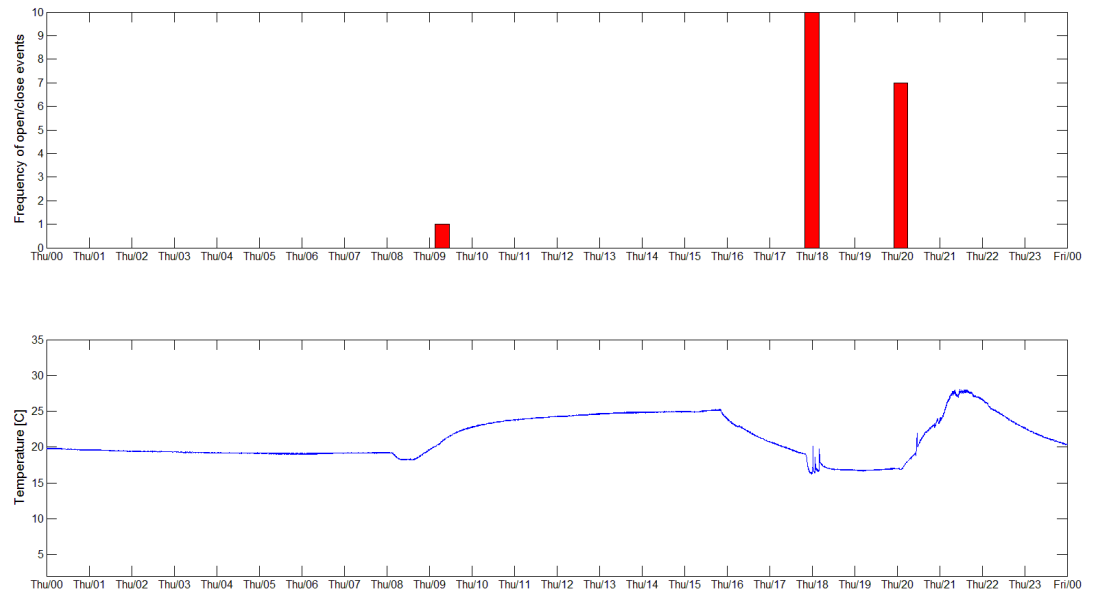
Figure 7.17: Household 7, Fridge Open/Close Events and Temperature



These graphs represent fridges that are operating effectively and within the temperature bounds considered safe. By comparison, those households shown to have poorer functioning fridges both visually and from the temperature data, were

shown to be less responsive to open and closing events. This is evident in Sandra's fridge that is represented in Figure 7.18.

Figure 7.18: Household 4, Fridge Open/Close Events and Temperature



The opening events here are matched with a rise in temperature that is sustained. Rather than the fridge motor reacting to the rise and cooling accordingly, as is evident particularly in Figure 7.16, the fridge takes longer to recover and cool the environment before additional openings occur. Hence when this happens, the fridge temperature is already at an inflated level from the original opening event, struggles to reduce the temperature back down to the resting temperature and the temperature within the fridge is shown to increase further. It is worth noting that the raised temperature recorded here could have been further impacted by the positioning of the fridge, which was directly in front of a window in the line of direct sunlight. Additionally, although not measured, the internal house temperature of this property was consistently noted to be warm and although no conclusions can be drawn, could also be affecting the temperature performance of the fridge.

However, caution must be exercised in the interpretation of these results as the monitoring of the internal fridge temperature, using AR(T) devices, was a proof of

principle within this study, and it is difficult to conclude which method, spot check, AR or AR(T) is presenting the most reliable temperature measurements. However, the representation of the fridge cooling cycle as depicted by Figures 7.16-18, is of significant value in that it presents a clear overview of the fridges' operating capacities, above and beyond the monitoring of temperature alone. Further research is recommended using these devices in order to establish accuracy of method⁴⁴.

7.9.2 Storage

As part of the fridge audit, a record was made of foods found that had exceeded their UBDs. The attitudinal responses gathered in Phase 1 would infer that the households were prepared to consume certain foods beyond their recommended UBD. Typically, the foods found to be past this were jars (condiments and jams) and vegetables, although some 'high-risk' RTE foods as well as raw meat and eggs were also found. Vegetables were observed that were over a month beyond their recommended UBD, whilst jars and condiments were over a year. Figure 7.19 depicts the reduced visual quality of vegetables stored beyond their recommended UBDs.

Two households were found to be storing 'high-risk' listeria including cooked meats and soft cheeses beyond their UBDs, as shown in Figure 7.20. Whilst most could be considered minor infringements, up to three days past the UBD, one household was observed to be storing soft cheese that had exceeded its UBD by two years (Sandra). Eggs were also found to be stored beyond their BBD and shown to be stored for up to 18 days past this (Sandra); significantly more than the 2 day best-practice recommendation. Table 7.4 documents all the foods recorded that were beyond their UBDs.

⁴⁴ On the back of this research the FSA has funded an AR(T) feasibility study as part of the Kitchen Life project which aims to assess the merits and potential contribution of these devices.

Figure 7.19: Refrigerated Food Freshness



Figure 7.20: 'High-Risk' Listeria Foods Past the UBD



Table 7.4: Fridge Audit: Foods Exceeding the UBD

Household	Date of Audit	Food Item(s)	Date on Product	Condition (open/unopened)
Joan	1/11/2011	Mayonnaise Pickle Brandy butter Cucumber Cherry tomatoes	October 2010 March 2009 March 2010 30 th October 2011 27 th October 2011	In use In use In use In use In use
Peter	28/11/2011	Mustard Homemade broth	November 2008 No date	In use -
Gill	8/12/2011	Eggs Pastrami Cottage cheese Roast chicken Peanut butter Marmite M&Ms	27 th November 2011 7 th December 2011 6 th December 2011 7 th December November 2011 June 2011 August 2011	- Un-opened Un-opened In use In use In use Un-opened
Sandra	12/1/2012	Minced coriander paste Soft cheese triangles Chilli ketchup Pickled garlic Tomato puree Eggs	October 2010 25 th January 2010 November 2011 14 th June 2008 31 st December 2006 26 th December 2011	In use In use In use In use In use -
Kathy	10/01/2012	None	-	-
Annie	2/2/2012	Bread Tonic water Mediterranean relish	26 th January 2012 March 2011 August 2011	Open Open Open
Jack	13/2/2012	None	-	-
Burt	21/2/2012	Sirloin steak Bacon Celery Carrots Brussel sprouts Onions Potatoes Savoy cabbage Butter Milk	18 th February 2012 20 th February 2012 1 st February 2012 20 th February 2012 1 st February 2012 10 th February 2012 December 2012 19 th February 2012 4 th January 2012 20 th February	In use In use In use In use In use In use In use In use In use In use
Martha	21/2/2012	Stork Stork Salmon Cherry tomatoes Celery Lemons Lettuce	17 th December 2011 5 th September 2009 18 th February 2012 19 th February 2012 13 th December 2011 15 th February 2012 5 th February 2012	In use In use Un-opened In use In use In use In use
Evelyn	1/3/2012	None	-	-

(Source: Author compiled)

With the exception of one household (Sandra) the fridges audited were not observed to be overfilled and in the case of lone person households the fridges were observed to be sparse in content. Although some organisational consistency was apparent, (i.e. jars stored on the top shelf) the fridges were generally observed to be disorganised, particularly in relation to the appropriate storage of raw meat products. These were observed to be kept on higher fridge shelves, the consensus being that this was safer than on lower shelves; this increased the potential for cross-contamination with fresh produce. Figure 7.21 depicts this.

Figure 7.21: Fridge Organisation



(Burt)

Observations highlighted that across the households the purchase of 'high-risk' chilled RTE listeria prone foods was limited. Older lone person householders were observed to purchase the fewest of these, and their purchase of cooked meats was limited. Avoidance of these products was explained as a result of packet sizes being too large for lone households, increasing the likelihood of financial and food wastage.

'But I've found that erm, getting pieces of meat now for me, it's either too much or it shrinks and there's not enough or and is it worth it?' (Jack: I2)

Cohabiting households purchased a wider range of 'high-risk' products, although, due to the expense of, in particular cooked meats, they had a tendency to cook their own, or purchase cooked meats from delicatessen counters, as this allowed for them to dictate quantity thereby negotiating cost and waste concerns. Meats purchased from delicatessen counters were considered to look more appealing; to be of better quality, and help households' satisfy their beliefs as to how shopping should be conducted (see Section 7.5.1).

'The delicatessen, I must say it looks nice when you get it- going back to ideas of how shopping used to be done' (Jack: DI)

Figure 7.22 outlines the high-risk foods observed in the households' fridges. Cooked meats, soft cheeses (Brie and Camembert and blue veined cheese), dips particularly houmous, and smoked fish were found. Households were not observed to purchase ready-made sandwiches or pre-cut fruit, the price of which was noted to prohibit this.

Figure 7.22: 'High-Risk' Products



7.9.3 Cleaning

Households lacked routine when it came to the cleaning of their fridges and they were observed to base the need on visual cues.

'I clean it as it needs it, err and that's, you can see it, you can see if it needs it' (Gill: 12)

'When it looks as if it needs it I suppose' (Annie: 12)

'If it looks dirty or I have made a mistake then I will clean it or when I look at it and think 'oh dear', but not often' (Gill: 12)

'Not necessarily every time, but I should think, I mean when it looks messy I clean it and erm, if it doesn't I don't.' (Kathy: 12)

'Erm, if there was a spill I would just wipe it down' (Annie; 12)

'What I tend to do is, if something had got spilt if I have taken a thing of milk out and squeezed it by mistake and it has spilt, I would just use a cloth and clean it up, um if I am actually cleaning the fridge and I think this place could do with a bit of a clean, like once a year' (Gill: 12)

'I very rarely clean the fridge, if I get say, somebody has made me a bowl of soup and it has been in the fridge and I have for some reason taken it out of the freezer and put it into the fridge and the liquid runs on to the bottom shelf and that then will clean that, or when I take the last milk bottle out, I get my milk delivered and it comes in glass bottles as well none of this crap from the supermarket, and if I lift the milk bottle out of the little slot on the door and I can see weeds growing in it then I will clean it and stuff like that' (Peter: 12)

As illustrated by the quotes above, a distinction was made between 'deep cleaning' and 'spot cleaning'. 'Deep cleaning' occurred less frequently and was prompted by both a niggling feeling that the fridge ought to be cleaned, as well as visual cues. 'Spot cleaning', on the other hand, was prompted by visual cues and/or in response to spills for example. The cleaning methods adopted and frequency of 'deep cleaning' was consistent across the households and closely in line with that explained by Evelyn.

'Well I'd probably do it before I went shopping, so there won't be that much in, so I take everything out of the fridge, and then take out all of the shelves. Wash down all the inside, put it back and then put the food back in again' (Evelyn: 12)

Such fridge cleaning was undertaken infrequently by households and typically was conducted when food stocks were low.

'No, it's just as I observe it. And if it's getting empty, then it's an invitation to get in and clean it out, isn't it?' (Burt: 12)

'Well I'd probably do it before I went shopping, so there won't be that much in' (Evelyn: 12)

By comparison 'spot cleaning' was conducted more frequently, and primarily involved a small area of the fridge being cleaned without the removal of all items. Cleaning of the fridge fell outside of the remit of everyday cleaning and was viewed as a specialist job. The reasons given for not regularly cleaning the fridge included: the household not being physically able to, the view that it was too much to ask a cleaner to do (additional work), and infrequent use (especially referring to the microwave and the oven).

Reduced physical ability to clean was most evident in the oldest participants who found themselves unable clean large appliances such as fridges and ovens. This led to some employing a cleaner to assist with these tasks, although households consistently expressed the feeling that tasks of this nature were beyond the remit of their cleaner, Burt expresses this:

'she doesn't do the oven, that's more of a specialised thing, isn't it, to get it cleaned out? Generally I'm responsible for that. If I asked her, certainly she would...Very conscientious is Shelia, but I can't expect her to do more' (Burt: 12)

7.10 Food Provisioning Practice Outcomes

This section endeavours to report on the observed food provisioning practices performed regularly by this cohort.

These practices are shaped by contextual life-course factors, change influences and value negotiations made by a household. As highlighted in Section 7.3, maintaining independence in terms of food provisioning was the most dominant theme emerging from across these households and the householders developed strategies to maintain their independence in the face of changes they were encountering as part of the ageing process. Through negotiations they developed food provisioning practices they found were sustainable and acted as the mediators of change, facilitating them in maintaining their independence. These practices included: batch cooking; meal simplification; acceptance of gifts of food from others; paring down; eating out of the home; signing up to a meal delivery service; hoarding; and reliance on others either in terms of their wider support networks or more formal provisions such as meal delivery programs (Wiltshire Farm Foods). These practices were observed as strategies performed across the households and were used to varying degrees and in different combinations. The remainder of this chapter provides a holistic explanation of what each involves and draws upon case illustrations from across the households.

i. Batch Cooking

Batch cooking refers to the process of cooking in large quantities and involves producing more than is required for a single meal so that additional portions can be refrigerated or frozen for consumption at a later date. Batch cooking was not associated at all with the practice of using leftover foods. Eating leftover food was regarded as synonymous with waste, was the result of unintentionally producing too much food and was a situation that householders actively avoided. Batch cooking, on the other hand, was a deliberate strategy employed by the householders to help them manage the time, effort and energy required to produce their preferred meals and to minimise how often they needed to cook from scratch.

'I will do a big pan of curry, it tends to be either chicken or mince, I will do sometimes a roast chicken and just pick off that, umm or sometimes a big pan of mince for spaghetti, otr chilli con carne, or something like that' (Sandra: I1)

'You know quite a big quantity, and that's very hard to you know not only buying but cutting down, in fact you see I nearly always cook for two or three and just have it the next night' (Annie:11)

'Actually I was thinking, my chief activity seems to be at present, is making casseroles. I enjoy casseroles... because really they're a meal itself. I've got to watch myself though because I have a habit of getting something out and then finding something else there. And so I end up with a bit of a brick of a casserole that needs watered down by the time it comes to reheating it. Because I do a lot and fill about maybe eight margarine tubs and freeze them' (Burt: 11)

The practice of batch cooking allowed them to maintain their beliefs about what a meal consists of and how they should be cooked enjoyed. This strategy is negotiated and valued as it reduces the physical and mental energy required to prepare food. Cooking from scratch required energy in the form of mental processes (deciding what to prepare and preparation know-how), motivational processes (the drive to prepare food), and the physical ability required to prepare a meal (standing for long periods etc.). Within households 'batch cooking' provided a solution to the problems faced by householders' reduced levels of energy and motivation. It also reduced the amount of time they spent preparing food by concentrating it into one cooking occasion, whilst still allowing them to prepare meals from scratch and to eat those meals daily as illustrated in Figure 7.23.

Figure 7.23: Batch Cooking



(Kathy)

Moreover, this approach to food provisioning had further advantages. First, batch cooking allowed lone person households to be financially efficient in terms of negotiating supermarket portion sizes aimed at larger households and making use of promotional offers. Second, and in line with the importance of thrift to this cohort (see 7.5.3), batch cooking reduced the potential of waste. Third, batch cooking allowed households to make energy savings in terms of making the most of appliances being on and preparing more than one meal at a time. Jack and Martha explain this (see Figure 7.24):

'Last weekend there was a special offer in Morrison's right? Fresh chickens half price £1.70 a kilo instead of £3.40. So I thought oh Friday, I do my main shopping on a Friday, and an odd time I might have to go and get bread and milk. But that's by the week. So on the Friday, I got a, so on Friday, I stayed in the afternoon, watched the racing, did my cooking and did one or two other things at the same time. Had chicken and chips for my tea on Friday, had a nice chicken salad on the Saturday with potatoes, and on the Sunday I had my breast, with gravy and peas and my carrots and my erm broccoli and my potatoes.' (Jack: 11)

'And I do have, occasionally, what you shouldn't eat, bacon and sausage and that. That was on special offer last week. There's a packet of bacon in there and about 8 Cumberland sausages. But there's still four, because what I did on that Friday, I put the sausages in the oven at the same time to cook with the chicken you see.' (Jack: 11)

'Well I had the oven on, to do the casserole, and while that was cooking, I just beat up a couple of eggs and milk and sugar' (Martha: 11)

Figure 7.24: Batch Cooking



(Martha)

Finally, in terms of wellbeing this approach to food preparation reduced the anxiety felt by some in relation to the preparation of foods for themselves and for entertaining guests, by ensuring that there was food in reserve in case of emergency (illness or unplanned visitors).

'it's lovely, if sometimes I am really, you know I will do a pan of food for a week and that is lovely, because, its great I think I have got something here, I just come home and eat it, you know, but when I haven't got that back up, and I haven't got the food there it is awful' (Sandra: I1)

'But I can't keep things warm [so] I try to make things that I can prepare earlier... And that err, don't all need the use of the oven at once. I prepare what I can earlier' (Joan: I1)

'I had erm, visitors at the weekend, so I did a big shop and a big cook to last through the weekend, and then this coming week, I will be living on the leftovers, which I'll be using up...and then yesterday, I did another big cook, because I'm going away for the weekend to a rented cottage and I'm taking a meal for six. So I've got it cooked and in the freezer. So then I might go a fortnight, then I've got somebody coming to stay, but I've already got some cooking I didn't use before' (Kathy: I2)

The practice of batch cooking predominantly involved cooking meals from scratch. The observations highlighted discrepancies with the self-report data collected in Phase 1. This was particularly the case when it came to hand washing and specifically hand washing after handling raw meat. Observations showed that hands tended to be either not washed at all or wiped on cloths (dish cloths or tea towels) rather than washed with hot soap in line with best practice guidelines and, as the self-reported results in Phase 1 suggested, was common practice. Figure 7.25 shows hands being wiped with a dishcloth during the batch cooking of a chicken casserole. The excerpt below, drawn from the activity transcript of household 1, shows the absence of hand washing whilst cooking bacon.

Figure 7.25: Hand Washing



(Martha)

P1: Removes the lid of the plastic container and removes from it rashers of bacon with her fingers, she lifts the rashers of bacon and separates them. She then puts them back down in the plastic tub and turns to the cooker and reaches for the frying pan that has been resting on the cooker top and pulls it from the back to the front ring, she ignited the gas and turns on the cooker flame. She picks up one of the rashers of bacon and places it into the frying pan...she then returns to the tub and recovers the bacon with the film of the original packaging and reaches for the plastic lid of the tub and replaces it and presses it down with both hands. She walks with the plastic tub to the opposite side of the kitchen and reaches for the fridge door; she opens it and places the tub containing the bacon back into the fridge. She reaches for an item in the fridge and then stands and closes the door. (Joan: AT1)

Batch cooking reduced householders' reliance on their fridge, but placed increased importance on the freezer. It was consistently reported that '*I find I'm not using the fridge all that much*' (Martha: I2).

Figure 7.26 represents how the portions produced from '*batch cooking*' are stored across the households.

Figure 7.26: Storage



(Kathy)

Emphasis was placed on the labelling of foods prepared during batch cooking to ensure that they were distinguishable, although as Figure 7.26 shows and Martha confirms, these typically did not include dates when the batch was cooked and/or frozen.

'[I would label] What's in there, for example I've got in the freezer casserole beef, or beef casserole, or parsnip soup...but I don't put a date on them' (Martha: 12)

Households had low levels of knowledge about best practice freezer storage recommendations and consistently reported eating foods contained in the freezer until they were gone, rather than in line with best practice and/or manufacturer's guidelines. Batch cooking and the lack of labels on homemade meals further compounded this, although attempts were made to eat older foods first. Freezers were infrequently cleaned and defrosted. The decision to clean and/or defrost a freezer was made on the basis of visual appearance or when stocks were low:

'The freezer gets a bit neglected I'm afraid...You see everything is on a smaller scale for me, being on my own, so the turnover is probably quicker anyways you see' (Burt: 12)

'Erm not very often because it's such a palaver, and, unless it's freezing outside, you lose your food, and erm, it doesn't really get

dirty because everything's all wrapped up and closed. I don't know, maybe once a year. More often if I think it's getting too iced up' (Kathy: 12)

'No. it's a self-defrost' (Sandra: 12)

None of the householders changed or monitored freezer temperatures, consistent with the rationale given for fridge temperatures. Freezer temperatures were not monitored and the households determined performance on the condition of food when removed.

'No, because the stuff comes out as frozen and it takes up to a day to defrost, and that's about right' (Kathy: 12)

'I didn't know you could...No, I thought my fridge did it; it doesn't seem to be a separate thing there (Annie: 12)

ii. Meal Simplification

As established in Section 7.5.1, negative associations were attached to ready-meals. This was despite evidence that a common practice emerging across the households was the simplification of meals and the trading down from cooking from scratch to more basic meals that required limited preparation and cooking. As part of the practice of meal simplification, households developed a range of simplified solutions. These include: simplified cooking from scratch (omelettes, baked potatoes, grilled meat and vegetables), cold meals (and the inclusion of 'high-risk' listeria foods, most notably cold meats), tinned meats (that are not considered to be 'high-risk' listeria foods (CDC, 2011)), the use of ready-meals, and composite cooking where convenience foods such as quiches and pies were supplemented with vegetables prepared from scratch or with frozen and tinned foods. All of which were still considered by the households to fit into their belief of what cooking from scratch involved. A last resort involved signing up to a meal delivery scheme (Wiltshire Farm Foods).

'I mean I always cook vegetables with every meal, so, I do cook everyday...if I'm having a pasta dish, which I shove it in the microwave, which is wonderful, and I won't have potato with that, so I might have cooked tomato, because that's supposed to be better for you than not, and erm broccoli and erm, maybe a leek with it.' (Annie: I1)

'I take my vegetables, I eat vegetables and with Wiltshire Farm Foods, I always have fresh vegetables' (Martha: I2)

Figure 7.27 and Figure 7.28 illustrates these solutions.

Figure 7.27: Cold Meals



(Gill)

Figure 7.28: Low Involvement First Principle Meals



(Sandra)



(Annie)

This cooking strategy was employed primarily by those living alone, and was strongly tied in to the notion of cooking fatigue and the lack of motivation to prepare meals for themselves.

'I like good food I come a family that like good, my mum was an excellent cook, I used to be a good cook, I have to say myself, I'm not so good now, but, because I can't be bothered' (Martha: I1)

'I don't eat so much, and at times, I set out thinking I'll do this and then I don't get round to it...I used to do more cooking I suppose I used to, look down upon ready-meals, but they seem to have improved actually, and I've got lazier as well' (Burt: I1)

'When I have got older now, I can't be bothered, it's just too much bother to cook and do healthy things, so I tend to just do convenience things' (Sandra: I1)

This was consistently expressed with some guilt and recognition that the simplified food they ate now was not in line with their own beliefs about food and meal preparation. However, the benefits of adopting this approach mirrored those associated with batch preparation and include: the consistency they allowed with taste preferences, reduced physical and mental effort associated with cooking from scratch and a reduction in waste associated with the preparation of meals for one. Although for some, the preparation of meals using this approach was more expensive than if they cooked them from scratch. This was particularly the case for Martha who purchased meals from a meal delivery company (Wiltshire Farm Foods). However, Martha had accepted that the trade-off was worth it to her as the benefits listed above were more valuable than the increased costs associated with her chosen solution.

iii. Gifting

Gifting was adopted as an informal means of provisioning food and typically the household receiving gifts of food from their wider social networks including friends and family. It was a practice that was isolated to single person households. The nature of the food gifted varied considerably ranging from cakes, jams, fruit and

cooked meat to main meals, soups and pies. Although the households concerned did not directly seek such gifts, this means of food procurement addressed all of the value negotiations. Accepting gifts of food reduced the time and effort required in food preparation and supported the households in continuing to consume meals/foods cooked from scratch and homemade in line with their beliefs about what constituted proper food. It also helped them address concerns they had about their own health and wellbeing, in particular in relation to managing their medical conditions and associated loss of appetite. Receiving such gifts provided a psychosocial boost, especially when the gifts were considered to be treats. Finally, gifting helped reduce waste associated with preparing food for one and with the financial burden associated with purchasing food.

Figure 7.29: Gifted Food



(Peter)

The intention of gifting food was to reduce physical and mental effort in food provisioning and preparation for the recipient and was often intended as a gift. As such, those gifting made efforts to produce food that was in line with household's taste preference (shown in Figure 7.29).

The practice of gifting was most welcomed by lone male households, who had little interest in food provisioning (most notably Peter). This is in line with findings of Brennan *et al.* (2007). Peter explains how gifting helps him.

'I have three friends, who cook for me. When you go into the fridge, you'll see cartons with err broth and stuff like that in it. ...I've got another friend who does mean cheese scones and apple tarts... if one of my friends, if they have me round to their house for a meal, and say there's four of them sitting down, they'll cook for five and I'll go along and get a plate with a meal on and things like that...Whether they take pity on me, or they think I need fattening up, I don't know. Or whether they're just nice people, but I do okay in the food line from other people' (Peter: 11)

However, for some the practice of gifting was viewed negatively. For example, it was at odds with their desire to maintain their independence, was not always in line with taste preferences and the gifts received were often too much for them which left them feeling obligated to eat the foods to appease the giver and avoid waste. Burt and Annie illustrate this as follows:

'So she'll [daughter] will suddenly say, oh I've got lots of oranges, and I've already bought some too, but never mind. So I shove them in the fridge. So I, yes, Caroline does sometimes land me with things' (Annie: 12)

'They keep turning up with food as if I was in need of food parcels...But when they depart I've got these damn things to eat up' (Burt: 12)

iv. Paring Down

Paring down emerged as a significant theme across the households, and has been noted in Sections 7.8 in relation kitchen design and equipment. The notion of paring down which primarily involves reducing the amount of equipment used in food preparation in particular was observed as part of the process of downsizing homes and possessions and was most evident amongst those living alone. 'Paring down' the amount of kitchen equipment, often in line with other practices most notably meal simplification and gifting, led to some kitchen equipment becoming

redundant. The extent to which this had occurred varied across the households from the extreme case of Peter removing his cooker, to examples where households have reducing the number of pans and small electrical appliances such as food processors and blenders. Annie explains the practice of 'paring down'.

'Well you don't need anything else. What I really use more are pots and pans... No I find...well, I did have a food processor and then I gave it back and I did have a toaster and I thought I'm not going to use this so I gave to my family back things actually...I try not to clutter up. I'm going to go through my clothes. Because when I buy something I used to give something away, you know, to a charity shop' (Annie: DI)

However, one of the consequences of the practice of 'paring down' is that sometimes households find they may have pared down too much and as a result they are required to make substitutions when they find they no longer have the equipment they need. This was most notable in the case of Peter who no longer has a chopping board despite regularly chopping food. As a result, he chopped on a plate and/or directly on his work surfaces. This is illustrated in Figure 7.30. Neither did he own oven gloves which meant his tea towel took on a multifunctional role that included being used for drying dishes, drying hands, wiping benches, removing hot items from the microwave and as a placemat for serving.

Figure 7.30: Substitutions



(Peter)

The practice of 'paring down' also reduces the energy and time associated with cleaning and maintaining such equipment. Peter has only two plates, bowls, cutlery etc. He washes up once every two days and finds that this both saves him the physical energy he would expend if washing up every day and reduces his hot water consumption. Annie and Gill also refer to this practice:

'No, the only awful thing I do is when I'm eating the soup by myself; I probably eat it out of the saucepan' (Annie: 12)

'I mean if I cook a chicken I use a roasting bag so it doesn't splatter everywhere. I think if you don't make any mess you don't have to clean it up you see' (Gill: 12)

v. Planning

Intentional planning of shopping, primarily through the writing of shopping lists, was adopted in order to reduce the physical effort and time associated with the purchasing of food (for Evelyn this extended to planning weekly menus) and was prominent across the households. This ensured purposeful shopping, reducing the effort required to shop for food, reducing the likelihood of items being forgotten and the need for households to engage in 'top up' shopping. It also reduced the potential for food waste and overspending. This strategy is summarised by the following quotes:

'My shopping list book, that's what I'm going to buy, and that's what I'm going to make, I take this shopping list with me, So I don't forget anything' (Joan: 12)

'Yeah, well I was, well I always have a list, I mean I've decided what I want, or I buy things you know.' (Jack: 12)

'Yes I always have a list...Unless you see some fantastic bargains, or you've forgot your main ingredient...I might forget something that I really want and that's annoying and...well you just sort of tumble about all over the place, waste of time if you haven't got a list...sometimes you might see something, and think oh that is a good idea, but I don't do much of impulse buying, because I

usually have an idea in my head what I am going to get, otherwise you end up with stuff that doesn't go with each other and so on'
(Kathy: I2)

Planning extended to food preparation, particularly if meal simplification or batch cooking was part of the process; central to this was the use of the freezer. This allowed for the organisation of meals and flexibility with food. Householders were able to be economical by freezing food purchased or food prepared in bulk, thus extending the life of foods close to or beyond their UBD. Additionally, it allowed households to cater and care for others in a way that was manageable for them. Kathy talks about this giving her peace of mind as she is able to continue to prepare meals for her family and be organised whilst also giving her flexibility should their plans change.

'I'm going away for the weekend to a rented cottage and I'm taking a meal for six. So I've got it cooked and in the freezer... But it's all a bit hitty missy because sometimes I've got the meals ready and we're down at the beach and we decide we'll just stay there for fish and chips. So I've got to have it all sorted so it can go into the freezer and not get wasted' (Kathy: I2)

As a result, the householders engaged regularly in defrosting food. They were observed consistently to defrost foods out of the fridge, which contravenes best practice guidelines. Defrosting required households to remember to remove foods from the freezer in advance. Often they forgot this meaning that they also used other more immediate techniques such as the microwave to help defrost food. Typically householders were observed to use work surfaces or sink draining boards to defrost foods, which is shown in Figure 7.31 below.

Figure 7.31: Defrosting



(Martha)

vi. Eating out of home

'Eating out of the home' relates closely to communal and social aspects of eating and links to beliefs that eating should be a social occasion. Companionship during meals was sought through attending lunch clubs and eating out of the home alone or with friends. Particularly in the case of lunch clubs, emphasis was not given to the food provided, the importance of which was typically downplayed, viewed as variable and not always in keeping with their own tastes or standards of preparation.

'I go to the community centre in Byker for my lunch...it's all right, but I mean it's only volunteers' (Jack: I1)

The main reason for attending, however, was for the social interaction experienced.

'I do go round to Age UK, and it is just round the corner. I take somebody of ninety who is a little bit absent minded. So we go round together, and that's generally on a Wednesday...we have a lovely meal there and chat. The meals are wonderful, Erm, and that's very social again' (Annie: I1)

For others the stigma of lunch clubs prevented attendance but meals out with friends served the same purpose. Again the emphasis was placed on the social interaction enjoyed rather than the food itself.

'And I like to go with people, you know, and we'll have a fancy meal. But it's for the conversation and the booze mainly' (Peter: I1)

vii. Hoarding

'Hoarding', as a practice, was observed as the intentional over purchasing of food that was in excess of the amount required to feed the household and was kept for long periods of time. This reaction to change was adopted as a means of reducing the amount of energy required when shopping for food, and to reduce a householder's anxiety about having sufficient food to eat. However, this over-shopping resulted in the decision of what to prepare becoming more complex and, by implication, increasing the amount of mental effort required. Gill and Sandra, both of whom were single households and felt they had limited levels of cooking competency best represented this practice. For Gill, this was closely aligned with the prominence of thrift in dictating her food provision practices, whilst for Sandra this was more symptomatic of her troubled relationship with food as a consequence of her mental health and wellbeing. In this case the over stocking of her fridge represented her reluctance to throw items away on the grounds of thrift. The consequence was that she had a selection of 'high-risk' listeria foods that had exceeded their UBDs (see Table 7.4). Within these households (Gill and Sandra) the intentional hoarding of kitchen equipment and appliances was used as a mechanism to try to incentivise the household to prepare and cook food that was in line with their beliefs and preferences. However, the reality was that this practice acted to further confound low confidence in cooking competency, and for Sandra, created additional anxiety around food provisioning. Figure 7.32 highlights the extent of Sandra's hoarding of kitchen technology, none of which she regularly used.

Figure 7.32: Technology



(Sandra)

viii. Reliance on others

'Independence Transitioning' represents the journey that older people take with food as they go through the ageing process. The changes experienced require negotiations and continual re-evaluation of the food provisioning practices they perform and the adoption, where necessary to maintain independence, of new food provisioning solutions. Turning to or relying on others is considered to be last stage on the *'Independence Transitioning'* continuum, a stage that is synonymous with being dependent on others for their food provisioning. Strategies to avoid this are applied throughout the food provisioning process and have been outlined. As highlighted in Section 7.3, independence in terms of food provisioning was closely guarded; this is illustrated by the following quote:

'Oh I'm not going to ask for help, once you do that, you know, you're going down' (Burt: 12)

The very essence of independence rejects the notion of relying on others, with this viewed as being a *'last resort'* (Burt: 12) option that was available, but rarely

considered or sought. Although the gifting of food could be considered as reliance on others, the fact that this was not intentionally sought as a food provisioning solution, and was not relied upon as the only measure, meant that it was not generally viewed in this manner. The staunch and often defiant defence of independence was also observed in those that rejected this solution. In only one instance was assistance from others sought in relation to food procurement and this was by Martha, the oldest household within the sample. However, as the quotes below illustrate, she still tried to maintain as much autonomy as possible, despite finally asking for help:

'The shopping bus brings me home; the driver carries all my shopping into the hall, well into the house...He doesn't put them away because I want some things to go into one draw and other things into another draw' (Martha: 12)

Interestingly, getting assistance with cleaning was viewed differently, and although this required a trade-off between wellbeing and financial resources, households were willing to pay, valuing the time and health benefits it permitted, whilst allowing them to maintain consistency with their beliefs in what constituted a clean home. Assistance with cleaning in the home, whether formal or informal, was a strategy employed to help reduce the physical and mental energy required, and was extended to include the cleaning of their kitchens. Assistance with cleaning in the home was divided into two categories: formal assistance that was bought at a financial cost to the household, and assistance received without payment through informal networks such as other householders or relatives. The adoption of formal support to assist with cleaning was often a solution to changing physicality as a consequence of the ageing process.

'I have a cleaner because there are some things that I have great difficulty doing if I got down on to my knees now you would have to help me up because, or you would giggle when you saw me trying to stand up, so cleaning the shower tray and things like that I would, I would find great difficulty in doing it' (Peter: 12)

'Vertigo, yes. When I, pulling out furniture, and beds and things like this, which I never thought about, it's bending over, erm possibly also I'm going to have cataracts done...I thought well this is ridiculous. How old are you, don't be such a fool, you're not really sixty odd, And before I had vertigo, I only felt thirty seven inside, I have added another thirty years on, but I still don't think of myself as eighty odd, but I am. And that's when I thought right, if I can get this cleaner and erm, she did three hours stint.' (Annie: 12)

'Well she, I find it difficult to clean my bath properly, so she does that in the bathroom, and she goes through with the hoover, I can't manage the hoover, it's too heavy. But I've got a small electric thing, which I go round with' (Martha: 12)

In households where assistance with cleaning was not sought, the time, energy and wellbeing benefits were not valuable enough to compensate for the financial cost associated with this. The most prominent reasons for not valuing this included the individual not being financially able to employ a cleaner, the receipt of informal support from other household members and finally the notion of trust.

'But I did, when I first retired, I had meningitis and I had to get a cleaner in and erm, I thought, what I thought I would do, and what I would still like to do is have a cleaner say once a week, or even say once a month. And because I had no recommendation, I tried agencies, and I tried two agencies, and they so put me off' (Kathy: 12)

Trust was also being linked to discrepancies in cleaning standards.

'but err to be honest, if I had a cleaner I would clean before she came and I wouldn't think she'd do it to the right standard' (Joan: 12)

This was also prominent within the households that received informal support from other household members.

'I want to say cleaning's David's duty. He's supposed to do the cleaning...But sometimes if I can't stand it anymore, I'll get the hoover out' (Evelyn: 12)

Here the division of labour in the home was observed to prohibit the maintenance of beliefs of one householder over the other. However, in order to maintain the *status quo* in the home, confrontation was avoided in relation to cleaning.

7.11 Summary

This chapter has presented the empirical findings of the EIS. It began by presenting ten short contextual vignettes of each of the householders in the sample and included their food trajectories over the life-course and the role that food now plays in their lives, prior to the examination of cross-comparative results. Thematic analysis of the data uncovered the significance of the life-course in shaping the households' relationships with food, the changes that were presented across this, requiring constant value negotiations to be made and food provisioning and handling solutions to be sought. Ultimately all food provisioning practices were shown to be solutions put in place to manage the dynamic changes that are inherently part of the ageing process. Maintaining independence was the driving force behind the food provisioning solutions developed by the households. Thus the notion of '*Independence Transitioning*' is offered as the substantive theoretical contribution to the understanding of the everyday domestic food provisioning and handling practices of the 60+. *Chapter 8* will discuss the implications of these findings from a food safety perspective.

Section 4

Chapter 8 : Discussion

8.1 Introduction

This chapter discusses the implications of the primary and secondary research findings for the successful adoption of domestic food safety best practice recommendations. The chapter begins by discussing the results of Phase 1 (*Chapter 5*), which were used to as a platform to inform Phase 2's EIS. Second, the empirical findings of Phase 2, particularly the central conceptual contribution of '*Independence Transitioning*', is presented as fundamental to understanding the barriers that inhibit the adoption of domestic food safety best practice recommendations amongst the 60+. Third, consideration is given to the food safety implications of the food provisioning practice outcomes identified in *Chapter 7*. This chapter concludes by discussing the implications of the research findings for understanding and engaging with the food provisioning practices of the sample cohort.

8.2 Segmenting the Older Consumer

Research objective 3 sought to:

To provide a sampling framework for the observational component of the research by segmenting the 60+ population in the North East of England, based on lifestyle, attitudes towards food and attitudes towards and knowledge of domestic food safety practices

A review of the literature identified five hypotheses related to this objective that were investigated within Phase 1:

1. The over 60s are a heterogeneous group with increased age impacting upon one's ability to handle and prepare food
2. Gender influences adherence to domestic food safety recommendations in the over 60s cohort

3. Adults aged 60 and over will demonstrate less personal culpability and exhibit an illusion of control in relation to domestic food safety
4. The cohort will demonstrate discrepancies between knowledge and practice of domestic food safety recommendations
5. Being aged 60 or over increases the likelihood of engaging with unsafe kitchen practices and owning poorly functioning kitchen equipment

These hypotheses are now discussed in turn. In support of hypothesis 1, this research highlights the heterogeneity of the 60+ in respect to food preparation and handling. Whilst the intention of the segmentation analysis was to identify those most 'at risk' of illness from foodborne disease, this phase highlighted each of the 3 clusters to demonstrate propensity to deviate from best practice recommendations and report food safety behaviours that put them at risk of contracting foodborne illness. However, the nature of the risk posed provided the basis for differentiating between the 3 distinct types of older people identified in Phase 1. Enthusiasm and enjoyment of the preparation of food was greatest for Cluster 1. Although experienced food handlers and preparers, those in Cluster 2 were still enjoying food, although their interest in its preparation had diminished. Having been regular food preparers for many years, this group are suffering from cooking-related fatigue, evident in a lack of motivation to experiment and a preference for preparing dishes from their existing repertoire. Unlike Clusters 1 and 2, Cluster 3 reported a diminished interest in food and its preparation, relying upon convenience meals or others. Cluster 3 are considered to be at the greatest level of physical susceptibility to foodborne disease due to the range of severe medical problems they are living with. Similarly Cluster 2 is beginning to contend with health issues and this change in health status may, in part, explain their reduced interest in food preparation. Cluster 1, on the other hand, did not report suffering from any severe health problems. However, it is well documented that risk of contracting a foodborne illness is not isolated to physical vulnerability, with knowledge, attitudes and behaviours being shown to contribute significantly to an individual's vulnerability and susceptibility (ACMSF, 2009). In support of research Hypothesis 1, significant differences on these measures emerged across the

clusters, helping to illustrate the multidimensional nature of 'risk' faced by this cohort.

In line with the findings of Kennedy *et al.* (2005), the clusters were shown to have differing socio-demographic profiles, with significant differences identified for age, marital status, income, health and WSN. A member of Cluster 1 is most likely to be at the younger end of the 60+ age continuum, married and thus cohabiting and of excellent or very good reported health status. A member of Cluster 2 is most likely to be married or newly widowed, living in rented accommodation with a good to very good self-reported health status. The variables tested and shown to be significant were indicative of Cluster 2 experiencing a 'transitional' phase, encountering changes in personal circumstances such as their marital status, living arrangements and physical health. A member of Cluster 3 is most likely to be widowed; living alone in rented accommodation and with a good to fair self-reported health status.

Contrary to expectations, hypothesis 2 was rejected because gender was not shown to be statistically significant within this research. However, it is important to recognise that no firm conclusions could be drawn in relation to gender within this research, since as documented in *Chapter 5*, the final sample for this phase of the research was heavily female biased. Nevertheless, it is worth noting that Cluster 2 was predominantly female (73.9%). This Cluster exhibited overconfidence in their own judgements about food and its safety, leading to their belief that some deviating domestic food safety practices to be more appropriate than best practice recommendations. This is in line with the concept of optimistic bias, in which consumers are shown to under-estimate their own likelihood of encountering negative future events (Redmond and Griffith, 2003; Miles & Frewer, 2002; Woodburn and Rabb, 1997; Frewer, Shephard and Sparks, 1994) and in terms of food safety are less likely than comparable others to become ill (Redmond and Griffith, 2003; Woodburn and Rabb, 1997). This is of concern from a risk communication perspective as it is likely that the self-confidence shown by Cluster 2 may lead them to dismiss domestic food safety advice as not directly relevant to

them (Redmond and Griffith, 2004). To a lesser degree, this was also shown to be a factor affecting the adherence to domestic food safety best practice recommendations by Cluster 1. Despite being shown to be more knowledgeable about risks associated with food (both microbiological and production concerns), Cluster 2 also demonstrated propensity to deviate and attribute risk to others, but not necessarily themselves. However, the potential for engaging in deviating domestic food safety practices extends beyond Clusters 1 and 2, with the data showing an increased likelihood that those in Cluster 1, and to a lesser extent Cluster 2, will be responsible for the food preparation for others, particularly those in Cluster 3. This not only increases their own vulnerability but also, by implication, jeopardises the safety of others, including spouse, family members, and friends.

A more fine-grained analysis highlighted that the acceptance/rejection of hypothesis 3 was cluster dependent. Cluster 2 do not associate food with any risk to their own personal health and, similar to Cluster 1, they are sceptical of the manufacturers' BBDs and UBDs, being happy to disregard them and showing a preference for basing food quality assessment on their own intuition and sensory judgement. The optimism of Cluster 2 is further shown in their ability to handle and prepare food as experienced food-handlers. This reaffirms the position taken by Fischer and Frewer (2008 p. 2860), who argued against the rational assumption of a positive relationship between frequency of food handling and safety, suggesting instead that frequent food preparation causes food consumers to become '*evermore careless*'. Cluster 2 members' eschewing food safety recommendations which was also motivated by a 'no waste' mentality.

Cluster 3 were acutely aware of the risks posed to their personal health by food and adhered to domestic food safety best practice guidelines. They take measures to protect themselves by trusting and adhering to recommendations made by food manufacturers and other authorities, and by being rigorous in their adherence to UBDs and BBDs. Interestingly, Cluster 1 also identified risks to their personal health as a consequence of poor domestic food safety practices. However, they failed to fully appreciate and/or accept the control measures put in place to protect them at

the point of purchase, demonstrating the potential for deviating practice once the food is in their control. Personal judgement calls were made by Cluster 1 when it came to the assessment of food suitability and discrepancies made between products, showing an increased likelihood of disregarding food safety recommendations on dairy products, although more caution was taken for meat based products. These findings provided support for Hypothesis 4. Notwithstanding the analysis conducted at the cluster level, results from the PCA analysis highlight microbiological food risks to be of greatest concern to the sample as a whole, and are consistent with the findings of Miles *et al.* (2004).

From a food safety perspective, Cluster 3 would appear to demonstrate the least potential for deviating from domestic food safety best practice guidelines. However, despite demonstrating conscientious food safety attitudes and reported practices, Cluster 3 are less engaged with the food provisioning and preparation process as their physical and health status has reduced. Cluster 3 was reliant upon formal and informal networks of support for assistance with daily living, which included food procurement and handling. This gradual relinquishment of personal control over food provisioning is the key determinant of the vulnerability status of Cluster 3 with the food preparation responsibilities often falling to their wider support network, some of whom may belong to Clusters 1 and 2.

Despite rigorous adherence to domestic food safety best practice recommendations, Cluster 3 may unintentionally be exposed to malpractice and deviations from them through others such as formal 'paid for' carers, family and friends who are supporting them in provisioning the foods that they eat. Strikingly, in an attempt to maintain some semblance of control and independence over their food provisioning, 96% of Cluster 3 was found to regularly consume at least one and up to nine, chilled RTE products per week. Such RTE foods are known to be the vehicles that support the transmission and contraction of human listeriosis. In addition, consistent with the finding of Johnson *et al.* (1998) this research confirms that for Cluster 3, despite general understanding of food manufactures' food safety label (UBD and BBD) recommendations, the members have great difficulty in

reading such labels, which may result in unintentional breaches of point-of-purchase food safety controls and the consumption of unsafe foods. Clusters 1 and 2 did not have difficulty reading food safety labels; rather they regularly diverged due to personal choice and ignored such recommendations.

This research identified a limited understanding of recommended fridge temperature across all three clusters, consistent with the findings of Hudson and Hartwell (2002). On this basis, hypothesis 5 was accepted. Cluster 3 was also shown to be more likely to have limited access to continuous hot water in the kitchen, which has implications for hand washing and cross-contamination. Cluster 1, on the other hand, was shown to be more likely to own a dishwasher, which provides the potential for reducing cross-contamination *via* unclean dishes. However, no assessment of the level, quality or functionality of kitchen equipment was considered by this phase of the research.

Previous attempts to segment food consumers has been made on the basis of food safety knowledge (McCarthy, *et al.* 2007; Kennedy *et al.* 2005). However, none of these had the exclusive focus on the 60+. A summary of these findings is shown in Table 8.1.

Table 8.1: Phase 1 Comparison of Hypotheses, Literature and Findings

Hypothesis	Literature base for hypothesis	Finding (accept/reject)	Cluster evidence
1. The 60+ are a heterogeneous group with increased age impacting upon their ability to handle and prepare food.	Brennan <i>et al.</i> (2007) Johnson <i>et al.</i> (1998) Hudson and Hartwell (2002)	Accept	Heterogeneity was evidenced in the presence of the three clusters which showed differences in attitudes towards food, knowledge of food safety and self-reported food safety practices.
2. Gender influences adherence to food safety recommendations in the 60+	Brennan <i>et al.</i> (2007) Davidson, Arber and Marshall (2009) McCarthy <i>et al.</i> (2007)	Reject	Gender was not identified as statistically significant across the clusters, although cluster 2 was predominantly female.
3. Adults 60+ will demonstrate less personal culpability and exhibit an illusion of control in relation to domestic food safety.	Fischer and Frewer (2008) Jevsnik <i>et al.</i> (2008) Kennedy <i>et al.</i> (2005) Mcdonald and Hunter (2008) Redmond and Griffith (2003) Terpstra <i>at al.</i> (2005) Unusan (2007)	Accept for C1 and C2. Reject for C3.	Illusion of control was exhibited in Clusters 1 and 2 in relation to adherence to food safety best practice guidelines. However, Cluster 3 showed high levels of awareness of and self-protective behaviours associated with food safety and the following of best practice guidelines.
4. The cohort will demonstrate discrepancies between knowledge and practice of food safety recommendations.	Brennan <i>et al.</i> (2007) Bruhn and Schutz (1999) Henson and Caswell (1999) Jackson <i>et al.</i> (2007) Jevsnik <i>et al.</i> (2008) Kennedy <i>et al.</i> (2005) McCarthy <i>et al.</i> (2007) Miles, Braxton and Frewer (1999) Redmond and Griffith (2005) Griffith and Wilcock <i>et al.</i> (2004) Worsfold and Mitchell (1998)	Accept for C1 and C2. Reject for C3.	There is a disconnect between food safety knowledge and practice particularly for Clusters 1 and 2. Although Cluster 3 participants exhibit self-protective behaviours, (suggesting rejection of hypothesis 4), a potential lack of control in food provisioning through third party carers assuming this role, has the potential to involuntarily expose the Cluster 3 member to deviations from food safety best practices.
5. Being aged 60+ increases the likelihood of engaging with unsafe kitchen practices and owning poorly functioning kitchen equipment.	Brennan <i>et al.</i> , (2007) Johnson <i>et al.</i> (1998) Gettings and Kiernan (2001) McCarthy <i>et al.</i> (2005 & 2007)	Accept	The recommended fridge temperature range was not widely understood across all clusters.

(Source: Author compiled)

Whilst Phase 1 successfully segmented the 60+ according to food safety knowledge, attitudes and behaviours, key questions left unanswered were considered in Phase 2.

8.3 'Independence Transitioning'

The ageing process causes progressive and irreversible biological and physiological changes, which are noted to contribute to an increased vulnerability of older adults (Lumbers and Raats, 2006). The dynamic nature of the ageing process requires that individuals consistently adapt and make changes to the way they provision food. By taking their life-course into consideration it was possible to identify points of transition and change. As discussed in *Chapter 4*, the FCPM was used to provide a framework for the identification of provisioning outcomes as it takes into consideration how important contextual and life-course influences have been in shaping the households' everyday relationship with food (Falk *et al.*, 1996). Three key factors identified as important in defining the current food provisioning practice outcomes of this cohort were; 1) the life-course 2) change and 3) independence.

Ageing is a dynamic process and inherent within is the notion of change. As outlined in *Chapter 2*, the prominent changes experienced after 60 include: retirement, bereavement and widowhood, ill health, giving up home and giving up driving (Darnton, 2005). In addition to these, the EIS identified empty nesting (children leaving home) and divorce to be additional catalysts for change. Despite these factors being classed as major transition points in life, households in the EIS study were observed to respond to such transitions by making small incremental changes to the way that they provisioned food. These findings are in line with those of Sobal and Bisogni, 2009; Pfau and Saba, 2009; Lumbers and Raats, 2006; Falk *et al.* 1996. However, consistent with the findings of Edstrom and Devine (2001), few of these EIS householders made the connection between these transitions and changes they have made in how they provisioned food. This may be explained by their strong desire to maintain consistency in their food provisioning despite significant transitions occurring, which was also reflected in the findings of Pfau and

Saba, 2009. In cases where major changes were necessary, householders expressed dissatisfaction with the changing role of food in their lives in line with the findings of Pfau and Saba (2006) and Lumbers and Raats (2006).

The purpose of adopting GT analytical procedures to the analysis of the EIS data, was to generate substantive theoretical understandings of the food provisioning and food handling practices of the 60+. Letting the data 'speak for itself' and adopting an inductive approach to the analysis revealed that the cohort primarily made small incremental changes in order to adapt to the fluctuating and varied challenges posed by the ageing process and their motivations to maintain independence. This notion of independence was central to the changes and the strategies observed in food provisioning and food handling by the sample. This finding of maintaining independence is consistent with the current position taken by the literature (Pfau and Saba, 2009; Berg *et al.* 2006 and Lumbers and Raats, 2006, Arber and Ginn, 1991). This research has further advanced the theoretical conceptualisation of independence as a process termed '*Independence Transitioning*'.

In order to be successful in '*Independence Transitioning*', households are required to make value negotiations. Past research highlights that groups have a common set of values that are used to define personal food systems. However, these values are contextually and culturally dependent, and open to variation (Connors *et al.* 2001). The common core values amongst the householders were shown to be energy, time, finance and wellbeing. These factors were negotiated in the process of adopting food provisioning solutions or, as Sobal and Bisogni (2009), Connors *et al.* (2001) and Falk *et al.* (1996) define, 'personal food systems'. The ultimate aim of any provisioning solution was that it addressed all of the respective criteria in that it minimised the amount of time and energy spent on food provisioning and preparation allowing them to direct attention to other activities. It minimised the costs associated with food provisioning and reduced the potential for waste (both domestic food waste and the associated costs) and it maximised their enjoyment of the food they ate and ensured their wellbeing, particularly in relation to health.

Although balance amongst the respective factors was the most favoured outcome, in some instances it was observed that the negotiation favoured one element over another (a finding consistent with Connors *et al.* 2001). For example, in order to have a clean house, some participants were prepared to pay for assistance as a trade-off for a task that was found to be increasingly physically difficult to undertake. However, at the heart of all these negotiations was the maintenance of independence.

The following sections of this chapter will consider more specifically the food provisioning practice outcomes that were observed across the households, as evidence of '*Independence Transitioning*' and the domestic food safety implications embedded within. Consideration will first be given to the role of the kitchen as a facilitator and barrier to this, followed by discussion of the food provisioning practices including food purchasing and handling.

8.4 The Kitchens

The observational research conducted in Phase 2 used SPT as the framework to guide the EIS, which allowed for the consideration of practices beyond the sole focus on the individual. Adopting this perspective allowed for consideration of the environment, and the objects that were central to the performance and reproduction of domestic food provisioning and handling practices. Considerable differences in the households' kitchens were observed, primarily related to household size and tenure, which had implications for the available space, design, materiality (stuff) and usage of the kitchen. The discussion centres on each of these issues and the food safety implications and/or barriers that they present.

8.4.1 Space, Design and Materiality (Stuff)

Widowhood and lone-living was shown to be a transitional life event that had prompted some households to move from larger to smaller homes. The implication of this on kitchen size and use was evident. Those in rented accommodation had

the most basic and smallest kitchens, which limited the amount of work surfaces, external access and in some cases windows, thereby reducing natural light, eating facilities, the variety of kitchen equipment and appliances that could be stored and the number of people that could prepare food in the space. Typically these kitchens were open plan and linked to the living room areas of the home. This and the lack of air extraction limited the types of food that could be prepared to avoid cooking odours lingering.

Common across all households and consistent with the findings of Johnson *et al.* (1998) was that all kitchens had a fridge, freezer and microwave and continuous hot running water. However, ownership of what could be considered 'standard'⁴⁵, kitchen equipment was not observed, particularly in lone and older households. This was most evident in one household who did not own a cooker. Less common was the ownership of dishwashers, with only two households having such a kitchen appliance. Seven households' kitchens had a washing machine, whilst three relied on community facilities (laundrettes) and WSNs to do their washing. Younger and cohabiting households, as well as those that had not transitioned into rented accommodation or downsized, were observed to own all 'standard' kitchen equipment.

Food safety implications could be seen in the design of the kitchen spaces, which from a practices perspective, concerns the material capacity these spaces allowed. Rented accommodation in particular flats, had limited square footage, with the kitchen being the smallest room within the home. As illustrated in *Chapter 7*, small kitchens meant the exclusion of 'standard' household equipment, for example washing machines, that were consistently observed to be missing from these homes. This meant that dishcloths and tea towels were typically washed together with general laundry and on a less regular basis than advised. Washing practices were observed to intersect with messages relating to environmental protection and energy efficiency such as, washing at low temperatures (see Section 8.8). Mintel

⁴⁵ Standard kitchen equipment in this research included fridge, freezers, cookers, ovens, kettles, microwaves, washing machines and continuous hot running water.

(2008) argues that older consumers are the main champions of the environment, being the most aware and proactive subgroup of the population. Washing at low temperatures (i.e. under 60°) does not guarantee that pathogens, if present, will be killed and there is potential for cross-contamination between clothes, tea-towels and dishcloths.

The availability of continuous hot water is also essential to performing domestic food practices, particularly those relating to hand washing and the cleaning of surfaces/utensils to manage cross-contamination (Brennan *et al.* 2007; McCarthy *et al.* 2007). According to Jay *et al.* (1996 cited in Jevsnik *et al.* 2008, p.741) hygienic hand washing for food handling purposes is defined as requiring '*warm water, soap or detergent, and a scrubbing or rubbing action for at least 20 seconds*'. However, despite the availability of hot water, the lack of mixer taps, particularly in rented accommodation, prohibited washing hands in accordance with best practice recommendations, as the water coming out of the hot taps was too hot and householders were concerned about scalding. Therefore, to avoid scalding, householders did not wash their hands or washed them in cold water.

Additionally, dishwashers have been shown to increase food safety by reducing cross contamination through washing plates/cutlery etc. at high temperatures (Brennan *et al.* 2007). Only two households owned and operated a dishwasher, owing to the associated costs of running and lack of value placed on this equipment because of small household sizes, simplified cooking practices and kitchen space restrictions.

The lack of space also limited the availability of work surfaces, which increased the propensity for cross-contamination whilst preparing food. When or if food was prepared for others, this meant having food prepared in advance of guests arriving and reheating, it also meant that households were creative with the workspace available (placing cooked food on the floor for example).

8.4.2 Usage

In contrast to the popularised vision of the kitchen being the heart of the home, (Wills & Brennan, 2012; Meah and Watson, 2011; Redmond and Griffith 2009a), these older households were observed to engage less with the kitchen, having linear usage patterns clustered around key eating occasions during the day (breakfast, lunch and dinner). The kitchen in older households was thus more utilitarian and consistent with the traditional notions of the working and back kitchen (TiKL, 2011). In these households the kitchen functioned purely as a space for the storage and preparation of food. Here use of the kitchen was predominantly restricted to the householder, with only occasional others (weekend visitors) noted to use the space. The functional domain occupied by the kitchen in these households was significantly influenced by the limited space available which can be argued to impact upon independence and quality of life. It is recognised that one's ability to shop for and cook food, is intrinsically tied into the concept of personhood and is central to independence (Berg *et al.* 2006; Lumbers and Raats, 2006). The considerable limitation of the space in older, lone and rented households, whilst making the task of food preparation less onerous, can be argued to de-skill the practitioner. Thus older consumers could be argued to alter their cooking practices in line with the availability of space and equipment that can physically be contained within the kitchen, which in turn could be argued to accelerate dependency. This is supported by research conducted in Sweden that, although conducted in a clinical setting, highlighted that older patients who were not given the opportunity to feed themselves became dependent (Sidenvall *et al.* 2004 in Lumbers and Raats, 2006). Whilst it is acknowledged that older consumers make considerable effort to adapt in order to maintain independence (Pfau and Saba, 2009; Lumbers and Raats, 2006 and McKie, 1995), reducing the ability of these adults to perform food provisioning practices through the removal of the material objects that are fundamental to their performance, can also negatively impact upon quality of life and result in feelings of dependency, depression and isolation (Lumbers and Raats, 2006).

By comparison, younger and cohabiting households demonstrated more intense and varied use of the space. In cohabiting households, divisions in the kitchen domain were observed and food preparation predominantly fell to female householders (also noted by Davison, Arber and Marshall, 2009; Fjellström, 2000; Brennan *et al.* 2007; Sidenvall, Nydahl and Fjellström, 2000 and Thompson, 1996). However, other householders were observed to assist with meal preparation and snacks outside of peak usage times. Moreover, the kitchens in these households were more fluid spaces, used for socialising, watching television and listening to the radio. External doors linked these spaces to outside and the blurring of the boundaries between inside and out were evident in the growing of plants and storage of gardening equipment. In addition, the kitchen was used for personal hygiene (hair washing) as well as the sleeping, feeding and washing of pets. The blurred boundaries of these spaces and the more multifunctional and varied use could be argued to increase the possible pathways for food microbial contamination which is a conclusion also proposed by Wills and Brennan (2012). The use of the kitchen as storage for gardening equipment, or as a place for pets, could increase transmission of the environmental pathogen *Listeria* spp. known to support the growth of *L.mono*. In addition, the multi-person use of the kitchen space presented concerns specifically relating to discrepancies in attitudes, knowledge and practice between different household members. From a food safety perspective, competing food safety standards and values within households could be a key concern, particularly given the acknowledgement within the literature of the shift away from females as the sole food handler in the home (see Meah and Jackson, in press; Davidson, Arber and Marshall, 2009; Lake *et al.* 2006; Murcott, 2000; Kemmer, 2000 and Harnack *et al.* 1998). However, owing to the prominence of lone households within this sample, a more detailed examination of the social and gender dynamics and kitchen lives of these cohabiting older households is required before substantive conclusions to be drawn.

Irrespective of age or household type, all households highlighted elements of their kitchens that did not meet their needs or requirements. Across the cohort, householders found that cupboards were too deep to reach into, worktops were

too high to work at comfortably, cupboards were too high and inaccessible without using a step for access and fridges and freezers were equally poorly positioned or too deep. This confirms the findings of the TiKL (2011) study that consistently highlighted older people's kitchens to have a number of ergonomic problems to which householders developed coping strategies, made alterations and developed wish lists (Maguire, 2011). This is also a finding within this research where some households were shown to have made modifications to their kitchen space in order to suit their needs better. However, the range of modifications was small and temporary with large structural changes avoided, motivated by a 'make do' attitude and the notion that changes were not worth investing in, owing to the age of the household. Changes to the design of the kitchens were linked to advanced old age, with younger households making only aesthetic alterations. Consistent with the findings presented from the TiKL (2011) study, the households adopted a range of coping strategies. These included: the use of smaller lighter kettles (travel size), the use of top ovens to avoid having to bend down to reach the main oven compartment, the use of breadbins as storage to avoid the use of high cupboards and the storage of non-essential kitchen equipment in the higher and harder to reach cupboards as well as the use of step ladders. Again in line with the findings of the TiKL (2011) reported by Maguire (2011), to the greatest extent possible step ladders were avoided as they posed falling risks, although where unavoidable, they were used with caution. In addition, frequently used items such as plates, cups and glasses were stored on work surfaces to avoid having to reach up to cupboards.

Those in rented accommodation were more limited in their scope for design change and although all homes met the statutory minimum fitness standard for housing, outlined in the UK Government's Green Paper '*Quality and Choice: A Decent Home for All*' (Great Britain. Department of the Environment, Transport and the Regions, 2000), the changes made were felt to be more suited to a 'typical' service user, with consultation in design and usability limited and without consideration of the changing needs of the household. This is a finding that is consistent with the literature relating to the personalisation of homes, particularly research conducted by Omar, Endut and Sarowono, (2012), Clifton, (2009) and Baldwin and Tomita,

(2007). Again this lack of control could contribute to feelings of dependency and depression that are known to result in isolation (Lumbers and Ratts, 2006). However, despite a lack of control over the structural elements of the kitchens, aesthetically all households had decorated the spaces to reflect their interests, histories and in a manner consistent with their level of engagement with the space (Omar, Endut and Sarowono, 2012). Consistent with the suggestions made by Wells (2000) adaptation in this way gave meaning to the space and increased householders' satisfaction with it.

Commensality was salient across the households, in concurrence with the findings of McKie *et al.* (2000). In addition to the meal involving traditional and recognisable foods, a social component was essential to the ideal of a meal being '*proper*' (Fjellström, 2009). There was a preference for meals to be shared, a finding consistent with Fjellström (2009); Abu-Rayya (2006); Lumbers and Raats (2006); Falk *et al.* (1996) and Murcott (1982). All households were observed to make efforts to make meals social events. For those married or cohabiting, this was represented by the formality of eating the evening meal, which was differentiated and distinguished from others by being eaten at the dining table. For those living alone, companionship was sought through formal and informal networks, which was largely dictated by age. For older households, lunch clubs provided companionship, whilst for younger, this was through meals with friends and eating at restaurants, a finding consistent with Fjellström (2009); Lumbers and Raats, (2006) and Falk, *et al.* (1996).

Within the home, the dining table played a pivotal role in facilitating social eating. However, only one of the households was observed to have the facility for eating in the kitchen. The lack of an eating space within the kitchen further cemented the functional and utilitarian role of the space, particularly within the older households. Households did not associate the kitchen with a place where food was eaten, although some differentiation in meal occasions during the day was shown, with households more likely to eat quick meals (breakfast) or snacks in this space. This is in contradiction to the findings of Cohen-Mansfield and Jensen (2009) who found

the majority of older adults living in private residences ate the majority of meals in the kitchen. However, this study was conducted in the USA where size of homes and cross-cultural differences will be of significance. The size of the kitchens within this study prohibited, for most, the presence of a table in the kitchen. Moreover, from a life-course perspective, it was found that for those that had been married and had families, the table held social significance and importance in defining a 'proper' meal. For example, when tables were located outside of the kitchen, they were observed to be strategically positioned near to windows to increase a sense of companionship. In lone person households strategies were also employed to make meals social. Within these households this was demonstrated in the avoidance of a table which was considered isolating. Instead, food was placed on tray which was sympathetic to the formality and role of the table, and allowed them to eat whilst watching television, which was considered a good substitute for company, as discussed by Sidenvall *et al.* (2000).

8.5 Food Provisioning

Independence in relation to food procurement and handling was of paramount importance to all households, and was a finding that was consistent with Mckie (1999) and Berg *et al.* (2006) who recognised that one's ability to shop for and cook food is intrinsically tied into the concept of personhood. All households were shown to maintain autonomy over food procurement. The findings identified that they had a preference for purchasing food that was fresh, locally sourced and purchased frequently. However, life-course analysis highlighted barriers preventing the continuation of such ways of procuring food. For example, changes in mobility, physicality and transport, which prevented frequent food shopping occurrences was consistent with the exploratory findings of Milne (2011).

The finding that many of the sample used supermarkets to shop once a week with top-up visits in-between for essential items is consistent with market data e.g. FSA (2009). A less prominent finding was the notion that shopping for food gave purpose and provided a reason for getting out, echoing the findings of Lumbers and

Raats (2006); Wilson *et al.* (2004); and Hare *et al.* (1999). For these households 'top-up' shopping was conducted with more frequency (often daily), as it gave householders an opportunity for social interaction, which was consistent with the findings of Sidenvall *et al.* (2001). This was most evident for householders who had few external interests or hobbies and for older households that were living alone, and who suffered mobility and health issues. This was considered to be motivation for them to leave their home regularly and a physical and social activity they could manage. Increased frequency of food shopping was also linked to the notion of thrift, as households that were physically able and/or who had access to their own transport, were observed to shop around (visiting multiple supermarkets and food retailers) and taking advantage of supermarket promotions, although this was most evident amongst the younger households.

Leighton and Seaman, (1997) identified that 90% of 60+ adults who were fully reliant upon state pensions do not drive. However, within this research, most of the sample were able drive and had access to a car. For these households, the car was predominantly used for food shopping. Households that were unable to drive were restricted to shopping at local retailers. Although all households were located in urban areas, they did not rely solely on small, convenience stores, as has been suggested by Lumbers and Raats (2006), McKie (1999) and Wilson *et al.* (2004). Food purchased from small local retailers has been presented as a causal factor in the contraction of listeria (Gillespie *et al.* 2010). Although householders were shown to purchase food from such retailers, this was limited to essential products such as bread and milk, or specialist items from delicatessen style shops and was part of 'top-up' shopping. The lack of transport meant that households were restricted by what they were able to carry. This led to the implementation of shopping strategies such as the use of rucksacks and 'pushers' (push-along shopping trolleys) and consistent with the findings of McKie (1999) the division of shopping trips over multiple days. However, no evidence was found to suggest this significantly limited purchases, or that it meant foods were omitted from shopping lists, as has been previously suggested by Hare, (2003), McKie (1995) and Giles (2009).

Reductions in physical mobility and reduced motivation through depression and isolation were also shown to be prohibiting factors to frequent food shopping. Consistent with the concept of '*Independence Transitioning*', and the findings of a review of food in later life conducted by Lumbers and Raats, (2006) amongst others (see Maguire, 2011; Meneely *et al.* 2009; Wilson *et al.* 2004; Hare, 2003 and McKie, 1995), households were shown to have developed coping mechanisms for these changes which included the use of a car and disabled parking badges, lifts, shopping trolleys and rucksacks, as well as planning of shopping times to avoid busy periods. In contrast to the extant literature, there was no evidence that these households relied on WSNs for assistance with food procurement (Meneely *et al.* 2009; Lumbers and Raats, 2006; Hare, 2003 and McKie, 1995). In line with more recent research conducted as part of the TiKL (2011) reported by Maguire (2011) this research found reliance on others to be seen as burdensome and at odds with the over-riding desire to maintain independence. However, for the oldest and most frail householder, assistance was sought from formal support networks in the form of a community transport scheme and the inclusion of home delivered meals, which again was consistent with the findings of Lumbers and Raats (2006). Research evidence presented by Almanza, (2007) has shown older adults who receive 'meals on wheels' to be at greater risk from a food safety perspective in that meals are often not eaten in one sitting but rather spread over multiple meal occasions, although, no evidence of this was observed within this study.

The use of community transport schemes did, however, considerably increase the time taken to shop for food, transport it home and unpack which, from a food safety perspective, could be a concern in terms of temperature abuse of products, that is reported by Hudson and Hartwell (2002). In line with the evidence presented by Giles (2009), those with mobility restrictions were found to shop less frequently, in this instance fortnightly, and stretch out the use of foods between shopping trips. This has also been shown to affect those living in rural communities (McKie, 1999; Wilson *et al.* 2004) who have limited access to transport, although given the urban concentration of this cohort, this finding was not supported.

However, this did result in householders eating food that was less than fresh, and particularly vegetables that were beyond the UBD, and the heavy reliance upon freezers. Using these for multiple food storage purposes is consistent with the domestic freezing practices reported Hand and Shove (2007).

8.6 Food Safety Implications

'Independence Transitioning' was evident in the food provisioning practices of the 60+. Making small changes to the way that food was handled permitted the households to maintain autonomy over this process. Evidence of the simplification of meals was observed across the households and incorporated a range of solutions which could be considered to simplify the food provisioning and handling process. This is a finding that is consistent with those noted by Pfau and Saba (2009), in their research relating to older adults' use of convenience foods. However, embedded within these outcomes were a plethora of more practice-specific food safety concerns. The most up-to-date domestic food safety best practice recommendations presented in *Chapter 2* have been used to provide the framework for this discussion. Using this as the basis for analysis, Table 8.2 highlights the potential areas of weakness and food safety implications associated with each practice outcome. At the cohort level, the simplification of food provisioning practice outcomes and the food safety concerns highlighted could act to increase susceptibility to foodborne disease. The implications associated with each will now be discussed.

Table 8.2: Food Safety Implications of Food Provisioning Practices

Provisioning outcome	4 Cs	Food safety concern(s)
Batch cooking	Cooking Chilling	Preparation methods Cross-contamination Cooling Storage Labelling Duration of storage Defrosting Re-heating
Meal Simplification	Cooking Chilling	Preparation methods Food type, does this include 'high-risk' listeria foods? Storage Duration of storage Defrosting Re-heating Are they eaten past the UBD?
Gifting	Cooking Cleaning Cross-contamination Chilling	Reliance on the food safety standards of others Unknown origin Unknown preparation methods Cross contamination Storage Duration of storage prior to giving Duration of storage once received Re-heating Eaten to appease giver Reluctance to waste Are they eaten past the UBD?
Paring Down	Cooking Cross-contamination	Appropriate cooking equipment owned integral to compliance with food safety best practice recommendations
Planning	Chilling Cooking	Duration of food storage, particularly frozen foods Defrosting
Eating out of home	Cooking Cleaning Cross-contamination Chilling	Reliance on the food safety standards of others Unknown origin
Hoarding	Cooking	Duration of storage Reluctance to waste Foods eaten past the UBD
Reliance on others	Cooking Cleaning Cross-contamination Chilling	Reliance on the food safety standards of others Unknown origin Unknown preparation methods Cooling Cross-contamination Duration of storage prior to giving Duration of storage once received Re-heating Eaten to appease giver Are they eaten past the UBD? Frequency of food purchasing visits

(Source: Author compiled)

i. Batch Cooking

Batch cooking was the purposeful practice of cooking in larger quantities than required for a single meal, so that it could be portioned, refrigerated or frozen and used later. Whilst previous research has also highlighted this practice (Pfau and Saba, 2009; Terpstra *et al.* 2005), there has been a tendency for this to be referred to as '*leftovers*' both within research and best practice recommendations (see Section 2.5.1). However, this research showed that households regarded this as a distinctly different practice, with leftover food regarded as unintentional and synonymous with waste, thus was actively avoided. From an educational and communications perspective this could be a valuable distinction to draw and could account for why such messages may lack relevance for the cohort (Redmond and Griffith, 2005).

This food provisioning outcome requires adherence to food safety guidelines across the 4Cs in the cooling, storage, defrosting and re-heating of batch cooked food. Thus this practice offers potential for deviation at a number of points within the preparation process. During food handling, the potential for cross-contamination was observed, such as washing or wiping of chopping boards using dish cloths after handling raw meat. Consistent hand washing following the preparation of raw meat was not observed. Observations highlighted that hands were either wiped on a cloth or not washed at all, which is a finding consistently reported by previous research (Kennedy *et al.* 2011; Jevsnik *et al.* 2008; Brennan *et al.* 2007 and Worsfold and Griffith, 1997). The heat of hot water and the lack of mixer taps, particularly in rented accommodation, as noted in Section 8.4.1 could perpetuate deviation in this regard. However, this contradicts the self-reported practices reported in Phase 1, and thus supports research that identifies discrepancies between consumers' knowledge of and performance of best practice recommendations (Jevsnik *et al.* 2008; Brennan *et al.* 2007 and Worsfold and Griffith, 1997). Moreover, consistent with HACCAP inspired approaches, observation highlighted considerable pathways for cross-contamination related to

hand-washing, with households observed to touch a number of locations in the kitchen including fridge handles, oven handles, cupboard doors and serving dishes after handling raw meat. Additional evidence suggests the lack of any regular cleaning routines, particularly for large kitchen appliances and handles (see *Reliance on others*). It could therefore be suggested that this creates reservoirs for contamination around the kitchen, which could become central contamination sites. This finding is consistent with those of Evans, *et al.* (2012); Kennedy *et al.* (2011); Haysom and Sharp (2005) and Scott (1999).

Consistent with the findings of a number of past studies (Brennan *et al.* 2007; Hudson and Hartwell, 2002; Johnson *et al.* 1998), households were found to have poor comprehension of the recommendations for freezer storage temperatures and the duration that products should be kept within the freezer. Householders made attempts to eat the oldest food first, although foods were stored within the freezer indefinitely until they were consumed, and there was no evidence to suggest that these households complied with manufacturers' freezer storage recommendations. The motivation not to waste food meant that freezers were infrequently cleaned as this required stocks to be low and the belief that food may spoil during such cleaning. Moreover, foods prepared in batch and stored were observed to include labels of contents but not dates. Additionally, one of the benefits identified with meals prepared in batch and the subsequent freezing of these, was the ability to re-heat them from frozen. There was no evidence to suggest that these foods were re-heated more than once. However, there was evidence that occasionally, households forgot that they had defrosted these meals and they were therefore, being stored in fridges for longer than the best practice recommendation of 24 hours, thereby increasing the potential for ingesting spoilt food.

ii. Meal Simplification

The simplification of meals through eating convenience options freed households from the responsibility of meal preparation and considerably reduced the physical

and mental effort required to prepare it. Consistent with the findings of Falk *et al.* (1996), Pfau and Saba (2009) and Lumbers and Raats (2006), the motivation behind this was ease of preparation as opposed to the time savings it allowed. Consistent with evidence presented by Pfau and Saba, 2009; Souter and Keller 2002; McKie *et al.* 2000 and McKie *et al.* 1999, this allowed householders to prioritise their energy reserves and direct these towards other activities, for example social activities. As the evidence from this research highlights, households did not automatically make the 'trade down' to what can be considered as fully convenient or ready-made meals, rather simplification included a range of meal options that the householder had at their disposal. These included the preparation of reduced involvement first principle cooking (for example omelettes or jacket potatoes), the purchase of a ready-made main meal element (for example quiches or pasta dishes), the use of ready-meals and meal delivery programs. The perception of these solutions was not equal. Householders were shown to hold a preference for preparing at least some component of their meal, as noted by Costa *et al.* (2002 cited in Pfau and Saba, 2009). However, ready prepared meals were generally viewed negatively, a finding consistent with McKie (1999, p.532) and Lumbers and Raats, (2006) who found older consumers to regard ready-made meals as '*junk food*'. Nevertheless, in accordance with the findings of Pfau and Saba (2009), these foods were accepted as they allowed the householder to maintain independence and remain in their home surroundings.

In agreement with the findings of Pfau and Saba (2009) it was shown that householders transitioned through the range of simplified meal options as they became more limited by their physicality and less motivated to prepare food from first principles. This allowed them to transition successfully through the changes faced as they aged, whilst allowing them to maintain independence and continuity of identity and ideals relating to what constituted a '*proper meal*' (McKie, 1999, p.532, see also Pfau and Saba, 2009; Sobal and Bisogni, 2009 and Falk *et al.*, 1996, Murcott, 1982). In line with research conducted by Costa *et al.*, (2002 in Pfau and Saba, 2009), this research also highlighted that those with low cooking competency and those affected by depression and isolation were most heavily reliant on the

most simplified meal options and ready-made meals. Despite the literature citing consistencies between the use of increased pre-prepared food consumption and gender, with lone males more likely to rely on this preparation method, (Pfau and Saba, 2009; Brennan *et al.* 2007 and Lumbers and Raats, 2006) no evidence was found to support this conclusion within this research.

The prominence of composite cooking as part of the food provisioning practice of meal simplification was valued in that it allowed the individual to retain partial autonomy over food preparation. This increased feelings of independence, control and satisfaction over the food eaten which is an observation also made by Pfau and Saba (2009) and Lumbers and Raats (2006). From a food safety perspective the simplification of meals mirrored the food safety concerns for batch cooking. Although it is argued that reduced involvement with food preparation can contribute to the deskilling of food handlers (Meah and Watson, 2011), this can also create an alienation from the best practice recommendations, because the FSA guidance is no longer relevant to the householders (i.e. the preparation of a whole chicken). In addition, for those that were shown to prepare composite meals, shopping frequency significantly influenced the freshness of produce (particularly vegetables), with items stored and used beyond their UBD (Giles, 2009).

Consistent with the findings of Phase 1, adherence to UBDs was product specific. Vegetable UBDs were routinely ignored with visual inspections determining product safety and edibility. The UBD for frozen convenience products such as ready-made meals were also largely ignored. Moreover, confirming the findings of Hudson and Hartwell (2002), there was evidence to suggest that such products were sought and purchased when reduced in priced and stored in the freezer to prolong their lives. However, where this strategy showed particular potential for deviance was in the inclusion of RTE foods in the preparation of cold meals. However, Phase 2 contradicted the *a priori* hypothesis gained from the literature that older consumers would be heavy purchasers of RTE foods and high-risk listeria food products. In instances where these were purchased, particularly within lone households, the portion size of RTE products appeared unsuitable, which is

consistent with the accounts given by Pfau and Saba (2009) and Terpstra *et al.* (2005). In order to avoid waste, this resulted in them consuming these products beyond the UBD, a behaviour also noted by Hudson and Hartwell (2002). Intentional deviation occurred more in the sample's younger households, where greater illusions of control were noted than in older households, which is consistent with Fisher and Frewer (2008) and Terpstra *et al.* (2005).

iii. Gifting

Gifting was observed as an informal means of provisioning food, with food typically donated by WSNs including friends and family, and was specific to single person households. In agreement with the findings of previous research (Brennan *et al.* 2007; Pfau and Saba 2009), single male households benefited most from this type of food provisioning and means of coping with lone living and low levels of cooking competency. In general, recipients of gifted food did not provide food gifts to their peers. Married and cohabiting households and the household that had been recently widowed (Kathy) were not recipients of gifted food from WSNs. However, food within these households retained its 'gift' status, which is consistent with the research conducted by Sidenvall *et al.* (2000). The female householders within these homes prepared meals for their husbands and visiting family members that were in-line with their taste and health requirements, rather than their own, and food was presented as a symbol of caring. This is a finding consistent with the research conducted by Sidenvall *et al.* (2000), Dean, Raats and Grunert (2009) and Lumbers and Raats, (2006).

Gifting presents a more complex set of food safety concerns, which as highlighted by Phase 1, is exacerbated by food safety attitudes, beliefs and behaviours of others involved in the process. Here uncertainties were raised around the origin of the food, the preparation methods used and the heavy reliance on the food safety diligence of the cook, which is consistent with the evaluations made by Giles (2009). Observations showed that after receiving the food item, the food's history was not considered and households treated these products as new (or as if it had

been purchased). Households therefore, gave no regard to how they had been made, their preparation date, how they had been stored (for example, had the foods been frozen prior to being received) or whether they had been reheated. Once they were in the household's possession, they were treated as new products and food safety best practice recommendations were applied in the same way that they would have, had the foods been purchased. By comparison to more formal meal provision solutions, such as meal delivery programs, where food safety is strictly monitored up until the point of purchase and delivery, the informality of gifting meant that products were observed to have no labels or dates. Furthermore, the social aspect of this food procurement practice, coupled with the cohort's staunch avoidance of waste, further aggravated potential for this to deviate from best practice recommendations, a finding consistent with Milne (2011), FSA (2009), McKie *et al.* (2000) and McKie (1999). Moreover, households were observed to feel obligated to eat these foods to appease the giver, but also to align with their own waste avoidance ideals. The practices associated with the gifting of food therefore demonstrated considerable scope for breach of best practice recommendations on a number of levels.

iv. Paring Down

It is recognised that a change in living circumstances is an inevitable part of the ageing process (Cohen-Mansfield and Jensen, 2009; Tomassini, 2005 and Falk *et al.* 1996). The first stage is the transition to smaller homes that are specifically designed for older adults, enabling independent living without having to maintain private residences (Cohen-Mansfield and Jensen, 2009). This change typically involves the '*paring down*' of possessions which was a salient theme across the households, particularly in those who had been widowed or were single and living alone. Within the kitchen this was also evident in the way that food was handled and prepared through batch preparation, meal simplification and gifting that made certain kitchen items redundant. From a food safety perspective, the overarching concern with this practice is the ability of households to successfully adhere to food

safety best practice recommendations (Shove, Pantzar and Watson, 2012; Brennan, 2010).

Chapter 4 identified the three essential elements to practice; *images*, *skills* and most significantly in this regard, *stuff* (Shove and Pantzar, 2005). Material objects were highlighted as indispensable to the 'doing' of a practice being not merely 'passive bystanders' but 'shape[ing] the practice itself' (Strengers, 2010, p.13; Brennan, 2010; Hargreaves, 2008 and Warde, 2005). With this in mind, basic objects are embedded within food safety best practice recommendations and are one of the prerequisites to the successful adherence to these. Table 8.3 presents some of the essential food safety recommendations outlined in *Chapter 2* to which certain kitchen equipment is intrinsic for successful compliance.

However, as highlighted previously in Section 7.6 and in Section 8.4.1, some items listed in Table 8.3 were consistently absent from the households, which significantly inhibited their ability to successfully adhere to food safety best practice recommendations. This included significant pieces of kitchen equipment such as cookers and washing machines, but was most evident in the case of items such as temperature probes and fridge thermometers, which were not considered to be 'normal' or essential kitchen equipment. Although this research highlighted that these items were not likely to have ever been owned by households, the ownership of them was considered to be unnecessary in the home as sensory observations could be made to assess a product's suitability to serve and consume; a finding also noted in Terpstra *et al.* (2005).

Table 8.3: Objects Embedded In Food Safety Best-Practice Recommendation

	Recommendation	Objects
Chilling	Keep the fridge at the right temperature (Between 0 and 5 degrees)	Fridge Fridge thermometer
	Meat and fish is thoroughly defrosted before cooking and defrosted items are stored in a bowl or container so that liquid from the defrosting process does not run on to other things and to stop bacteria spreading	Fridge Freezer Containers
	Frozen raw food can be defrosted and stored in the fridge for two days before consumption or disposal	Fridge Freezer
	The microwave is used to defrost only if foods are intended to be cooked straight away otherwise it should be covered and defrosted in the fridge	Microwave
Cooking	Re-heated food should reach 70 ^{oC}	Thermometer Cooker Microwave
Cross-Contamination	Never use the same chopping board for raw meat and RTE food without washing it (and the knife) thoroughly in between	Multiple chopping boards Hot water Detergent
Cleaning	Remember to wash your hands: Before preparing After touching raw food, especially meat After going to the toilet	Hot water Detergent

(Source: Author compiled)

The paring down of stuff extended to more basic items such as chopping boards, oven gloves and, as has already been considered within this discussion, hot water. The lack of chopping boards was evident in those that possessed low levels of cooking competency which contradicts the findings of Hudson and Hartwell, (2002) who found older consumers to have both plastic and wooden chopping boards. However, consistent with the arguments presented by Hargreaves (2008), the performance of food provisioning practices was not constrained by the lack of key kitchen equipment (*stuff*). In households that did not possess chopping boards (2 of 10) substitutions were made, and food was shown to be cut on plates, cooking trays, directly on draining boards and worktops, the latter of which are known to be prominent locations for growth of microbiological pathogens (Evans, Redmond and Fielding, 2012; Kennedy *et al.* 2011 and Scott, 1999). Within the remaining households wooden chopping boards were favoured, owing to their reported

natural anti-bacterial qualities. Plastic boards were considered less hygienic given the fact they discoloured. With regards to the lack of oven gloves, this again led to substitutions being made, with the tea towel taking on a multifunctional role, presenting considerable cross-contamination opportunities.

v. Planning

Planning was consistently observed across households and included the planning of food purchases, shopping visits, food storage and meals. This practice was beneficial in terms of maintaining independence and autonomy over the food provisioning process. The use of lists and the planning of shopping visits to avoid busy periods were consistent with similar evidence presented by Mintel (2009). Planning ensured that householders were efficiently using their available resources, and allowed them to prioritise their energy, in terms of the time taken to shop, navigate the store, avoid overspending and reducing the likelihood of having to make top-up visits. Being resource-efficient in this way allowed householders to engage in other social activities, which is a finding also recognised by Pfau and Saba (2009). Such purposive shopping also reduced the potential for food waste, which research highlights to be a priority for this cohort (Milne, 2011).

The freezer was observed to play a fundamental role in food acquisition and storage (Shove and Southerton, 2007). It permitted efficient use of energy, facilitating the practice of 'batch cooking' and 'simplification'. It also ensured that the householders had food at their disposal, should they suffer unexpected illness and offered householders flexibility should their plans change, which again reduced the likelihood of wasting food. Whilst the freezer provided a multi-functional food management solution, food safety concerns are embedded within this practice. For example, consistent with the findings of Hudson and Hartwell (2002), householders were observed to defrost food items out of the fridge on kitchen worktops and/or on sink draining boards, rather than the recommended 24 hours in a fridge. Thus the planning of meals did not extend to defrosting practices and the planning of adequate defrosting times. Lengthy defrosting times were counterintuitive to the

immediacy of meals that the freezer was considered to facilitate. Additionally, householders were unable to give comprehensive responses to the correct temperature at which a freezer should operate and had no means of measuring it, nor did they comply with manufacturers' recommendations in terms of how long food should be stored, also noted by Hudson and Hartwell (2001) and Johnson *et al.* (1998).

vi. Eating out of Home

Eating out of home was primarily a strategy adopted for companionship, over the food provisioning solution it provided, which is consistent with the body of literature relating to the significance of food for older adults (Fjellström, 2009; Lumbers and Raats, 2006 and Falk *et al.* 1996). Older households were observed to include eating meals at lunch clubs as part of their food provisioning practices. However, consistent with the findings of Falk *et al.* (1996) greater emphasis was placed upon the social interaction they facilitated rather than the food served (Fjellström, 2009; Lumbers and Raats, 2006). Not all householders embraced lunch clubs, and within this study they were observed to be used by the oldest lone householders. Concurrent with the findings of Cheang (2002), younger lone households viewed these with some cynicism, considering them to be for people older than themselves. However, the commensality of eating was still important and younger lone householders were observed to seek this from eating out at restaurants, either alone or with friends and take advantage of what Cheang (2002, p.303) regards as the '*third place*'.

'*Third places*' (Cheang, 2002, p.303), whilst valued from a social perspective and the vital role they play in enhancing the nutritional intakes of some older adults (McAlpine *et al.* 2003), also present some challenges from a food safety perspective. In much the same way as gifting, concerns exist here in relation to ceding control of food safety practices to a third party (Giles, 2009). Whilst food service represents a more regulated food preparation environment, householders were observed to take left-over food away with them to eat at home, which raises concerns about re-

heating, temperature abuse and eating foods that exceed the guidelines relating to left-over foods.

vii. Hoarding

Whilst it is acknowledged that older adults store food so that they have reserves in case of unexpected visitors, or a period of illness which might restrict their ability to purchase food (Giles, 2009; FSA, 2009; Hare, 2003 and Mckie, 1999), hoarding of food was typified by the generalised practice of over-purchasing. The intention was to reduce the anxiety associated with food preparation and ensure that food was readily available in the home. However, it was observed mainly in households where people were living alone, had limited cooking competency, or were affected by isolation and expressed feelings of depression affecting their motivation to procure food. This was also a practice that was observed to be heavily associated with thrift, whereby householders were opportunistic in buying reduced price items thus taking advantage of cost savings. Hoarding also extended to the inclusion of kitchen technology, the purchase of which was thought to increase the propensity for the household to cook from first principles. However, rather than reducing levels of anxiety related to food preparation or facilitating preparation by first principles, this method was observed to increase anxiety relating to food choice and confound feelings of depression.

In terms of food safety, this practice illuminated a number of considerable concerns. First, the over-purchase of food, including foods with UBDs, and the storage of these for extended periods, increased the potential for ingesting spoilt food and food that had exceeded the UBD (Gettings, 2009; Giles, 2009). Second, hoarding was a practice connected with optimistic attitudes towards UBDs (Miles and Scaife; 2003), and households were observed to make their own judgements relating to these based on the lack of experience of encountering illness, and the overriding sense that food should not be wasted (Milne, 2011; Falk *et al.* 1996). This attitude further confounded the risk of encountering illness as a consequence of ingesting spoilt food. Again the freezer played a prominent role in the storage of this food and, as

highlighted, all households did not adhere to manufacturer's storage recommendations and kept food until it was consumed, which was more acute in households that were observed to hoard (Hudson and Hartwell, 2002; Johnson *et al.* 1998).

viii. *Reliance on others*

If the food provisioning outcomes identified are considered as a continuum of solutions that are adopted to facilitate '*Independence Transitioning*', reliance on others can be considered as a last resort option. Whilst there is evidence to suggest that one of the strategies employed to assist with food procurement is reliance on WSNs to access food outlets, (see for example, Meneely *et al.* 2009; Hare, 2003 and McKie, 1995), this research highlighted this activity to be actively avoided. The consensus across the households was that this was felt to be burdensome and signified a relinquishment of control over food provisioning; greatly threatening independence. Consistent with the findings of Pfau and Saba, (2009) and their research considering convenience food options in later life, the adoption of formal assistance with food provisioning and the presence of meal delivery was found; this negated concerns over inconveniencing informal support networks. However, this was only observed in one household with the oldest and most frail participant (Martha).

A different view was held for cleaning. Householders were observed to make value negotiations and were consistently shown to appoint cleaners to assist with this. Willingness to pay for this service gave householders the ability to prioritise energy reserves, thereby permitting them to engage in other activities, including social engagements and food provisioning; a finding also consistent with Pfau and Saba, 2009 and Costa *et al.* (2002 in Pfau and Saba, 2009). As a result this research highlighted that social activity and food provisioning were important markers of independence, whereas cleaning was not.

From a food safety perspective there are considerable concerns relating to reliance on others, with risks arising from carers, institutions and WSNs failing to follow food safety best practice guidelines, which could expose vulnerable older adults to increased risk of foodborne illness; corroborating the evaluations of Giles (2009). As mentioned earlier, gifting raised similar concerns. This is further compounded by one of the central findings of Phase 1, the heterogeneity of food safety and food risk attitudes of this cohort. Thus, one could suggest that the informal networks of support established to maintain independence in terms of food provisioning could act to increase vulnerability due to discrepancies in food safety attitudes of carers/food providers and recipients of care (as evidenced in Phase 1). There is potential for carers/food providers to fail to appreciate the multi-dimensionality of risk and the vulnerability within the 60+ cohort fully. A more subtle food safety concern was raised in relation to cleaning. Assistance with cleaning was bought in and paid for by the household to assist with tasks that they were physically unable to do. However, this research highlighted that cleaners did not clean kitchen appliances, although would if asked. This task was considered by the householder's to be beyond the remit of their cleaners and they were therefore be reluctant to ask them. This included the fridge and particularly the handle, which is known to be a site for microbial growth and a cross-contamination risk (Evans, Redmond and Fielding, 2012; Kennedy *et al.* 2011 and Haysom and Sharp, 2005 and Scott, 1999).

From a policy perspective the promotion of independent living, supported by the layers of assistance, both formal and informal (Humphries, Forder and Fernández, 2010; Thane, 2009; Pickard, 2003; Arber and Ginn, 1991) and the strength of feeling towards the maintenance of independence from within the older food consumer population, could ultimately be contributing to increased vulnerability to foodborne disease within the cohort.

8.7 *Is Food Safety a Practice?*

Food safety was not observed to be a practice in its own right and accounts for why it was observed to hold low levels of prominence in these households. The focus on

strategies (outlined in Section 8.5) to be successful *'Independence Transitioners'*, resulted in a simplification of the food provisioning process. From a practice perspective this process was evidence of the *'carriers of practice'*⁴⁶ (Shove, Pantzar and Watson, 2012). Shove *et al.* (2012, p.70) recognise this and liken it to the world of work, where individuals climb the career ladder, showing how *'experience, expertise and identities'* change as they become immersed in the practices with which they engage. A carrier of practice can be regarded to have a lifecycle within a practice and transition through the hierarchy of practice, which at its peak reaches the status of *'full-practitioner'*. Therefore, at any one time a range of people with varying skills and competencies will populate a practice. It is this that allows practices to endure and develop, and just as practitioners gain skill, practices are only noted to survive and develop by recruiting new practitioners and losing others, thus *'the influx of new recruits often leads to the exit of others'* (Shove, Pantzar and Watson, 2012, p.72).

It is this conceptual understanding that was observed in simplification of food provisioning practices amongst the households. As outlined in *Chapter 4*, food provisioning is a practice within which, at any one time, a range of practitioner skills and competencies is evident. In the aforementioned example, presented by Shove, Pantzar and Watson (2012), food provisioning can be seen to adopt new recruits, with evidence of this being observed within the households, particularly in the case of female households becoming *'homemakers'* following marriage, or in the case of Burt, later in life following widowhood. Evidence of the households moving up the food provisioning practice hierarchy was observed, as the householders became more frequent and experienced food handlers. The simplification of food provisioning was evidence of them reaching the end of their lifecycle within the practice and prompted their descent down the hierarchy of practice, transitioning to its periphery and the *'down skilling'* (Meah and Watson, 2011) of the households as food provisioners and handlers. Eventually, although not evident within this sample, this would lead to full

⁴⁶ According to Shove, Pantzar and Hand (nd) *'carriers of practice'* enable practices to persist and survive, in order for them to survive they need to *'attract and retain suitably committed followers or as we term them, 'carriers'*. Moreover, they suggest that *'The careers of individual practitioners determine the fate and future of the practice itself'* and *'As more or different people become involved so the meaning and experience of involvement changes and so the practice evolves'*.

disengagement with the practice through reliance on others and dependency. Limited levels of cooking competency was observed, particularly within single (un-married) households (Gill and Peter), with simplified meal options having always typified their food provisioning practice. This signified practitioners' different entry points to a practice. In this instance, a low level of cooking competency was observed to have accelerated the transition process, with these households having less distance to travel or significant changes to make on their transition out of the practice. This transition process was an essential requirement in order for the household to be successful and independent in the practice of food provisioning (Shove, Pantzar and Watson, 2012). A central component of this downgrading through the hierarchy of practice and the carrier reaching the end of their lifecycle within it was the off-loading of elements of the practice that were considered unnecessary to food provisioning and handling, and that could inhibit independence. Although food safety was embedded within the food provisioning outcomes of the cohort, the types of food differed from those that they may once have prepared, when holding the status of '*full practitioner*', and upon which the domestic food safety best practice recommendations are based. Thus it is argued that the food safety best practice recommendations lacked relevance to the simplified food provisioning practices that they had assumed; this explains the lack of prominence food safety held within households.

8.8 *Intersecting Practice*

Within the home it is recognised that domestic practices are bundled together (Shove, Pantzar and Watson, 2012). *Chapter 4* highlighted that everyday life is a complex web of intricate practices, elements of which are likely to intersect with each other (Halikier and Jensen, 2011; Milne, 2012). Southerton's (2003) study of domestic time management highlighted that shortcuts and compromises in practices are accepted as they allow for more energy to be given to the enactment of others (Shove, Pantzar and Watson, 2012). Time was not a significant factor for this cohort, although the limited amount of physical and mental capital that they were able to expend on practices that facilitated and were essential to their independence, prompted compromises and shortcuts to be made in the

negotiation of domestic household practices. Moreover, this prioritization allowed for households to invest greater amounts of energy into what could have been considered '*dominant projects*' (Shove, Pantzar and Watson, 2012 p.78). For example, social and recreational activities within this sample included playing tennis, walking, volunteering and gardening, which from a household perspective, were considered to be more significant markers of independence. The notion of '*dominant projects*' also accounts for the variation within households in what, for them, were the most significant markers of independence. For example, for Joan this was cleaning and '*keeping home*', whilst for Gill and Kathy this was being physically active and playing tennis and golf, and for Peter the ability to socialize outside of home.

The intersection of practices, the reduction in physical and mental energy required to be a '*full practitioner*' and the drive for independence, placed competing demands on the householders' commitment to their '*dominant projects*'. Upholding participation in these households, required maintaining independence through the hierarchy of food provisioning and competing domestic practices, such as willingness to pay for assistance with cleaning. Each of the competing practices will be discussed briefly, and their implications for food provisioning and safety presented.

i. Health and wellbeing

Ageing is characterised by progressive and irrevocable biological decline (Lumbers and Raats, 2006; Rowe and Khan, 1987) and practices related to health held prominence within the households. Although beyond the analytical scope of this research, households were noted to take multiple medications (polypharmacy) to treat medical conditions, which could weaken immune function and increase vulnerability to foodborne disease (Witkamp, 2009; ACMSF, 2009). To address these health vulnerabilities, householders made dietary modifications and adaptations to the time that meals were consumed. This included the increased intake of high-risk RTE smoked fish, to comply with dietary recommendations for heart conditions; this is also

recognised as presenting listeria risk (ACMSF, 2009; Gillespie *et al.* 2006 and Farber and Peterkin, 1991). The AR(T) data highlighted householders used kitchens during the night and whilst interview evidence suggested this was to take medication and for the preparation of drinks and snacks, kitchen usage in poor light, when householders might be tired, could reduce concentration and attendance to best practice in food safety. Maguire (2011) reports the poor lighting of kitchens in older households to make seeing packaging instructions and cooker dials difficult, which may be further compounded by night-time kitchen use.

ii. Cleaning

Although not being quite as prominent a marker of independence as food provisioning, cleaning and personal hygiene were still considerable factors in the maintenance of independence. As has been shown throughout this discussion, the reduction in physical capacity forced householders to make value negotiations in order to ensure that they maintained their status as independent cleaning practitioners. Householders were observed to strategize in order to maintain this, the solutions of which intersect with food provisioning and ultimately food safety practices. As highlighted in Section 8.5 for some, the willingness to pay for a cleaner and share the household responsibility for cleaning, highlighted concerns relating to discrepancies in the carriers performance of the practice. Simplification of cleaning routines was observed in, for example, focusing on essential cleaning i.e. worktops, sinks and dishes at the expense of larger kitchen equipment. Householders' simplification of food provisioning was also motivated by reductions in the need for cleaning. Examples of this ranged from covering chopping boards with newspaper, eating directly from pans, cooking foods in the packaging they were purchased in, which could be disposed of rather than washed. In addition washing-up single items under running water if not very dirty; which was also observed by Maguire (2011), all of these practices reduced the need for washing-up. Although analysis of householders' ideals suggested these practices would be undertaken following each meal preparation, observations identified them to be conducted less frequently.

iii. Thrift

Householders held concerns relating to reduced income following retirement. The drive towards thrift intersected directly with food provisioning practices and had several implications from a food safety perspective. Householders were shown to shop en-route to and from activities, co-ordinating journeys to reduce the amount of trips made by car. Such shopping trips increased the likelihood of temperature abuse of foods, with no households observed to take cool-bags with them when shopping; a concern highlighted by Hudson and Hartwell (2002). Householders were observed to be motivated by purchase opportunity rather than necessity, which was apparent in relation to the purchase of products that were reduced in price and close to their UBD. This practice was directly linked to waste management practices, which in turn increased the propensity to consume foods that had passed their USB, a finding consistent with the current concerns of the FSA (2012, Food Safety Week 2012 dedicated to food safety on a budget) and also suggested as a concern by Milne (2011), Giles (2009), Brennan *et al.* (2007), Hudson and Hartwell (2002) and Johnson *et al.* (1998).

iv. Socialising

Eating with others and the commensality of meal occasions has been noted to play an intrinsic role in older people's satisfaction with life, improving their nutritional status and ultimately facilitating and maintaining independence (Dean, 2009; Fjellström, 2009; Lumbers and Raats, 2006; McKie, 2000; Sidenvall *et al.* 2000 and Murcott, 1982). Households were observed to value this practice over the food provisioning opportunity it presented, which led to them compromising on taste and food quality preferences; a finding also noted by Falk *et al.* (1996), as well as consuming foods to appease the giver. This practice intersects with food provisioning and compromised food safety which, as acknowledged in Section 8.5, was primarily related to the inclusion of others within the food provisioning process and concerns relating to conflicting food and food safety values (Giles, 2009).

v. Waste management

Consistent with the finding of the following authors; Milne, (2011), WRAP, (2008), FSA, (2009), McKie *et al.* (2000) and McKie, (1999) the households within this research held strong 'no waste' beliefs. The households' waste management practices reflected this, with these having implications from a food safety perspective. In terms of storage, households were shown to remove the packaging from purchased items, particularly those that were to be frozen. In so doing UBDs were removed and householders relied on memory of purchase and visual cues to establish if the product was safe to consume. Householders were observed to be heavy recyclers, also noted by Mintel (2009), which included the re-use of food packaging items. For example margarine tubs, which were instrumental in the food provisioning practice and storage of 'batch cooking', and plastic carrier bags used for covering food stored in the fridge, which had the potential to introduce bacteria and pathogens into the fridge environment. Once again, this practice potentially includes the consumption of foods that are passed their UBD.

The consideration of intersecting practices is one of the primary merits of SPT. This appreciates the intricate web of practices that are undertaken in the household, often simultaneously, placing competing demands on householders' energy reserves. Shortcuts and compromises promoted independence and this finding reinforces the value of not viewing food provisioning practices in isolation from others. This supports the argument for undertaking research with a more holistic approach to understanding the way that life is lived within the domestic kitchen (Wills and Brennan, 2012; Brennan, 2010).

8.9 Knowledge versus Practice

In order to draw conclusions about the contribution of Phase 2 of this research, it seems prudent to consider how it has furthered understanding of the domestic food provisioning and handling practices of the 60+ from the attitudinal and

knowledge-based understandings generated in Phase 1 of the thesis. Phase 1 identified a number of postulations that Phase 2 sought to address. Table 8.4 details these postulations and provides a comparison with the findings of Phase 2, each of which are discussed in turn.

Table 8.4: Comparison of Postulations From Phase 1 and Results of Phase 2

No	Postulations derived from Phase 1	Findings of Phase 2	Consistency with Phase 1
1	The cohort will demonstrate discrepancies between knowledge and practice irrespective of age	Discrepancies between knowledge and practice were observed across all households irrespective of age. However, differences between intentional and unintentional deviation was found.	✓
2	Gender does not influence adherence to food safety recommendations in the 60+ cohort	Deviation from best practice recommendations was evident across the sample irrespective of gender; however, given the small sample size this finding cannot be generalized.	✓
3	C1 demonstrate less personal culpability and exhibit an illusion of control in relation to domestic food safety	All households demonstrated an illusion of control in relation to domestic food safety best practice.	✓
4	C2 demonstrate less personal culpability and exhibit an illusion of control in relation to domestic food safety	All households demonstrated an illusion of control in relation to domestic food safety best practice.	✓
5	C3 demonstrate high levels of personal culpability and do not exhibit illusion of control	All households demonstrated an illusion of control in relation to domestic food safety best practice.	✓
6	C2 have a no waste mentality	The exclusivity of the 'no waste mentality' to Cluster 2 was not found in Phase 2, this was an attitude that was prevalent across all households.	✗
7	C3 consume the most RTE food Products	The amount of RTE food consumed was relatively few across all households and was not more prevalent in households belonging to Cluster 3.	✗
8	All clusters lack knowledge relating to safe fridge temperatures	Knowledge of fridge temperatures varied between households. Fridges were observed to be operating above 0-5 degrees 'safe' range and households were not shown to possess the means or motivation to monitor fridge temperatures.	✓

(Source: Author compiled)

- **Postulation 1**

Phase 1 showed agreement with postulation 1 and consistent with previous research (Jevsnik *et al.* 2008; Brennan *et al.* 2007; Jackson *et al.* 2007; McCarthy *et al.* 2007; Kennedy, *et al.* 2005; Redmond and Griffith, 2005; Wilcock *et al.* 2004; Scott, 2003; Miles and Frewer, 2001; Bruhn and Schutz, 1999; Henson and Caswell, 1999; Miles, Braxton and Frewer, 1999; Griffith, Worsfold and Mitchell, 1998), highlighted discrepancies between knowledge and practice across the householders, irrespective of age. However, Phase 2 presented a more complex picture of the discrepancies between levels of knowledge and practice. In relation to the handling of raw meat, particularly chicken, householders held the view that raw meat required washing in cold water prior to cooking. Simplification of meals meant that across the households the preparation of whole chickens was infrequent, owing to wastage concerns, although where chicken was prepared, usually fillets, washing was observed and was generally regarded as the safe approach. This was also shown to be the case with the best practice recommendation for checking whether meat was properly cooked. Householders did not own temperature probes, which was considered to be professionalizing the cooking process and was not considered necessary as a visual inspection could be undertaken. Additionally, the prominence of slow-cooked meals, for example casseroles prepared as part of the 'batch cooking' process, guaranteed that meat was thoroughly cooked and made cooking thermometers redundant.

These findings do not indicate intentional deviance from food safety best practices; instead they highlight householders' lack of knowledge of current best practice recommendations. In addition, such recommendations are not relevant to their cooking practices, given the simplification of meals and these households reaching the end of their lifecycles within the practice of food provisioning, marking a downward transition through the hierarchy of the food provisioning practice. This observation was consistent with the findings of Brennan *et al.* (2007) and Meah and

Watson (2011) and was symptomatic of the flux in food safety best practice messages and the changes of these from past educational advice given as part of home economics training. Household holders were exposed to often contradictory messages given by a range of stakeholders. These included messages on what is safe, tasty and healthy, how food should be prepared for one, for guests or on a budget, as well as the skills that are now required to negotiate advances in the science of food. For example, adapting to convenience products and new innovations in technology such as microwave defrosts and worktop grills, as well as UBDs. In order to continue to prepare food without anxiety (Jackson, 2010) and contend with these issues, older consumers cooked food with their experience-based knowledge of best practice

Researchers such as Fisher and Frewer (2008), Brennan *et al.*, (2007) and Lumbers and Raats (2006), suggest female household holders may have been formally trained in how to cook and how to be proficient and safe 'home makers'. However, benefiting from intergenerational knowledge transfer was not supported within this research. Instead the findings were consistent with the conclusions of Meah and Watson (2011) and identified that cooking knowledge was built from a variety of sources including experts, friends, books and formal training in the form of evening classes. Most significantly, life-course interviewing highlighted household holders to having to learn 'on the job'.

Notwithstanding the unintentional food safety breaches, more deliberate deviation was shown in relation to the best practice for defrosting foods and household holders' adherence to UBDs. The freezer was recognised as a prominent facilitator to the multiple food provisioning practice outcomes (particularly batch cooking, meal simplification and hoarding); a finding also observed by Hand and Shove (2007). Concurrent with the findings of Hudson and Hartwell (2002) and Johnson *et al.* (1998), household holders in Phase 2 were shown to be unclear about the correct temperature at which their freezers should be set, with no household holders reporting to check this. Phase 1 identified household holders being unsure of the best practice recommendation for defrosting foods. More intentional discrepancies between

knowledge and practice were observed in relation to this, and despite 6 households in Phase 2 correctly identifying that defrosting foods in the fridge was best practice in Phase 1, observations revealed foods were typically defrosted on work surfaces and in particular draining boards. The findings of this food safety best practice violation are consistent with a number of international studies (Kennedy *et al.* 2005; Suruijal and Badrie, 2004 and Meer and Misner, 2000). Jevsnick *et al.* (2008) found evidence that this practice was correlated with self-taught cooks; this research would appear to support this. However, the time taken to defrost foods in the fridge was given as the reason that this method was not consistently adopted. Moreover, confusion as to the correct placement of foods within the fridge and concerns over defrosting foods contaminating other items prompted defrosting practice outside of the fridge.

- ***Postulation 2***

Phase 1 of the research was female biased and to expand on the insights of previous research that has also been argued to be heavily female biased (Brennan *et al.* 2007; Hudson and Heartwell, 2002 and Johnson, 1998), Phase 2 purposively sampled male households. Although previous research has suggested a heavily gendered dynamic to risk (Davison, Arber and Marshall, 2009; Brennan *et al.* 2007; Kennedy *et al.* 2005; Thompson, 1996), and evidence to suggest that females are safer food handlers than males (Fischer and Frewer, 2008; Christensen *et al.* 2005), this research agreed with postulation 2 on the grounds that deviance from what was regarded to be best practice was observed across all households, irrespective of gender. The limited sample size within the EIS, makes it difficult to draw conclusions on this point; it is recommended that further research be conducted to examine this.

- **Postulations 3, 4 and 5**

Hypotheses 3 and 4 from Phase 1 of the research highlighted low culpability and high internalised control, particularly for Clusters 1 and 2 towards food manufacturers' UBDs. Phase 2 presented evidence to support this and in line with the findings of Hudson and Hartwell (2002) Phase 2 agreed with questions 3 and 4. However, in response to postulation 5, it was observed that Cluster 3 also demonstrated the tendency for deviation in this regard. Therefore, Phase 2 presented evidence to disagree with postulation 5. The EIS offered a more complex set of factors that affected household adherence to food safety best practice recommendations. First, whilst some households, particularly those in Clusters 1 and 2, showed intentional disregard of manufacturers UBD recommendations on the basis of thrift and the reliance on sensory perceptions, in others, primarily Cluster 3, this was unwittingly done. Households in Cluster 3 were shown to misinterpret the recommendations, particularly the guideline that suggests that once opened, RTE food should be eaten within two days. Furthermore, freezing RTE foods was considered to make UBDs obsolete, which is consistent with the conclusions of Terpstra *et al.* (2005). For householders representative of Clusters 1 and 2, the UBD presented conundrums around waste and taste, with some reporting food (particularly soft cheeses) to taste better 'ripe' (Annie, I2) and therefore, the UBD for this product was ignored. However, for younger householders, the avoidance of waste meant that unopened RTE foods were eaten past their UBD, although the length of time that this practice was considered safe was not established, unlike the findings of Meenly *et al.* (2009) or Johnson *et al.* (1998). Contrary to the finding of Johnson *et al.* (1998) and Maguire (2011) this study found no evidence to suggest that Phase 2 householders found UBDs difficult to read, confirming the findings of Phase 1.

- **Postulation 6**

The exclusivity of the 'no waste' mentality belonging to Cluster 2 was not substantiated within the EIS. Within Phase 2, this attitude was prevalent amongst all households irrespective of age or cluster membership. This finding was consistent with the exploratory insights of Milne (2011) and was shown to originate from early childhood experiences of rationing and poverty which has previously been acknowledged by the FSA, (2009) as well as McKie *et al.* (2000) and McKie, (1999).

- **Postulation 7**

Phase 2 showed that the amount of RTE products purchased and consumed by the households were both relatively few and not more prevalent in older households belonging to Cluster 3. Older households, specifically those living alone, avoided purchase of these items, as the portion sizes were considered to be too large for lone households, making them candidates for waste. This finding is consistent with market data (Mintel, 2009) and the findings of Hare, (2003). Additionally the cost of these products prohibited purchase, particularly in the case of cooked meats and complex products such as sandwiches. Younger and cohabiting households whose characteristics were consistent with Cluster 1, were observed to be more frequent purchasers of RTE products and were more likely to purchase a more extensive range. However, in relation to postulations 3 and 4 there was an observed tendency for these products to be purchased when they had been reduced in price or from delicatessen counters. Personal culpability and high locus of control are evident in the belief that the household was in control of the food safety risks and in a position to judge their suitability to consume, was evident across the younger households.

- **Postulation 8**

Finally, postulation 8's hypothesised lack of knowledge of correct fridge temperatures was substantiated in Phase 2 of the research. Fridge temperatures were typically operating higher than the 0-5 degree 'safe' range. Householders believed that their fridge '*just works*' (Joan: DB) with the temperature set when purchased or inherited. Householders judged how successfully the fridge was operating by the way that the goods inside felt (FSA, 2009; Cates *et al.*, 2007; Hudson and Hartwell, 2002 and Johnson *et al.* 1998), and the fact that foods had not spoiled or they had not suffered any complications as a result of this. This provided some support for the notion of these households' demonstrating optimistic bias (Fischer and De Vries, 2008; Redmond and Griffith, 2004; Miles and Scaife, 2003; Miles and Frewer, 2003; Redmond and Griffith, 2003; Woodburn and Rabb, 1997 and Sheppard and Sparks; 1994). Consistent with the findings of Gilbert *et al.* (2007) these householders did not possess the means or motivation to monitor fridge temperatures, with only one household possessing a fridge thermometer, which was purchased between Phase 1 and 2 of this study. In addition to studies that aimed at measuring domestic fridge temperatures (Gilbert *et al.* 2007; James, Evans and James, 2007; Jackson *et al.* 2007; Breen *et al.* 2006; Kennedy *et al.*, 2005; Johnson *et al.* 1998) this study was able to profile the cooling cycle of these domestic fridges. As highlighted by Hudson and Hartwell (2002, p.168) '*temperature control lies not only in the hands of the consumer but also within the performance and effectiveness of the domestic refrigerator*', an observation that is supported by the data generated by the AR(T) devices. Despite domestic fridges being set according to manufacturers' recommendations, their cooling capacities were shown to vary considerably across makes, models and ages.

In contradiction with the assumption that older consumers will have poorer functioning kitchen equipment (Johnson *et al.* 1998), this was not found to be the case. Whilst the kitchen itself may have been older (40 years Kathy for example), key kitchen equipment across the households, primarily ovens and fridges were

estimated to be less than ten years old. However, in the case of those that rented homes, householders could not be sure of the exact age or origin of the appliances as they were typically inherited with the property. Again, this highlighted concerns relating to the suitability of the equipment to meet the needs, requirements or preferences of the household, and from a food safety perspective, the condition and functionality of the fridges to cool within safe bounds. However, replacing these items was considered unnecessary, given the householders' age and the fact they found them to function adequately. It could be assumed that there would be a correlation between age and functionality of fridges, although, data from the AR(T) devices did not provide evidence of this. However, care has to be taken in the interpretation of these results, as the ages of the fridges were estimations made by the householders and for firm conclusions to be drawn, exact ages would be required.

Refrigerator cooling capacity was also shown to be influenced by positioning within the kitchen (Hudson and Hartwell, 2002). This, coupled with the lack of seasonal adjustments, could have potential to influence the cooling cycle of the fridges. Consistent with previous studies (Jevsnik *et al.* 2007; Hudson and Heartwell, 2002 and Johnson *et al.* 1998) and the finding of Breen *et al.* (2006), nearly half of the fridges were shown to operate $>5^{\circ}\text{C}$, with two fridges shown to be operating above 13°C . However, it is recognised that owing to the proof of principle nature of this temperature monitoring method, further empirical testing is required⁴⁷. No correlation between living alone and/or income was substantiated within this research as identified in previous research conducted by Johnson *et al.* (1998).

Additionally, the audit of fridges identified a number of foods that had exceeded their UBD. Whilst the majority of these were condiments (jars of pickle, jam etc.) and vegetables, this was also shown to include raw meat and RTE products that are known to be implicated in the contraction of listeriosis (ACMSF, 2009). However,

⁴⁷ A further proof of principle study has been funded by the Food Standards Agency as part of the KITLIFE (2012) project and will run alongside the ethnographic study conducted by the University of Hertfordshire.

foods past the UBD were persistently shown to be vegetables, which were considered 'safe' even if the UBD had been exceeded. Jars and condiments were shown to be stored for longer periods, with these foods being up to one year past the UBD recommendations. Reduced shopping frequency played a role in this, with older households, in particular those with reduced mobility and access to food outlets, being shown to stretch food provisions over longer periods. Consistent with the evidence presented by Giles (2009) this provides some rationale for the consumption of foods that were less than fresh, or households consuming very little in the way of fresh foods, relying on convenience, dried, frozen or tins.

The storage of eggs past the BBD was prominent. Households referred to being aware of changes in safety advice, which permitted the use of eggs beyond the recommendations. Two households were observed to be storing eggs that were more than 10 days out of date, which is significantly more than the best practice recommendation of one or two days, but no more (Livewell, 2012). Households demonstrated confusion relating to the most appropriate place to store eggs. This confusion was indicative of an unintentional breach of food safety best practice recommendations. Owing to this confusion, households reverted back to their own food safety best practice knowledge and evidence from supermarkets. Households typically believed that out of the fridge was the 'safe' storage option for eggs, as this is how they were stored in supermarkets.

With the exception of one household (Sandra), fridges were not overstocked, particularly amongst older householders who were living alone, and where the freezer played a more prominent role in food storage. However, as previously noted, confirming the insights gained from Phase 1 and consistent with the findings of Hudson and Hartwell (2002), there was evidence that householders were unsure of the correct positioning of foods within the fridge. This was particularly evident in the storage of raw meat, with this being stored away from vegetables (i.e. on the lower shelves) to avoid dripping and cross-contamination, which again is indicative of misinterpretation of the food safety best practice advice rather than deliberate deviance.

In summation, Phase 1 allowed for the investigation of attitudes, which were used to provide behavioural insights into the potential household food provisioning and handling practices in Phase 2. Whilst Phase 1 highlighted considerable self-reporting of deviation from best practice recommendations, observations highlighted these to be accurate accounts of behaviour, and this research showed considerable consistency between the self-reported practices in Phase 1 and the observed actual practices in Phase 2. Thus, this research has shown that confidence can be placed in older consumers' ability to self-report practices accurately, although this was not to say that the practices reported were 'safe' from a domestic food safety perspective. Rationale for this accuracy could be given in that the routine nature of life within older (particularly lone) households makes the bundle of domestic practices performed within the space less complex. It can therefore, be argued that these households do not have to contend with the same level of 'noise' of multi occupancy or younger households.

8.10 Summary

This chapter has collated the findings of Phases 1 and 2 through a discussion of the food safety implications of the self-reported and observed practices of the two respective phases. The centrality of the core concept of '*Independence Transitioning*' in prompting the simplification of food provisioning practices and the transition out of the food provisioning practice, was highlighted to have considerable food safety implications. First, the transition from private residences to rented or smaller homes was noted to reduce the space available for food preparation, as well as of key kitchen equipment. The effect of this was to constrain the variety of food provisioning practices that could be performed in the space, and structurally inhibited households' adherence to best practice recommendations, as well as accelerating the transitioning process towards dependency. Second, the relevance of food safety best practice recommendations for this cohort, given the transition out of the food provisioning practice, was highlighted. Food safety best practice recommendations were argued to be

targeted towards *'full practitioners'* and did not make allowances for the alternative practices adopted by the cohort. Finally, the notion that the practice of food provisioning is situated within a web of practices within the domestic environment was highlighted to place competing demands upon the households and thus *'dominant projects'* or those that were considered to be important markers of independence, were prioritised. The chapter concluded by presenting a cross comparative discussion of the findings from Phases 1 and 2 of the research. This highlighted that the cohort were consistent in their accounts of knowledge and practice and confirmed that confidence could be placed in their ability to self-report, although this was not to say that the practices that they reported were safe. Based on the evidence of the empirical work of Phases 1 and 2 and the discussion of the findings, *Chapter 9* will provide concluding remarks and reflections.

Chapter 9 : Conclusions and Reflections

9.1 Introduction

Within this final chapter, the original aim and objectives framing this research are addressed. The methodological processes are reflected upon, from both the perspective of the researcher and the participants. Recommendations for future research and concluding remarks are included.

9.2 Research Objectives and Conclusions

As outlined in *Chapter 1* this research was problem-orientated and sought to address a deficiency in knowledge relating to the *'food provisioning and the domestic food handling practices of the over 60s in the North East of England'*. In order to address this, the research objectives were to:

1. To critically analyse the key literatures relating to microbiological food safety, with particular reference to *Listeria monocytogenes*, ageing and food safety and the older consumer
2. To appraise the contributions of eligible theories such as the Theory of Planned Behaviour, The Food Choice Process Model and Social Practice Theory in order to assess their suitability for providing the theoretical underpinning of this research
3. To provide a sampling framework for the observational component of the research by segmenting the 60+ population in the North East of England, based on lifestyle, attitudes towards food and attitudes towards and knowledge of domestic food safety practices
4. To provide nuanced understandings of domestic kitchen practices by performing an ethnographically inspired study of ten households identified as being 'at-risk' of contracting foodborne illness from the segmentation analysis

5. To provide rich understandings of the everyday food provisioning process (including purchase, storage, cooking, eating and disposal) and practices of 60+ individuals
6. To discuss the implications of observed practice for the successful adoption of domestic food safety best practice recommendations, and the potential barriers that inhibit their adoption in this cohort
7. To reflect on the research process, which used a mixed method multi-disciplinary approach to segment and observe the food provisioning and food handling practices of those aged 60+

9.2.1 Objective 1: Microbiological Food Safety and the Older Food Consumer

The purpose of *Chapters 2 and 3* was to provide a critical analysis of the key literatures relating to microbiological food safety, with particular reference to *Listeria monocytogenes*, ageing, food safety and the older food consumer. This provided an overview of the contextual environment in which this research was situated; justification for the problem-orientated nature of this thesis, and a knowledge base for the empirical research. Foodborne disease is a global public health concern. In the UK, microbiological foodborne pathogens that cause human illness in this form which are monitored through the national surveillance system are *Salmonella* (species (*sp*): *S.enterica*), *Campylobacter* (*sp*: *C.jejuni* and *C.coli*), *Escherichia coli* 0157:H7, *Listeria* (*sp*: *L.monocytogenes*); and *Norovirus* (FSA, 2011b). In the UK there are approximately 1 million cases of foodborne disease, causing 20,000 hospitalisations and 500 deaths (FSA, 2010) and annual economic and welfare losses of £1.5 billion. Microbiological foodborne disease is argued to be preventable assuming basic food safety principles are followed throughout the food chain from farm-to-fork (Jacob, Mathiasen and Powell, 2010; Mullan, Wong and O'Moore, 2010 and Fischer and De Vries, 2008). The greatest proportion of verified cases of sporadic foodborne illnesses were shown to originate in the domestic environment. However, it was acknowledged that the true contribution of cases originating in the home was difficult to gauge given the significant number

of cases that are mis or unreported. In order to provide a basis for comparison, *Chapter 2* outlined the current consumer food safety best practice recommendations. These were subsequently used to frame the empirical quantitative research reported in *Chapter 5*, the methodological approach taken to Phase 2, the empirical qualitative research methodology outlined in *Chapter 6* and the results of the EIS reported in *Chapter 7*.

Chapter 1 outlined the distinct rise in cases (2000-2007) of listeria, witnessed to be exclusively affecting the 60+ population as the central problem that this research sought to address. *Chapter 2* provided an overview of what is known of this pathogen, the foods implicated in contraction, the levels and trends of infectivity, risk factors and susceptibility. Listeria was not identified to be one of the most prevalent foodborne pathogens (*Campylobacter* being responsible for the greatest proportion of cases). However, it was highlighted to be responsible for the greatest number of deaths. Age, in particular the 60+, was noted to be one of the primary predisposing factors in the contraction of, and increased likelihood of dying from, listeriosis.

The aged 60+ were revealed to have distinctly different food handling practices from their younger counterparts, particularly in relation to cooling, storage of leftovers, reheating and fridge and freezer temperatures (Brennan *et al.* 2007, Hudson and Hartwell, 2002 and Jackson *et al.* 1998). From an attitudinal perspective, older consumers were highlighted to have a high locus of control given their extensive experience in food handling and the amount of time that they had spent as food preparers in the home. They were also noted to regard themselves as safer than comparable others, giving support to claims of optimistic bias within the cohort (Cates *et al.* 2007; Miles and Scaife, 2003). Moreover, consideration of the older food consumer in *Chapter 3* identified them as facing a unique set of challenges that were considered from a food provisioning process perspective (Marshall, 1995). These included the importance of the social significance of food, reduced resources (including financial, energy and time) and physiological changes such as reduced physicality and mobility. An attitudinal assessment of the extent to

which these factors affected the food provisioning and handling was provided in *Chapter 5* and observed in *Chapter 7*.

Chapter 3 focused specifically on understanding the 60+ cohort to provide further justification of them as the primary focus of this research, as well as to inform the quantitative and qualitative research. The 60+ were highlighted to constitute a significant proportion of the UK populace as a consequence of falling birth rates and increased life expectancy. This ageing trajectory was presented as a feature of the UK demographic landscape, resulting in the nation being classified as having an ageing population. Acknowledgement of the heterogeneity of the 60+ was given and the different bases upon which they are segmented were presented. Of the empirical evidence reviewed, *Chapter 3* concluded that although multiple bases had been covered by the past segmentation attempts, none were adequate for understanding the lifestyles, attitudes towards food and knowledge of domestic food safety practices within the 60+ cohort. This gap in the literature led to the development of objective 3, which was reported in *Chapter 5*.

9.2.2 Objective 2: Review of TPB, FCPM and SPT

In response to research objective 2, the empirical orientation of this research and the theoretical and methodological approach was outlined in *Chapter 4*. The research adopted a mixed methods approach, the FCPM and SPT were used as the theoretical frameworks to structure it which permitted the inclusion of a mix of traditional (questionnaire, life-course and narrative interviewing) and innovative methods ('go-alongs', (Kusenbach, 2003), video documentation and Activity Recognition). This thesis is situated within the marketing discipline, therefore, the historical epistemological orientations of the discipline and past food safety research were considered. Marketing was highlighted to be a relatively young and derivative discipline (Baines, 2011), which, through its roots in appreciating market heterogeneity and the requirements for its segmentation, had traditionally been aligned with the positivist epistemological orientation. However, promoted by the consumer behaviour movement in the 1980s the chapter highlighted marketing to

have taken an '*interpretive turn*' (Sherry, 1991) which was recently branded under CCT (Arnould and Thompson, 2005). The epistemological orientation of food safety research has been traditionally aligned with positivism orientation. However, *Chapter 4* argued that food safety research has reached an impasse in accounting for the discrepancies between consumer knowledge of food safety principles and the practice of these in the domestic environment (Brennan, 2010; Fischer and De Vries, 2008; Brennan *et al.* 2007; McCarthy *et al.* 2007; Wilcock, *et al.* 2004; Redmond and Griffith, 2004; and Miles and Frewer, 2003; Hudson and Hartwell, 2002; Johnson, *et al.* 1998). This has given rise to calls for researchers to consider more holistically the complexities of everyday life and the ways that lives are lived in the domestic kitchen. Gaining more nuanced understandings of kitchen life was considered to benefit a range of stakeholders, although from a food safety perspective, appreciation of the micro-level social interactions allows the more comprehensive consideration of barriers to the adoption of safe food handling practices in the home (Milne, 2011; Meah and Watson, 2011; Brennan, 2010 and Hargreaves, 2008). This shift in thinking mirrored the aforementioned '*interpretivist turn*' in marketing. It was the appreciation of the contributions of both positivist and interpretivist orientations made by marketing, and more recently, by food safety research, that allowed this research to adopt a mixed methods approach and take the pragmatic middle ground between the two epistemological orientations. The fundamental principle of mixed methods was outlined to be the inclusion of both quantitative and qualitative methods within the one research study. Being aligned with both quantitative and qualitative methods permitted broad and deep insights to be generated, which best suited the research question and addressed the shortcomings of previous food safety research. This thesis was therefore segmented into two phases: Phase 1 the quantitative phase, was reported in *Chapter 5*; and Phase 2 the qualitative phase, were reported in *Chapters 6 and 7*. The contributions of both Phases were discussed in *Chapter 8*.

The epistemological pragmatism outlined in *Chapter 4* allowed for consideration of theories and methodological orientations that were best suited to answering the central research problem. Rather than favouring one approach over another, the

pragmatic orientation of this research allowed the researcher to select elements of theoretical and methodological contributions of two theories that complemented quantitative and qualitative domestic food safety research, namely the FCPM (Furst *et al.* 1996) and SPT (Reckwitz, 2002; Warde, 2005). *Chapter 4* evaluated the merits of each of these and established their contribution to the research.

However, in the process of selecting appropriate theoretical support for this research endeavour, eligible theories were evaluated. First, the SPT was presented as a predictive theory of human behaviour, which is based on the standard economic assumption that human behaviour is rational and linear. *Chapter 4* concluded the TPB to be the only predictive model within food consumer research and demonstrated it to have been extensively used in understanding consumer food choice behaviours (Conner and Armitage, 2006). Its appreciation of individual attitude and behavioural intention in predicting behaviour meant the model had high congruence with quantitative methods. However, as identified in *Chapter 2*, intention is not always the best indicator of actual behaviour in relation to food safety best practice, and with its focus on the 'individual', this model neglects the wider contextual factors that influence behaviour. Moreover, objective 3 and Phase 1 of the research sought to segment the 60+ based on attitudes, knowledge and behaviours in relation to food and food safety, the intention of which was to provide broad baseline understandings, whilst Phase 2 specifically addressed the need to understand action. Given this, an application of theory was considered inappropriate in this context.

Chapter 4 then evaluated the contributions of the FCPM (Furst *et al.* 1996) which identifies food choice as a process that is influenced by experiences over the life-course (Connors *et al.* 2001). This identified the need to understand the food histories of participants *via* life-course interviewing techniques. This was identified to be of considerable value given the research sample (the 60+). However, the primary limitation of this model was its focus on the individual and whilst advocating a multi-perspective approach, the alignment it held with self-reported methods lacked consideration of the domestic environment and the actual food

provision and handling behaviours. The FCPM was therefore adopted, but was unable to fully address research objective 4.

Chapter 4 identified that whilst able to provide consumer representations of behaviour, the psychosocial models outlined above were deficient in their ability to provide the rich and nuanced understandings of actual behaviours, which were required to address research objectives 4 and 5. In response to this, the chapter evaluated the contributions of SPT, a sociological model that de-centres the individual to sensitively and uncritically focus on practices and the reproduction of these within everyday life. The key contribution of this model was the focus on both behaviours and their representations (*'saying'* and *'doings'*, Warde, 2005, p.134). SPT therefore enabled the researcher to observe the food provisioning, handling and safety practices (*Chapter 5*) within the domestic environments of the sample households in Phase 2 of the research by observing and examining what the householders actually do in their kitchen sphere and the manner in which the practices are performed.

Chapter 4 concluded by providing a theoretical and methodological route-map of the thesis. Phase 1 of the research provided the baseline understandings of the 60+ in the North East with respect to their lifestyles, attitudes, knowledge and behaviours in relation to food and food safety and was reported in *Chapter 5*. Phase 2 sought to understand more specifically, the food provisioning and handling practices of the cohort, and was informed by FCPM and SPT. Phase 2 is reported in *Chapters 6* and *7*.

9.2.3 Objective 3: Segmentation Analysis

Objective 3 of this research was to conduct a segmentation analysis of the 60+ in the North East of England, based on life-style, attitudes towards food and knowledge of domestic food safety practices. The methodological approach, research procedure and results were presented in *Chapter 5*. A face-to-face administered questionnaire was selected as the primary data collection tool, the

results of which were analysed using multivariate analysis techniques or PCA and two-step cluster analysis. From this three clusters were identified, these were i) Independent Self-Assessor, ii) Experienced Dismissor and iii) Compliant Minimalist. The successful segmentation of the 60+ in terms of life-style, attitudes towards food and knowledge of domestic food safety practices highlighted the heterogeneity of the cohort in this context. All of the clusters were shown to demonstrate 'risk' and susceptibility to foodborne illness at some level, although the way in which this was experienced was shown to be the basis on which they diverged. This analysis alone was insufficient to provide a sampling framework for Phase 2 (*Chapter 6*). Therefore, the chapter included an analysis of older consumers' knowledge and propensity to deviate from domestic food safety best practice recommendations. This analysis highlighted 57 'high-risk' individuals from which 10 households were selected that were representative of each of the three clusters (*Chapter 6*). This analysis also highlighted an important sub-group for future research investigation, those living in sheltered housing. This is further acknowledged within *Chapter 8*, as well as within the recommendations for future research in Section 9.4 of this chapter.

9.2.4 Objective 4: Phase 2 EIS Methodology

The fourth objective to conduct an ethnographically inspired observational study in the homes of 10 households identified as being 'at risk' from the segmentation analysis, was addressed by Phase 2 of the research. *Chapter 6* presented the 'toolkit' of methods chosen to examine the food provisioning and handling practices of the households, which included an interdisciplinary range of methods that were sympathetic to the sample cohort and also best addressed the central research aim. The methods chosen included; life-course interviewing, kitchen 'go-alongs' (Kusenbach, 2003), fridge auditing and microbiological sampling, food purchase history, narrative interviewing, activity recognition and video documentation. Used individually, these methods were not unique, although their combined use in this context was. The methods not only met the central aim of the research but also demonstrated their suitability for investigating the older food

consumer. The chapter also demonstrated a proof of principle in the suitability and contributions of pervasive sensors (AR(T)s) in a domestic and food safety context. The interdisciplinary approach enabled the examination of the multi-dimensionality of food provisioning and handling practices and allowed for a fuller picture of these phenomena to be gained (Mason, 2006).

Chapter 6 outlined the analytical strategy adopted in the analysis of the data generated by the 'toolkit' of methods used to address research objective 4. The qualitative data analysis procedures suggested by Glaser and Strauss (1967) and Spiggle (1994) provided a systematic approach to the data analysis. Glaser's suggestion that '*all is data*' (Glaser, 2005) enabled the integration of the various data streams in an analytical strategy that involved: 1) a detailed case analysis of each household, including the identification of food provisioning routines and practices; 2) a comparative analysis across households that supported the elaboration, confirmation and illustration of everyday domestic food provisioning practices (Onwuegbuzie and Teddie, 2003); 3) identification of the facilitators and barriers to food safety best practice; and 4) the identification of overarching conceptual themes (*Chapter 8*). The analysis of practices within this analytical framework provided a worked example of one such analytical approach, which is absent within SPT literature.

9.2.5 Objective 5: Nuanced Understandings of the Food Provisioning Process

In response to research objective 5, which was to provide rich understandings of the everyday food provisioning process (including purchase, storage, cooking, eating and disposal) and practices of the 60+, *Chapter 7* provided the empirical results of Phase 2. In line with the GT analytical approach taken, *Chapter 7* presented the substantive theoretical contribution to understanding the food provisioning and handling practices of the 60+ *via* the concept of '*Independence Transitioning*', which was illustrated by examples from the data. The main premise of '*Independence Transitioning*' was that the life-course is a dynamic process and

households were required to adapt to changes faced during this process by making both subtle and major alterations to their lives. Consequently this involved altering their food provisioning practices in order to maintain independence and live within their own homes without full-time care assistance. In the process of adopting food provisioning solutions to the changes experienced, householders were required to make value negotiations, between energy, time, finance and wellbeing. The ultimate aim of any food provisioning solution was that it balanced these competing factors. However, at the heart of any solution adopted, was the facilitation of independence. The chapter outlined the salient food provisioning outcomes of the cohort to be *'batch-cooking'*, *'meal simplification'*, *'gifting'*, *'paring down'*, *'planning'*, *'eating out of home'* *'hoarding'* and *'reliance on others'*. Householders were observed to adopt these solutions individually or in combination. The food safety implications of these augmented food-provisioning practices were discussed in *Chapter 8*.

9.2.6 Objective 6: Practice Implications for Food Safety

The sixth objective was to discuss the implications of observed food provisioning and handling practices for the successful adoption of domestic food safety best practice recommendations, and the potential barriers that inhibit their adoption within this cohort. This was addressed and discussed in *Chapter 8*. First, the food safety implications of the Phase 1 empirical quantitative research results were discussed. It was identified that the cohort faced more complex sets of issues that inhibited adherence to domestic food safety best practice and which also extended beyond individual, attitudinal and behaviour factors uncovered in Phase 1. Appreciation of the environment in which food provisioning and handling practices were performed highlighted that space; design and materiality contained within the households' kitchens constrained the practices that could be performed. This led to adaptations and substitutions being made that were less than ideal from a food safety perspective. Available space, age, physicality, lone living and cooking competency were identified to be factors that contributed to householders' simplification of food provisioning practices that were identified in *Chapter 7*. From

a SPT perspective, food safety was not observed to be a practice in its own right; rather it was identified to be one element of the food provisioning practice. At any one time a range of practitioner competencies and skills are contained within the food provisioning practice. Practitioners were conceptualised as have a life-cycle within a practice, during which they climbed the hierarchy of practice through experiences and refinement of skill to become '*full practitioners*' (Shove, Pantzar and Watson, 2012, p. 72). The simplification of food provisioning practices was argued to be indicative of households reaching the end of their life-cycle within the food provisioning practice and making downward transition out of it. The central food safety implication of this was highlighted to be the lack of appreciation given to the '*simplification*' and augmented food provisioning practices adopted by older adults, by public health policy makers and communicators. Thus, acknowledgement of everyday food provisioning practices is not well reflected within the domestic food safety best practice recommendations given to consumers. It was therefore argued that these were directed towards '*full practitioners*' (those that cook frequently using first principles methods) and therefore lacked relevance to the practices of the 60+. This was particularly prominent in older and/or lone households that were observed to have significantly simplified their food provisioning and handling practices.

9.3 Objective 7: Reflections

Qualitative research is known to be a reflexive practice (Mason, 2002). In response to research objective 7 and given the unique 'toolkit' of methods assembled specifically for the study of the domestic food provisioning and handling practices of the 60+, it was considered prudent to provide reflections on each of the methodological techniques. Providing reflections also offers the opportunity to address some of the central limitations of this research. Owing to the breadth and depth required in order to fulfil the central research objectives (see Section 9.2) adopting a mixed method approach seemed to be '*intrinsically a good thing to do*' (Mason, 2006, p.9). Reflections of Phases 1 and 2 will be provided respectively and in-line with convention, these will be given in the first person.

9.3.1 Reflections on the Empirical Quantitative Research: Phase 1

A central limitation of the literature relating to the older person and specifically the limited body of food safety literature focusing on the older person, was the narrow focus on response from young and middle old respondents, to the exclusion of those in the old-old category (see Hudson and Hartwell, 2002; Johnson *et al.* 1998). My initial notion was that by replicating the sampling criteria of these research studies, the diversity of the experience of old age as presented by Rowe and Khan (1987) would not be reflected. Thus this research offered an opportunity to address this shortcoming by recruiting participants from across all ages, including those in the oldest age category. In doing this, the research sample explicitly acknowledged that the risk of contracting listeriosis increased with age, with those age 80+ shown to be particularly vulnerable (ACMSF, 2009). Consultation in the planning and design stages of the questionnaire, highlighted the specific sensitivities of the 60+ cohort generally, but more specifically highlighted issues relating to cognitive decline and fatigue that was more acute in the oldest-old. This had the potential to result in low response rates if traditional self-completion survey dissemination approaches were followed. Whilst this is a concern with any self-completion questionnaire, it could be particularly problematic within this cohort (Bell, 2005; Bryman, 2004; Milne, 1999). In order to fulfil my ambition for this phase of the research to be more inclusive and representative of the diversity of experience and attitudes of the 60+ and to address the aforementioned response rate concerns, the questionnaire was designed to be conducted face-to-face. The central benefits of this were judged to be reducing sample bias, increased participation from subgroups of the 60+ (i.e. those with visual deterioration or mobility issues that would make self-completion onerous). In addition face-to-face administration allowed for rapport to be built between the participants and myself, which aided recruitment for the second and more intrusive phase of the research. From a researcher perspective, this also allowed me the opportunity to immerse

myself in engaging with the 60+ population which was invaluable in providing first-hand understanding of the complexities of the lives and challenges faced by this subgroup of the population.

Interaction with the Phase 1 research sample also facilitated interpretation of the cluster analysis results. Although multivariate analysis is a quantitative statistical analysis process it is acknowledged that a certain amount of researcher judgement is required in selecting a cluster solution that feels intuitively right (Hair, *et al.* 2010). My involvement with the sample and having been there during the data collection process, gave me the confidence and informed perspective to select a three cluster solution, which statistically could have fallen within a 2-5 cluster solution range.

Prior to conducting the Phase 1, I was fortunate to be invited to assist with a small exploratory project conducted within SAFRD to explore the food and dietary behaviours of older adults within the Newcastle upon Tyne area (Giles *et al.* 2010). The research drew upon the Voice North database⁴⁸ (part of Newcastle University's Institute for Ageing and Health) for participant recruitment. The Voice North database contained contact details of 2,000 individuals age 18+ that had expressed an interest in taking part in university research and was the proposed method of participant recruitment for Phase 1 of the research. Although recruitment from this database would have been beneficial from a time perspective, I had concerns about the validity of using a population of a self-selected database. The methodological limitations highlighted by Giles *et al.* (2010) argued that these participants represented a narrow segment of the older population in the region and were not wholly representative of the range of socio-economic groups. Choosing to manage the recruitment process personally gave me more autonomy and negated the aforementioned sample bias concerns. This also gave greater me greater control over the fulfilment of the quota sampling boundaries identified in *Chapter 5* and

⁴⁸ Voice North can be accessed via Newcastle University's Institute of Ageing and Health.

permitted me to gain responses from difficult-to-reach individuals that would not otherwise have been included.

However, adopting this approach placed a heavy burden on my time and significantly extended the data collection period. As noted in *Chapter 5*, each questionnaire took approximately one hour to administer, although this was participant dependant and the sessions frequently exceeded this. Researcher flexibility was a further measure to ensure response rates and questionnaire sessions were conducted in locations that were of convenience to the respondents, which typically was their home. As outlined in *Chapter 5*, compliance with the university's lone worker policy placed considerable additional time and logistical demands by having to be accompanied on home visits. More contentiously, the presence of an additional researcher raises the issue of biasing participant responses to a socially acceptable perceived norm. This opens debates around the role of ethics and risk assessments suffocating the scope of social science research that seeks to observe actual behaviour in the domestic environment by placing '*unnecessary and unhelpful limitations on research practice*' (Wiles *et al.* 2012, p. 2). However, the inclusion of an additional researcher in the research process was not considered to have altered participants' responses, although in this instance it placed considerable limitations on the sample size.

The broad inclusion criteria for Phase 1 of the research required that respondents be 1) aged 60+ and 2) living independently, led to data quality concerns. Although the questionnaire had been piloted prior to being conducted, during the administration process households were observed to have difficulty providing responses, particularly to practice specific and perceived risk questions. Whilst the literature supports the notion that individuals will have difficulty verbalising habitual and mundane practices (Power, 2000), the findings of Phase 2 (*Chapter 7*) provided greater understanding of why this occurred. The heterogeneity of the cohort uncovered within Phases 1 and 2, highlighted particularly for the oldest participants, lack of ability to respond was symptomatic of the lack of concurrence between best practice and their actual practice. For example, asking about the

preparation of a raw chicken was moot for many participants, who no longer handled raw chicken. Thus, it is recommended that future research take more detailed consideration of this when designing the questionnaire such that questions are more focused on cohort specific practices, rather than testing knowledge rated against best practice recommendations, which may not be relevant.

Data quality concerns could be raised due to the length of time taken to complete the questionnaire and participant fatigue. In practice, only 2 questionnaires were not used because I judged the respondents to be tiring and prematurely cut short the interview.

9.3.2 Reflections on the Empirical Qualitative Research: Phase 2

Phase 2 was an intimidating and exciting process that forced me, as a researcher, to step considerably outside my methodological comfort zone. However, as researchers we are reminded of the benefits of pragmatically choosing research methods that best suit the research questions (Mason, 2006; Brannen, 2005 and Johnson and Onwuebuozie, 2004) and think '*outside the box*' in order to '*enhance*' qualitative explanations (Mason, 2006, p.20). The reality of this is intimidating and this research presented challenges to me on a number of levels. First, it was the first study to be situated within the domestic kitchen funded by this research body, (FSA) which carried with it a certain level of expectation. Second, the theoretical framework (SPT) chosen to guide the methodological approach in Phase 2 came with no practical advice on how to conduct empirical research investigating practice (Strengers, 2009; Hargreaves, 2008). Therefore, I had to take a leap of faith and trust that the pragmatically chosen 'toolkit' of methods would deliver and be suitable for addressing the research objectives and be appropriate to the 60+ cohort. Whilst this was a daunting task, it was also exciting in that the combination of research methods used was unique to this research, and the novelty of the multi-disciplinary approach forced me to engage with different disciplinary teams. The challenges here involved developing working relationships with researchers who held different ontological perspectives and spoke different methodological

languages (Mason, 2006; Brannen, 2005). Patience on both parts was required to make this collaboration work, particularly with the use of AR(T) monitors, where the technology and the type of data generated was alien to me. This required me to give up my autonomy over certain aspects of the data analysis, therefore, my mantra for this stage of the research was trust the experts, trust the data and trust yourself.

As with some parts of Phase 1, Phase 2 was also situated in the home. This again raised logistical data collection concerns and required that I be accompanied to each data collection visit. Whilst in Phase 1, this had been negated by, where possible, scheduling visits in third party locations, in Phase 2 this was unavoidable. The sheer number of research visits required for Phase 2 meant that it was logistically impractical for a member of the supervisory team to accompany me to each data collection visit. The solution was to employ an undergraduate third year placement student to assist with the data collection. Again this mirrored the concerns highlighted in Phase 1, the inclusion of an additional researcher biasing participant behaviour (Wiles *et al.* 2012). Moreover, this logistical limitation resonated with the reluctance for funding bodies and researchers alike to cross the threshold and locate research in the domestic environment, as identified by Evans (2012). The inclusion of another researcher reduced my autonomy over the research process and again raised concerns relating to the impact of having an additional and inexperienced researcher present during data collection visits, and the effect that this could have on the behaviour of the households. Despite this, the presence of an additional researcher during the data collection in Phase 2 was not deemed to have negatively affected household behaviour.

9.3.2.1 Life-course Interviews

Conducting the narrative interviews as the first data collection method felt instinctively sensible given that they allowed me, the researcher, to '*make sense*' (Wills and Brennan, 2012, p. 6) of the food-related lives of the households and gain valuable contextual insights into how this had changed over time. Giving the

interview sequential priority over the other methods seemed rational due to the opportunity for rapport building prior to the more intrusive research methods that followed (Evans, 2012). However, in some cases, householders struggled to verbalise their relationship with food and their explanations lacked detail, particularly relating to early food experiences. Whilst the literature suggests this to be a consequence of asking householders to recall mundane practices that they probably have not considered previously (O'connell, 2012; Power, 2000), it was felt that if the interviews were conducted within the kitchens, this may have sparked thoughts, memories, facilitated discussion and acted as prompts. Moreover, if they had been conducted later in the data collection schedule, the household may have been more immersed in the process, as well as more comfortable with the researcher and therefore, may have opened up more. However, the repeated nature of the data collection meant that it was possible to probe these issues on subsequent visits; and householders found it easier to talk in more depth when prompted and around the evidence that they had initially provided.

9.3.2.2 Fridge Audit/Microbiological Testing

Prior to conducting the fieldwork, concerns were raised relating to householders wanting to present favourable representations of themselves which could bias results (Wills and Brennan, 2012; Housley and Smith, 2010). With regards to the fridge, this could have resulted in households cleaning their fridges prior to the audit. However, the assessment of the visual cleanliness was not relied upon as the sole measure of households having fridge management practices. Data was collected that related to the products contained within (UBD and BBD), shelf-positioning, microbiological sampling and fridge temperatures. In addition, the longitudinal nature of the data collection period meant that the impact of this was negated by the fact that the researcher was able to revisit the fridge over the 4-week data collection period.

The arguments for the inclusion of microbiological testing within households fridges and sink drains was a measure of the unseen condition of the fridge and assessed

the environmental potential to support the growth of *L.mono*. Microbiological sampling raised a number of specific ethical concerns, primarily relating to how a positive result should be dealt with. The results of the sampling gave no positive results for either *Listeria spp.* or *L.mono* which, although positive, highlighted issues around the inclusion of this method and the real value to the study, had it been detected. Whilst householders were happy to allow for samples to be taken and in some instances enthusiastic about knowing the results of this, on reflection this method was perhaps an indulgence that this research project could have survived without, since this approach is more suited to HACCAP style research studies. I say this for the additional reason that knowing the microbiological status of the fridge for this one pathogen, does not mean that there are not other harmful pathogens present. From a participant perspective, passing the fridge as safe in terms of listeria could have encouraged household beliefs that their fridge management practices had been given the seal of approval by an 'expert'. In reality, as with cleaning, this was only one measure of the householders' fridge management practices and did not mean that the fridge was 'safe'. Whilst, the intention of the study was to observe practice uncritically, care was taken in the presentation of the microbiological results to the households. This was to ensure that they appreciated this was only sampling for one pathogen and was by no means a comprehensive measure of the microbiological status or the safety of the fridge.

9.3.2.3 Kitchen 'go along'

The rationale for adopting this method within the kitchen context was for the ability it gave to understand the kitchen space, design and materiality from the perspective of the household. Rather than passing value judgements or steering discussion based on the researcher's assumptions of the use of the space, the purpose of this method was to allow householders the freedom to express, critique and move naturally in the space as they would in their everyday lives (Kusenbach, 2003). One of the central oversights of this research during the design stages was the gross over estimation of the amount of time and level of usage that the kitchen would receive from these households. Before entering the field, I had uncritically

accepted the notion of the kitchen being the heart of the home (Brennan and Wills 2012; Meah and Watson, 2011; Redmond and Griffith 2009a). However, the reality was that within these households the kitchen played a functional role, being used predominantly for the preparation and storage of food, concentrated into specific time periods, and little beyond this. Thus, the challenge facing the researcher was how to ensure the kitchen was given centrality within the research, particularly as it appeared the natural inclination of the households was to usher the researcher into the living room. The 'go-along' approach addressed this and provided valuable insights in all of the households. The maps of the kitchens drawn after the 'go-alongs' and the photographs taken were an invaluable aide memoire to the researcher and allowed for reflection and comparisons of the kitchens across the households to be made. They also proved to be a useful elicitation tool, which could be drawn upon to discuss the kitchen without being in the space, this was particularly valuable for the older householders who had reduced mobility and used the kitchen less frequently. On reflection, the participant-led element of this technique was best suited to younger households in the cohort who were more physically able to conduct the tour. The reality of this approach was that for the oldest households, in particular those who were restricted in terms of their mobility, this method proved too demanding. Within these households photo elicitation and stimulating discussion through the use of maps and props taken from the kitchen potentially would have generated similar insights without causing fatigue.

Following the 'go-along', households were provided with disposable cameras as a means of engaging them with the research and allowing for data to be captured between visits (O'Connell, 2012). However, consistent with the findings of the TiKL (2011) study, householders did not use these. They were happy for the researcher to take photographs but were less enthusiastic about taking them themselves. They reported not being sure of what they should be photographing and they did not want to disappoint the researcher by taking photographs that risked being irrelevant to the research. Given the findings and the reduced level of household

engagement with food provisioning, disposable cameras would not be recommended in future research with the 60+.

9.3.2.4 Food Purchase History

Given the institutionally imposed restrictions on this research (*Chapter 6*) which, as argued in Section 9.3.2 were felt to have placed limitations on the researcher, the collection of shopping receipts was a compromise that allowed for the collection of data relating to food procurement without the need for accompanied shopping visits. This gave insights into the types of food purchased, the frequency of shopping, the geographical radius within which households shopped and the types of food purchased beyond what was evident in the fridge. Moreover the approach lacked the richness of the qualitative insights that could have been generated through observation and accompanied visits. This method also gave no insight into the length of time taken to shop, the procurement challenges faced in terms of transportation to, from or within the store, nor did it allow an understanding of the length of time taken to return home, or the unpacking process. However, in defence of the purchase history method, the presence of the researcher during accompanied shopping visits may lead to householders presenting favourable representations of their shopping practices (Wills and Brennan, 2012; Housley and Smith, 2010). The method did however, serve as an elicitation tool from which issues arising could be explored in more detail within the narrative interviews. Participants did not find the task of collecting receipts onerous and were diligent in supplying these. Analysis of the receipts and narrative interviews highlighted that, particularly in younger households, shopping was conducted en-route to other activities. This approach to shopping would have made accompanied shopping visits difficult and would have required households to make changes to their normal routines. Therefore, in the context of this research this method, supplemented by a narrative interview, sufficed especially given the already heavy burden of this research on the participants.

9.3.2.5 Activity Recognition

The inclusion of activity recognition sensors was not part of the original proposal for this research and occurred serendipitously. An introduction to researchers at Newcastle University's Culture Lab where AR(T) devices were being built which provided an opportunity to obtain a '*ground truth*' of activity (Olivier *et al.* 2009), demonstrated their potential to gain an insight into activity over an extended time period, whilst not requiring the researcher to be present. As reported in *Chapter 6*, these devices have been extensively tested within laboratory environments for health and wellbeing applications. However, they had not been as extensively used within participants' homes and had not been used in a food safety context. Therefore, the inclusion of these devices presented a creative opportunity to test their suitability and potential; hence they were included on a proof of principle basis. The use of these devices presented a number of challenges as outlined in Section 9.3.2, predominantly centred on communication and trust. As with any collaboration, in the early stages there was a period of adjustment and uncertainty. I was unsure about my ability to deploy these, uneasy about the data they would generate and my ability to interpret it. Likewise the Digital Interaction Group had to test my level of competence and adjust their expectations accordingly. This relationship was not something that '*just worked*', not only did we have to test, modify and re-test the technology, we had to develop a common appreciation of each others' skills and find common ground. This required patience, understanding, appreciation and trust on both sides.

In terms of the data generated, the ability to collect activity data from key sites in the kitchen was of value in that it was possible to contrast this with the self-reported activity to cross-verify and quantify usage levels. Contrasting this data with other sources allowed me to draw conclusions in relation to the cohort's ability to self-report practice. It should be noted however, that there is potential to

refining this which would allow further exploitation of the data generation potential of these devices. This finding provides one evidence base for using AR(T)s in the domestic setting.

The location of the sensors was predefined with the choice of the fridge, kettle, cutlery draw and tap, pragmatically based on these being essential sites and appliances that a typical kitchen would contain. Although all the households had these sites and appliances, the study highlighted householders to be heavy users of microwaves and freezers, which were integral to supporting simplified food provisioning practices. In future it would be prudent to consider the household and include sensors on appliances that are heavily used, for example, following an analysis of kitchen 'go-along' data. The alternative of placing the sensors into homes prior to the main data collection would allow for baseline understandings of the household and their engagement with the space to be generated, which could be used as the basis for interviewing. However, this would require incorporating additional deployment and analysis time into the study. Further reflections on including AR(T)s within a research design includes the synchronisation of sensors with video capture that could allow for the reduction and prioritisation of video data to peak activity periods. This could be of particular benefit in multi-occupancy households with greater usage levels.

Although the inclusion of these devices increased the quality and the scope of the analysis of the fridge, it was difficult to draw substantive conclusions from the temperature data generated from them. Principally, this was owing to the sensitivity of the sensors. Initially it was thought that those used by the DIG would be adequate for this. However, the initial results led us to question this, and the heavy over-moulding of the devices was thought to be inhibiting their temperature monitoring capacity. The second-generation devices were developed to address this. However, the small sample size (10 households) and the inclusion of two different sensors within this study meant that we could not make an assessment of which device was most accurately capturing temperature. In order to do this,

further empirical work is required⁴⁹. It would also be prudent to take measurements of the ambient kitchen temperature, as this would allow for analysis of external factors such as sunlight and central heating that might impact upon the working capacity of the fridge as suggested by Hudson and Hartwell (2002).

9.3.2.6 Video Documentation

Within the literature a variety of video documentation approaches was identified with no right or wrong approach indicated (see Pink, 2001). Rather the consensus was that the equipment used should be situational and budget dependent. In light of the problems of too much data reported by Martens (2012) during her study of kitchen practice through CCTV, it was decided video documentation would be limited to meal occasions. Given the limited levels of usage of the kitchen space and low involvement in food preparation, this was appropriate for the cohort. Given the institutional limitations imposed on the research, times of visits to the respondents' homes (within working hours) and in order to avoid disruption to their normal routines, it was decided that the 'set-up and shoot' approach would be most appropriate. However, the decision to adopt this was done with limited consideration of the size of the kitchens, some of which were significantly smaller than anticipated, which made it difficult to set-up the equipment. Whilst this was not ideal, if I had filmed the participant whilst preparing food, it would have been near impossible in the smallest kitchens, and could have compromised the safety of the participant and myself. Elicitation and review of the videos with the participants was essential. This allowed for greater understanding of the visual data generated and, where the video had failed to capture action that could have been of interest, it filled in the blanks.

The approach also gave autonomy over the filming to the participants, which had mixed results. For example, all but one householder was happy to be filmed but householder confidence in using the equipment varied. Giving the participants autonomy over the filming allowed them to co-construct the video and further

⁴⁹ The AR(T) feasibility study funded by the FSA as part of the KitLife (2012) project will address this.

engage with the data collection process (Muir and Mason, 2011). However, there was the potential for householders to self-edit the data and turn off the camera when they felt there was no significant action taking place. Although it could be argued that the householders were pre-empting data of interest to the researcher, presenting the video back to the householders and giving them the opportunity to talk through blanks, was considered sufficient to negate this. The oldest households lacked the self-efficacy and mobility (for example in reaching 'up' to turn on the camera) required to use the video camera. I therefore had to be flexible in collecting video data by observing food preparation without videoing or turning on the camera for participants and collecting it the following day. Given the experience of filming within these households, future research would be advised to consider the sizes of the kitchens and the feasibility of adopting a researcher-led filming strategy when choosing equipment.

9.4 Recommendations for Further Research

The recommendations given here are to draw this research endeavour to a close and, in doing so, pave the way for future research. This thesis has provided methodological contributions to the way that we conduct research in the domestic environment and how we sensitively study the domestic food provisioning and handling practices of the 60+. This research therefore offers explanatory insights into the way that we study the food provisioning and handling practices of the 60+. Methodologically there is considerable scope for refinement of the 'toolkit' used to study practices within this cohort. The methods chosen attempted to appreciate the complexity of food provisioning in the domestic kitchen and the micro-level interactions and negotiations that take place in the domestic environment and their impact for the adoption of food safety best practice. However, understanding the broader context and competing demands on and within older households can be argued to be of significant value, not only from a food safety perspective, but to a range of stakeholders. Whilst consideration of housing design and location is a considered from a policy perspective as a primary facilitator of independence (see HAPPI report 2009), little consideration is given to the food provisioning practice

negotiations and the role the domestic kitchen plays in shaping these. This seems misdirected, given that the ability to prepare food for oneself is a significant contributory factor in life satisfaction (Dean and Raats, 2009; Fjellström, 2009) and as demonstrated, a primary marker of independence. Given the continued promotion of independent living in old age, policy makers are urged to consider these issues specifically.

This research has highlighted the importance of kitchen design in prolonging older householders' engagement with food preparation and handling. First, the size of the kitchen will dictate the ease by which they are able to move in the space, given the increased likelihood that in advancing old age householders may suffer reduced mobility, requiring walking aids; therefore the kitchen size should reflect and facilitate this. Kitchen size was also shown to inhibit the inclusion of 'standard' kitchen appliances that are fundamental to adherence to food safety best practice, particularly the inclusion of washing machines, lack of which could be considered to present cross-contamination risks. Moreover, the lack of mixer taps that allow households to control the temperature of the water, acted to discourage hand washing and presented a further cross-contamination risk. This research would advocate the inclusion of these in homes specifically designed for older adults.

Mirroring the findings of the TiKL (2011) study, work surfaces were positioned too low, forcing householders to stoop and rest on work surfaces whilst they prepared food. In addition, given the heavy reliance of these households on microwave ovens, the level of the worktop made cleaning these appliances difficult. Cupboards were shown to be too high to reach 'up' into safely, with stepladders being used, arguably presenting a falls risk. Cupboards were also shown to be too deep for households to reach into, this resulted in households leaning on cupboard doors to support themselves as they reached into the cupboards. This again arouses concern from a falls perspective and/or resulted in the household not using the space to its full potential, for example, storing infrequently used items in such cupboards. Maguire (2011) reports households to make use of carousels to make corner cupboards easier to access, however, none of the households within this

research were observed to have modified the kitchen in this way, but rather the inaccessibility of the space had acted to further prompt the practice of 'paring down'. From a housing design perspective, it is acknowledged that it is difficult and expensive to make changes to existing housing stocks, although architects, designers and housing associations designing homes specifically for older adults are urged to consider size and functionality in the kitchen design of these homes.

Turning attention to the appliances within the kitchen, as had been cited by previous research (Hudson and Hartwell, 2002; and Johnson *et al.* 1998), the fridge was shown to be a site for considerable deviation from best practice recommendations. Lack of knowledge of the correct/safe fridge temperatures was demonstrated, even in households that knew this, fridge temperatures were shown to exceed the 0-5°C 'safe' bounds. Fundamental to this was the lack of clarity on how the fridge temperature controls operated, and the how the fridge number settings corresponded to actual temperature. Taking a SPT perspective, a top-down approach to change is considered to assist in achieving sustained behaviour change (Shove, Pantzar and Watson, 2012; Birtchnell, 2012). Therefore, the findings of this research would argue that greater accountability from fridge manufacturers is required, making it clearer to consumers how they can monitor the temperature of their fridges without being required to purchase additional *stuff* (thermometers). In sheltered accommodation homes, the householders were shown to inherit fridges when they moved in, thus there was no record of the age of the fridge and they were assumed to '*just work*'. A recommendation in this regard would be for sheltered housing accommodation managers to check fridge operating capacities and/or monitor temperature, particularly if appliances are to be inherited and/or consider providing residents with a fridge cleaning service, as this was infrequently conducted.

Given the lack of empirical research conducted to date in this area, this research has succeeded in opening the kitchen door and provided insights beyond this threshold. Methodologically there are a number of contributions that this research makes. It is to date, the first piece of microbiological food safety research to be

situated in the homes of the 60+, that used a diverse and novel ensemble of methods to objectively and sensitively observe practice, which can be regarded as a significant contribution to the body of research on mixed methods. Moreover, it further contributes to the expanding array of empirical examples of SPT.

Empirically this research contributes to the literature relating to the older consumer, in particular, the central contribution is the concept of *'Independence Transitioning'* provides insights into what motivates older consumers to remain independent. The strategies that the 60+ adopt in response to the changes experienced as part of the *'Independence Transitioning'* process has implications for the way that food is provisioning and for the cohorts engagement with food safety best practice. Beyond the contributions made from a marketing perspective, this research further contributes to our understanding of and how independent living can be facilitated in the 60+, which is a paramount concern for both government policy makers and within public health. However, as recognised by Glaser and Strauss (1967), inductively derived theories have the capacity to develop and in order to further substantiate this, further empirical work is required to test this concept. In addition, this research has uncovered a number of avenues that, although beyond its scope, warrant consideration. Examples of future empirical research opportunities could include:

- Consideration of those residing in sheltered housing. This sub-group was highlighted to be a 'high-risk' group and whilst reported to have strong adherence to food safety best practice recommendations, their lack of involvement in the food provisioning process and reliance on others to undertake this activity compounded their risk. Future research would be advised to consider this cohort and the range of stakeholders involved in their food provisioning process.
- Phase 1 identified that Clusters 2 and 3 dismissed food manufacturers UDB and BBDs. Future research might consider more closely the activities associated with the consumption of foods beyond these dates, and the

journey of RTE foods within the household, to assess their microbiological quality.

- This research has identified food provisioning practice to be a hierarchical process. Central to this was the notion that there is movement of practitioners both into and out of the practice (their life-cycle within the practice). Future research might observe the extent to which these findings translate to other societal groups that may be entering the practice and also demonstrate simplified cooking practices (for example: young households, students and professionals).
- Cohabiting households were shown to contain differences in attitudes and behaviours towards domestic food safety best practice. Future research should consider the micro-social dynamics within the household and the impact of this upon food safety in the home.

9.5 Afterword

The opportunity to research the older food consumer has been hugely rewarding, not least in that it has opened my eyes to the richness of the lives and experiences of older people, the heterogeneity of which is too often overlooked or drowned out by debates of the nation's ability to cope with ageing populations and the dependency burden this creates. This research has taught me the value and virtues of interdisciplinary cross-collaborative working and the wealth of methodological possibilities that are available that will help to address the impasses reached in understanding what people do and why. Widening the scope of research to consider the context in which lives are lived can provide a more nuanced understanding of consumer behaviour, with the *proviso* that we are willing to take a leap of faith and step outside the confines of our disciplinary and ontological boxes. This is something that I am now committed to and will endeavour to practise in my future academic research.

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Appendices

Appendix 1: European food safety surveillance context

Globally, a range of approaches has been taken in the surveillance of foodborne disease; these were comprehensively reviewed by Flint *et al.* (2005). Monitoring of food safety is not unique to the UK and many countries have established bodies for the monitoring, controlling and communicating of food related risks. Such authorities include, the aforementioned FSA in the UK, the Food Safety Authority of Ireland, the French agency AFSSA, and German authority BVL and the American Food and Drug Administration FDA. Specifically within the EU, a number of policy initiatives recognised the need for a robust and reliable system for the surveillance and capture of communicable data. In 1998, the European Parliament passed a decision to establish a network for surveillance and control of communicable disease at the community level, in order to co-ordinate data from member states (Decision 2119/98/EC, OJL 268, 3.10.1998, p.1). In the UK the directive (2119/98/EC) saw the newly formed FSA, identify microbial threats as one of their key concerns (FSA, 2001) and in response the agency created the Foodborne Disease Strategy Group (FDSG) who were tasked with delivering the agencies 2000-2005 strategy (Brennan 2010). From its inception the agency set out the strategic goal of reducing the instance of foodborne disease in the UK by 20% (FSA, 2010). In parallel similar developments and acknowledgements of the need for surveillance networks were being made in the US motivated primarily by the Centre for Disease Control (CDC). Surveillance at the EU community level was slower to emerge, however, the directive lead to the establishment of the European Food Safety Authority (EFSA) in 2002. The EU Taskforce on Zoonoses Data Collection was set up in 2007 and were tasked with creating a set of unified reporting guidelines for foodborne outbreaks and required by EFSA to undertake the analysis of all collected data and to publish annual community summary reports on foodborne outbreaks. Whilst data contribution is not obligatory, the collation, and dissemination, of the food safety data received from primarily EU nations, is the

responsibility of EFSA. In total three annual reports have been published (EFSA, 2009, EFSA, 2010 and EFSA 2012) with their most recent report '*The European Union Summary Report on Trends and Sources of Zoonoses, Zoonotic Agents and foodborne Outbreaks 2010*' published in 2012 and in which data is reported for 27 member and four non-members states (EFSA, 2012).

Using data reported from EFSA allows for cases across member states to be compared and foodborne disease rates to be gauged at a pan European level. Whilst it must be acknowledged that with regards to reporting some level of variation exists across countries and for some countries mandatory reporting of cases is not enforced (most notably Portugal) (EFSA, 2010). Key conclusions drawn from the 2012 report highlighted that, cases of *Sallmonellosis* have decreased for the sixth consecutive year, whilst the incidence of *Campylobacter* had increased and *Campylobacter* was the most commonly reported zoonotic disease in humans with 212,064 confirmed cases (EFSA, 2012).

The FSA takes the lead in investigating accidental and deliberate incidents of food contamination that can lead to human illness in the UK. In 2008, 1,298 incidents were investigated. When established the FSA held responsibility for Scotland and Northern Ireland, however, their remit now only included England and Wales. This accounts for the historical variance in the data reported. Between 2000 and 2006 there was an increase in incidents recorded and investigated as a consequence of legislative changes, a wider definition of incidents and increased reporting (FSA, 2010). Table 1 presents the main categories of incidence investigated by the FSA and the percentage of total incidents associated with each (FSA, 2010). In addition to the incidents reported here, there was one high level case involving salmonella in eggs from a specific supplier in Spain.

Table 1: Incidents Categories

Cause	% Cases Attributable
Microbiological incidents	18%
Chapter 575 Environmental contamination (fires, spills and leaks)	Chapter 576 17%
Chapter 577 Natural chemical contamination (mycotoxins, algal toxins and others)	Chapter 578 12%
Chapter 579 On-farm incidents	Chapter 580 12%

(Source: FSA, 2010)

Table 1 illustrates that food may become contaminated at any point within the food chain, although microbiological contamination accounts for the highest percentage of incidences investigated by the FSA in 2009 and reported in 2010. While the FSA has overall responsibility for food safety, they work closely with a number of other key partners and agencies from local authorities, health services and infectious disease control partners to deliver this. At a manufacturing and retail level regulatory control of commercial food premises in the UK rests with local authorities. Primary Care Trusts (PCT) are expected to take the lead public health role in dealing with illness associated with foodborne disease. Incidence levels are approximate, as surveillance relies upon a number of factors including: patient reporting, medical confirmation, stool sampling and verification. Consequently laboratory-confirmed cases are considered to be the most robust indicator of trends over time (FSA, 2007).

As a major part of the FSA efforts to monitor and reduce the incidences of foodborne disease the FSA has funded two waves of Intestinal Infectious Disease Studies (IID), IID1 (2000) and IID2 (2011) to collate data from across key agencies and partners. The studies sought to estimate the overall incidence levels of IID caused by organisms in the community, which presented to GP surgeries and were reported through the national surveillance system (IID2, 2011). In 2000, it was reported that 9.4 million cases of IID annually of which 1.3 million cases of IID were attributable to foodborne disease. Thus foodborne disease was estimated to account for approximately 14% of total IID cases (Brennan, 2010; IID1, 2000).

Results of the 2012 study estimated 17 million sporadic community cases of IID of which one million sought consultation from a GP. No estimate for the proportion attributable to foodborne disease was provided in the 2012 study. Norovirus was found to be the most commonly presenting pathogen, responsible for 3 million cases of IID annually, and 130,000 GP consultations. *Campylobacter* was also found to be a considerable burden, responsible for 500,000 community cases, with 80,000 cases presenting at the GP (IID2, 2011). It appears that between the first and second waves of the IID study the number of cases of IID has risen sharply, IID2 reporting between 2008-2009 it to be 43% higher than the figures estimated by IID1, between 1993-1996 (IID2, 2011). However, the two studies are not strictly comparable as IID1 collated data only from England and Wales, whereas IID2 included Scotland and Northern Ireland and it has not been possible to remove the Scottish and Northern Irish data in order to undertake an English/Welsh comparison between IID1 and 2 (FSA, 2011).

Concerns have been raised as to the reliability of the statutory reporting system, and while it provides a reasonable indicator of the total numbers of incidences, it may greatly underestimate the actual number of cases seen by medical practitioners. Comparison of IID rates reported to the national surveillance with those in the community, highlights this, calculated based on the IID1 data a ratio of 1:88 was observed, thus for every one case recorded in the national surveillance system, 88 community cases went unrecorded. For *campylobacter*'s this ratio was 1:10, and for salmonellas this was 1:4. Improvements in diagnostics for viruses allowed the figures and for norovirus to be recalculated for the same period and estimated it to be approximately 1:1000 (IID2, 2011). Moreover, consensus within the literature highlights that this is especially considered to be the case where the domestic kitchen is at the source of contamination (Milton and Mullan, 2010; Jackson *et al.* 2007, Hanson and Benedict, 2002, Kendall, Hilliers and Medeiros, 2006, McCabe-Sellers and Beattie, 2004 and Hilton and Austin, 2000) and for particular pathogens such as *campylobacter* and norovirus where for the majority the symptoms are considered not severe enough to warrant seeking medical attention. Lack of regulation beyond purchase, reliance on consumer knowledge

and their own reporting of instances contribute significantly to the lack of clarity and reliability of reporting systems and case calculations (considered in more detail in section 2.5) (Unusan, 2007). This problem is compounded further, by doctors who may not attribute illness to foodborne disease, or simply may not notify, and may fail to recognise emerging pathogens (McCabe-Sellers and Beattie, 2004; FSA, 2000).

Post Code
Identification

Appendix 2: Phase 1 Questionnaire



Food Provisioning and the Domestic Food Hygiene Practices of the Over 60s in the North East of England

Introduction

Good morning/afternoon/ evening, my name is Helen Kendall; I am a PhD research student at Newcastle University. I am currently conducting a survey looking at the food buying and storing habits and the domestic food hygiene practices of the over 60s in the North East of England on behalf of the Food Standards Agency. I would be very grateful for your time and help in answering some questions.

The purpose of this questionnaire is to build up a detailed picture of the daily experiences of adults over the age of 60 in the North East of England, specifically relating to their attitudes and behaviours towards food. The information that you provide will be strictly confidential and remain for use only by the University.

Procedure

The questions will be read aloud to you and you may take as much time as you need to express your answers. The administration process of the questionnaire will be recorded; the recording will remain confidential and for use only by the University. Participation in this research is voluntary and if at any point you wish to withdraw you may feel free to do so without prejudice.

Declaration

Please sign and date below to give your consent to participate in this part of the research study and to accept that you understand the nature of the study and any information you provide will be kept in the strictest confidence and answers given used only by Newcastle University.

Signed-----Date -----

Screening Questions:

1. How old are you? (in years)-----

2. Are you living independently? (not in residential care) Yes No

YOU AND YOUR HOUSEHOLD

Initially I would like to understand a little bit about you and your household.

YOU

1. Gender: Please select one

Male

Female

What is your current marital status?

2. **Current Marital Status:** *Please tick all that apply.*

- | | | | |
|-------------------|--------------------------|---------------------|--------------------------|
| Single | <input type="checkbox"/> | Married | <input type="checkbox"/> |
| Civil Partnership | <input type="checkbox"/> | Divorced | <input type="checkbox"/> |
| Widowed | <input type="checkbox"/> | Living with partner | <input type="checkbox"/> |
| Separated | <input type="checkbox"/> | | |

Other please state -----

3. **Which would best describe your current living arrangements? Do you...** *Please tick*

*only **one** box, if you have chosen rent options please answer question 4.*

- | | |
|--|--------------------------|
| Own your property out right | <input type="checkbox"/> |
| Own your property with a mortgage or loan | <input type="checkbox"/> |
| Pay part rent and part mortgage (Shared ownership) | <input type="checkbox"/> |
| Rent your property | <input type="checkbox"/> |
| Live in home rent free | <input type="checkbox"/> |

Other please state -----

4. **Who is your landlord?** *Please select **one** of the following options.*

- | | |
|--|--------------------------|
| Council (local authority) | <input type="checkbox"/> |
| Housing Association, Housing Co-operative,
Charitable Trust, Registered Social Landlord
Private Landlord or letting Agency | <input type="checkbox"/> |
| Employer of household member | <input type="checkbox"/> |
| Relative or Friend of a household member | <input type="checkbox"/> |

Other please state-----

5. Approximately how many years have you lived in your current home? -----

To understand a little bit about how you travel are you able to drive?

6. Do you hold a current driving licence? (If **no** please go to question 9)

Yes No

7. Do you have access to a car or van that you are insured to drive?

Yes No

8. How often do you drive? Please select **one** option.

Everyday	<input type="checkbox"/>	More than once a week	<input type="checkbox"/>
Once a Week	<input type="checkbox"/>	Once a fortnight	<input type="checkbox"/>
Once a month	<input type="checkbox"/>	Less often than once a month	<input type="checkbox"/>

YOUR HOUSEHOLD

We have talked a little bit about you and your current living situation; I would now like to understand a little bit more about your home environment and find out whom, if anyone, you share your home with.

9. How many people, other than yourself live in your home? -----

10. How old are they? -----

Please write in numbers the age of **each** household member that you have identified in the table below.

11. Are they male or female? Please write either male or female in the box for **each** household member identified.

12. What is their relationship to you? Each relationship type has been assigned a number, please use the number that best describes **each** household member and place it in the table below.

Employment type	Number
Employed full-time	1
Employed part-time	2
Self employed	3
Unemployed	4
Retired	5
Child under 16	6

13. In the table below please indicate which employment status best describes each member of your household. *Each employment status has been assigned a number, please use the number that best describes **each** household member and place it the table below.*

14. Can they drive? *Using yes or no, please indicate for **each** household member in the table below.*

15. Do they contribute financially to the household? *Using yes or no, please indicate for **each** household member in the table below.*

	HH:0	HH:1	HH:2	HH:3	HH:4	HH:5	HH:6	HH:7
10. How old are they? <i>(please write age in Years)</i>	i.e. 76							
11. Are they male or female? <i>(Please write M or F)</i>	M							
12. What is their relationship to you?	Husband							
13. Employment Status	Retired							
14. Can they drive? <i>(please indicate either yes or no)</i>	Yes							
15. Do they make a Financial contribution to your household? <i>(Please write yes or no)</i>	Yes							

16. Do you have any pets? *(if no please go to question 19)*

Yes No

17. Does your pet live inside your house? Yes No

18. Where do you feed your pet? *Please write your answer in the space provided*

WIDER FAMILY NETWORKS

Now that we have considered you and your immediate household I would like to get a feel for your wider family networks.

19. Do you have children? (If **no** please go to question 27)

Yes No

20. How many children do you have? -----

21. Do you have any grandchildren? (if **no** please go to question 24)

Yes No

22. How many Grandchildren do you have? -----

23. Do you ever have childcare responsibilities for your grandchildren?

Yes No

24. How often do you have contact with your children? Including; face to face, telephone, email, skype, text.

Everyday	<input type="checkbox"/>	More than once a week	<input type="checkbox"/>
Once a Week	<input type="checkbox"/>	Once a fortnight	<input type="checkbox"/>
Once a month	<input type="checkbox"/>	Less often than once a month	<input type="checkbox"/>

I would like to understand if your children help you with any everyday tasks, and vice versa if you may support them with any everyday tasks.

25. Do your children help you to do any of the following everyday tasks? Please

indicate by placing a cross in the box corresponding to each of the children that you have indicated in question 20 and the task that **they** do for you.

Child	1.Cooking (food preparation)	2. Shopping (food shopping)	3. Housework (Cleaning)	4.Transport (to food shops)
C:1				
C:2				
C:3				
C:4				
C:5				

26. Do you help your children with any of the following everyday tasks? Please

indicate by placing a cross in the box corresponding to each of the children

*that you have indicated in question 20 and the task that **you** do for them.*

Child	1.Cooking (food preparation)	2. Shopping (food shopping)	3. Housework (Cleaning)	4.Transport (to food shops)
C:1				
C:2				
C:3				
C:4				
C:5				

We have talked about you as a parent; I would also like to understand a little about your parents.

27. Are your parents still living? (If **no** please go to question 30)

Yes

No

Question	Mother	Father
28. How old are they? (approximately in years)		
29. Do you have a caring role for them? (y=yes n=no)		

30. How often do you have contact with them? Including; face to face, telephone, email, Skype, text, please select **one** option.

Everyday More than once a week

Once a Week Once a fortnight

Once a month Less often than once a month

31. Do you help your parents with any everyday tasks? Please place a cross in the corresponding box for the task that **you** would do for them.

Parent	1.Cooking (food preparation)	2. Shopping (food shopping)	3. Housework (Cleaning)	4.Transport (to food shops)
Mother				
Father				

WIDER SUPPORT NETWORKS

32. Is there anyone else that you have not mentioned that supports you, such as friends, wider family – niece, nephews, neighbours and support workers? (If you have answered *no* please go to question 38).

Yes – not currently but can call on if needed

Yes

No

33. How many people would you consider as providing support to you? Please write the number of people in the space provided.

Question	Support Network: 1	Support Network: 2	Support Network: 3	Support Network: 4	Support Network: 5	Support Network: 6
34. What is their relationship to you?						
35. Do you have a caring role for them? (y=yes and n=no)						

I would like to understand if any of the individuals you have identified as being in your wider support network would help you with any of the following everyday tasks.

36. Do they help you with any of the following everyday tasks? Please indicate by placing a cross in the corresponding box for the task that *they* do for you.

Wider Support network (SN)	1.Cooking (food preparation)	2. Shopping (food shopping)	3. Housework (Cleaning)	4.Transport (to food shops)
SN:1				
SN:2				
SN:3				
SN:4				
SN:5				
SN:6				

37. Do you help them with any of the following everyday tasks? Please indicate by placing a cross in the corresponding box for the tasks that *you* do for them.

Wider Support network (SN)	1.Cooking (food preparation)	2. Shopping (food shopping)	3. Housework (Cleaning)	4.Transport (to food shops)
SN:1				
SN:2				
SN:3				
SN:4				
SN:5				
SN:6				

RETIREMENT

Having considered you, your household and your wider family networks, I would like to understand a little bit about your current work status.

38. Do you consider yourself to be retired? *(If you have answered yes Please go to question 42)* **Yes** **No**

You have indicated that you are not retired can I ask you what it is your current occupation?

39. How would you describe your current occupation? *Please write your answer in the space provided.* -----

40. Please indicate when, if ever, do you plan on retiring? *Please write your answer in the space provided.*

41. What type of retirement do you see for yourself? *Please place a cross in the answer that best suits your current plans, please then go to question 45.*

Semi-retirement **Full-retirement**

I would like to understand your current situation...

42. What type of retirement best describes your situation?: *you may select more than one option: for example you may be fully-retired but do voluntary work or are studying.*

Semi- retired

Fully-retired

Retired from original job but working new job full-time (Paid)

Retired from original job but working part-time (Paid)

Student

Volunteer (unpaid)

Unemployed

Other please state-----

43. How would you describe your occupation prior to retirement? *(housewife included)*

I would like to understand which of the following statements best describes the reasons for your retirement? Again it may be that more than one of the options fits your situation best and you may select more than one.

44. Please select your reason for retiring: *select all that apply.*

- | | | | |
|----------------------------------|--------------------------|---------------------------------|--------------------------|
| Reached statutory retirement age | <input type="checkbox"/> | Completed full years of service | <input type="checkbox"/> |
| (Job requirement) | <input type="checkbox"/> | Ill health of family member | <input type="checkbox"/> |
| Ill health (Personal) | <input type="checkbox"/> | Early retirement | <input type="checkbox"/> |
| Forced retirement | <input type="checkbox"/> | Redundancy | <input type="checkbox"/> |

Other please state-----

LIVING (£)

I would now like to broadly understand the nature of the income sources you rely upon. From the list below please indicate which best describe your situation. You may receive a combination of these so you may select more than one option.

45. Please indicate from the list below the sources of income you rely upon: *select all that apply.*

- | | | | |
|-----------------------------|--------------------------|---------------------------|--------------------------|
| State Pension | <input type="checkbox"/> | Savings | <input type="checkbox"/> |
| Private Pension | <input type="checkbox"/> | Financial Assistance from | <input type="checkbox"/> |
| Family Occupational Pension | <input type="checkbox"/> | Equity Release | <input type="checkbox"/> |
| Investments | <input type="checkbox"/> | Salary | <input type="checkbox"/> |

Other please state-----

46. Which yearly income bracket best reflects your yearly household income?

*Please select **one** answer.*

£5, 000- 9, 999	<input type="checkbox"/>	£30, 000-39,999	<input type="checkbox"/>
£10, 000- 19,999	<input type="checkbox"/>	£40, 000- 49,999	<input type="checkbox"/>
£20,000- 29,999	<input type="checkbox"/>	£50, 000 +	<input type="checkbox"/>
Don't Know	<input type="checkbox"/>		

In addition to the options you have selected, do you receive any other form of living allowance?

47. In addition to the income sources you have indicated above do you receive any form of living allowances? Please select all that apply.

Disability allowance	<input type="checkbox"/>	Attendance allowance	<input type="checkbox"/>
Housing Benefit	<input type="checkbox"/>	Council tax benefit	<input type="checkbox"/>
Winter fuel allowance	<input type="checkbox"/>		

Other Please State -----

HEALTH AND SELF PERCEPTIONS

I know how old you have already told me that you are but...

48. How old do you feel? (in years)-----

49. Which of the following would you use to best describe your health status? *Please*

select one option.

- | | | | |
|-----------|--------------------------|-----------|--------------------------|
| Excellent | <input type="checkbox"/> | Very good | <input type="checkbox"/> |
| Good | <input type="checkbox"/> | Fair | <input type="checkbox"/> |
| Poor | <input type="checkbox"/> | | |

Other please state-----

50. Do you smoke?

- | | | | |
|--------------------------|-----|--------------------------|----|
| <input type="checkbox"/> | Yes | <input type="checkbox"/> | No |
|--------------------------|-----|--------------------------|----|

51. On average how many units of alcohol would you consume each week?

(For reference one small (125 ml) glass of wine is equal to 1.5 units) Please

write your answer in the space provided.

I would like to understand a little bit more about the conditions that you may suffer from and how these affect your everyday life, I am going to list a number of medical conditions and I would like you to tell me which if any you have suffered from. If you have not suffered from any of these conditions please go to question 56.

Condition	52. Which of the following conditions have you been treated for? (please tick all that apply)	53. On a scale of 1-5 how does the condition affect your daily life? (1= severely 5= not at all)	54. Do you take prescribed medication for this condition? (y=yes, n=no)	55. Do you get support for this condition? (y=yes, n=no)
Arthritis				
Osteoporosis				
Chronic Heart Condition(CHD)				
Diabetes type 1 & 2				
Cancer				
Parkinson's				
Dementia				
Alzheimer's				
COPD (Chronic, Obstructive Pulmonary Disease)				
Asthma				
Acid reflux related illnesses (ulcers, heartburn)				

Condition	Which of the following conditions have you been treated for? (please tick all that apply)	On a scale of 1-5 how does the condition affect your daily life? (1= severely 5= not at all)	Do you take prescribed medication for this condition? (y=yes, n=no)	Do you get support for this condition? (y=yes, n=no)
Bowel related disorders				
Visual impairment (cataracts, glaucoma etc...)				

LEISURE, TRAVEL AND TECHNOLOGY

I would like to understand a little more about your everyday leisure activities; on a daily basis do you partake in any of the following?

56. Do you partake in any leisure and/ or social activities outside of the home?

(If no please go to question 59)

Yes No

57. Please rank the three main leisure and /or social activities that you partake in

1.

2.

3.

58. How often would you partake in the activities you have indicated? Please

write the activities that you have indicated in order and for each tick the amount that you would engage with the activity stated.

Activity	Everyday	Once a week	Once a month	More than once a week	Once a fortnight	Less than once a month
1.						
2.						
3.						

I would now like to understand some of your attitudes and opinions relating to how you spend your leisure time and your attitude towards travelling, I would now like you to rate the following statements, 1 = strongly disagree and 5= strongly agree by circling the answer that best reflects your view.

Statement	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
59. I go on holiday as often as I can	1	2	3	4	5
60. Since I have turned 60 I have travelled more often	1	2	3	4	5
61. I regularly use microwave when preparing food at home	1	2	3	4	5
62. I travel abroad on holiday	1	2	3	4	5
63. I regularly use the internet	1	2	3	4	5
64. I regularly use technology in my kitchen (food Processors etc...)	1	2	3	4	5
65. I order food shopping using the internet	1	2	3	4	5
66. I enjoy socialising with friends	1	2	3	4	5

FOOD AND FOOD SAFETY

Thank you for providing me with the information relating to you and your everyday lifestyle, I would now like to ask you some questions about you and your relationship with food more specifically your attitudes towards food and food safety. I would like you rate the following statements from 1= strongly disagree to 5= strongly agree.

To what extent do you agree with the following statements? 1= strongly disagree 5= strongly agree, please answer by circling the number that best reflects your view.

Statement	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
67. I often feel lonely	1	2	3	4	5
68. I am the only person that purchases the food that I eat	1	2	3	4	5
69. I don't enjoy eating as much as I used too	1	2	3	4	5
70. I find it easy to get to the shops in my area	1	2	3	4	5
71. I prefer to shop for food as and when I need it	1	2	3	4	5
72. I only purchase the food I eat from supermarkets	1	2	3	4	5
73. I like to experiment with new recipes	1	2	3	4	5
74. I enjoy cooking and preparing food	1	2	3	4	5
75. I am the only person that prepares the food that I eat	1	2	3	4	5

Continued overleaf...

Statement	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
76. Shopping for food is a social activity	1	2	3	4	5
77. For me socialising often involves food	1	2	3	4	5
78. I prefer to cook meals from scratch	1	2	3	4	5
79. I often eat alone	1	2	3	4	5
80. I eat out often	1	2	3	4	5
81. I see food as fuel rather than something that I enjoy	1	2	3	4	5
82. I usually eat meals that do not require cooking	1	2	3	4	5
83. I shop for food once a week	1	2	3	4	5
84. I see cooking as a means to an end, and not something I enjoy doing	1	2	3	4	5
85. I enjoy eating out	1	2	3	4	5
86. I purchase ready made meals for convenience	1	2	3	4	5

87. Do you have any dietary preferences? (including religious, vegetarian, vegan etc..)

88. Do you eat any of the following foods? (please select all that apply).

- | | | | |
|----------------------------------|--------------------------|-------------------------------------|--------------------------|
| Pate | <input type="checkbox"/> | Sliced Meat | <input type="checkbox"/> |
| Bagged Salad | <input type="checkbox"/> | Soft Cheeses (Brie, Camembert etc.) | <input type="checkbox"/> |
| Smoked Fish (Salmon, Trout etc.) | <input type="checkbox"/> | Coleslaw | <input type="checkbox"/> |
| Pre- made Sandwiches | <input type="checkbox"/> | Dips (Hummus, Taramasalta) | <input type="checkbox"/> |
| Pre-cut fruit | <input type="checkbox"/> | | |

89. Do you purchase any of products selected above from delicatessen counters?

Yes No

90. Do you have an allotment or grow any of your own food?

Yes No

91. Do you have continuous hot water available in your kitchen?

Yes No

92. On average how long is it usually between purchase and unpacking of your shopping at home? In approximate hours please write your answer in the space provided.

I would now like to understand a little more about your opinions of food safety.

93. How safe do you consider the food from the following outlets to be? Please

indicate by circling the number that would best suit your view for each of the listed food suppliers, where 1= extremely unsafe and 5= extremely safe and 6 = you have not heard of this before.

Food Supply	Extremely Unsafe	Unsafe	Neither	Safe	Extremely Safe
Supermarkets	1	2	3	4	5
Fast food outlets (McDonalds, KFC,	1	2	3	4	5
Hospitals	1	2	3	4	5
Italian restaurants	1	2	3	4	5
Indian restaurant	1	2	3	4	5
Chinese restaurant	1	2	3	4	5
Pubs	1	2	3	4	5
Other restaurants (Any you may visit)	1	2	3	4	5
Your Home	1	2	3	4	5
Small Shops (deli's, farm shops, butchers etc...)	1	2	3	4	5
Caterers	1	2	3	4	5
Private Members clubs (Golf, Rugby, Football, Tennis, Bowls	1	2	3	4	5
Working men's clubs	1	2	3	4	5

I would now like to know your opinion of how likely the following are to cause illness

94. How likely are the following to cause you to become ill? Please indicate by circling

the number that best suits your opinion with 1 = extremely unlikely and 5 =

Extremely likely and 6= I have not heard of this before.

Causes of illness	Extremely Unlikely	Unlikely	Neither	Likely	Extremely Likely	I have not heard of this before
Food additives	1	2	3	4	5	6
<i>Salmonella</i> bacteria	1	2	3	4	5	6
High salt concentrations in food	1	2	3	4	5	6
Re-heating food at home	1	2	3	4	5	6
<i>Campylobacter</i> bacteria	1	2	3	4	5	6
BSE in Beef	1	2	3	4	5	6
<i>E.coli</i> bacteria	1	2	3	4	5	6
Saturated fats in foods	1	2	3	4	5	6
Eating Genetically Modified (GM) foods	1	2	3	4	5	6
Having an unhealthy diet	1	2	3	4	5	6
<i>Listeria</i> bacteria	1	2	3	4	5	6
Antibiotic residues in food	1	2	3	4	5	6
Viruses in foods	1	2	3	4	5	6
Food handling practices of retailers	1	2	3	4	5	6

Continues overleaf...

Causes of illness	Extremely Unlikely	Unlikely	Neither	Likely	Extremely Likely	I have not heard of this before
Your own food handling practices in the home	1	2	3	4	5	6
Hormone residues in foods	1	2	3	4	5	6
Pesticide residues in food	1	2	3	4	5	6
Mould on food	1	2	3	4	5	6
Probiotics in foods	1	2	3	4	5	6
Organic Food	1	2	3	4	5	6

95. How often do you suffer from stomach bugs? *Please select one answer*

Never Occasionally

Regularly Often

96. In the last five years have you suffered from food poisoning? *(if no please go to question 100)*

Yes No

97. In the last five years how many times have you suffered from food poisoning?

In any of the situations you have indicated above...

98. Did you go to a doctor?

Yes No Don't Know

99. What was the organism that caused the food poisoning? -----

100. Did this occur in the UK or abroad? (Please state where)-----

101. What was the source of contamination? -----

102. Do you have a dishwasher in your home?

Yes No

I would now like to think about food preparation and whether you think the following statement are correct (yes) or incorrect (no). Please indicate the answer to the following statements by ticking the most appropriate box.

103. Is it safe to defrost raw meat:	Yes	No	D/K
In the refrigerator			
On the kitchen counter			
In the microwave			
Under running water			

104. Chicken is only safe to cook:	Yes	No	D/K
After being washed with boiling water			
Straight from the packet			
After being washed with cold water			

105. After preparing raw meat on a chopping board is it safe to clean the board and utensils by:	Yes	No	D/K
Wiping them with a cloth			
Washing them in cold water			
Washing them in warm water			
Washing them with soap and warm water			
Wiping them with kitchen towel			

106. When preparing a meal that involves both raw meat and vegetables is it safe to:	Yes	No	D/K
Use the same chopping boards			
Use individual chopping boards			
Doesn't matter			

107. When you defrost and refrigerate food is it safe to eat	Yes	No	D/K
Within 24 hours			
Within 48 hours			
Within 72 hours			

108. How can you tell when your meat is properly cooked?	Yes	No	D/K
The juices run clear			
It looks cooked			
Using an internal temperature thermometer			

109. After handling raw meat is it acceptable to clean your hands by?	Yes	No	D/K
Wiping them with a cloth			
Washing them in cold water			
Washing them in warm water			
Washing them with soap and warm water			
Wiping them with kitchen towel			

110. In the fridge, is it safe to store raw meat on the:	Yes	No	D/K
Top shelf			
Middle shelves			
Lower shelves			

111. Your fridge temperature	Yes	No	D/K
Should be kept between 0-5 degrees			
Should be kept below 0 degrees			
Should be kept between 5-10 degrees			
Doesn't matter			

112. You are preparing your vegetables is it safe to eat them	Yes	No	D/K
As purchased			
Once washed under running water			
Once the skin is peeled off			
As per the instructions on the packet			

113. You have just cooked a chicken and have some leftover is it safe to:	Yes	No	D/K
Put it in the fridge whilst still hot			
Cover it and place it in a cool place for 1-1.5 hours then put it in the fridge			
Turn off the oven and leave the chicken there for 1-1.5 hours then put it in the fridge			
Cover it, leave it to cool overnight on the kitchen counter then put it in the fridge			

114. You still have some cooked food left over in the fridge is it safe to eat after	Yes	No	D/K
Two days			
Three days			
Four days			

115. Eating food that has past its use-by dates is safe for	Yes	No	D/K
Never safe			
One day			
Two days			
Three days			

To what extent do you agree or disagree with the following statements? where 1=strongly disagree, 5=strongly agree, please circle the answer that best reflects your view.

Statement	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
116. I rely on how food looks as an indicator of freshness	1	2	3	4	5
117. I would eat cheese that has past its 'use-by' date	1	2	3	4	5
118. I don't like to waste food	1	2	3	4	5
119. I would use raw meat that had past its 'use-by' date in cooking a meal	1	2	3	4	5
120. I rely on a foods 'use-by' date as an indication of freshness	1	2	3	4	5
121. I rely on the smell of food as an indicator of freshness	1	2	3	4	5
122. I would eat cooked meats that have past their 'use-by' date	1	2	3	4	5
123. I often cook using leftover foods	1	2	3	4	5

Statement	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
124. In order not to waste food I will eat food that has gone past its 'use-by' date	1	2	3	4	5
125. I find 'use-by' dates difficult to read	1	2	3	4	5
126. I consider the food I eat at home to be safer than any that I could eat outside the home	1	2	3	4	5
127. There is no difference between 'use-by' and 'best-before' dates	1	2	3	4	5
128. I do not check the 'use-by' dates on foods I eat from my fridge	1	2	3	4	5
129. I would use milk that had past its 'use-by' date	1	2	3	4	5
130. 'Use-by' dates are set by food manufactures to cover their own backs	1	2	3	4	5
131. The food I eat at home is safer than any I could eat in a restaurant	1	2	3	4	5
132. Food manufacturers build in 'extra time' when setting 'use-by' dates, and therefore, it is ok to eat food after the 'use-by' date has past	1	2	3	4	5
133. I would use disinfectants	1	2	3	4	5

when cleaning surfaces in my kitchen					
---	--	--	--	--	--

Thank you for your time

**Part Two of this research is an ethnographic study which will involve
accompanied shopping trips and household observation.**

**Please indicate below if you would like to be contacted with view to participating
further in this study or if you require further information. You will then be
contacted shortly.**

Your continued help would be very greatly appreciated.

YES I AGREE TO PARTICPATE IN THE REMAINDER OF THE STUDY

I WOULD FIRST LIKE MORE INFORMATION BEFORE COMMITTING

UNFORTUNATELY I CANNOT PARTICIPATE IN THE REMAINDER OF THE STUDY

IF YES OR FOR FURTHER INFORMATION:

MY CONTACT DETAILS ARE:

Address: -----

Town: -----

County: -----

Postcode: -----

Telephone: -----

Hours I am available to contact on this number: -----

Email address: -----

Appendix 3: Phase 1 Recruitment Advert



Research volunteers needed

Would you be willing to help in some research? Helen Kendall, of Newcastle University, is researching the domestic food-purchasing and hygiene practices of the over-60s in the North East in conjunction with the Food Standards Agency. She would like volunteers to complete a questionnaire, which aims to assess the variation in life experiences of older adults and goes on to look at their attitudes towards food safety. The questionnaire will be administered to all respondents personally, at a location of your convenience, your home, local community centre, coffee shop or the university for example and will take about 40 minutes to complete. On completion of the questionnaire Helen will give you £10. If you're interested in volunteering or want further details, please contact her on:

0783 455 8524 or via email at: h.e.kendall@ncl.ac.uk

Appendix 4: Phase 1 Recruitment Letter



Dear ...

I am contacting you as you have indicated an interest in taking part in future studies carried by the Human Nutrition Research Centre at Newcastle University. I would like to tell you about a new PhD research project currently being conducted. I have included an information poster about the study for you to look at.

The study is investigating food buying, preparation and storage behaviour in the over-60s

Participation in the study involves;

- Being aged 60 years or over
- Willing to complete a questionnaire which should take less than 40 minutes

On completion of the questionnaire, you will receive £10 as thanks for your time and participation

If you are interested in taking part or would like further information:

e-mail h.e.kendall@ncl.ac.uk or telephone Helen Kendall on 07834558524.

We look forward to hearing from you and thank you for your time.

Yours sincerely

A handwritten signature in black ink that reads "Chris Seal." with a horizontal line underneath.

Professor Chris Seal

Appendix 5: Phase 2 Information Sheet



You are invited to take part in a study to understand the everyday food handling practices and behaviours of the over 60s in the North East of England. The research is part of PhD studentship that has been funded by the Food Standards Agency, and will involve 10 households from the North East.

What is the purpose of the study?

Over the last decade the Food Standards Agency and the Department of Health have observed an increase in cases of Listeria in adults aged 60 and over, and established a link between this rise and the way that food is handled in the home. This research will explore the everyday food handling practices of the over 60s in the domestic kitchen to explore the relationship between the home food handling practices of consumers aged 60 and over and look at its potential contribution to cases of food-borne illness.

Why have I been chosen?

You have previously taken part in the first phase of this research (answered the questionnaire) and expressed an interest in the second stage.

Do I have to take part?

Participation in the study is voluntary. You have a right to decline the invitation or to withdraw from the study at any time without providing an explanation or incurring any penalty.

What will happen to me if I take part?

If you agree to take part in the study, you will be asked to allow observations to be made in your home (kitchen). The observations will span over a four-week period, on dates that are convenient to you and be broken down into a number of stages. A mix of methods will be used to generate a detailed picture of you, your life-style and your everyday food safety practices. The first will begin with an in-depth interview to understand what food means to you and how this has changed over your lifetime. In addition to this initial interview over the course of the four weeks you would be required to partake in a further three interviews, looking at how you shop, how you clean your kitchen and a final interview to review the data collected and assess your experiences of taking part in research of this nature. All of the discussions

will take place in your home and would last approximately one hour. With your permission the discussions will be audio recorded.

The second activity will require us to understand how, where and what food products you purchase. We will ask that to do this you record your food shopping occurrences and collect food shopping receipts for the first two weeks of the study. We will also monitor the level of activity within your kitchen. To do this we will place small sensor devices inside your fridge and on a number of appliances, and once positioned they will be left for 14 days. The devices will only measure vibrations and are designed to be unobtrusive. Third, an audit of your fridge will be conducted and the contents removed and photographed, swabs will be taken of the sink and drain and sent to the microbiology lab at Newcastle University for analysis. Finally, a video recording of you preparing up to 3 meals will be made, to look at the way you handle food.

Are there any risks that could be incurred by taking part in this study?

The researchers have undergone training in the management of observational research and have all been CRB cleared. In the unlikely event that we discover microbiological cause for concern when sampling, you will first be informed, environmental health officers have been made aware of the research and with your approval would be contacted for advice and assistance if necessary.

Are there any potential benefits of taking part in the study?

There will not be any immediate benefits to those who take part in the study. However, it is hoped that the results of the study will, through time, benefit older food consumers and policy recommendations will be made to the Food Standards Agency to assist with the reduction of food-borne disease instances.

Each participant will receive a £80 Eldon Square voucher for their time and trouble.

What if something goes wrong?

It is extremely unlikely that something will go wrong during this study. However, you should know that the University has procedures in place for reporting, investigating, recording and handling adverse events and complaints from study volunteers. The University is insured for its staff and students to carry out research involving people. The University knows about this research project and has approved it. Any complaint should be made, in the first instance, to the researcher identified for this particular study. Any complaint you make will be treated seriously and reported to the appropriate authority.

Confidentiality:

Any information you supply will be held in strict confidence, viewed only by the named researchers (see below) and then anonymised. All audio recordings will be transcribed (copied word for word) and analysed. Your contribution on the transcripts will be identified only by a participant number. Results will be anonymous (i.e. you will not be identifiable) and will be used for research purposes only. All video data will only be seen by the researcher and the supervisory team at Newcastle university, no sound will be used in the recordings and data will be stored in a password protected file. At no point will names be used and a household identification number will be used throughout any write-ups and when referring to you and the same premise will apply to all data collected. All microbiological data will be identified using the unique household identification code and your identity will remain anonymous.

All anonymised data will be stored in a locked password protected computer and/or a locked cupboard within secure office space.

What will happen to the results of the study?

The information collected from this research will be analysed, the interpretation of which will be presented in the final thesis submitted for award of Doctor of Philosophy. In addition to this it will be used to provide policy recommendations to the Food Standards Agency and inform their future research into consumer food handling in the domestic home. A lot of data will be produced in this study. Interview transcripts activity data and microbiological data may be made available to other researchers for reanalysis with your permission. In this case, anonymity and confidentiality of the participants will be maintained.

Who is funding and undertaking the research?

This research is being funded by the Food Standards Agency. The PhD candidate is the main researcher on this project however; analytical support will be given from the Schools of Biology, Computing Science and Agriculture, Food and Rural Development at Newcastle University.

Who has reviewed this study?

This study has been reviewed by the Food Standards Agency and this project by Newcastle University's Faculty of Science, Agriculture and Engineering's Research Ethics Committee.

Contact details:

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Appendix 6: Phase 2 Ethical Approval



To Whom It May Concern

Our ref: NK/IND

8 July, 2009

Zurich Municipal Customer: University of Newcastle

This is to confirm that University of Newcastle have in force with this Company until the policy expiry on 31 July 2010 Insurance incorporating the following essential features:

Policy Number: NHE-08CA03-0013

Limit of Indemnity:

Public Liability:	£ 25,000,000	any one event
Products Liability:	£ 25,000,000	for all claims in the
Pollution:	aggregate during any one period of insurance	any one event
Employers' Liability:	£ 25,000,000	inclusive of costs

Excess :

Public Liability/Products Liability/Pollution:	£ 2,500	any one event
Employers' Liability:	Nil	any one claim

Indemnity to Principals :

Covers include a standard Indemnity to Principals Clause in respect of contractual obligations.

Full Policy :

The policy documents should be referred to for details of full cover.

Yours faithfully

Alison Cliff
 Alison Cliff
 Underwriting Services
 Zurich Municipal
 Farnborough

Zurich Municipal
 Zurich House
 2 Gladiator Way
 Farnborough
 GU14 6GE

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Direct Phone 01252 387859
 Direct Fax 01252 375244
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Communications will be monitored
 regularly to improve our service and
 for security and regulatory purposes

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 and regulated by the Financial Services
 Authority for the conduct of UK
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Zurich Municipal is a trading name of Zurich
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 A public limited company incorporated in
 Ireland Registration No. 13460 Registered
 Office: Zurich House, Ballsbridge Park,
 Dublin 4, Ireland.
 UK branch registered in England and Wales
 Registration No. 847985
 UK Branch Head Office: The Dutch Centre,
 3000 Parkway, Whiteley, Fareham,
 Hampshire PO15 7JZ
 Authorised by the Irish Financial Regulator
 and regulated by the Financial Services
 Authority for the conduct of UK business

03700102 (08/05/2009) 100012004

Appendix 7: Phase 2 Consent Form



******(One copy to be kept by participant, and one by the Researcher)

Title of Project: Food Hygiene Study 2011

**Name of Researcher: Helen Kendall h.e.kendall@ncl.ac.uk
Tel: 0191 222 5269 Extension 5269**

Please initial box

1.	I confirm that I have read and understand the information sheet dated (<i>Month / Year</i>) for the above study. I have had the opportunity to consider the information and to ask questions. Any questions asked have been answered satisfactorily.		
2.	I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my legal or personal rights being affected.		
3.	I understand that the researchers will hold all data collected during the study, will be kept confidentially and all efforts will be made to ensure I cannot be identified as a participant of the study (except as might be required by law). I give permission for the researchers involved in the study to hold relevant personal data on me.		
4.	I understand that other researchers will have access to this data only if they agree to preserve the confidentiality of the data and if they agree to the terms I have specified in this form.		
Chapter 582	I understand that at no point would my name be given, and I am happy for the video data collected be shown as part of the dissemination of this research, this would include being shown to colleagues within the university, to the FSA. If the researchers would want to share this data beyond this separate consent will be sought.		
Chapter 584	I agree to take part in the above study.		

Name of participant (please print)		Signature		Date (ddmmmyy)
Chapter 585 Name of person taking consent (if different from researcher)		Chapter 586 Signature		Chapter 587 Date (ddmmmyy)
Chapter 588 Name of Researcher		Chapter 589 Signature		Chapter 590 Date (ddmmmyy)

Appendix 8: Phase 2 Life Course Interview



Phase 2: (1) In-depth interview discussion guide.

INTRODUCTION

Good Morning/Afternoon/ my name is Helen Kendall, I am a 3rd Year PhD researcher, at Newcastle University in the School of Agriculture Food ad Rural Development. As you are aware this is the second stage of a 2- stage research project looking at food and food-borne illness in the domestic kitchens of those aged 60 and over. This is the first data collection task of the study and will be a life course interview. The aim of the interview is for me the researcher to talk informally with you about you, your lifestyle and your relationship with food. I will ask you to guide me through what food has meant to you, beginning in childhood right through to the present day. The interview will take approximately one hour and will be recorded using a Dictaphone. If at any point you would like to stop please feel free to do so without prejudice. All of the information provided would remain anonymous, for the purposes of this research you will only be known by a reference number. If following the interview session you think of anything you would like to change or add to the discussion please do not hesitate to let me know.

FOOD AND YOU

1. REFLECTIONS ON FOOD:

Past...

- Can you describe your earliest memory of food?
- Can you tell me about food and the role it played in your life as you were growing up? *Early childhood- until you left home*
- What has food meant to you?

Present...

- What does food mean to you now?
- How would you describe your interest in food?
- What is the role that food plays in your life?

2. DIETARY PATTERNS:

- How often do you cook?

- Are you the only person that is responsible for preparing the food that you eat?
- In terms of food what is a typical day?
- Can you give examples of the different types of foods that you would eat for:
 - Breakfast
 - Who would cook?
 - Eat with?
 - Same everyday?
 - Lunch
 - Who would cook?
 - Eat with?
 - Same everyday?
 - Dinner
 - Who would cook?
 - Eat with?
 - Same everyday?
- Do you snack? - *Give examples*
 - What would be a typical snack
 - How often would you snack?
 - How do you decide what you are going to eat?
 - Does this depend who you are with?
- Are there any other mechanisms of food preparation that you might rely on? *Probe: family, friends, lunch clubs, meal delivery programs?*
 - *If yes: why do you use these and how frequently?*
- Do you eat out?
 - How often?
 - Where would be a typical place that you would go to eat?
- How do you shop for food?
 - How often is this?
 - Which food outlets do you use?

- How do you get there?
- How do you transport the food you have purchased?
- What are the main things that you think about when you are deciding what to cook? – *Probes: cost, other people's preferences, convenience, taste, health, availability of ingredients, cooking skills, physical ability?*
- How do you choose food for others, family members or guests?

3. SOCIAL INFLUENCES:

- Do you influence what others eat?
- Do others influence what you eat?
- Who are these individuals and how do you and do they influence what is eaten?

4. FOOD CONSUMPTION OVER THE LIFE COURSE:

- Have your eating habits changed over the years?
 - In what way?
- Can you identify what has been behind those changes? *Probes: growing up, getting married, having children, divorce, retirement, widowhood, health*
- Have your shopping and food purchasing habits changed?
- How is your eating different to how it has been in the past?
 - What is the most different?
 - What has lead to this change?

5. CHANGE:

- Have you ever changed or attempted to change what you eat?
 - Why was this?
 - What or who was the motivation behind the change?
 - Was it successful?
 - How long did the change last?
- Is there anything that you would like to change about how or what you are eating now?
 - What are the barriers stopping you from doing this?

6. FUTURE CHANGES:

- Has anything that we have talked about surprised you?
- Can you see the way that you cook for, shop for or prepare food changing in the future?

Appendix 9: Phase 2 Fridge Audit Protocol

Fridge Audit: Item/location/date and condition

Part No:

Household ref:

Item	Fridge shelf/ position?	UBD	Brand/Packaging	Open/ Un- used	Leftovers

Appendix 10: Phase 2 Camera User Guide

Participant Instructions for the Flip Camera


- The researcher will set up the camera and will position it to record.
- You are required to turn the camera on at the moment at which you begin to cook your meal (*please start recording from the moment you enter the kitchen to start cooking*)
- The camera is to record until the point at which the meal is served and eaten, if the camera stops recording before this time please make the researcher aware of this when they come to collect the camera.

Recording Instructions:

1. Turn the camera on using the power button located on the right hand side of the camera
2. Press the large red button in the middle of the camera to begin recording
3. Press the large red button in the middle of the camera to stop recording

Playback:

1. Press the ▲ button to play back the recording

Note: Please do not press the  button this will delete all recordings.

Appendix 11: Phase 2 Narrative Interview

Phase 2: (2) In-depth interview discussion guide.

INTRODUCTION

Good Morning/Afternoon/ As you are aware this is the second stage of a 2- stage research project looking at food and food-borne illness in the domestic kitchens of those aged 60 and over. This is the second in a series of in-depth interviews aimed at understanding your relationship with food and specifically how you shop and store food. The aim of the interview is for me the researcher to talk informally with you. I will ask you to guide me through where you shop for food, how often you shop, how you shop and transport food the food that you purchase home, who if any one that helps you with shopping and what you do with the food you purchase when you return home (where you store it). The interview will take approximately one hour and will be recorded using a Dictaphone. If at any point you would like to stop please feel free to do so without prejudice. All of the information provided would remain anonymous, for the purposes of this research you will only be known by a reference number. If following the interview session you think of anything you would like to change or add to the discussion please do not hesitate to let me know.

SHOPPING

1. HOW AND WHEN

- How do you shop for food?
 - How often is this?
 - Which food outlets do you use?
 - How do you get there?
 - How do you transport the food you have purchased? *Walk, car, bus?*
– *do you take a cool bag for cold items?*
 - Do you order food? *Meal delivery programs? Internet?*
 - How long does it take you to shop for food? *Refer to questionnaire response*

- How has the way that you shop for food changed over time?
- Are there any restrictions on the foods that you purchase? *Price? Preferences of others? Availability? Access? Ability to transport?*

2. ASSISTANCE

- Do you receive help with shopping? *Partner? Relative? Friend? Organisation- shopping bus?*

3. MEAL PLANNING

- How do you decide what food you will purchase?
- What are the main things that you think about when you are deciding what to purchase? – *Probes: cost, other people's preferences, convenience, taste, health, availability of ingredients, cooking skills, physical ability?*
- Do you plan meals or take a list shopping?
- What items would you regularly purchase?
- Do you look out for or purchase discounted foods? *BOGOFF, 342 etc ...*
- Do you purchase food to 'have in'? *supplies?*

4. STORAGE

- Do you have a fridge and a freezer? *Combined? Separate? What size? How old?*
- How and where in your kitchen do you store the foods that you purchase?
With examples explain:

1. Ambient foods i.e. *Tinned foods, foods in jars, biscuits, cakes, packeted foods –cupboard, fridge...*
2. Dairy foods i.e. milk, eggs, cheese, yoghurt – *fridge, freezer...*
3. Meat products i.e. raw or cooked –*fridge, freezer, cupboard*

- 4. Ready to eat foods i.e. smoked salmon, cooked meats -ham, pre-cut fruit, coleslaw
- How long do you store food for in you freezer? *As per the recommendations? One month, one month +, till they are used?*
- Do you remove food from its original packaging to store?
- Do you feel you have enough space to store food in your kitchen?

CLEANING

1.WHO CLEANS

- Who in your household is responsible for cleaning the kitchen? *You? Spouse or partner?*
- Do you receive any external help or assistance with the cleaning of your kitchen? *Family? Friend? Relative? Hire help? Provided by living accommodation? if yes...*
 - *What do they help you with?*
 - *How often?*

2. CLEANING AND MEAL PREPARATION

- Do you clean as you cook?
- What would you clean whilst you cooked? *Put away un-needed foods away? Wipe benches? Wash utensils during use? Wash chopping boards during use?*
- Do you wash dishes after eating? *At the end of the day?*
- Do you own a dishwasher? If yes...
 - How often do you use it?
 - How often do you clean it?

3. CLEANING ROUTIENE

- Describe your kitchen cleaning routine? i.e. *Clean cooker first? Wash floors last? Clean appliances once a week? Clean as and when?*
- How often do you clean your kitchen? *Daily? Weekly? Monthly?*

4. PRODUCTS

- What equipment would you use to clean? Dish *cloths*? *Scourers*? *Microfibre cloths*? *Paper kitchen towel*?
- How often do change or wash your cleaning equipment (dishcloths)?
- How often do you change or wash your tea towels?
- Which cleaning products do you use? *Bleach*? *Sprays*? *creams*?

5. WHITE GOODS

- How do you clean your fridge?
 - How often do you clean the fridge?
 - What would you use to clean your fridge?
 - Do you check or change the temperature?
- How do you clean the freezer?
 - How often do you clean the freezer?
 - How would you clean the freezer and what would you use to clean the freezer?
 - Do you check or change the temperature?

5. DISPOSAL

- How often do you put your bins out?
- Do you recycle? *What do you recycle? and how do you recycle?*
- Do you clean your bins?
 - How often?
 - What with?

Appendix 12: Phase 2 Debrief interview



Phase 2: De-brief; Discussion Guide.

INTRODUCTION

Good Morning/Afternoon/ my name is Helen Kendall, I am a 3rd Year PhD researcher, at Newcastle University in the School of Agriculture Food ad Rural Development. As you are aware this is the second stage of a 2- stage research project looking at food and food-borne illness in the domestic kitchens of those aged 60 and over.

As discussed at my first meeting with you, I am obligated to conduct a debriefing session as the final data collection task. This should take no longer than an hour and a half, and it will provide me with an opportunity to talk informally with you about the data collection methods used, and share with you my preliminary observations made.

The interview will take approximately one hour and will be recorded using a Dictaphone. If at any point you would like to stop please feel free to do so without prejudice. All of the information provided would remain anonymous, for the purposes of this research you will only be known by a reference number. If following the interview session you think of anything you would like to change or add to the discussion please do not hesitate to let me know.

PREPARING FOR THE STUDY

1. What were your motivations for partaking in the study?
Personal interest? Money? Fun? Something to do (activity)? Help out?
2. Did you prepare for the first visit?
3. Did you do anything differently before the first study visit?
 - a. If so what did you do?
 - b. What was the motivation behind this?
 - c. If answered no why was this?
4. What were your first impressions of the study and the study team?

RESEARCH METHODS

I would like in this section to talk informally with you about the range of methods used in the research...

1. How did you find the research methods used?

Consider methods in order: Life course interview, fridge audit and kitchen go-along, microbiological sampling, sensors, video/observation and shopping receipts

2. Did you particularly dislike any of the methods used?

- a. If yes which one(s)?

- b. Why?

3. Did you like any of the methods used?

- a. If yes which one(s)

- b. Why?

4. Did you find any of the methods difficult? *i.e. technical problems/ equipment complicated/ daunting/ scary/ too demanding?*

5. Did you feel confident that the methods had been explained to you?

6. Did you have any concerns about any of the methods used?

- a. What were your concerns?

YOUR DATA

Within this section I would like to run through with you the different forms of data that has been collected about you and domestic kitchen life. This is preliminary findings and open to your input. Please feel free to alter any information that you may feel has been misinterpreted or miss represented.

- Interview 1- life course summary table
- Fridge Audit- Microbiological results, fridge content analysis, photographic data, kitchen usage data
- Shopping receipts data- Household table
- Video data- playback and key questions

- Cooking and Cleaning interviews- summary table
 - Household narrative summary
1. Has anything about the data that I have shown you surprised you?
 2. Do you have any questions for us about the data that has been collected?

COMMUNICATION ANALYSIS

Within this section of the debrief, I would like to review with you some of the existing literature used by the FSA to communicate with the general public generally and the over 60s specifically about food-safety.

1. Leaflet one – *Grub Eye- Fridge*
 - a. *Have you seen this image before?*
 - b. *What do you think the key message is?*
 - c. *Where would you expect to see this kind of advertisement?*
 - d. *Who do you think it is aimed at?*

2. Leaflet two- *Listeria*
 - a. *Have you seen this image before?*
 - b. *What do you think the key message is?*
 - c. *Where would you expect to see this kind of advertisement?*
 - d. *Who do you think it is aimed at?*

SUMMARY

Finally we would like to thank you for your participation in the research, and finally we would like to ask you...

1. Is there anything that you would like to ask us?

Appendix 13: Phase 2 Remuneration



Thank you very much for participating in my PhD Food Hygiene Study 2011-12. Each participating household completing the research receives £80 in high street shopping vouchers in recognition of their contributions to the study.

Please sign and date below to certify that you received your £80 in vouchers.

Print Name: _____

Signed : _____ Date: _____

For Internal Use only:

Researcher Name:

Date Received:

Signature:

Appendix 14: Microbiological Laboratory Report



CERTIFICATE OF ANALYSIS

FAO:	Helen Kendall	Order Number:	
Company:	SAFRD Newcastle University	Date Received:	10/01/2012
Address:	Agriculture Building Newcastle University Campus Newcastle upon Tyne NE1 7RU	Analysis Started:	11/01/2012
		Report Date:	31/01/2012

Reference: Report Number: 12-09186

Lab No	Client Reference	Sample Description	Specification
168792		HH5 Sink	■
168793		HH5 Fridge	■
168794		HH3 Fridge 10:30am	■

Lab No.	Sample Description	Result
168792	215 Listeria spp. (detection)	Not Detected
168793	215 Listeria spp. (detection)	Not Detected
168794	215 Listeria spp. (detection)	Not Detected
		cfu = colony forming units

END

Signed for and on behalf of Geneius Laboratories Ltd

Christophe Noel, Head of Division, R&D

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