

The public's valuation of food safety: can it contribute to policy?

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Abstract

This thesis examines the 'economics of food safety'. The discussion outlines a theoretical 'equilibrium' model of food safety. This is used as a basis for understanding the concept of 'market failure' in the food safety context. Three specific market failures are identified. These are risk perception, information asymmetry and social costs and benefits. It is suggested that the government needs to intervene to correct these market failures. This leads into the main research undertaken as part of the thesis. The core issue is the extent to which government intervention is demanded by the public.

The government intervenes through the provision of public goods which in this context is the work undertaken through the Food Standards Agency. To estimate the demand for food safety activities, undertaken by the Agency, it is necessary to elicit the public's willingness to pay for food safety. The thesis uses a stated preference technique, contingent valuation, to try and estimate the demand, and so the willingness to pay for the 'food safety public good'. It is suggested that the technique is most appropriate for the valuation of common cases of food poisoning. Methodological problems still arose with a restricted safety concept. In particular, part-whole bias where the relatively narrow scope of the question was overlooked. Respondents tended to generalise to include, in their valuation of the food safety issue, more serious forms of food safety hazard.

The research suggests that public understanding of the food system is vital for the success of such a contingent valuation exercise. However, such knowledge appears to be limited, given respondent's disconnection from farming, food manufacturing and to a lesser extent food retailing. Thus the public's limited knowledge of the food system is a major constraint on the usefulness of contingent valuation in this area.

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List of abbreviations

FSA: Food Standards Agency	
GM: Genetically Modified	
GMO: Genetically Modified Organism	
WTA: Willingness to accept	
WTP: Willingness to pay	
WTP question: Willingness to pay question or valuation question	

Introduction to the research study

In the past 15 years, in the United Kingdom, the significance of food safety policy has grown. Food safety 'emergencies' ranging from salmonella in eggs in 1989 and in particular BSE in 1996, to dioxin in 1999 have led to a greater emphasis, in government policy, on food safety. In 2000 The Food Standards Agency was established to improve the co-ordination and communication of food safety policy. It aimed to provide independent recommendations into food policy to balance the needs of different stakeholders.

Perhaps the political imperative to restore credibility in decision making meant that less emphasis was placed on economic issues, such as the costs to the economy of food poisoning. The Food Standards Agency has estimated the annual cost of all food poisoning at £350 million (Food Standards Agency 2000b).

The general purpose of the research is to find out how much public demand there is for activities, undertaken by the Food Standards Agency. The specific aim is to assess the usefulness of economic valuation techniques in the food safety context. Such techniques measure the benefits of particular policies in monetary terms. There are two major questions:

- 1) Can a monetary valuation be placed on particular food safety measures?

If such an amount can be obtained, then there is a secondary question:

- 2) To what extent can such valuations contribute to policy making?

These two questions will be returned to at the end of the thesis, to find out how well they can be answered.

Preface

This section outlines the structure of the thesis.

The theoretical foundations of the thesis are outlined in part 1. Chapter 1 begins with a discussion of a conventional demand and supply model applied to food safety. This is to illustrate how, in principle, there could be an equilibrium level of food safety. Chapter 1 then relaxes this assumption and suggests that food safety can be under and over supplied which is characterised as 'market failure'. The social costs and benefits which fall outside the operation of the market are also examined.

Chapter 2 explores the theme of public goods which are needed to correct the market failures previously outlined. Economic theory suggests that governments do not know how much intervention to provide. These public goods are not bought and sold like commodities in conventional private markets. Therefore government policy makers do not have the 'market signals' from which to make decisions about the quantity of public goods that are demanded.

The methodology for the research study is outlined in part 2. A method is needed to find out how much of a public good is desired. The method adopted in this research entails the public being asked how much of the food safety public good they want, or how much they are willing to pay for public goods. In other words, the public are asked to state their preferences for public goods.

Chapter 3 examines the differences between revealed and stated preference. Revealed preference is when there is indirect guidance from the market, as to the valuation of public goods. Stated preference is where the public is asked to directly value a public good when it is compared to other goods and services. Chapter 4 studies variations between alternative stated preference methods. It is argued that the contingent valuation method is an appropriate technique for the valuation of public goods.

Chapter 5 provides detail on the chosen approach including an examination of elicitation formats [e.g. open and closed-ended questions] and payment methods [e.g. taxes or market prices]. There is also a comprehensive discussion on property rights and 'part-whole bias'. Chapter 6 examines how issues related to food safety could affect the valuation exercise. In particular, the concepts of risk perception and information asymmetry are relevant. Chapter 6 also uses a discussion of environmental valuation to inform the research. An examination of broader food safety concerns [including the food supply chain] is also provided to focus the investigation.

Part 3 details the practical research that was undertaken for this thesis. The preliminary research is outlined in Chapter 7. This stage of the enquiry was about which food safety issue would be most appropriate for valuation. This first stage was developed, with the discussion in chapter 6, so that the safety concept for valuation was restricted to common cases of food poisoning. These instances of food poisoning are confined only to inadequate food hygiene practices in the food outlets where the food is sold. Chapter 8 describes the piloting of the contingent valuation questionnaire. This stage of the research was about how to devise a question for the purposes of the food hygiene valuation concept. Chapter 9 outlines the outcome of the final questionnaire. This stage is the main empirical study which attempts to estimate the value of a food safety policy to deal with common cases of food poisoning.

Part 4 provides a discussion based on the research. Chapter 10 details qualitative responses from the empirical study. In particular, some of the reasons that respondents gave for being willing (or unwilling) to pay are discussed. Food safety issues, such as property rights, trust in the food system and understanding of the food supply chain are examined. Chapter 11 provides a cost benefit analysis based on the results of the main study. A relevant concern is that there is no 'real' market data with which to compare the contingent valuation results. Finally, in chapter 12, there are some conclusions on the main food safety issues that have been raised in the thesis.

Part 1: Background to the study

Chapter 1: The market for food safety

1.1. Introduction to the ‘market’ for food safety

There are two main concepts to be addressed in this chapter. First, the notion of the ideal market under perfect competition, where a theoretical equilibrium amount of food safety can be achieved; second, the concept of food safety not being an absolute goal is introduced.

Economic trade-offs are about the allocation of scarce resources between alternative uses. More formally, “economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses” (Robbins 1935). The “end” to be sought is a reduction in death and human suffering caused by food borne disease. The scarce means which have alternative uses are the “vast and varied” resources available to society; these include the scarce skills of food scientists and food technologists” (Swinbank 1993:84). Food safety is the purpose to which some of these resources could be devoted.

In this context, food safety can be defined as “the inverse of food risk, the probability of not suffering some hazard from consuming the food in question” (Henson and Traill 1993:153). Hazard is defined as the severity of an adverse impact. Risk is defined as the probability of the hazard occurring (Ritson and Li Wei 1998:253). It is argued that consumers are willing, theoretically at least, to trade off cost against safety. “There is a willingness of individuals to accept a degree of food risk in exchange for other attributes” (Ritson and Li Wei 1998:254). Thus safety may not be demanded fully when taste, the appearance of the food or price are favourable. For example, unpasteurised milk and soft boiled eggs have been purchased despite reservations over safety.

The trading off of safety against other food attributes can be explained by considering the demand and supply of food safety. “Food safety can be regarded as a good like any other, with supply and demand interacting to determine a

market clearing price. The demand for food safety is determined by consumers willingness to pay for additional safety, reflecting the value placed upon the benefits that they derive e.g. reduced pain and suffering, longer life expectancy etc" (Henson and Traill 1993:153).

Swinbank (1993:86) explains how demand for food safety may increase with greater affluence. "If real income increases, and the demand curve shifts to the right then a new market equilibrium will be determined which will involve a higher level of food safety and a higher price". To elaborate "as wages increase, consumers have higher opportunity costs of time. This means that the costs of illness ... are greater and the productivity losses to society are higher for those with higher wages. More affluent individuals and societies will demand a higher level of food safety and will be willing to pay for a reduction in health risks" (Kinsey 1993:170-1).

Moreover, in an affluent society like Britain, food safety can be seen as price inelastic. "Beyond a minimum income level when an adequate diet can be afforded, food safety, certainly for life threatening conditions, is likely to show the characteristics of a price inelastic good with consumers willing to pay a sizeable price premium for a product they perceive to be "safer" (Swinbank 1993:86). Organic food could be seen as a price inelastic good with sellers able to pass on higher prices if consumers believe that it is "safer", than conventional food.

1.2. Food Safety cannot be an 'absolute goal'

Swinbank (1993:86) outlines why increasing the supply of food safety increases the cost. "The provision of safer food will require the use of more resources: greater selectivity in choosing raw materials, more hygienic handling procedures, better chill-chain facilities etc". Alternatively, it could be the number of inspections per unit of food produced that increases marginal cost (Kinsey 1993:170). The marginal cost of additional food safety is likely to rise; as society moves towards the elusive, but unobtainable, goal of absolute safety. The result is that the marginal costs of each additional unit of "safety" could reach very high levels

(Swinbank 1993:86). As marginal costs increase consumers will be increasingly unwilling to pay for extra 'units' of food safety (Swinbank 1993:86). "It will only be profitable for industry to supply safety up to the level at which consumers are willing to value it". This achieves "an optimal amount of safety" (Ritson and Li Wei 1998:255). In other words, the demand and supply of food safety are in equilibrium.

Nevertheless, if food safety becomes increasingly costly to provide, i.e. marginal cost is greater than marginal benefit, then it would become sensible to spend money elsewhere. The corollary is that food safety is not an absolute goal but is competing with other public and private interests for resources (Ritson and Li Wei 1998:255).

To return to the equilibrium model of food safety, theoretical assumptions have to be made. It must be assumed that food risk can be measured and observed clearly; and that consumers know how much food safety they want. This 'amount' of safety will then be supplied by industry. The theoretical assumption would be of perfect competition with market participants being perfectly informed (Swinbank 1993b:16). If this was the case "there would be no need to know what the aggregate costs and benefits of food safety amount to. The market, through the interplay of demand and supply, would automatically deliver the optimum level of food safety" (Swinbank 1993:91). However, assumptions of perfect competition are unrealistic as a 'real' market is likely "to be characterised by a small number of dominant [oligopolistic] sellers and less than perfectly informed buyers" (Swinbank 1993:87). If this is the case then the industry may under-supply food safety because consumers are unable to tell whether too little safety has been provided. Nevertheless, "there is some reason to believe that food safety in particular and quality in general will be supplied by the market e.g. through branding" (Swinbank 1993:87)

1.3. The over and under supply of food safety

However, branding could lead to an over-supply of food safety. A market solution to the issue of how much food safety is needed could provide "too much" food safety. Swinbank (1993:88) provides an example: "for certain products, such as canned goods, susceptible however remotely, to a 'dread effect' like death from botulism, the market disciplines can be severe; and under such circumstances companies will go to extreme lengths to protect the good name of their brands". Food companies may wish to protect themselves from "food terrorists" who may threaten to poison their food (Swinbank 1993:88). In some instances the market

over-emphasizes food borne disease risks and this leads to over investment in food safety by companies. Moreover, media coverage of food contamination may cause consumers to overestimate the damage from the consumption of a product (Segerson 1999:63).

In other instances “the market under reacts and produces too low a level of food safety”. For example “in other parts of the food system where branded products are not so prevalent and the dread effect of contracting food borne disease not so marked, the market mechanism might not bite so deeply e.g. salmonella in eggs before Edwina Currie’s statement” (Swinbank 1993:88-9).

These examples show that the theoretical equilibrium model of food safety although providing valuable guidance is unrealistic. The value of the classical demand and supply model is that it can “assess impacts of actual or proposed regulatory changes that affect market supply, such as a ban on a pesticide or some other supply restricting action. A typical regulatory action that restricts supply will shift the supply curve to the left causing a rise in price. The size of the price impact depends on the responsiveness (elasticity) of the quantity demanded. The less responsive (inelastic) the demand relationship, the greater will be the impact on market price; and the greater will be the impact on consumers relative to producers” (Caswell ed. 1991: 5,6,11). If it is assumed that frequently there is a lack of available substitutes to food conventionally grown with pesticides, then consumers will face an inelastic demand curve. The impact of a pesticide tax would then be borne mostly by consumers.

The two practical examples given show why the market for food safety is not in equilibrium and why government intervention may be needed. It is stated that (Swinbank 1993b:19) “those seeking to justify state intervention on the grounds of “market failure” need a high standard of proof”. Perhaps, the two examples above are instances of such proof given that “the market cannot be relied upon automatically to provide the desired amount of food safety” (Ritson and Li Wei 1998:255).

Market failure can also be understood as the 'goods' that markets fail to produce, such as a reduced food borne disease burden on the Health Service, because no one [in the food industry] finds it in their interest to produce them. This is because the cost of producing the 'goods' can never be completely recovered in profits. Consequently, "there is a divergence between private and socially optimal levels of food safety" (Henson and Traill 1993:153). There is a difference between the demand for food safety from a consumer and the need for food safety from society in general. This argument is discussed in the next section.

1.4. Social Costs and Benefits

1.4.1. Definition of social costs and benefits (externalities)

This section discusses externalities which is an example of market failure. It "arises whenever an individual's production or consumption decision directly affects the production or consumption of others; other than through market prices" (Begg et al. 1984:334).

Social costs, in the context of food safety, can be understood as the expense "which falls outside the individual food consumer" (Ritson and Li Wei 1998: 257). Ill health which results from food consumption imposes costs upon society. These costs are external to the private decisions that are made about what is an acceptable level of food safety (Henson and Traill 1993:159).

In a positive context, information available on food safety for the consumer, "yields benefits to society as a whole (because there is less of a burden on the NHS and so the taxpayer)" (Griffith et. al. 1999:8). This is in addition to the private benefits accruing to the individual who pays for the safety information. These social benefits which result from the public good characteristics (see chapter 2) of information are not adequately taken into account in the marketplace and therefore the market for food safety information is likely to be under supplied.

1.4.2. Externalities associated with an individual purchasing unsafe food

Social costs can be divided into tangible and intangible costs. Tangible social costs include broader losses to government such as “state funded medical and hospital expenses above those directly borne by the sufferer” (Swinbank 1993:90). In the context of outbreaks of disease such as salmonella “the expense of investigation and the follow up (studies) of affected individuals” is also relevant (Sockett 1993:117). Moreover, if social costs are seen as implications beyond the consumer then there could be “costs to be incurred by sectors of the food industry when illness is associated with a particular type of food or product. These may include loss of product confidence by consumers, recall and destruction of a contaminated product” (Sockett 1993:117). Also there are other measurable costs to industry in general; for example losses in production if workers are ill through food poisoning (Swinbank 1993:89).

Intangible social costs include the loss of leisure and distress to others, close to the individual, such as friends and family (Swinbank 1993:90). However, it is more difficult and contentious to evaluate intangible costs e.g. loss of leisure (Ritson and Li Wei 1998:257). Moreover, the loss of life is particularly fraught because, potentially, there is a paradoxical situation where death is ‘less costly’ than major illness. This is because death may result in lower health treatment costs.

1.4.3. The social benefit (or cost) of a policy to correct the externality

The previous analysis suggests that it would be worthwhile to consider intervention so that more food safety is provided. For example, environmental health officers could be employed to make sure food outlets provide clean premises. This is not just to try and make sure that food customers do not become ill, but also to reduce the health costs to society. If the tangible and intangible costs could be reduced then it would be beneficial to society. However, such a benefit would need to outweigh the cost of say an environmental health employment initiative. The tangible costs could attract a “direct monetary measure” (Ritson and Li Wei 1998:257) and so theoretically could be included in such a cost benefit analysis.

However, intangible costs present a challenge to economists. “The quantification of intangible costs is problematic involving complex methodologies based upon contingencies (or estimates) which are abstract from the real world” (Henson and Traill 1993:159). For example, it may be difficult to ask consumers to ‘value’ the cost of lost leisure time, if they theoretically happened to suffer from a rare case of food poisoning. Thus, a cost benefit analysis would be difficult to calculate because of the problem with the measurement of intangible costs.

Finally, decision making is not just about reducing externalities or correcting the market failure. This is because a policy to reduce externalities is not costless. There is a cost to government of intervention and there is also a cost to business. The cost to business of complying with regulation, introduced by government, is an expense which would not exist in the free market (Swinbank 1993:91). Food regulation will lead to additional costs to the food industry, (and so consumers) above what would have been incurred in a free market. There are industry costs of “determining, enforcing and complying with regulations” (Swinbank 1993:91). Moreover, there are distributional issues namely who pays for the regulations. Taxpayers, the food industry e.g. employees and shareholders in growing, processing or distributing companies, or consumers in higher prices, could all bear the costs of regulation (Swinbank 1993:91).

1.5. Summary of chapter one

This chapter has shown that the concept of a market equilibrium for food safety is not realistic. Indeed, equilibrium has rarely been observed in real life (Soros 1998:36). Nevertheless, the idealised model of equilibrium is useful because it illustrates what is not a desired outcome; attempts to achieve absolute safety at extremely high marginal costs.

However, without intervention food safety may be undersupplied. This is because, the self interest of the market may not cause societal benefits to emerge; to an optimum level. State intervention could help correct the under-supply of food safety. One of the aims of the thesis is to find out how much intervention is needed.

To understand this concept it is necessary to look at the role of 'public goods' in market economies which is the topic of chapter two.

Chapter 2: Public goods and state intervention

2.1. Introduction

"A public good is a good that, even if consumed by one person, can still be consumed by other people" (Begg et. al. 1984:351). The main aspects are that "it is possible for one person to consume without reducing the amount available for someone else and it is impossible to exclude anyone from consumption except at a prohibitive cost" (Begg et. al. 1984:351). Food safety is a public good when it is difficult to exclude people from its consumption. In many cases it is not possible to regulate so that various levels of safety are attached to different products (Ritson and Wei Mai 1998:256). Consequently, people are unable to buy different 'amounts' of safety. Thus, if the government is going to intervene then the public will expect consistent standards. "In these circumstances the cost (of say regulation) has to be shared among all consumers (when added to price as an industry cost) or shared by all taxpayers, when public expenditure is involved" (Ritson and Wei Mai 1998:256).

However, food safety is not a pure public good, like national defence. This is because with defence it is not possible to opt out of the public provision. Military spending entails that every member of the public "necessarily consumes the same quantity, namely whatever quantity is supplied in aggregate" (Begg et. al. 1984:352). However, this is not the case with food safety. People, who eat out less, may use less of the public good than others; that is, they do not benefit so much from say the monitoring of food premises. Also, food safety is not a pure public good because surveillance of the food industry is only 'modifying' the market. It is providing 'enforcement' of food safety regulations additional to work already undertaken by the private sector. Thus, one of the debates is how far state intervention is needed in addition to industry safety measures.

One of the issues in economics is the extent to which public goods, such as food safety regulation, should be funded. This presents a challenge because when 'food safety' is supplied to all the population, then everyone can benefit regardless

of whether they are willing to pay or not. Due to the public nature of the good it will be provided irrespective of whether an individual demands it or not. Given that people can benefit without paying directly then they could be getting a ‘free ride’. In common, with many public programmes, some people may be receiving more value from the public good than they are willing to pay for.

Free riding can occur because of the inability to exclude people from the consumption of public goods. Since people benefit simultaneously from the given capacity of a public good (whatever is supplied, is supplied in aggregate) then it follows that the marginal cost of the collective benefit will be zero. “The marginal cost, to the public, remains zero even though the marginal factor cost, with respect to variations in capacity of the good, is positive” (Mishan 1981:434). In other words, the marginal factor cost of food regulation increases, e.g. with the employment of more environmental health officers. With marginal cost remaining zero but marginal factor cost increasing with the size of the public good; free riding becomes more of a problem with greater investment in public goods. This makes the additional funding of state intervention more of a challenge.

There is a case for intervention as there are reasons for food regulation being supplied by the public sector. The difficulty of discovering the value people place on public goods could be one reason for food safety being located in the state sector (Mishan 1981:440). A feature that would act against food safety being in the private sector is the need for private enterprise to introduce physical means of exclusion in order to exact payments from the beneficiary. Thus if food regulation was supplied in the private sector then production would be inefficient. The price would be set above (zero) marginal cost. This is because additional resources would have to be used in providing effective means of exclusion (Mishan 1981:440-1). The “optimal use (of public goods) requires that the service be freely available to all which also realises the exchange efficiency condition as everybody pays the same zero price for the marginal service” (Mishan 1981:438).

If food safety is to be located in the public sector then the appropriate amount of taxation to pay for it needs to be determined. This is the challenge; because it is

unclear what value individuals place on food standards. Since policy makers do not have these values then they will find it hard “to construct a valid demand curve” for food safety (Mitchell and Simmons 1994:68). Policymakers do not have market signals so it is difficult for efficient choices, over the quantity of public goods, to be made. In a market for private goods you can discover how much people want something from their willingness to pay for it. However, elections, which determine the provision of public goods, do not give such clear signals to policymakers. Decision-makers only learn how many people want a policy but not the strength of their feeling (Mitchell and Simmons 1994:68). Consequently, some assessment is needed of strength of feeling; that is, for example, how much people would be willing to pay for food standards.

Apart from the ‘free riders’ mentioned earlier there is also what might be called ‘forced riders’. An individual paying a standard rate of tax might feel overcharged. This is because public goods are provided in single quantities. Therefore some people receive higher standards than they would want (Mitchell and Simmons 1994:89). The challenge of ‘forced riding’, and ‘free riding’, suggests that a methodology is needed so that there is a better understanding of how much regulation is wanted by the public. However, it is difficult to apply principles of market pricing to public goods; “governments cannot readily and accurately measure how much of a public good is demanded” (Mitchell and Simmons 1994:87). This is because, the benefits of a public good being jointly consumed, cannot be sold separately to each individual at a price (Mishan 1981:430). Although this is one of the main aims of the thesis; to try and measure the demand for food standards.

Until now intervention has been examined in general. However, there is an issue of where government should intervene (see chapter 6 on information asymmetry). Kinsey (1993:175) suggests that food products, which have characteristics which are transparent to consumers, require little government intervention in the form of inspection. However, “some agency must still be accountable for the truth of the information on the labels and in the advertising”. In contrast Kinsey (1993:175) states that “those goods (attributes) that carry large negative benefits (externalities)

will be over provided unless taxed or restricted in some way". The argument here seems to be that experience goods, whose characteristics are transparent to consumers in the long run, require less intervention than credence goods. Credence goods seem to require intervention because the attributes of those products carry large negative externalities. The claim that food products are free from bacterial pathogens and carcinogens is a credence good (Kinsey 1993:173).

The ways in which government could intervene are now examined. There is a demand instrument e.g. information remedies (Henson and Traill 1993:160-1). In other words, "government may inform and educate consumers about a risk or require producers to do so" (Ives et.al. 1995:1-2). There are also supply instruments such as process standards and product performance standards. "Government may establish standards (say temperature standards) which must be met by producers during processing of foodstuffs. Government may (also) require foods at the point of sale to meet minimum safety requirements such as maximum allowances for pesticide residues or micro-organisms. Some items may even be banned" (Ives et.al. 1995:1-2).

Intervention though is not without cost. It is possible that supply - based solutions, with the imposition of overly strict standards, may restrict choice and inflict unnecessary costs on a large portion of society (Henson and Traill 1993:162). If the "range of qualities or standards over which the market operates is curtailed" too much then there is a loss of consumer welfare (Swinbank 1993:91). This would be the case if the range of products now on sale excluded some products that (consumers) would otherwise have purchased, or if (consumers) were forced to pay a higher price for unwanted levels of safety (Swinbank 1993:91).

In chapter one, the market automatically balanced demand and supply. However, as stated previously this 'best' way of reaching the 'equilibrium' amount of food safety does not work out in practice. There are imperfections and so reasons for intervention. The government therefore tries to devise a 'second best' solution to find out the appropriate level of food safety. When government intervenes it needs some guidance, some decision rules, to enable it to determine the appropriate

level of food safety (Swinbank 1993:92). Therefore government now faces the challenge of "determining the point where the marginal (additional) spending on food safety just balances the marginal benefits gained from the resultant increase in food safety" (Swinbank 1993:92).

Cost benefit analysis may be helpful in trying to guide government towards the optimum level of food safety regulation. In terms of government expenditure this is a major challenge. This is because with public good trade offs then the optimum (amount of expenditure on food safety) also implies that no redirection of spending from say road safety to food safety could increase human welfare (Swinbank 1993:92). Nevertheless, the level of intervention, which could be applied to food safety, still needs to be addressed.

The analysis developed here does not offer much guidance as to the appropriate size of the 'food safety public good'. Nevertheless it emphasises that the introduction of public goods, poses problems "because the market cannot provide the information necessary to determine whether state intervention is economically viable or not" (Mishan 1981:441). It has also been shown that state intervention is not without cost. If government intervention is to take place; then the state should act as an analogue to the market to provide public goods and eliminate externalities. To do this it should achieve the same preference (demand) revelation for these public goods as the market achieves for private goods (Mueller 1989:3). This is the purpose of willingness to pay analysis (contingent valuation) introduced in chapter four. As stated earlier the state needs 'demand revelation', if it is to successfully allocate resources. This is crucial as public support for public services, may depend upon research methods being able to highlight the demand, or need, for such state intervention.

2.2. The contrast between food safety and 'pure' public goods

An examination of some of the issues affecting the Food Standards Agency is now relevant. It will show that government intervention is complex in the food safety arena, and perhaps more difficult than intervention which supplies 'pure' public goods. Longfield (1997) argues that "food safety is undoubtedly a matter for

government". Since the late 19th century, in particular, the state has intervened in the 'market' for food safety. "The sale of food and drugs act of 1875 remains essentially in force today" (Collins 1993:102-3). Thus, food safety has become a 'right' based on statute and common law.

Arguably, the contemporary food safety 'emergencies' have led to a potential breakdown in trust in the government. As Longfield (1997) states: "If we can't trust the government to ensure our food is safe, then what can we trust them with?". This view highlights the state's role in upholding food safety standards. Nevertheless, it overlooks the difficulty that the government faces with intervention in this area. The state cannot simply supply food safety. It can only deliver appropriate regulations, and there is much debate over what food laws are considered to be appropriate.

The government cannot sub-contract the manufacture of 'food safety' as would be the case with say defence equipment. Thus, the provision of a pure public good is perhaps easier for the state to deliver. Moreover, regardless of the public's views on national defence there is agreement that it is the government's responsibility. In contrast, the private sector has a significant responsibility for food safety which lessens the role of the state.

A flood defence policy could also be easier for the government to implement. Coastal flood protection is almost certainly the responsibility of the state because it is difficult to practise exclusion, so the private sector will refuse to pay. Government could contract out the building of a flood wall. Perhaps, the amount of flood protection required, by the public, could be estimated without too much difficulty. Different types of flood wall could be specified, in terms of their size and cost; and their ability to withstand the greatest flood over a particular duration. This information could be communicated to the public, so effectively they could determine whether they want flood protection which should cover say a 5,10 or 20 year period.

2.3. Food safety as an impure public good

Earlier in the chapter, it was argued that the public could not opt out of 'pure' public goods such as national defence. The following discussion suggests that the situation with food safety can be different. Food safety can be interpreted as an 'impure' public good. The basic standards of food safety are enforced collectively (i.e. as a public good 'across the board') by Environmental Health Officers. However, above these basic standards the private sector plays a significant role in the delivery of food safety. This is because, crucially, parts of the private sector, can exclude people from its food safety standards.

The major supermarkets, in particular, have developed "their own quality definitions of foodstuffs which go well beyond the more limited (government) food safety and hygiene legislation" (Marsden et. al. 1999:444). Thus the state's role is that of an external guarantor, to the supermarket's regulation policies. The customers of the supermarkets benefit from the major retailers safety initiatives. However, those who cannot afford to shop at the major supermarkets, or do not have access to them, are excluded. Those who are excluded from the supermarkets food safety initiatives have to rely on the state's "baseline standards and supervision" (Marsden et. al. 1999:437). Government supervision remains important for maintaining food standards in the independent sector such as in takeaways (Marsden et. al. 1999:443). Thus state intervention can be described as a public good for the domestic regulation of the independent food sector. Nevertheless given that the supermarkets are influential in setting their own standards, then the state's role is limited. The Food Standards Agency may, to a large degree, be better understood as a merit good.

2.4. Food safety as a merit good

"Merit goods are goods that society thinks everyone ought to have regardless of whether they are wanted by each individual" (Begg et. al. 1984:355). The justification for the public provision of merit goods is that society places a different value on these [merit] goods from the value placed on them by the individual. Like public goods, it follows that individual choice within a free market

economy will lead to a different [inefficient] allocation; from the allocation that society wants to see (Begg et. al. 1984:355).

Education could be used as an example of a merit good, and the following argument discusses the [merit good] case for government intervention in education. Arguably, university education should be considered as a private good. On this basis university students should see education as a personal investment and they should have to borrow money if they want to 'purchase' such an education. If education is left to the market in this way then demand could fall as many people will not want to borrow such money. Thus education as a positive externality, in say a production context, would be lost. The merit good case is that: "more education will raise the productivity of not only the individual worker but of the other workers with whom this worker co-operates" (Begg et. al. 1984:355). This example could be applied to food safety education where knowledge of food hygiene practices would not only benefit the individual but other people who consume the food prepared by the individual. This would be relevant in the home, but particularly in catering establishments. Thus say if individuals demand too little [food safety] knowledge, then the Food Standards Agency could encourage the provision of food hygiene education. Communication of food safety practices through television advertisements has been one way that the Agency has attempted to provide this education.

Part 2: Methodology for the research study

Chapter 3: Revealed and Stated Preference

3.1. Definitions of revealed and stated preference

Chapter 2 argued that it is difficult to find out how much of a public good is needed. The lack of a “marketed output” from a public good, such as the enforcement of food safety regulations, means that there is no precision when it comes to measuring the quantity of a public good that is needed (Kamarack 1983:105). It is though possible to derive information indirectly from the market. An approach which is described as 'revealed preference' (see top of table 3.1). Alternatively, the public could be asked to state their preferences directly. This is described as 'stated preference' (see the bottom of table 3.1).

Table 3.1. Behaviour based methods for the valuation of public goods.

	Results from directly observing valuations	Results from indirectly observing valuations
Observed Market Behaviour	OBSERVED / DIRECT Referenda (4.3)	OBSERVED / INDIRECT Travel cost (3.4) Housing example (3.4)
Responses to Hypothetical Markets	HYPOTHETICAL / DIRECT Contingent Valuation (4.2)	HYPOTHETICAL / INDIRECT Conjoint analysis (4.5) Contingent ranking (4.7)

Sources: Based on Mitchell and Carson (1989:75) and O'Doherty (1996:44).

3.2. The cost of illness approach

This section will briefly examine how much food safety could be worth, from the (revealed) costs of food-borne illness. There is an approach which estimates the cost of illness. It is the total of the medical costs of an illness, in addition to the forgone market income from lost work time (Antle 1999:608). The value of a food safety policy could be quantified by adding (1) the amount that health costs are reduced, and (2) the money that the public would earn, if they did not suffer from a food-borne illness.

The problem with this approach is that there is a difficulty in measuring the illness costs for non wage earners or undervalued workers e.g. voluntary carers (Ives et. al 1995:53). The method focuses on lost monetary income or lost output. This emphasis on economic productivity could result in an under valuation of illness in those who do not work, for example the elderly. Such an approach may be seen as "unacceptable" to society as a whole (Ives et. al. 1995:41). Moreover, intangible costs, such as the loss of leisure time through food borne illness are beyond the scope of the cost of illness approach. Consequently, there is a case for using a different method for the valuation of food safety policies.

3.3. Willingness to pay and consumer's surplus

This section provides the direction for the rest of the chapter. It is necessary to introduce the concepts of willingness to pay and consumer's surplus. The economist's fundamental criterion of value is willingness to pay, and how much money people are prepared to 'give up', or trade-off, for, in this case a public good. The demand curve, as an ordered summary of people's willingness to pay, is of importance in measuring the societal benefit of additional food safety. The aim of the research is to approximate the demand curve for food safety (Laslett 1995:11-12).

If there is not an appropriate (revealed preference) method of examining the 'market' for food safety then there still exists, theoretically at least, a latent demand

curve that could be uncovered using a (stated preference) questionnaire (Hanemann 1995:81). If such a survey were undertaken then a sample would be taken, from a representative population group. A willingness to pay question would be asked to respondents, and the results when aggregated should correspond to a market demand schedule (Hanemann 1995:81).

The concept of consumer's surplus is now relevant. It is a demand related concept that measures "the difference between the amount of money that the consumer is willing to pay, for a given quantity of a good, and the amount that the consumer actually pays" (Call and Holahan 1983:91). For a quantity increase, in public goods, the consumer surplus measure can be interpreted as the respondent's maximum willingness to pay, in order to gain the quantity increase and still maintain the initial level of utility (Mitchell and Carson 1998:25). The measurement of consumer's surplus, when aggregated, can help estimate the public benefits of a quantity increase in a public good.

The consumer's surplus (the total sum elicited from a study of people's collective willingness to pay) is a reflection of what a safety improvement was worth to the public; relative to the alternative ways in which they could have spent their limited incomes (Jones-Lee et. al. 1999:77). The emphasis is on public preferences, because decision making should take into account people's preferences. It is members of the public who will be affected by choices made over safety spending. It is the public which stands to benefit from improvements to public safety and it is ultimately they who will have to pay for it (Jones-Lee et. al. 1999:77).

3.4. Examples of revealed preference

The discussion will now look at whether knowledge gained through environmental valuation could be used to value food safety. The demand for environmental public goods has been 'revealed' by examining the purchases of related goods in the private market place (Garrod and Willis 1999:7). One revealed preference method used in environmental valuation is the Travel Cost Method. It can be used to estimate the demand, or marginal valuation, curve for recreation sites (Garrod

and Willis 1999:7). It has been used to estimate the value of a National Park. It does this by assessing the demand for the related market good. It examines how much people are prepared to spend on travel to gain access to the park (Garrod and Willis 1999:125). This should help the researcher understand how much they demand the National Park. The advantage, of this approach, is that it is based on observed behaviour involving a real rather than a hypothetical choice (Ives et. al. 1995:42).

It is also suggested that the demand for goods, such as housing, can be used to derive the demand for environmental goods. For example, a house in a National Park has an environmental 'good', or benefit, of a scenic view. If the non environmental characteristics of housing are controlled then it is possible to work out "the implicit price that individuals are willing to pay to consume the environmental characteristics (such as the view) associated with the house" (Garrod and Willis 1999:8). In theory, it could be possible to work out the demand for National Parks by comparing house prices inside and outside the Parks. Houses inside the National Park could have a better view than a similar property outside the Park. The price differential between the two properties could give some indication of the value, of the view, that the *landscape* of the National Park property provides.

3.5. Preventative expenditure and averting behaviour

Revealed preference can also be understood by using the concept of preventative expenditure or averting behaviour from the environmental economics literature. Preventative expenditure is about what people are prepared to spend to *reduce* an environmental problem. For example, double glazing could be installed to *reduce* road traffic noise (Garrod and Willis 1999:7). An 'averting behaviour' approach infers a monetary value by observing the costs that people are prepared to incur in order to *avoid* negative effects. For example, an individual could *move* to an area with less air pollution, at a greater distance from their place of work, thus incurring additional transport costs in terms of time and money (Garrod and Willis 1999:7).

An example of preventative expenditure, in terms of food, could be the need for consumers to spend money to acquire information. For instance, information about how to store food properly to decrease the probability of food-borne illness. Food 'averting behaviour' could be understood as a switch from, what consumers perceive as, less safe to safer foods. For example from meat to non-meat alternatives or vice versa. This is elaborated upon in the following discussion on BSE.

A study was conducted in France to analyse consumer's meat purchasing behaviour after the 1996 BSE crisis. An exercise was developed to determine the public's willingness to pay for beef which should not transmit CJD (Latouche et. al 1998:347). The authors suggest that averting behaviour does not fully value the benefit of safer food. It is suggested that the "complete avoidance of the exposure is possible since the consumer can choose alternative products that are supposed to be safe". People could avoid the need to evaluate the potential risk from beef consumption by choosing an alternative product e.g. non meat alternatives such as soya.

The cost to the consumer from reducing their exposure to health risks "is a lower limit of the true value people give to health risk reduction" (Latouche et. al. 1998:349). Therefore, this expenditure, to avoid health risks, cannot be used as a proxy for the full willingness to pay for safer food. It is similar to expenditure on double glazing which reduces traffic noise to the householder inside the property but not outside (Garrod and Willis 1999:43). Thus expenditure on double glazing is only a partial solution, and a low estimate of the value people place on the environment.

It is stated that "following Henson (1996) the theoretically correct measure of the value that individuals attach to better food safety is their willingness to pay for safer foods; i.e. the largest monetary amount they are willing to pay for a specific improvement in food safety" (Latouche et. al. 1998:349). The French authors built a hypothetical scenario, into their willingness to pay study, that only beef consumption is available. The problem is that respondents were asked to pay only

for 'safer' beef and so some people stated very large bids (willingness to pay amounts); given that they were not allowed to 'buy' substitute products. In practice, in actual food markets, alternative purchases can be made e.g. other meat or non meat choices so the French study is not realistic. This example is useful though in highlighting the challenge with trying to value safer food.

3.6. Revealed preference - the market for organic food

Another possibility is that the demand for food safety could be revealed by examining the purchase of related food products. In this context, the market for organic food may appear to be useful for estimating the demand for food safety. For example Corsi and Novelli (2003:1) asked Italian consumers whether they would be willing to pay for organic beef meat. However, the authors suggest that organic meat "is considered safer and more environmentally friendly". On this basis an increase in the demand for organic food cannot necessarily be explained by a greater desire for food safety. The demand for organics may be due to environmental as well as safety concerns. Moreover, the safety element, of a purchasing decision for organic food, is difficult to separate from other characteristics such as taste, freshness or the locality of the produce.

This highlights the problem with revealed preference. "Like all induction, it requires an act of faith to extrapolate from particular choices to general assertions about behaviour and preference" (Sen in Hanemann 1995:107). "The Achilles' heel of revealed preference is that you have to know what the choice", to purchase organic food, "is about" (Hanemann 1995:108-9).

3.7. Stated preference as an alternative to revealed preference

Market based revealed preference techniques attempt to identify and observe purchasing choices, in situations in which people may actually trade off income against food safety. But if demand for organic food is, in practice, such a poor proxy for demand for food safety, then revealed preference appears to be inappropriate in this context. Although revealed preference has the advantage of

basing estimates on real choices it is limited by the rarity of pure wealth versus risk tradeoffs (Jones-Lee et. al 1985:50). As chapter 2 outlined, people expect consistent food standards; so trading off money against food safety rarely occurs. Moreover, the discussion on organics highlighted the difficulty of disentangling the effect of other non safety factors from safety purchasing behaviour.

In contrast to revealed preference, a [stated preference] questionnaire approach may be considered. This potentially allows the researcher to obtain the information that he requires (Jones Lee et al. 1985:51). The virtue of this approach is its directness. Mishan (1971:705) provides the justification and foundation for such a direct method. He suggests that if there is not appropriate real market data then economists should consider the alternative. If researchers are concerned with understanding increases in the demand, for non-market goods, then they may have to consider the possibility that data yielded by surveys, based on the questionnaire method, is better than no data at all.

This leads into a discussion of the stated preference method. This method "question(s) individuals directly about the value they place on non-market (public) goods" (Henson 1996:404). Pearmain and Kroes (1990:2) suggest that stated preference is about using "people's statements of how they would respond to different situations". Stated preference is also a relevant tool in environmental valuation because revealed preference, or behaviour in the market place, cannot value all environmental goods. Methods such as travel-cost "cannot estimate non-use values since there is, by definition, no related market good for the mere existence, as distinct from use, of a (National) park" (Garrod and Willis 1999:125-6). It is not possible to have a market, or revealed preference, for a good that exists but is not used. This is also true in the food safety context as the following example will outline.

The services delivered by environmental health officers do not benefit the public directly. They do not provide 'safe food' themselves rather they provide reassurance to the public by enforcing existing standards. There is a 'direct use' value to consumers if they purchase safer food because outlets are inspected. Also there is an 'option value' of enforcement. If a consumer wanted to buy food

from a takeaway they would have the option of doing so because the food premises are being monitored.

There is no 'market' for the services of Environmental Health Officers. It is for this reason that stated preference is needed to value a food safety public good, such as the enforcement work undertaken by Environmental Health Officers. The enforcement of food safety regulations provides choice to the public. By ensuring, in theory at least, that all food hygiene outlets meet the legal standards then the public is reassured and so is able to buy food from a wide range of food premises. This choice may not be exercised but there is, at least, an option value that cannot be easily derived from purchases made by food consumers.

3.8. The potential for stated preference to guide state intervention

Stated Preference techniques could, in theory, provide valuations of public goods even in the absence of markets (from which revealed preference could be used). The benefit of food safety regulations could be valued using stated preference. Such a benefit valuation could be explicitly outlined and so the basis for decision-making would be transparent (Garrod and Willis 1999:4). A food safety valuation explicitly done for scrutiny by policy makers, and the public, is helpful (Turner et. al. 1994:109). Decision makers can explicitly see what value is being attached to food safety. They can then consider how the valuation was derived, by the researcher, and provide feedback on the quality of the valuation. The next chapter will discuss different methods of stated preference.

Chapter 4: Methods of Stated Preference

4.1. Introduction

This chapter will first examine the contingent valuation technique as it has frequently been used in environmental valuation. It will then discuss other methods of stated preference such as choice experiments.

4.2. Definition of contingent valuation

Contingent valuation is where individuals are supposed to be able to give meaningful monetary values for public goods which are generally not priced (Mitchell and Carson 1989:96). It aims to measure the benefits of non marketed goods so that they can be entered directly into cost benefit calculations (Bateman and Willis eds 1999:1). Such a study *could* be conceptualised as a hypothetical referendum, but with a price [often in the form of a tax] on the public good to be provided. The study is intended to be self contained as it is meant to just affect the respondents answering the question. Thus respondents are voting on "whether to tax themselves for a particular purpose" (Hanemann 1995:90). The method "avoids the absence of markets for public goods" because the public is presented "with a hypothetical political market in which they have the opportunity to buy the good in question" (Mitchell and Carson 1989:2-3).

The questionnaire situation where the good is presented needs to be made realistic to respondents. Thus participants should then be able to accurately predict their decision whether to pay and if so how much to pay (Hanemann 1995:109). The questionnaire, apart from being realistic, should also provide impartial information, about the good in question, and should use a representative sample of the population.

Contingent valuation could have a useful input into public policy resource allocation. It has the potential to improve upon the decisions made at general elections. The problem with elections (as stated in chapter 2) is that they do not

provide accurate market signals. A contingent valuation study could give the necessary 'market signals' as to the demand for public goods. This is because the method can be analogous to referenda.

4.3. The analogy between a referendum and contingent valuation

A referendum is an act of referring a political question to the electorate by a direct vote. It can be seen as direct democracy as the decision making is in the hands of the public rather than political parties. The theme for discussion here is whether people behave and vote differently in political markets compared to consumer markets. It is argued that the private or consumer market may not be relevant to state intervention. This is because when it comes to voting in elections, and to decisions about public goods, people may be less self interested and more public spirited than when they participate in the market for private goods. For example, for votes over public spending such as for pensions or schools, people may vote in favour of them even though they may not directly benefit. Private desires (i.e. consumer demand) can still be considered in a public voting context. However, the discussion on public spiritedness suggests that a political market is a more appropriate analogue for contingent valuation surveys than are private markets (Mitchell and Carson 1989:93-4).

If a referendum is used as the basis for the question then a contingent valuation study has the possibility of offering an almost real life situation. The behaviour to be predicted by such a study is how informed citizens would actually vote if a proposition to provide an additional, or improved public good, was on a ballot. After all referenda are used, in America at least, to make binding decisions about the provision of state services, such as a new school building to be financed through public expenditure. Moreover, a referendum has clear economic implications for a voter's household as it "will have to bear its share of any cost implied by the proposal it passes" (Mitchell and Carson 1989:94). The application of referenda to contingent valuation is helpful because "they provide an institutional model for asking people to express their preferences for public goods" (Mitchell and Carson 1989:77).

Defence spending, as a pure public good, could be an appropriate application for contingent valuation. The technique could be used to value specific military programmes. In Switzerland referenda have been used to find out if people want to pay, for a certain amount of extra defence equipment (Hanemann 1995:83). In comparison if a defence valuation exercise had been undertaken in the United Kingdom, on willingness to pay for the 2003 Gulf War, then there would have been the potential for a rational input into decision making. Contingent valuation results could have better reflected the welfare of society, than the outcome of an opinion poll on public attitudes towards the war. This is because with contingent valuation people would not only have had to state whether they were in favour of the war; but whether they were willing to pay higher taxes for the war. These taxes could alternatively have been spent on other public goods, such as health and education. If such an exercise was used as the basis for a decision, then respondents would have had a powerful incentive to take the valuation exercise seriously. In practice, politicians are unwilling to sanction such a willingness to pay exercise because it could restrict their scope for decision making. Nevertheless, this does not discredit the appropriateness of the research method for the valuation of pure public goods.

Moreover, contingent valuation could be “more representative than its real world referendum counterpart” (Mitchell and Carson 1989:95). The poor, for example, could be better represented in a contingent valuation study than they would be by ordinary political participation. Contingent valuation interviewers, instead of relying on voters to register and come to the polls, go to the respondent’s homes and work hard to ensure people’s participation. Also if people with lower incomes are underrepresented among respondents because it is more difficult to get them to participate, then statistical techniques could be used “to weight the data to compensate at least in part for this shortfall” (Mitchell and Carson 1989:95).

The contingent valuation method, if it were to be adopted widely, would have to improve upon existing methods of consultation over public goods. Existing methods tend to be quite simple. For example, they could ask the public whether they would be willing to spend more money on public goods or whether people want the same amount of money spent or even less spent (Mitchell and Carson

1989:75). Simple methods such as this may be favoured by local authorities. A local authority could ask people if they wanted more, less, or the same amount of money spent on food safety. Thus borough councils can obtain a rough idea of public preferences about food safety. However, a local authority survey may offer a sparse description of a public good. Respondents are rarely given information about what is currently being spent on public goods and how it is being spent (Mitchell and Carson 1989:87). Moreover, a council survey may offer an insufficient incentive to the respondent to consider monetary trade offs. For example, a council survey is unlikely to include an attempt at creating a market, in other words a trade off situation. Moreover, such a survey would be unlikely to specify a payment obligation. But this type of public consultation is relevant as it provides examples which contingent valuation studies should improve upon if they are realistically going to contribute to policy.

4.4. Other methods of stated preference

Other methods of stated preference are relevant. These other approaches are conjoint analysis and contingent ranking.

Contingent valuation exercises concentrate on the valuation of a particular scenario, such as greater regulation of food safety. This requires researchers to concentrate on providing adequate information about the scenario so that the respondent can judge the overall improvement. The results of these exercises provide information on preferences considering the whole situation rather than specific aspects of it.

4.5. Conjoint analysis

Conjoint analysis can be used to examine the response of the individual to changes in the attributes contained within the whole situation; as well as the scenario as a whole. Thus, rather than examining the entire situation as a contingent valuation study would do, the conjoint analysis approach allows researchers to break down the whole concept into different parts. Therefore, it is

possible to determine preferences over individual attributes (Garrod and Willis 1999:203). Conjoint analysis has been applied in marketing for over 25 years, for example see the egg study below (Bateman and Willis eds. 1999:462). However, more recently it has been applied in economics (see Louviere 1991, Louviere et. al. 2000).

In a conjoint analysis respondents are given hypothetical options. These options represent “packages”, or combinations, of different attributes which usually describe a particular product (Pearmain and Kroes 1990:17). In Ness and Gerhardy’s analysis of eggs; eggs have attributes such as production method, origin and price (per half dozen). Consequently, there could be a battery egg, which is imported and has a price of say 52p (Ness and Gerhardy 1994:29). The aim is to analyse consumer multi-attribute trade offs, for example, a local free range egg, with a price of 84p against an imported battery egg priced at 52p. The objective is to find out which attribute combinations confer the highest utility (Ness and Gerhardy 1994:27). For example, is an expensive free-range egg preferred to a cheaper battery egg?

One problem is that there are many product combinations which can be traded off against each other. There may be three levels, battery, barn and free range associated with the attribute of production method. These three levels will then have to be combined with different origins and price tiers. “As the number of attributes and levels is increased, the number of resulting options also increases, so that the task of assessing all of them soon becomes too much for most respondents. A range of strategies can be pursued to reduce the number of options” (Pearmain and Kroes 1990:7). But “even in fairly modest experiments, the number of concepts can become too great to expect respondents to make meaningful evaluations” (Ness and Gerhardy 1994:28). Although, too few levels may impede the analysis, for example if price were omitted, and only the production method and the origin were included. Therefore a balance is needed (Garrod and Willis 1999:207).

In Burton et. al's full study outlined later (2001:487) there were 27 choice sets

which were split into 3 subsets of 9. This shows the complexity of these types of studies as a respondent is being asked to make 9 different trade-offs. This is convoluted as there were five attributes to be considered. These were food bill, production technology, level of farm chemical use, food miles and health risk.

However, the advantage of this method is that it should avoid part-whole bias, which is discussed in detail in chapter 5. The whole GM 'scenario' was broken down into parts. It could be hypothetically assumed that GM technology reduces the use of chemicals and reduces food health risk. The 'overall benefit' of these two elements can be broken down and evaluated separately to see which one was worth more to the consumer. The advantage of this approach is that the trade-off, between say the reduction in chemical use and money, is more specific than contingent valuation where only the whole 'GM scenario' can be evaluated. The following section examines the method again to argue that valuation studies related to genetically modified food may not be appropriate.

4.6. Choice modelling and willingness to pay for GM food

The conjoint analysis or choice experiment study by Ness and Gerhardy on eggs was based on market prices and actual types of conditions for hens' e.g. battery or free range. These attributes are readily available in food outlets whether they are supermarkets or farm shops. The inherent problem, with Burton et. al's study (2001) on GM food, is that GM food has not been, and may not be, fully introduced in Britain. Evaluation of the GM issue, in the United Kingdom, could have been hindered by the public's awareness that a number of policy decisions had to be made (Rigby et. al. 2004:148). For example, ingredients derived from GMO's need to be labelled as GM despite the absence of detectable GM ingredients (Rigby et. al. 2004:130).

The study proposes a simple choice set, trading off traditional technology at 100% of the current weekly food bill against GM technology at 80% of the current bill (Burton et. al. 2001:481). It is not clear, in practice, that GM foods would be "80% of the current bill". Studies such as this should not present situations which leave themselves open to being contested by respondents.

This choice study appears to be limited by different types of protest responses. First, some of the respondents removed the choice sets. ‘Cleaning’ took place where people tried to scribble out and change the choices which indicates that people were trying to protest vote (Rigby 2001). Second, some respondents selected the status quo for all the choice sets presented to them. The authors admit that the respondents may again be registering “a form of protest vote: because of strong objections to some aspect of the choice sets, they consistently select the current position, without any consideration of the attribute levels presented” (Burton et. al. 2001:487). The researchers chose to exclude these responses because it was felt that some people were not making choices based on the attribute levels. Holland (1995:36) suggests that rather than excluding anomalous cases it would be better to re-consider them. It is worth finding out the number of protest responses and why such concerns are present.

The following discussion outlines a possible concern with genetically modified food. It has been proposed that there should be a GM free label so that consumers can identify what food would be and would not be genetically modified (Grocer 2001). However, this could mean that conventional food will become a premium product and such food will sell at a higher price, with the new label. This would be the case if genetic modification began to dominate the market and the GM free food became a niche product. Perhaps, a food with ‘no added’ GM ingredients could become a special product like foods with ‘no added’ sugar (Fine et. al. 1996:140). Therefore consumers who want to continue purchasing conventional food would have to pay more to keep their consumption patterns unchanged. This would be an erosion of the consumer’s property rights (see 5.3). Also this might explain why respondents were “consistently selecting the current position” as stated above. Alternatively, this may explain why some people refused to engage with the choices at all (Holland 1995:36), or even tried to change them.

Perhaps qualitative studies are more appropriate when examining genetically modified food. This is because consumers can simply state their views for or against. A quantitative study on genetically modified food would be more

complicated. Burton et. al's study, made hypothetical assumptions about attributes such as the price levels. In addition it treated the current price level, of conventional food, as fixed. It appeared to overlook the benefit, in price terms, which GM food would receive, from conventional food, potentially, becoming marginalised as a niche product.

4.7. Contingent Ranking

Another stated preference technique is the contingent ranking method. “The contingent ranking method [asks] respondents to rank their choices rather than just choose the one that they most prefer [like conjoint analysis]. In contingent ranking a sample of individuals is required to rank a discrete set of alternatives from their most to their least preferred” (Garrod and Willis 1999:211). Garrod and Willis (1999:275) have used contingent ranking to investigate the public’s demand for different levels of biodiversity offered by various forest management standards.

It is suggested that respondents may use varying criteria, in making ranking decisions, at different levels. In other words, the criteria for ranking the first and last choices may not be consistent. Whether this is due to respondent fatigue or difficulty in discriminating between lower ranked alternatives is unclear (Garrod and Willis 1999:215-6).

The indirectness of the method presents a problem. With contingent ranking, the researcher tends to elicit preferences in the form of attitudes rather than behavioural intentions. Instead of requiring respondents to declare clearly that they are willing to give up a specified amount of money in order to receive the good in question [as in contingent valuation], the contingent ranking technique [only] requires respondents to make rank order preferences for a set of alternative choices” (Mitchell and Carson 1989:85).

4.8. The choice of stated preference method

Contingent valuation could be viewed as the most appropriate method. It is less of a cognitive burden than contingent ranking or conjoint analysis; given that there

were 9 choice sets in Burton et. al's study (2001:487). The complexity of conjoint analysis could lead to respondents consistently selecting the current situation (see 4.6). This may be because people are using the 'status quo' option as a way of simplifying their answers (Rigby et. al. 2004:66).

In contrast contingent valuation is more straightforward as there can be only one question. Thus, the advantage of contingent valuation is that respondents could provide more considered answers to this 'one whole scenario'. The construction of a plausible, generic, food safety situation is useful given that the valuation exercise is being directed at members of the public.

Another advantage of contingent valuation is that it focuses on the trade off between the 'whole scenario' and 'the cost' (Rigby et. al. 2004:148). In comparison to the United States, the British public is unfamiliar with this kind of trade-off and votes on tax propositions (Willis 1995:127). However, this kind of exercise could improve the quality of the British debate over taxation. Emphasis could be placed on the real economic issue, i.e. the public's willingness to pay, rather than political campaigning (see 5.2.2.). The different approaches for undertaking a contingent valuation exercise are addressed in the next chapter.

Chapter 5: Methodological challenges when undertaking a contingent valuation study

5.1. Discussion on Elicitation Methods

5.1.1. Introduction to elicitation methods

This chapter will explore the methodological challenges which confront a contingent valuation study. These challenges are elicitation methods, payment methods, property rights and part-whole bias.

The main methods (or 'elicitation formats') will be examined. Bids or values are obtained through some form of questionnaire survey and elicitation format, in which individuals are asked to state their maximum willingness to pay for the good (Garrod and Willis 1999:134). The aim is then to work out from this the consumer's surplus for the public good.

5.1.2 . Open and closed-ended formats

First there is an open-ended question in which no values are specified and individuals are asked a simple question on their maximum willingness to pay for the good e.g. what is the most you would be willing to pay for the 'food safety public good'? Where respondents have no prior experience of purchasing it, which they would not as there is not a market say for food hygiene regulation, "then respondents may experience considerable difficulty with this format" (Garrod and Willis 1999:134).

It is also suggested that open-ended formats should not be used to elicit non-use or passive values. For example, the existence of regulations; in other words "those situations for which there is no market in the good or similar good" (Garrod and Willis 1999:134). The open-ended method would be appropriate when valuing National Parks where respondents have experience in purchasing similar goods e.g. access to other private recreation sites. However, this elicitation format has

less relevance to food safety, as there is not a similar good which could inform demand for food safety, as a public good. Also, there could be a problem of inconsistency if the open-ended approach were used to value food safety. If people are uncertain, and not knowledgeable, about food safety, then their response will reflect this and there could be a variance, or inconsistency, of willingness to pay responses across the cross section of the sample (Bateman and Willis eds. 1999:529)

A second type of approach is a closed-ended question where a range of values are specified and the respondent chooses one of the values. This type of question could be asked as follows: suppose a food safety public good, such as the enforcement of food hygiene regulations, could be improved; would you be willing to pay £x (where x is the WTP amount) to make sure that this improvement took place. This type of question is useful because it offers guidance to the respondent, as to their potential willingness to pay, where there is not a market. There is guidance because the “format anchors the respondent’s answer to the range of values presented, although respondents can be offered an ‘other’ category in which they can specify a value (Garrod and Willis 1999:134).

A combination of the two approaches leads to “a dichotomous choice question in which a single payment amount is presented to the respondent who either agrees or disagrees with the amount” (Garrod and Willis 1999:135). This approach is like a referendum with a payment attached. For example: suppose a food safety public good, such as the enforcement of food hygiene regulations, could be improved - would you be willing to pay £75 extra to make sure this improvement was implemented (Yes / No) ?

“The payment amount is randomly varied in the sample questionnaire survey across a pre determined range” (Garrod and Willis 1999:135). This pre-determined price range has to be established. The problem is that the range of values, to be used in an empirical study, will require a piloting exercise. Open-ended questions will be needed to elicit the pre determined range. A large scale open-ended pilot study is useful for a dichotomous choice or referendum

type format, to establish that responses are well calibrated (Garrod and Willis 1999:135).

The aim is to make sure that the amount specified, e.g. the £75 stated above, is in the 'right' place. An ideal open-ended pilot would be able to put the £75 amount in the middle of a later closed-ended sample of WTP responses. This would help the pre-determined range to focus on the public's median willingness to pay. For example, a dichotomous choice question could be asked to elicit whether the respondent was willing to pay, say, £100, it might then be found that the majority of respondents were not willing to pay. Therefore, the bid level could be switched to £50. If the majority of people were willing to pay at that level then the bid amount could be raised to £75 as would be predicted by an ideal pilot survey.

The advantage of this dichotomous choice procedure is that it reduces non-response because the respondent just has to give a yes or no answer. Also, because people are responding to monetary amounts along a pre-determined range then there is not the problem of outliers. People have to respond to a pre-determined payment figure and are not allowed to give an unrealistic, outlying, bid amount as could be the case in an open-ended question (Pearce and Ozdemiroglu 2002:50,52).

Researchers have been concerned about respondents in dichotomous choice situations who are prone to 'yes-saying' (Aakkula 1999:115). This will have the effect of increasing the average willingness to pay which appears to be a limitation of this approach. If respondents are not given the opportunity to say 'don't know' [in a dichotomous choice question] then there could be too many agreement responses. Mitchell and Carson (1989:173) suggest that affirmative responses may be caused by questionnaire design. They quote a methodological experiment where respondents were asked whether they were in favour of a hypothetical public goods programme or not. The proportion of people who volunteered a don't know response was 69%. In another version, which explicitly offered respondents the option of saying they did not have an opinion; 90% of people refused to give one. The use of a "don't know" statement (Hanemann 1995:95) could reduce 'yes

saying' where people are too inclined to agree with a willingness to pay statement.

5.1.3. Iterative bidding

There is also the "iterative bidding format or series of dichotomous questions". The iterative bidding approach begins as a dichotomous choice question: is the respondent willing to pay £x (£100) for the food-safety public good (Yes/No)? To avoid too much repetition the iteration may double (£200), or halve (£50), the previous bid (£100) presented to the respondent, depending upon whether the person was WTP or was not WTP. The bidding process aims to move, or iterate, between the sum the respondent is willing to pay and that which he is not, to determine a more precise WTP amount (Garrod and Willis 1999:135).

This method has been criticized because the bidding method may be tedious for respondents. Also the efficiency gains from follow up WTP questions (iterative bids) may be small (Garrod and Willis 1999:136). The gain in efficiency is small because going from a single to a double bounded format could introduce a bias into the study. The second bid may be inconsistent with the first (Bateman and Willis eds. 1999:382). People may not react in a neutral way to the second bid amount. If the respondent had said 'yes' to the first bid then they might view the presentation of the second [higher or doubled] bid as an attempt at bargaining which may be resented. Thus, in this case, there could be a bias towards a follow up no response.

If the individual had said 'no' to the first bid then they may feel that a second [lower or halved] bid is unwanted. They may feel that they are being offered an inferior or cheaper version of the commodity. If so, this would cause a greater incidence of follow-up no responses "than would be anticipated on the basis of the 'no' response to the first question alone" (Bateman and Willis eds. 1999:385).

The effect whereby the respondent does not react in a neutral manner has been described as a "reiteration bias". The problem is that respondents could "alter their behaviour over repeated invitations to bid" (Garrod, Scarpa and Willis 1999:11).

The basic single-bound, closed-ended, format does not have this re-iteration bias.

The starting point for the 'bidding game' may also be contentious as it could affect the respondent's answer. Respondents may use the first bid amount presented to them as a clue regarding the appropriate willingness to pay amount (Bateman and Willis eds. 1999:530).

5.1.4. Payment cards

A payment card approach is where respondents are presented with a card with potential contributions to the public good being valued from £0 to some upper limit. The advantage, of a payment card, is that it can present visual information to respondents. It lists all the possible bid amounts and so it is not anchored to a particular bid amount (Bateman and Willis eds. 1999:195). Another advantage of this approach is that it provides more context than open-ended questions (Aakkula 1999:114).

The respondent only has to choose one WTP amount from the card and so it is quicker to answer than the iterative bidding format. Respondents are just asked "what amount on this card is the most you would be willing to pay for the public good being proposed" (Garrod and Willis 1999:136). The amount chosen can be understood only as an indication of willingness to pay; that it lies between the highest number below the amount circled, and the smallest number above it (Bateman and Willis eds. 1999:305). For example, take 1, 2 and 3 on a card; 2 is circled but the WTP could lie between 1 and 3.

Starting point bias could seriously affect the payment card approach. The starting point, commencing the range of WTP amounts, could influence the final WTP value for the good. People could think that the starting point suggested is what other people pay and therefore what is expected of them (Garrod and Willis 1999:155). Given the example above people might think a non payment (£0) may be appropriate because of the starting point bias.

5.1.5. The choice of elicitation approach: open and closed-ended formats

The development of the methodology should inform how the research study is undertaken. Before 1985, most contingent valuation studies used an open-ended willingness to pay question such as "what is the most you would be willing to pay?" Since then most major CV surveys have used closed-ended questions such as: if it cost £x would you be willing to pay this amount. The argument in favour of a closed-ended approach is that people do not know their WTP for most items whether they are private or public goods. Moreover, people cannot discover it by examining their utility function or demand curve. Instead willingness to pay is revealed to them, from the consequences of their acts of judgement, when they make purchasing decisions. For example, "here is an item it costs \$5 will you take it?" (Hanemann 1995:90-1). These purchasing decisions "whether in the market or in voting (for public goods) are usually discrete" (Hanemann 1995:90-1). Therefore the decision making is clear and so the closed-ended format is more realistic.

Moreover, there is an abundance of evidence that respondents find open-ended questions more difficult to answer than closed-ended ones. "Even if people have experience buying an item and can state an amount which they would be willing to pay, they may find it hard to state the maximum" (Hanemann 1995:90-1). The maximum WTP is needed to estimate the consumer's surplus properly. Open-ended responses can underestimate maximum willingness to pay because "the maximum is an extreme [and so] errors of cognition tend to fall on the low side" (Hanemann 1995:90-1). This bias may be reinforced by strategic behaviour, free riding, associated with open-ended questions which leads respondents to state less than their maximum willingness to pay. Moreover, experimental evidence shows that open-ended surveys reveal less than the consumer's maximum willingness to pay.

Arguably, the closed-ended referendum format is superior to open-ended surveys. There is apparently no strategic reason for the respondent to answer a referendum question falsely. This led to the method being endorsed by the United States

Department of Commerce's National Oceanic and Atmospheric Administration's panel (Hanemann 1995:90). The method has been used in many environmental valuation studies, for example see Garrod and Willis (1999:250-1). Also, a recent study on genetically modified food used a closed-ended dichotomous choice question (Rigby et. al. 2004:84). Although Willis (1995:127) argues that "there is no definitive evidence that referendum models out perform open-ended, payment card or iterative bidding formats for public goods. There is no standard against which results from different methods can be compared".

A closed-ended question could be constructed so that if the respondent wants the good, at the specified tax price, then they have to say yes. Also they would have to say no if the tax price was too high for them. The question should lead to respondents thinking that if extra tax is (not) paid then there is (not) the investment in the public good. Respondents should not believe that the good is certain to be provided as this could lead them to understating their willingness to pay. Instead the aim of the researcher is to elicit the respondent's willingness to pay correctly (Mitchell and Carson 1989:85). This leads into a discussion about the question being incentive compatible.

5.1.6. Incentive compatibility

A valuation question is incentive compatible if a respondent has the incentive to correctly reveal their willingness to pay (Bateman and Willis eds. 1999:161). Incentive compatibility requires the contingent valuation scenario to be coercive, i.e. the respondent would have to pay the amount bid, and consequential, i.e. the level of the bid should impact on the chances of the good being supplied.

One of the dangers with a contingent valuation survey is that it offers respondents "a costless way to make a point" about the provision of public goods (Bateman and Willis eds. 1999:136). To avoid this, the scenario needs to be made realistic. If the payment situation could be implemented, then there is an incentive for the respondent to give an honest willingness to pay. It will be in the respondent's interest to accept the bid if his WTP is greater or equal to the price asked and to reject otherwise (Pearce and Ozdemiroglu 2002:52). If a valuation

question is incentive compatible then it should avoid the 'warm glow' problem outlined in the next section.

5.1.7. The Warm Glow Effect

Respondents could treat the request for a willingness to pay amount, in a contingent valuation questionnaire, as they would a donation to charity. The respondent would not be making a proper trade off between money and safety. The respondent is not stating their demand for a public good but may instead be purchasing 'moral satisfaction' (Kahneman and Knetch (1992:57)). People may say they are willing to pay because it gives them a feeling of well being [a 'warm glow'].

Contingent valuation is about asking individuals to make private contributions to a publicly provided good. But this gives respondents the opportunity to enjoy private 'warm glow' benefits from hypothetical contributions towards the good (Chilton and Hutchinson 1999:344). The problem is that respondents may be more interested in the private warm glow benefits of giving and less concerned with the scope of the public good. Therefore it could be problematic to transfer the result of a contingent valuation study to the real world. If though a valuation exercise could be made to appear realistic then perhaps the 'warm glow effect' could be removed. The question would need to encourage an honest response, i.e. be incentive compatible, with respondents believing that they could be taxed on the basis of their responses. This is because taxation is assumed not to contain warm glow preferences from giving money to government (Chilton and Hutchinson 1999:348).

5.2. Discussion on Payment Methods

5.2.1. Payment methods

The chapter has so far looked at elicitation methods. The discussion will now examine different payment methods. Taxation was previously highlighted as part

of a referendum style question and so could be easily chosen as a payment method. However, the issue is more complicated as the next section on taxation outlines.

5.2.2. Taxation as a payment method

The chosen payment method should be connected to the good in question. It should be fair and equitable as those paying for the good should be those receiving the benefits (Garrod and Willis 1999:132). In theory, income tax is connected to say national defence and is a fair method of payment. This is because taxpayers pay while it is they who receive the benefits.

The advantage of taxation as a payment method is that public goods are usually funded out of taxation. In particular, hypothecated taxation clarifies the link between the payment of taxes and the delivery of public goods. Thus taxation could have legitimacy with the public (Mulgan and Murray 1997:303). If the public could perceive higher taxes going into say an improved health service then they may be willing to pay higher taxes (Independent 2000).

However, the poor quality of the debate over taxation, presents problems for its use as a payment method. For example, in the run up to the 1992 election confrontational political imagery was used. For example a “poster portrayed Labour as a huge locust gobbling up all before it” (King et. al 1993:141). This negative campaigning could damage the case for public goods, giving the impression of a government taking too much of the public’s money. Also in 1992 tax was portrayed as a “bombshell” as if the public were being attacked by the state. The 1997 general election was no better; tax was used as a ‘weapon’ to attack the incumbent [Conservative] government. Labour emotively warned of plans to put VAT on food (Butler and Kavanagh 1997:60).

The implications of negative campaigning are that the public may have a perception of government exploitation. The danger is that harmful political advertising may undermine society’s support for public goods. The concern is

that the use of the term 'tax', could cause a [public good] valuation question to be dismissed out of hand. Also a valuation question which used income tax as a payment method would perhaps discourage responses from low or non-taxpayers. This is because tax may not be seen as relevant by such respondents.

5.2.3. Market Prices as a payment method

Food safety valuation studies have asked people whether they would be willing to pay a higher price for safer food. Examples include willingness to pay a price premium for pesticide free produce such as Fu et. al. (1999:220). This is a consumer study which asked people how much more they would be willing to pay for food where pesticide residue was 25% less. Such studies show that consumers are willing to pay higher prices (Fu et. al. 1999:221) for what they perceive to be lower food borne risk. This could justify the use of market prices as the payment method; on the basis that it may not create the protest responses which taxation may engender. Market prices could be an appropriate method although some concerns with market prices, as a payment method, need to be addressed. This is the purpose of the next section.

5.2.4. Problems with market prices as a payment method

Griffith et al's study on chemical contaminants (1999) used food prices as the payment method. One quarter of Griffith et.al.'s (1999:113) respondents agreed with the statement:"If I had to increase the amount I spend on food each week to fund the programme, I would change the type or amount of food I buy". Higher food prices could lead to less food being bought or the same quantity with a lower quality and price. The funding of public goods is not supposed to affect food consumption; if it did then it would create another distortion which could require intervention. Another concern is that, some consumers may be saying that they would change the type or amount of food that they are buying to avoid having to fund the programme. Food prices, potentially give people the opportunity to 'free ride' by changing their food consumption patterns so they do not have to pay.

The study removed 30% of the respondents, from the benefit estimation, who were not willing to pay for the surveillance programme. The justification for doing this is free riding; that people may want the public good of surveillance but are not willing to pay for it. It is stated that "it is apparent that the vast majority of zero bids were protests rather than a valid assessment of the actual value placed by respondents on the programme" (Griffith et. al. 1999:108). However, some respondents may not have been willing to pay because they did not understand the question. People may have thought that they were being asked to pay more, through higher food prices, for a public programme for which they were already paying taxes. The question is about keeping the programme and paying a higher price for food versus removing the programme (Griffith et al. 1999:103). It appears implicit, that taxes would fall slightly if the programme were removed. Respondents may have difficulty understanding this concept because the reduced tax burden is not made clear.

5.2.5. Summary of discussion on payment methods

The previous discussion suggested that the use of market prices can be problematic. An increase in food prices is an unusual way to fund public goods. Indeed, the proposal to fund the Food Standards Agency from a levy on food retailers was dropped. This was due to industry opposition, but also the costs to retailers would have been passed onto consumers which would have been unpopular. Nevertheless the concerns with income tax could cause the payment question to be rejected, regardless of whether people want more food safety or not. Market prices may avoid this problem and could therefore be more appropriate.

5.3. Discussion on Property Rights

5.3.1. Willingness to pay and willingness to accept

The discussion will now explain why the study needs to be about 'willingness to

'pay' rather than 'willingness to accept'. A willingness to accept question involves the respondent having to trade off less safety for more money. This is a contentious exercise as the Griffith et. al. study (1999:103) emphasised. Nearly all the respondents [92%] said they definitely or probably would not be prepared to pay lower food prices in exchange for lower levels of food safety. To understand fully why the willingness to accept measure is controversial, it is necessary to discuss the concept of property rights.

5.3.2. Introduction to Property Rights

Consumer property rights are where the consumer can decide whether or not to consume the good (Garrod and Willis 1999:17). Under pure public goods, such as defence expenditure, exclusion cannot be practised, or the benefit avoided, so consumers do not have a property right. However, under impure or semi-public goods, such as some aspects of food safety regulation, consumers do have a choice. For example, they can purchase food from supermarkets where public intervention is limited. The problem is that the public could feel that they have to pay twice. First, in terms of private averting behaviour, to minimise individual or household risks, by shopping at the major supermarkets. Second, in terms of paying for the government to address food hazards particularly in small premises, whether they use these or not.

If the individual does not own the right to a good, then the relevant measure of the usefulness of the good to the individual is the maximum he would be willing to pay to acquire it. However, if the individual owns the good, then the minimum the individual would be willing to accept as compensation for its loss is the appropriate utility measure. This is because willingness to accept is the amount that would restore the individual to his utility level before being deprived of the good (Garrod and Willis 1999:126).

It is suggested that research on consumer demand could provide insight into alternative levels of food safety, either above or below the established standards (Caswell ed. 1991:20). Willingness to pay is about measuring an increase in food

safety above the established standard. Under willingness to accept, a respondent is asked to state how much money they want for a lower level of food safety. However, it is difficult to measure “below the established standard”. Willingness to accept tends to be higher than willingness to pay. The reasons for this are useful for highlighting the problems associated with property rights.

5.3.3. The challenge from property rights

Willingness to accept may be higher because people may reject the property right implied by WTA questions; that they have to “sell” their right to some food safety attribute. Moreover, psychologists suggest that ownership itself makes a commodity more valuable resulting in a higher selling price (Garrod and Willis 1999:127). Compared to willingness to pay for a commodity, respondents are more reluctant to forgo the same good if they feel that they own it.

Moreover, respondents may behave in a calculated way. They may have a greater incentive to act strategically when being asked about how much money they want for the loss of a good. In contingent valuation terms, this could be a home owner wanting to overstate their demand for compensation in the context of a compulsory purchase (Garrod and Willis 1999:127-8). People may demand much more to give up an object, such as the ownership of a house, than they would be willing to pay to acquire it. This creates an asymmetry of value and is described as “loss aversion”. The value function (the trade off between money and safety) is steeper for losses than for gains (Mitchell and Carson 1989:35). Individuals would, in theory, want increasing [steeper] amounts of money for incremental [steady] increases in food risk.

To summarise, people’s values and willingness to make trade offs are conditioned by their initial endowment of the goods in question. It is argued that individuals “disproportionately prefer the status quo” (Garrod and Willis 1999:128). This may have interesting implications for food safety and may explain some of the food concerns of recent years e.g. over the introduction of novel foods which is clearly a departure from the status quo.

5.3.4. Irradiated food and property rights

The introduction of irradiated food could be contentious from a property rights perspective. Donaldson et. al. (1996) studied people's willingness to pay for the irradiation of poultry meat. The aim of the study was to estimate the benefits of using irradiation to eliminate the risk of poultry-borne illness. In particular, the purpose was to estimate the intangible benefits of reducing the risk of illness. A preliminary question was asked to elicit whether respondents would buy irradiated poultry meat. If they would, they were then asked about their willingness to pay. This was done by asking respondents about their willingness to pay, over and above current expenditure, for poultry meat which had been treated by this method (Donaldson et. al. 1996:285). "Participants were asked how much extra they would be willing to pay; as a percentage of what they currently spend on poultry each week" (Donaldson et. al. 1996:287).

Irradiation is about exposing products to specified doses of ionizing radiation so that the safety of the poultry can be maintained. For example, salmonella and campylobacter are killed off by irradiation (Donaldson et. al. 1996:286). The problem is that the use of food irradiation was not permitted in the UK until 1991 (Donaldson et. al. 1996:286). More significantly, is that the food retailers do not, officially, sell irradiated food making the study unrealistic from a public perspective (Marsden et. al. 1997:26). Also, like genetically modified food, there is not a consensus on whether irradiation is acceptable (Henson 1995) which could lead to a rejection of the property rights underlying the question.

The property rights assumption is that since consumers do not have irradiated food then they would be willing to pay more to acquire it. This is acceptable for those who approve of the technology. However, the methodology encountered problems, for those who did not approve of irradiated meat. Respondents were instead asked if they were willing to pay more to have poultry meat which had not been irradiated. Those respondents were being asked to pay more to maintain the status quo (i.e. non irradiated poultry meat). Not surprisingly many of those,

whose preferences were for non - irradiated poultry meat, were not willing to pay.

5.3.5. Property rights and protest responses

Mitchell and Carson (1989:32) describe a study with both willingness to pay and willingness to accept questions. Respondents frequently gave protest responses, or infinite values, when asked how much they would accept in return for not having an amenity, for which they own the property right. In contrast, the willingness to pay question, to receive the amenity, appeared to be less contentious. The implication is that willingness to accept generally is not used because it appears that people are unwilling to trade off rights, which they think they should have, against money. The protest bids and infinite values may reflect the unwillingness to trade off or lose a particular 'property right'.

A study of the greenbelt, on Tyneside, "demonstrated that the preservation of the greenbelt, in terms of the amenity value of the land, was highly dependent upon the property rights perspective and whether accept or payment measures were used in the evaluation. Willingness to pay to avert the loss of the green belt was only one third of the willingness to accept compensation for its loss" (Garrod and Willis 1999:174).

"The example illustrates the importance of the property rights perspective to the valuation of an asset. It might be argued that, in Britain, amenity rights to greenbelt land are vested with the local community. Unfortunately, local authorities are all too willing to grant planning permission for urban development on green belt land without compensating local residents in any way for the amenity loss" (Garrod and Willis 1999:174). Environmental valuation has undergone greater investigation, than food safety valuation, so again there is an example from the environmental literature that could help inform this research. The property rights issue will need careful attention in a food safety contingent valuation given that policy appears to be loaded against local residents in the context of no compensation.

5.3.6. Food safety property rights

In the context of food safety, property rights could be less contentious if improvements to safety are outlined. A reduction in risk is appropriate for valuation because people do not 'own' the safety right and so should be willing to pay. Moreover, in chapter 1, it was explained that people were willing to consume food which might not be entirely safe. This might be because people feel that they have a right to gain or acquire food which might not be safe e.g. soft boiled eggs.

The property rights issue becomes more contentious if the subject is a reduction in 'rights'. The public will strongly defend their right not to eat potentially unsafe food. This is based on the above discussion on the willingness to accept compensation. The Food Standards Agency's recommendation that the Over Thirty Month Rule should be replaced with BSE testing is particularly controversial. The Over Thirty Month Rule "does not allow cattle over 30 months to enter the food chain" (Food Standards Agency 2003b). The Agency's own figures suggest that it is safer than BSE testing. The change, based on the Agency's most realistic estimates, "could mean less than one additional case of new variant CJD (human BSE) over the next sixty years". The recommendation could be justified on the basis of excessive (marginal) costs given the slight difference in risk between the two policies. The money saved is £300 million per year, given that the OTM rule costs £360 million compared to BSE testing of £60 million. This money could perhaps save more lives elsewhere say if it were invested in the health service. Nevertheless, the Agency is recommending a policy which will increase risk; in which case a willingness to pay measure, of the Agency's activities in this area, would be inappropriate. A willingness to accept measure would be more accurate but attempting such a measure could be impossible if the compensation figure were stated to be infinite. Moreover, the perceived risks are of the worst kinds such as dread risk, CJD is invariably fatal, and involuntary risk, the food consumer will not know if they are that possible additional CJD case. Also, the external costs could be huge if the 'additional case' were a blood or organ donor.

5.3.7. A new approach to Property Rights

Mitchell and Carson (1989:38) propose a “new property rights approach” to the problems posed by willingness to pay and in particular willingness to accept. They suggest a “rethinking of the property right implied in those public goods which require annual payments … to maintain a given level of the good”. The respondent will be asked what they are willing to pay, so that the present level of consumption, of the public good, can be maintained. Mitchell and Carson (1989:38) suggest that many public goods have the characteristics outlined. For example, they argue that “air quality would rapidly decline if no money were spent by business and government on control measures”.

In a contingent valuation study the respondent would be first informed that they are already paying taxes to provide the current quality level of a good such as air visibility. They would then be asked to state the maximum payment (which could be the present payment) that they are willing to make to preserve the current quality level. “To use a referendum analogy, the consumer is asked to set the highest amount they would be willing to pay annually in taxes for a given program, which guarantees to maintain the present level of supply of a good for the next and succeeding years” (Mitchell and Carson 1989:41).

The Griffith et. al. study (1999) highlights the difficulty of the new property rights approach. Respondents were asked: “if for some reason, the current source of funding for the survey and research programme were to stop and the only alternative source of funding would increase the price of food in the shops would you be willing to pay more for the food you buy each week to ensure the programme could continue?” (Griffith et al. 1999:105). However, the study may have suffered through the use of the new property rights approach. It may have been better if the question had stated, you pay a level of taxation for the monitoring of chemicals in food now; would you be willing to pay a certain amount more for a specified improvement in the monitoring programme. This would have been clearer to respondents as there is an explicit exchange between more money and a greater investment in monitoring. There is an issue about the present value of the current policy but that may not be well addressed by contingent valuation. Perhaps, contingent valuation is better employed where respondents can see a

direct relationship, in theory at least, between an increased payment and an improvement in the public good.

5.3.8. Summary of property rights issue

The challenge from the property rights issue pervades a contingent valuation questionnaire in this context. Food safety is seen as uncompromising; in other words consumers expect it to be provided. Although some consumers may be willing to pay more for some relatively strong guarantee of safety, the majority feel that it is a right; rather than a privilege for which extra should be paid.

Ironically, the increase in publicity about poor food safety could raise its value as a positive benefit (Loader and Hobbs 1999:692-3). This raises difficult questions about what consumers can expect from the food industry and from the existing level of public food regulation. Poorer food safety could imply an erosion of the consumer's property rights which would explain why additional safety would be seen as having a positive benefit. The public would need to purchase 'food safety' and be willing to pay for it to make up for the poorer prevailing standards. They might though be reluctant to buy the 'ownership' of food safety, as they may feel that they should already possess this property right. These expectations will have implications for the public's willingness to pay.

This section has shown that a contingent valuation survey, examining food safety, below the initial level would be difficult to justify given the controversial nature of willingness to accept measures. Therefore contingent valuation is suitably applied when monetary values are associated with anticipated improvements in safety (Jones-Lee et al. 1985:49). The research undertaken for this thesis focuses on [the measurement of] the benefit of risk reduction. If the hazard is serious enough to involve the saving of lives, then the economist can attempt to elicit the value for "the prevention of a statistical fatality" (Jones Lee et. al 1999:51).

Garrod and Willis (1999:131) suggest that once the property rights issue has been resolved then a contingent valuation study can be undertaken. However, this

issue is not easily resolved. The public may be reluctant to accept explanations for why increases in risk have occurred. This is because food safety is a public right [see 2.2]. Therefore, the advantages to the public arising from 'successful' food safety could be perceived to be small. However, the costs of food safety problems can be huge; in particular where the hazard is serious.

5.4. Discussion on Part-whole bias (described as 'embedding')

5.4.1. The challenge from Part-whole bias

The valuation of the whole scenario in a contingent valuation study [see 4.4], could lead to 'part-whole bias'. This is where values of individual (food safety) characteristics when aggregated separately, can be worth more than the value of the whole concept (Garrod and Willis 1999:9). The problem is that different quantities of the same public good tend to be treated, or valued, in the same way (Garrod and Willis 1999:163). For example, people may be willing to pay almost as much to preserve a single elephant as they would be willing to pay to preserve the whole of African wildlife (Holland 1995:26).

In the food safety context, if the benefit of reducing different types of food poisoning were valued separately then they would probably be worth 'more', than if they were appraised collectively. Part-whole bias is a persistent challenge in contingent valuation. Garrod and Willis (1999:144) describe a private goods study where the value of the parts consistently exceeded that of the whole which suggests that further refinement of the contingent valuation method will not lead to the eradication of the part-whole bias in public goods. This discussion can be understood using the following case study on salmonella.

5.4.2. Food poisoning case study

5.4.2.1. Covey et. al. 1998: A study on food poisoning informed by Henson's 1996 research.

This is a study on egg consumption in which people were asked how much more they would be willing to pay for an alternative brand of eggs. The research compared this alternative safer brand of eggs, where the risk of food poisoning was lower, with the type of eggs that they would usually buy.

The researchers were interested in whether respondents were likely to assign much the same values to a good; as to a subset of that good. The 'good' was the benefit, from the reduction in risk of food poisoning, to the respondent. The 'good' included the range of food poisoning possibilities, from death, to severe cases, to mild episodes of illness. A subset of the 'good' was only part of the benefit; say a reduction in the risk of death only.

The questionnaire asked people what they would be willing to pay for the safer [alternative] brand of eggs, on top of the average price per box. They were asked what they would be willing to pay for the reduction in [egg consumption food poisoning] risk. They were asked their willingness to pay in two different ways to test the embedding concept (see table 5.1). A major shortcoming was that, a in the bottom up format, was different to, c in the top down layout.

Table 5.1: Covey et. al. questionnaire on food poisoning risk

Bottom up	Top down
Reduction in risk of	Reduction in risk of
(a) Food poisoning leading to death	(a) Death + severe + mild
(b) Severe food poisoning	(b) Death + severe
(c) Mild food poisoning	(c) Death
(d) Death + Severe + Mild	(d) Mild

5.4.2.2. Discussion on embedding

Proponents of contingent valuation, such as Mitchell and Carson, suggest that

embedding is a problem caused by defects in the survey design rather than shortcomings with the method itself (Covey et. al. 1998:246). However, Covey et. al. (1998:246) suggest that the onus is on the practitioner to establish the sensitivity of their measurement device properly; through the use of internal consistency checks. The implicit argument is that if after thorough and proper investigation embedding still occurs, then this would raise doubts over the methodology. Covey et. al. (1998:249) suggest that "if x is a subset of a bundle of goods X, and if respondents are WTP the same amount for x as for X, they would be exhibiting the kind of insensitivity to scope .., known as the embedding effect".

The authors compared willingness to pay to reduce the risk of death (the subset of a bundle of goods) with reductions in the risks of death, severe and mild food poisoning (the bundle of goods). It is suggested that the results (1998:254) show limitations with contingent valuation. Different orders were used to measure willingness to pay to avoid the various food risks. The first order was (1) death, then (2) death and severe food poisoning and lastly (3) death, severe food poisoning and mild food poisoning. The second order was the reverse. In other words, (1) death, severe food poisoning and mild food poisoning, then (2) death and severe food poisoning and lastly (3) just death. In the first order by adding food poisoning the valuation increased slightly. In the second order, by taking away the food poisoning the valuation decreased by more. Death contributed more to the total amount (death, major food poisoning and minor food poisoning) in the first order.

The subset of the bundle of goods (death) contributed more to the whole bundle of goods (death and major and minor food poisoning) when it was asked about first. This shows that the order in which the questions are asked affects the valuation. The question order has an impact on the value of the parts in relation to the whole. This should not be the case and so this "sequencing effect" (Aakkula1999:96) raises doubts over the methodology.

One of the reasons for Covey et. al's unsatisfactory results may be that reductions in the risk of death were used to test embedding. "The very small size of the

reduction in the risk of death - just 1 in 6,000,000 - magnifies such [embedding] effects when it comes to calculating the value of statistical life" (Covey et.al. 1998:254). The subset, death, dominates the whole group of goods, death and severe and mild food poisoning.

Another concern is with the food safety benefit presented in Covey et. al's study (1998:254). The benefit could have been seen as a "good thing". Thus people just stated what they could afford to obtain ownership of it. The public may have responded by stating a willingness to pay amount, to purchase the good, which represented what they could afford to pay without greatly disturbing their current expenditure pattern. Respondents may have offered a valuation based on what they could afford rather than a valuation based on the scope of the good presented.

5.4.2.3 Understanding food poisoning

This section outlines that the public may not be able to understand different extents of food poisoning. Therefore different scopes of illness could be treated the same. Covey et. al. (1998:249) note that respondents are unable to differentiate between severe temporary episodes of food poisoning, and the same initial experience followed by a lifelong chronic condition. This indicates the difficulty with trying to explain serious cases of food poisoning to respondents. Henson's (1996:404) food poisoning study argued; the main weakness of contingent valuation surveys is their reliance upon hypothetical scenarios. *Salmonella* from eggs being an example of a food hazard which is rarely relevant to the public's understanding. Indeed, health issues, underlying the use of contingent valuation in this food policy area, may be difficult for economists to use fully.

Covey et. al (1998:249) used Henson's severe (temporary) food poisoning description from his 1996 study but thought that another definition for chronic food poisoning was necessary. They suggest that "from a survey of the clinical literature, it appeared that a proportion of severe cases of food poisoning from eggs are liable to result in a chronic condition known as Irritable Bowel Syndrome".

5.4.2.4. Conclusion to Covey et. al's study

The valuation of reductions in risk, to avoid death, should be avoided. First, it may dominate other factors that could be valued such as severe and more common cases of food poisoning. Moreover, death is emotive and the minute risks of 1 in 6 000 000 are abstract from the public's understanding. Chronic types of food poisoning could also be avoided as it may be unclear how long these episodes of illness are likely to last. The practitioner undertaking a valuation study has the problem of not knowing when severe food poisoning is likely to become a chronic condition.

The danger is that severe temporary and severe chronic cases of food poisoning could become embedded or difficult to separate from each other. To reduce this 'embedding' problem only common, that is less severe and non permanent, cases of food poisoning could be outlined in a study. Moreover, common cases of food poisoning could be more understandable to respondents.

5.4.3 Problems over the scope and scale of a contingent valuation question

A general concern is that respondents do not understand the scope or scale of the question. A contingent valuation questionnaire, on food safety, could lead into areas which go beyond food safety; defined as the probability of not suffering some food hazard (Henson and Traill 1993:153). If respondents were asked whether they were willing to pay for safer meat then they may have trouble separating food safety, from other issues such as animal welfare.

Respondents may not be able to distinguish between differences in the scale of the good (Garrod and Willis 1999:158). Individuals may find it hard to distinguish between minor or more serious outbreaks of food poisoning. There could be confusion over the scope of food regulation. It could cover just food poisoning or have much greater breadth including BSE. The following case study shows the

problems that can occur if respondents overestimate the scope of the public good being presented to them.

5.4.4. Case study on chemical contamination

5.4.4.1. Griffith et al's study on chemical contaminants (1999)

This study is an attempt to value a government programme monitoring chemical contaminants in food. The research looks at chemicals, such as dioxin, which may enter the food chain inadvertently from industrial processes. Naturally occurring toxicants, such as mycotoxins, are also examined by this former MAFF surveillance project.

“The aim of this evaluation is to assess whether current controls on chemical contaminants and naturally occurring toxicants are cost effective” (Griffith et. al. 1999: i). Contingent valuation was used as members of the public were asked whether they would be willing to pay “a certain pre-specified amount each week through higher food prices to (make sure that) the current programme of controls would continue” (Griffith et. al. 1999: vi). As part of the contingent valuation exercise “a variety of attitudinal questions were included to test the reliability of responses to the willingness to pay question” (Griffith et. al. 1999: vii), to find out whether people were giving valid reasons for being willing to pay or not.

5.4.4.2. Problems with understanding the scope of the programme

Embedding was present in the study when nearly 30% of respondents agreed with the statement: “I would expect the survey and research programme to help reduce all hazards associated with food not just those with which it is specifically aimed at”. So, nearly 30% of people expected the study to do more than monitor chemical contamination in food. This could lead to those people overvaluing the benefits of the programme.

The authors concluded that the policy intervention produced a significant net social benefit (Griffith et. al 1999:118). The average willingness to pay was used to

estimate the value placed on the current controls by the population as a whole (Griffith et. al. 1999:113). To calculate the benefit across the population it is necessary to multiply household willingness to pay, per year, by the number of households. The household annual "willingness to pay" was £38 which if multiplied by the number of households [23.5 million] gives a total annual value across the population of £887 million. This leads to a cost benefit analysis over the duration of the five year programme. The benefits of the programme are valued at £4.4 billion [£887 million for 5 years] compared to a cost of 19.3 million.

The embedding problem suggests that the estimated benefit should be treated with caution. The programme is one of surveillance only, so the net social benefit could be due to respondents also valuing a reduction in the source of the contamination. Perhaps, respondents were also valuing a reduction in the sources of pollution which could affect food safety. Heavy metals, such as cadmium, could contaminate the food supply highlighting the need to reduce atmospheric pollution. A report on the chemical aspects of food surveillance states that:"major atmospheric sources of cadmium include refuse incineration, non-ferrous metal production, iron and steel production and fossil fuel combustion. The main routes by which cadmium contamination of agricultural soils in the UK can occur are from atmospheric deposition" (MAFF 1998:8).

A programme which monitors the levels of chemicals in food should lead to later action being taken, when contamination is above a specified threshold. However, surveillance does not have any direct value on its own. It is a preliminary cost, an essential prerequisite, which guides decision making over where intervention may be needed. It is the follow up action such as a ban on contaminated food where the direct benefit lies. The public's valuation of the 'monitoring benefit' may be vastly over estimated. The public may believe that the industrial processes which can cause contamination are being dealt with as part of the chemical monitoring programme.

It is difficult to see how a monitoring programme can have such huge benefits. A broader programme, than just monitoring, would try and reduce contamination at

source such as through tighter controls on incinerators and other industrial processes. Controls such as these largely explain, the 82%, reduction in dioxin intakes from food in the United Kingdom (ENDS 2001:48). The problem is that a broad set of measures, such as those described, should be worth significantly more than a monitoring programme, which itself was supposed to be worth £4.4 billion. However, if the public are unable to distinguish between the scopes of different programmes then a 'chemical reduction at source' programme would also be valued at about £4.4 billion.

Another environmental example is instructive. A contingent valuation study could estimate the benefit of a public programme to monitor air pollution from road vehicles in a particular area. However, the valuation would not be able to include any actual health benefits because these are dependent upon later interventions. Health benefits would require additional policies, such as those to reduce traffic levels or improve exhausts. Likewise, the success of the contaminants programme will depend on the quality and quantity of subsequent interventions which may be needed. It is suggested that MAFF has looked at "the impact on the food chain of emissions of dioxins from incinerators and other chemical plants". The tests on dioxin in milk in the Bolsover area is an example of this survey (Griffith et al. 1999:21). The fundamental issue though is about what action is taken regarding food once it has been tested. This is particularly the case if it is shown to be contaminated.

5.4.5. Insensitivity to scope

The previous discussion argued that respondents may not be able to judge the scope of a public goods programme accurately. The particular concern is that respondents may not be able to understand properly the difference between the 'part' and the 'whole' of a good (see 5.4.1.). A method can be used to try and reduce this challenge in contingent valuation studies (Aakkula 1999:97). A study could describe a good and a smaller part of the good too, with a clear statement that the good and the smaller entity are separate. Respondents could then be asked to value the (whole) good and to allocate a proportion of its value to the

smaller entity. This has been undertaken for the valuation of landscapes (Willis and Garrod 1993:1-22).

Another study (Powe and Bateman 2004:258-271) asked respondents to value riverine saline flood alleviation schemes in an area of Broadland, an area that stretches across parts of Norfolk and Suffolk in Eastern England. "A larger, embracing scheme to protect the "whole" area from saline flooding was compared to four smaller, separate "part" schemes that would only protect sub-areas of Broadland" (Powe and Bateman 2004:259). It is suggested that variations in the perceived realism of different programmes could lead to an insensitivity of scope. The 'part' schemes were considered to be significantly more realistic than the 'whole' scheme (Powe and Bateman 2004:259). "It was found that respondents perceiving a scheme to be realistic were ... significantly likely to be willing to pay more than those who questioned the realism of a given scheme" (Powe and Bateman 2004:268). Thus 'part schemes' could be valued more highly, in relation to the whole, because of the perceived realism of the 'part-schemes'. Consequently, realism could be a relevant factor in explaining insensitivity to scope.

In terms of food safety, there is perhaps the danger of attempting a valuation of an unrealistic whole scenario. The above analysis "that respondents may consider larger schemes less realistic than smaller alternatives" (Powe and Bateman 2004:268) should be borne in mind. It may be unwise to value the elimination of food poisoning as this could be seen as unrealistic. Respondents could simply reject such a (whole) scenario and refuse to pay. How food safety issues could impact on a valuation study is discussed in the next chapter. Such issues need to be perceived as realistic and understandable for the exercise to be a success.

Chapter 6: The impact of food safety issues on contingent valuation

6.1. Introduction

The last chapter examined some of the methodological issues affecting a contingent valuation survey. This chapter will discuss how food safety issues impact on such a valuation study. In particular, risk perception and information asymmetry are relevant. It will also examine how people approach questions involving safety, and how this can affect their valuations. Again environmental examples are helpful as they provide guidance for how a safety valuation could be undertaken and what issues may emerge.

Risk perception, will be discussed in detail first. It will put food safety in context. It will suggest that other broader concerns, such as nutrition, may be of greater economic significance than food safety concepts.

6.2. Risk Perception

6.2.1. Introduction

This discussion focuses on the divergence between the risk perceived by the public and the 'actual' level of risk assuming it is known. The cause of this divergence is that there is a limited amount of information that the public can assimilate. Moreover, the information which is considered may be interpreted in a subjective manner. For example, consumers may become overly concerned about certain risks and may overestimate particular risks such as botulism. Consumer pressures for safety could lead to excessive costs as the example in chapter 1 suggested. Perhaps, an underestimation of food risks, on the part of consumers led to "too little" safety being provided, given the example of salmonella in eggs.

6.2.2. Classifications of food risk

Consumer risk perceptions make decision making regarding food safety fraught. It is stated that public "value judgements are not resolvable scientifically" (Doderlein 1988:9). This can be explained by the potential gap between consequences and probabilities. The consequences, of an invariably fatal food hazard, approaches infinity although the probability (the risk) for the relevant event may approach zero" (Doderlein 1988:5). Market failure may arise through consumer's misunderstanding of probabilities. People "have been shown to have problems dealing with very small changes in probabilities and in understanding risk change concepts" (Ives et. al (1995:73). Thus, market failure could occur because consumer purchasing behaviour could become volatile leading to, say, too much demand for food safety.

The severity of the hazard is relevant as the "zero-infinity" problem suggested. A small chance of a severe outcome, such as botulism, may cause more concern than a higher chance of a less severe outcome, for example salmonella (Ritson and Li Wei 1998:257). Another concept is availability bias. In general terms, rare causes of death are overestimated and common causes underestimated. For example, the public estimate of number of deaths from botulism per year is higher than the actual number of deaths. "This seems to agree with the general prediction from availability that vivid events will be easier to recall and that they will be given an inflated subjective probability". It is suggested that there is causality between news media reports and subjective risk estimates. This is because; a bias in newspaper reports tends to favour those dramatic deaths that can be overestimated (Brehmer 1988:29-30). The probabilities associated with hazards which are highly visible, sudden and receive high levels of publicity, such as botulism are over-estimated, whereas the probabilities associated with silent, gradual events, such as diet related coronary heart disease or cancer are underestimated (Henson and Traill 1993: 156).

The difficult problems, in terms of risk perception, are to a greater extent those food issues for which society has no frequency information or little such information such as BSE (Brehmer 1988:32). Ritson and Li Wei (1998:257) suggest that food concerns which are subject to contradictory evidence also

present a challenge. This is because, given BSE, scientific evidence is inconclusive and expert opinion is in disagreement (Lang et. al. 1996:5). Also scientifically defined risk, in other words, the “quantification of risk as probability for fatalities per year” (Bjordal 1988:45) may have less value, to the consumer, in the context of conflicting estimates and explanations. Moreover, in the face of evolving evidence over risks the public may take a conservative attitude. “Research indicates that, as evidence accumulates, public perceptions are slow to change, and can be extremely persistent in the face of contrary evidence. Initial impressions about a hazard tend to structure the way that subsequent evidence is interpreted” (Cox and Tait 1991:184).

Expert and public perceptions of risk may differ over particular food hazards. There is a difference between what many scientists perceive to be relevant, such as microbiological concerns, versus what consumers perceive to be relevant, e.g. chemical contamination (Brennan et. al. 2001: 10-12). Expert judgements often focus upon fatality rates but this is only one of the aspects that affect the public's perceived risk.

Therefore consumers do not always agree with the risk calculated by experts. Such differences do not mean that lay people are irrational in their risk assessment or that experts are wrong (Brehmer 1988:29-30). It is just that they have different perspectives. For example, a public perspective may give more emphasis to risks affecting vulnerable groups such as the old and young. Perhaps, the way CJD may be affecting a particular, although not necessarily vulnerable group, younger people, could account for some of the concern over the disease.

There are other concepts associated with risk perception. A voluntary risk is preferred to an involuntary one. A decision to choose a specific product, where the risk is understood, is preferred to a possible exposure to an unknown risk. A takeaway meal is an example of an unknown risk if the takeaway does not label its foods in detail. Also, naturally occurring risks are perceived more favourably, compared to man made risks. For example, unpasteurised milk may be more harmful than food conventionally grown with pesticides. However, if 'raw' milk is

seen as natural then it may be perceived more favourably than conventionally grown food. Lack of awareness of food issues may also be problematic. For example, there may be particular concern over patulin, a chemical which was found in apple juice.

If consumer biases are leading to disparities with expert opinion then there are implications for government intervention. The chemical versus microbiological dichotomy would be a classic example. Perhaps a disproportionate level of attention is given to chemical hazards, compared to microbiological hazards. This is because chemical hazards suggest a range of unfavourable risk perception factors such as an involuntary hazard and lack of public knowledge. Caswell and Henson (1999:593) suggest that the food hazards which command the most attention from governments are not necessarily those for which the risk to human health (as scientifically or probabilistically defined) is greatest. Rather, governments may also be guided by political considerations such as the need to protect “consumer confidence” or to be seen to be “taking action”.

The debate over genetically modified food can be seen as a debate over control over the food system and, in particular, the public’s control over their food consumption. This suggests that the public would prefer to choose whether or not to consume GM food on a voluntary basis.

6.2.3. The relevance of nutrition to the economics of food safety

The James report (1997) claims that in economic terms, nutritional aspects of food quality and safety have a much greater economic and health impact than microbiological, chemical or GM or novel food concerns. James suggested that “the economic cost of diet based diseases is three to four times that of all food scares, including BSE” (Financial Times 1997). This suggests that a broad definition of food safety is needed including the nutritional quality of the diet. Diet is relevant as it puts the cost of major food concerns, such as BSE, into perspective. However, health problems caused by poor nutrition or diet could be perceived as a voluntary risk. This is because information is now widely available on what is an

appropriate diet. Therefore the public can make their own choices to a greater extent over nutritional issues compared to food 'emergencies' such as BSE.

6.2.4. Risk Communication

This leads onto how the government should deal with consumer risk perceptions. The government has frequently chosen to communicate risk to the public with emphasis being placed on a dose - response approach. This is the amount of food which would need to be consumed to cause ill health. An example of a dose response approach was when radioactive waste was found in supermarket salmon (Daily Telegraph 2003). The Government's Food Standards Agency communicated risk stating that a consumer would need to eat 700 portions of salmon a day for the salmon to be 'unsafe' (Food Standards Agency 2003a). However, the issue could also be considered from the premise of an involuntary risk; that the public unknowingly purchased contaminated salmon. Greenpeace took what could be interpreted as an 'involuntary risk perspective' stating that the radioactive waste should not be there (Daily Telegraph 2003). Given that the radioactive waste was not previously known to be present, to newspaper readers, then the public did not have a voluntary choice over purchase. The difference in risk perception between The Food Standards Agency and Greenpeace makes the evaluation of government intervention, in terms of risk communication difficult.

6.2.5. Risk homeostasis

This section continues the theme of perceived risk. A hypothesis was developed (Wilde 1982) that the public attempts to keep the level of risk at a constant level. This theory has been termed risk homeostasis and has also been described as risk compensation. It is suggested that "safety interventions that do not alter people's propensity to take risks will be frustrated" because people will try and "re-establish the level of risk" with which they were originally content (Adams 1995:215). Examples of this theory have often been given in the context of road accidents. It is argued that if roads are made safer, then motorists will drive faster. This offsets the reduction in risk, say from improved road design (Cox and Tait 1991:191).

Risk homeostasis theory could be applied to food safety. If a food technology is believed to be safe then society will use it more dangerously, to get more benefit out of it. Genetically modified (GM) food could be seen as safe because arguably it is 'substantially equivalent' to conventional food. However, G.M. food could also be understood as food technology being used in a more dangerous manner. Society could turn to a riskier food technology which offers a cheaper alternative (Fischhoff 1984:1830).

An increase in takeaway food purchased presents a challenge in terms of risk compensation. This is because takeaways which once may have been perceived as luxuries could now have become social necessities. If such meals are now more widely available, and part of everyday life, then their consumption can be thought of as socially necessary (Berry 1994:20).

The emergence of takeaway food is an example of the divergence between food consumption and food preparation and provides a justification for government intervention. When people purchase takeaways the food consumer, the principal, is separated from the preparer, the agent. This means that the 'the agent' should adopt the (presumably) high standards of 'the principal'. However, there is an incentive for the agent to adopt lower standards of cleanliness than 'the principal' so there is the problem of 'moral hazard' which results in an increased risk of food poisoning (Craven and Johnson 1999:146-7). The preparer has the scope to 'undersupply' food safety as the consumer cannot see the food being prepared. Moreover, there is an incentive to 'undersupply' food safety as safety measures are likely to cost more money and reduce profits. This theme highlights that producers, or preparers of food, have more knowledge about the safety of food than consumers.

The state could intervene, through the employment of additional hygiene enforcement officers, to make sure that the food preparer is not allowed to reduce standards. However, this intervention may be offset by the increased risk from greater takeaway food consumption.

To elaborate, more environmental health officers could be employed to monitor takeaway food shops. Health officers could prosecute unclean food premises and force them to raise their standards or ultimately close them down. This could reduce the risk of food poisoning from the consumption of takeaway food. If such risk is reduced then the public may have more confidence in the hygiene practices of takeaways. Consumers could then eat out more exposing themselves to a greater extent to the hygiene practices of the takeaways. This could lead to increases in food poisoning as people eat out more. Thus the reduction in risk from the government intervention could theoretically be offset.

The argument presented is a hypothesis. It would be difficult to prove such a theory in practice. The purpose instead is to show that government intervention to reduce risk may not necessarily have the desired effect. This needs to be borne in mind when governments allocate resources. Thus there is an issue over whether greater food hygiene regulation encourages people to take greater food risks. The employment of environmental health officers may give the public confidence in eating out, but perhaps only in the short term. If the theory is accurate then it may be more cost effective to encourage people to eat out less and take more responsibility for their own food preparation. There are other approaches which the government could take, which would require less government intervention in terms of monitoring food premises. The state could encourage "food citizenship" whereby the public is an active participant in their consumption (Lang 1997:13). Cooking initiatives could be promoted to reduce the public's reliance say on takeaway food.

6.2.6. Summary

Risk perception can cause a failure in the market for food safety as it breaks one of the conditions of perfect competition. Imperfect information, in terms of an inaccurate perception of the food risk, will lead to a market valuation which under or over-supplies food safety. Although one of the remedies, to employ health officers to oversee food hygiene in food outlets may not solve the problem of

insufficient food hygiene.

6.3. Information Asymmetry

6.3.1. Background to Information Asymmetry

In regard to food risks, producers or sellers may be better informed than consumers so the market may not be in equilibrium. Moreover, the classical model [in chapter 1] assumed that the costs and benefits of any action were fully known and would occur instantaneously. This is not the case with many food safety issues not being resolved for several years after consumption (Caswell ed. 1991:11). The 'under-supply' of food safety, with say BSE, may not be apparent to the consumer until well after the food has been consumed. This suggests that government intervention may be needed although solutions may not be satisfactory.

Information asymmetry is where producers or sellers may be better informed than consumers about the safety, and composition, of food. This presents a problem because producers could under supply food safety. An analogy with used cars (Akerlof 1970 in Swinbank 1993:87) can be used for explanation. "The sellers have more knowledge about the quality of the car than the buyers. But good cars and bad cars must still sell at the same price - since it is impossible for a buyer to tell the difference between a good and a bad car. Buyers will only be willing to pay for a bad car, and thus the sellers of 'good' cars must sell them for the price of the 'bad' cars. The analogy with food would be products with better safety but where higher prices cannot be commanded because of lack of differentiation. Even worse is that safer products could fail in the marketplace. For example, "consider two food products, one which is relatively safe, and the other which is relatively unsafe. Sellers of the products can tell which foods are safe and which are dangerous, but consumers cannot. Therefore although the safer product costs more to produce, it can only be sold in the market at the same price as the riskier product. As a consequence, food manufacturers only supply the risky product (because it can be produced at a lower cost and so will generate more profit) and

the safer product is forced from the market" (Henson and Traill 1993:158). The problem is that if consumers could recognise the value of the safer product then they may be willing to pay extra for it. However, because consumers cannot discover the safer product then they do not buy it. Thus, producers of safer products are not getting the benefit of selling safer products. Asymmetric information may be causing inefficiency as purchases of safer products may not take place (Molho 1997:7).

Information asymmetry could alternatively lead to food safety being overpriced. This situation could occur in the context of organic food if it is perceived as being safer than conventional food. It could be argued that if organic food is promoted for safety reasons, then it does not justify its price premium (Food Standards Agency 2000a). Consequently, this subject provides another example of market failure and another justification for government intervention; such as the Agency's pronouncement on organic food (see above). Also, considering a broad view of food safety to include nutrition, then some manufacturers may 'oversell' the benefits of their products. There is the danger of some producers misinforming consumers over risk reduction. "Safety issues are a major part of the marketing strategies of food manufacturers and retailers. In order to emphasise the benefits of their products, food producers may over-emphasize particular risks in competing products. Manufacturers of low and reduced sugar products may overemphasize the risks of sugar consumption" (Henson and Traill 1993:158).

When both the producer and consumer are unaware of the potential hazard, then the firm will overproduce the good. Antle in Segerson (1999:66) characterises this as "symmetric imperfect information" because neither producers nor consumers are aware of the potential damages from consumption of the product. "Even the seller will not necessarily be perfectly informed about, say the carcinogenic risk associated with a particular additive or production process" (Swinbank 1993:90). Market failure, is occurring if the production of potentially dangerous food is continued. But "symmetric imperfect information" is a particular challenge as there is no guidance on whether intervention is needed.

6.3.2. Search, Experience and Credence Goods

The concept of information asymmetry can be understood by the distinction between 'search', 'experience' and 'credence' goods. In chapter 1 an idealised market for food safety was presented which was based on the assumption of perfect competition. It was suggested that if consumers were fully informed they would be able to trade off food safety against other food characteristics. In this context, the food is defined as a "search good" because safety can be detected by appearance (Caswell ed. 1991:20); perhaps because the food, for example fruit, is bruised. However, food safety is rarely a search good. Food safety is not an explicitly measurable food product characteristic (Ritson and Li Wei 1998:255) with the hazards and risks listed. In reality, safety is rarely observed at the time of purchase; so this simplifying assumption needs to be dropped.

Food safety therefore tends to be either an "experience good" or a "credence good". The characteristic of an experience good is that safety can only be detected by consuming it. For example, food poisoning which occurs after eating a takeaway which on inspection seems acceptable. The characteristic of a credence good is that safety cannot be evaluated fully by the consumer even after consumption e.g. "the risk from unseen pesticide residues on fresh produce" (Caswell ed. 1991:20). Loader and Hobbs (1999:690) state: "in some cases, the consumer may only be aware of a food safety problem over the very long term, an example would be BSE, which appears to have an undetermined incubation period of several years. It could be argued that beef in the UK became a credence good in the wake of the BSE crisis". This concept is thus highly relevant to market failure and the major food concerns of recent years. These concerns could have made "food safety (increasingly) an important characteristic in a consumer's purchasing decision". For foods such as beef, in the wake of BSE, the consumer now has to "incur high information or measurement costs in determining whether the 'food safety' characteristic is present" (Loader and Hobbs 1999:690).

Segerson (1999:54) suggests that the market may encourage voluntary adoption of food safety measures for search and experience goods but not for credence

goods. For search goods “consumers have near perfect information about product safety before purchasing the good” (Segerson 1999:61). For experience goods “while the information set of the consumer may not be complete at the time of the initial purchase, in long run equilibrium the consumer will have near perfect information about product quality”. “If a firm is the sole producer of an identifiable product (e.g. a fast food chain) consumers will know the source of the product (at least with regard to the final preparation) and if they correctly perceive the risks associated with the product source, can adjust their demand accordingly” (Segerson 1999:65). For both search and experience goods, it would be expected that consumers would use the information available to them and alter their purchasing in accordance to changes in product safety (Segerson 1999:61). Producers should then respond to consumer demands, say for better food safety, otherwise they will lose custom.

However, for credence goods, consumers will not be able to discern changes in safety. In this context, consumers have to rely on information from scientific experts, although ultimately this advice cannot be verified at the time of consumption (Griffith et. al. 1999:8). The situation is similar to the market for used cars. The demand for a food product will not be responsive to changes in the safety of that product because consumers will be unaware of those changes. If consumers are unable to discern increases in safety for specific products (i.e. products from specific producers) then they will not adjust their demand for that product. Demand will instead reflect average (i.e. industry wide) product safety (Segerson 1999:61). Given this situation, there is market failure as consumers would not be able to encourage firms to invest in more food safety. Firms will be discouraged from safety investment because they cannot demonstrate such added value to the public (Viscusi 1989 in Segerson 1999:68). Nevertheless, individual businesses selling higher quality products will want to signal to consumers that their product is ‘safer’ than the industry average (Segerson 1999:61). For example, assume that organic milk is ‘safer’ than conventional milk but that consumers cannot recognise that quality. The problem for organic dairy producers is that there is little incentive to produce organic milk, at a higher price, because the ‘higher’ safety level may not be recognised.

6.3.3. The debate over food labelling

With credence goods, it may therefore be difficult for individual producers to signal high levels of safety to consumers. While producers may attempt to do so by, for example, labelling products as organic, consumers have no easy means of verifying these claims when safety characteristics are not readily discernable (Segerson 1999:62). However, it is argued that mandatory labelling or independent certification programmes can convert credence goods into search goods, by providing consumers with the information necessary to discern product quality accurately (Caswell and Mojdzuska 1996:1251).

A way out of this under-supply of quality problem could therefore be to rely on the costly process of quality certification. Certification is where, say, organic food is tested so that it meets the specified requirements. It could be done by 'a credible authority'; the Soil Association is an example, regarding organic food. For a private set of businesses, certification may be too costly, or they may not have the credibility. Therefore, an independent agency may be needed (Schillizzi 1999). This suggests that certification implies a fixed cost which has to be paid. The Food Standards Agency could act as such an independent agency which consumers would need to be willing to pay for.

The cost of a labelling system is not the only problem with credence goods. There are also potential failures related to the law. "If consumers are unaware of, or even simply underestimate, potential damages, then even when producers are fully aware, anything less than full liability will lead to overproduction of (an unsound) good and the under provision of food safety. In practice it is unlikely that firms will always be held fully liable even under a strict liability rule, due for example, to the difficulty of proving causation for credence goods" Loader and Hobbs (1999:690). Loader and Hobbs (1999:690) suggest that "in the event of a food safety break down an individual firm could be subject to civil legal action on the part of those who have become ill or on the part of the families. However, it may be difficult for consumers to prove which firm is at fault. Thus, Segerson (1999:68) suggests that

adequate consumer protection is likely to be achieved only with some form of government intervention. The need for government intervention is likely to be increased by affluence. In affluent societies where “the quality attribute being supplied is not transparent to consumers, consumers might reasonably insist on an increase in the quality standard set by their regulators” (Kinsey 1993:171).

There are two main ways the government could intervene. First, government could prohibit the marketing of foods containing certain characteristics. This is said to be economically irrational and costly (Caswell and Mojdzuska 1996:1251). It will be economically irrational when the risk attribute is of concern only to some consumers. It will be costly to some producers and so there is an increase in prices. However, Caswell (2000:122) qualifies this argument, in the context of genetically modified food. “The benefits and costs of a labelling policy will depend, in part, on the majority consumer viewpoint on a technology in a country. For example, if a large majority of consumers want to select against agricultural biotechnologies, then labelling may be an inferior approach to banning from a domestic benefit / cost perspective”.

The second solution is legislation to improve information flow and labelling. For example, mandatory disclosure of information about the nature of a product; such as ‘produced in a factory using nuts’. Labelling involves the specification of the source of the product, a list of the ingredients and the degree of certainty the labelling conveys (e.g. does contain, may contain, does not contain) (Caswell 2000:122).

Labelling may not, though, provide a satisfactory solution. Labels may not provide all the information. “Consumers may have a right to know everything about the products they are buying but there are practical (label size) and economic (cost versus benefits) reasons for not requiring all information to be provided on labels (Caswell 2000:121).

Alternatively, there could be too much information on labels. “Solutions to the consumer (lack of) information problem may impede one another if they create an

information overload problem for consumers. If, in addition to legislated labelling, individual firms employ their own certification and quality labelling standards, consumers will find it difficult to decipher the mass of product quality and safety claims. Ultimately, a label is only as effective as the clarity of its message. If consumers do not understand the message then their information costs will increase, not decrease" (Loader and Hobbs 1999:691).

A 'second best' solution is needed here; that is, government intervention is needed if the 'first best', the market fails. But there are problems with a government led information solution such as labelling. The complexity of modern food supply chains presents a challenge for food safety communication. For example microbiological safety presents a problem when pathogen levels change in the food chain (Ritson and Li Wei 1998:255). Labels for "natural" or "organic" Aberdeen Angus beef (Loader and Hobbs 1999:703) can be verified as the meat can be traced through the bloodlines of the cattle. In contrast labels for prepared meals, which have ingredients which have been added at different stages throughout the supply chain, are more difficult to evaluate.

6.3.4. The difficulty in the evaluation of beef products.

This discussion has outlined the serious informational asymmetries which are present. The concept of beef becoming a credence good after BSE is particularly relevant. Poor quality meat products, which may have been infected with BSE, provide an example of such credence goods as the average incubation of the disease could be 25 years (Diringer 1999). Thus the safety of a poor quality beef product may not be fully known until decades after consumption.

In the context of beef and BSE, market failures were not corrected properly by 'market forces' or the 'the law'. The public was unaware of where or when precisely BSE infected meat was being sold. Therefore they did not have the relevant safety information to inform their beef purchasing decision. Consequently families affected by BSE have been unable to take legal action against relevant meat businesses. Labelling policies have been inadequate in the context of poor

quality meat products such as mechanically recovered meat. For example, “in Britain, a certain percentage of mechanically recovered meat (a ‘sludge’ made from the by products of bones and the by-products of butchery) was allowed in meat products without declaration” (Lang 1995:6). Also it is unclear whether the absence of MRM on labels meant that it was not in the food. This is because companies may have had labelling policies of non-declaration (Lang 1995:7).

The purpose of this BSE example is to highlight the difficulty that would occur if the public were asked to evaluate the nature of the BSE hazard, and the probability of the BSE risk. In particular, it would be difficult for the public to evaluate the quality of a government labelling initiative, in terms of BSE. In terms of Aberdeen Angus the quality of the beef suggests that it should not be considered as a credence good. In that case, the market is working, as the labelling is likely to be accurate, and so there is little need for intervention. Loader and Hobbs’ description of beef as a credence good is better applied to mechanically recovered meat. Intervention is needed here such as the banning of the product which has now occurred. Nevertheless past failures perhaps still make the labelling of credence goods a difficult issue for the public to consider.

6.4. The challenge from risk perception and information asymmetry

This section will begin with a discussion of how risk perception can affect valuation. First, risk perception may cause hazards, with the same scientifically assessed level of severity, to be appraised differently by consumers. For example, reducing risks from pesticide residues in food may be valued differently from the value of reducing microbiological contamination. This could be the case even if pesticides and microbiological contamination presented the same level of hazard to the public. Second, a reduction in the risk from say microbial contamination may be valued differently, depending on which control strategy is used to achieve the risk reduction (Ives et. al. 1995:110). Third, credence good attributes increase the potential for consumers to misjudge food risks, thus increasing the difficulty of placing a monetary valuation on food risk reduction (Lin 1994 in Ives et. al. 1995:110).

The next discussion will argue that food safety may be similar to transport safety in terms of risk perception. However, the information asymmetry concept makes food safety valuation more difficult than transport safety appraisal. The theme here is the public or private context of the food risk. Although examples from transport safety policy are useful as they provide a contrast between rail and road safety risk perceptions. Such a direct contrast may not be available in the context of food safety.

Jones-Lee and Loomes found that people's willingness to pay to avoid a fatality on the London Underground was 69% greater than their WTP to pay to avoid a road fatality. It is argued that "the context effect accounted for most of the additional WTP: holding scale constant, WTP to reduce the risk of an accident on The London Underground was 58% greater compared with such accidents on roads. People abhor the notion of dying underground in a train crash or fire, a catastrophic event, over which they have no control" (Garrod and Willis 1999:158).

Factors such as risk perception may cause the public to overvalue risks where they have less control, such as on The Underground. The problem of the involuntary nature of risk is a relevant concern in the valuation of transport safety. There are higher valuations on involuntary hazards so rail safety is valued more highly than road safety for the same level of risk. Rail hazard is about the public having little control over safety as responsibility for safety has been contracted out to the rail companies. In contrast the public feel that they have more choice over road safety, as many motorists report that their driving skills are above average; suggesting that their motoring ability gives them control over safety. Moreover, motorists may see road accidents as being caused by other people i.e. other motorists (Carthy et. al. 1993:95). In contrast, rail accidents are attributed to the industry.

Arguably, the difference in risk perception between rail and road means that people are more likely to put a higher value on improved railway safety. If an individual travels by train then they expect it to be safe because they have 'contracted out' the responsibility for the safety to the rail industry. These high expectations could lead to relatively high public valuations of rail safety, which

provide an incentive for substantial investment in rail safety. Thus government spending may favour public [rail user] safety over private [motorist] safety (Newbery 1995:235 in Corkindale and Willis eds 1995). The problem is that risk perception may be leading to large differences in the amount of money needed to save a life. Government figures suggest that "to save one life on the roads you need to spend between £100,000 and £1 million while it is estimated to cost £14 million to prevent a single rail death. It is suggested that if the government came up with billions of pounds for rail safety then their priorities could be questioned (Observer 2002).

The public versus private safety examples from, transport policy could be applied to food safety. Public food safety could be defined as concern over eating out or risks from food bought in from major retailers. This may take precedence over private food safety; this could be described as food produced privately such as that grown on allotments. Food prepared in the home would also come into this latter category. The increase in the proportion of 'public food' compared to 'private food' may help explain why concern over food safety may have increased in recent years. The demand for food safety, can be explained by an increase in affluence and a growth in public safety (involuntary risk; with responsibility for safety contracted out to the industry) at the expense of private safety (i.e. more voluntary risks). To summarise, the public's valuation of safety could be distorted by increased 'public' food consumption.

Information asymmetry appears to be less of a concern in transport safety compared with food safety valuation. Information about transport accidents is less of a problem because road and rail fatalities can be clearly identified. Thus there is a case for transport safety to be appraised using contingent valuation. The causation of accidents in transport can be clear, e.g. trains going through red lights. The public can know in detail what issues need to be addressed, e.g. signalling improvements on the railway, and at what cost. Therefore, they have firm information upon which to value a reduction in risks. Transport accidents can be clearly identified, unlike credence good characteristics. A rail accident could be understood fully in a matter of days or weeks. In contrast food hazards may take

years or even decades to diagnose. This seems to be the case with BSE and also with the effect of chemical contamination, in food, on health. In the food safety context there are epidemiological issues which need to be addressed before monetary valuation can be undertaken. Arguably longer life expectancy has increased the level of perceived risk making people more concerned about hazards such as cancer. Credence good attributes could affect public concern over safety, 60 years after consumption. For example, it is estimated that the lifting of the Over Thirty Month Rule would lead to an additional 0.04 deaths over a 60 year period (Food Standards Agency 2003b). It is this time lag which could make food safety valuation such a challenge.

6.5. Control over involuntary hazard and Information Asymmetry related to credence goods

This section outlines how risk perception and information asymmetry affected a contingent valuation study. The public's risk perception can be affected by their feelings of control. Griffith et. al. (1999:6) suggest that "the risks from chemical contamination may be regarded as involuntary by consumers, which tends to increase the level of risk perceived". This emphasizes the problem of trying to value reductions in involuntary risk. The risk from food contaminated with chemicals is likely to be overestimated, relative to the 'actual' risk because of the involuntary nature of the danger.

Moreover, Griffith et. al's report (1999:85) describes the surveillance programme as aiming to reduce the incidence of unacceptable concentrations of chemical contaminants in food. The public may *perceive* a different solution. In the context of known carcinogens, policy could instead aim to eliminate rather than reduce chemical contaminants.

Information asymmetry is also relevant given chemical contaminants. The food which is assessed, under the programme, can be considered as a credence good. This is because "chemical contaminants and naturally occurring toxicants in food are not observable by the consumer at the point of purchase" (Griffith et. al.

1999:11). The characteristics of the food examined, under the programme, can only be assessed using scientific knowledge. Therefore, consumers have to rely on expert advice (Griffith et. al. 1999:8) which they have to take on trust. Consumers are often reliant on information provided "by food suppliers, the government or some other agency regarding levels of contamination" (Griffith et. al. 1999:11).

MAFF's chemical surveillance programme may be hindered because limited information may have been given to respondents. Griffith et. al. (1999:74) suggest that consumers were made aware of potential problems associated with food but there was no feedback on what had been done to control these problems, to date. Consequently, it would be difficult for consumers to evaluate the outputs of the programme; such as enforcement actions taken. Consumers would be unaware of such enforcement. The public not only has less information than producers in the market, but also is less informed than public officials given government intervention. State intervention is arguably failing for the same reason that market failure is said to occur; that there is information asymmetry; this time between the public and state officials.

Another concern is that the public may not be able to comprehend some of the contaminants. The term dioxin is shorthand for many different types of the contaminant. To illustrate the information asymmetry the most potent form of dioxin is "2, 3, 7, 8-tetrachlorodibenzo-p-dioxin (TCDD)" and is now classified by the American Environmental Protection Agency as a "human carcinogen" (Skrzycki and Warrick 2000).

6.6. The measurement and communication of risk

This chapter so far has shown how risk perception and information asymmetry, or insufficient information, could affect a valuation study. This section will show how [1] the measurement of risk, and [2] the communication of the level of risk to respondents, presents challenges to researchers. These challenges suggest that the development of a food safety study could be informed by how environmental valuations have been undertaken.

An understanding of food risk, with the purpose of measuring it, would appear to be central to an investigation in this area. The problem is that there may not be a consensus between scientists on the 'actual' level of risk. Scientific estimates of food borne dangers are often subject to a degree of uncertainty and may be no more than educated guesses by experts (Ives et. al. 1995:108-9). Scientific identification of risk may not be sufficiently timely to give the public enough information to make a decision on their 'real' willingness to pay. The prospect is remote of scientifically informing most [credence good] controversies fully within the time available to make decisions (Adams 1995:45). Epidemiology may not provide causal links between possible food hazards and subsequent ill-health, in sufficient time for policy makers to make a fully informed decision.

In terms of communicating risk, one of the earliest major contingent valuation studies attempted to put monetary valuations on specified reductions in risk (Jones - Lee et. al 1985). However, conveying risk levels and risk reductions, to respondents, presented a major challenge. This was because risk was communicated in probabilities of "x in 100,000". This proved difficult to do because respondents found such minute levels of risk difficult to comprehend (Mitchell and Carson 1989:8).

The attempt to value reductions in risk using probabilities (Jones - Lee et. al 1985) could be improved upon. Griffith et. al's research (1999) is a departure from this approach. They suggest that the quantification of a reduction in risk is difficult, in the case of chemical contaminants, because there is insufficient epidemiological data to support such a measurement (Griffith et. al. 1999:38). It is hard to measure the effectiveness of the monitoring and controls in terms of reductions in the risk of contaminant related disease (Griffith et. al. 1999:38). It was a sensible decision, by Griffith et. al. (1999), not to attempt to measure risk reduction, say, in dioxin. Dioxin is measured in minute detail such as nanograms per kilogram (10^{-9}) (Pless Mulloli and Edwards 2000:2). One nanogram is equal to, a teaspoon full of salt in a small lake.

Jones-Lee et. al.'s study from 1985 highlighted another problem. One danger is that contingent valuation may be too abstract from the public's experience (Carthy et. al. 1990:7). It may seem like an unreal 'laboratory experiment'. This is because it is difficult to ask an individual to weigh up the costs and benefits of food safety regulation; particularly when these are intangible and difficult to convert into monetary amounts (Henson and Caswell 1999:593). Indeed it is difficult to think of an example outside a laboratory where consumers might consider many possibilities and probabilities; and then proceed logically on some optimal cost - benefit ratio (Roe in Singleton and Hovden eds 1987:221). Participants would need to consider the severity of say food poisoning, a hazard which they may not have experienced recently. They would also need to estimate the probability of getting food poisoning; the risk. Finally, they would need to trade off these two factors against their willingness to pay.

6.7. Bounded Rationality

The concept of bounded rationality is relevant. Consumers have "limited cognitive capacity which reduces their ability to absorb and process complex information". They "tend to generate simplistic pictures of the real world upon which to base decisions" (Griffith et al. 1999:5). In a multi-dimensional valuation situation, the respondent has to process unfamiliar information in a short time. Therefore, the respondent will think about the question in a way that reduces the difficulty of the decision making. "The respondent is tempted to favour a simplified decision rule instead of a thorough consideration of all possible alternatives and their outcomes" (Aakkula 1999:104). Thus the respondent can come to a simplistic decision on food safety valuation. People may just judge the 'food safety public good' on the basis of whether it is a "good thing" or not; or whether they can afford the good or not.

6.8. The application of environmental valuation to food safety

Given the problems associated with conveying risk reductions, then an alternative way of conducting the research could be considered. There could be the potential

of applying environmental valuation to food safety valuation (Ritson and Li Wei 1998:256). Since environmental valuation examines an improvement to an environmental amenity, then it could be possible to replicate this in the food context. The aim could be to focus on the improvement to food safety, with less emphasis on the reduction of food risks. The public could be asked a valuation question on how much they would be willing to pay for additional enforcement of food safety regulations. This could be achieved through the employment of additional environmental health officers. The public would be paying for food safety enforcement on a similar basis to an environmental amenity.

The issue of risk reduction cannot be avoided completely as the purpose of the exercise is to value food safety. Perhaps the best that can be done is to value food safety regulation, rather than food safety as a reduction in the probability of food-borne risks. A method is needed which describes a meaningful food hazard, and its associated risk, without over-complicating the exercise.

6.9. The challenge of the definition of the good

Environmental valuation may be useful for informing how a food safety valuation could be undertaken. However, criticisms have been made of economic valuations of the environment. For example, Holland (1995:25), suggests that only artefacts are capable of monetary appraisal. Only products of human workmanship, such as nails and screws, can be valued because they have a clearly defined function. In contrast, the natural environment is “not for anything”. Environmental goods can be assigned value but the price is guided by the purpose which it is taken to have.

If land is used for housing then the price of the land, in a market, is determined by its use for property. However, land could have a different function as a park, or a farm, in which case the price would be different. Holland (1995:25) challenges economic valuation by suggesting that descriptions, say of land, are built into questions which the respondents of a survey are asked. It is argued that “a pre-judgement affecting the valuation of the natural good is already built into what

purports to be a discovery of value". A question asking for people's willingness to pay to protect greenbelt land from house building could be criticized. Respondents could reply by arguing that land should instead be used for a park or a farm. Thus people may challenge the property rights basis of the question. Although respondents may not own the land, and the associated property rights, they may reject the notion that they should have to pay more to preserve it as green belt land. There is an introductory issue, about what land is for, which shapes the subsequent valuation question. The use of the land needs to be addressed, and a consensus reached on its purpose, before a question can be asked about its valuation. Otherwise the basis of the valuation question could be challenged and respondents may not be giving a proper bid value or 'price' for the good. For example, people may give a willingness to pay response of £0; described as a 'zero bid'. The problem is potential ambiguity. People may give a zero bid because they do not value the greenbelt or because they do not think they should have to pay more to preserve it. The practitioner then has the difficulty of what to do with the responses, which reject the notion of having to pay more for the preservation of the greenbelt, because interviewees may believe the land should be used as a park or for a farm.

6.10. The definition of the food safety public good

This section continues the theme of definition and how a food safety question could be framed. Two particular concerns are outlined which affect how food safety could be defined in the valuation question. The Food Standards Agency's limited international role and the complexity of the food supply chain are relevant.

First, it is difficult to value government measures because the scope for intervention is constrained by international food policy. It is difficult to evaluate the contribution of the Food Standards Agency when the World Trade Organisation restricts its freedom of manoeuvre (Lang 2000). If the Codex commission, part of the World Trade Organisation, is influential in decision making, then the UK agency appears to be constrained by international bodies. Moreover, the United Kingdom Food Standards Agency is now also restricted by an intermediate agency

operating at the European level; the European Food Authority. Thus many of the major, credence good, issues are decided at the European or World level which limits the government at the domestic level.

A second challenge is how far the government should intervene. Although the Food Standards Agency has sought to focus on food consumption and consumer health, there are broader concerns which could be relevant. One such concern could be hygiene on farms and in abattoirs. The cleanliness of abattoirs could be traced back to dirty cattle. If farmers are paid for the weight of the cattle, then the cattle are likely to be presented for slaughter with a full gut; which, it is argued, increases the risk of contamination by E-coli (Foster 1997). The problem is how far the FSA, needs to become involved with an 'agricultural issue' such as the prices farmers are paid for cattle when they are slaughtered.

There is a debate between the 'business' and 'consumer' lobby over how far intervention is needed. Different viewpoints may be offered over say food poisoning. A 'business' view could be taken that consumer education is needed to reduce food poisoning (The Grocer 1998). However, consumer critics suggest that "it is no good blaming whoever cooks the food. The problem is at source on the farm" (Independent 1997a). The Consumer's Association argues that too much of a burden has been put on the consumer. They argue that: "the consumer has been looked at as the last line of defence (often) the only line of defence" (Independent 1997a).

The combination of a more international and more complex food system makes the topic a challenging one to convey to the public. It is said that there has been an increasing separation of consumers and producers in modern food supply systems. "Agriculture has become a highly specialised activity remote from the experience of most consumers. Industrial scale processing transforms food into forms which may be unrecognisable from primary inputs. Finally, the majority of food is now retailed through large supermarkets which again seems to increase the perceptual distance between consumers and primary producers" (Kneafsey 2003).

The complicated nature of the food supply chain makes it more difficult for food safety characteristics to be signalled. A cause of this signalling problem is the development and industrialisation of society. Through the public's division of labour and their own job specialisation people are less able to trace the origin, or control the composition, of their consumption goods. It is then difficult for people to assess the impact of their consumption, especially when the individual's health is concerned (Schilizi 1999).

The complexity of the food system suggests that a question, to the public, may not be well understood. There is the problem of 'industrial food' which may cause respondent's concern, because it was not communicated successfully to the consumer. For example, major meat producers failed to divulge how much mechanically recovered meat was produced in the 1980's and the 1990's (Independent 2001).

A solution to this problem could be to ask the public if they want locally produced food. The relevance of this is that the public may see food safety as associated with characteristics such as 'local' or 'traditional' food (Ritson and Li Wei 1997:11). Local food sold through a farmer's market may help to signal food characteristics to the consumer. Consumers may be able to identify local attributes of food, such as the close proximity of production, which could encourage more trust in the product.

However, local food is not a proxy for 'safe' food. Safe food is defined as, at the start of chapter 1, as a reduction in risk say in food poisoning. Therefore an examination of food hygiene and food poisoning is now relevant. Food hygiene legislation is another factor which could affect how the valuation question is framed by the researcher and answered by respondents.

The 1989 European Union official control of Foodstuffs Directive provided for consistent food inspection across member states. The Directive was implemented in the UK with the 1990 Food Safety Act. The Food Safety Act strengthened the powers of enforcement for environmental health officers. There were also tougher

penalties, and an increased legal responsibility for all food firms, to make sure that they complied with the Act (Loader and Hobbs 1999:686-687). The Food Standards Agency “introduced schemes throughout the UK for setting and auditing standards for the enforcement of food law by local authorities” (Hemingway 2000:5). However, the Agency faces a challenge in conveying to the public that its auditing of local authorities standards represents an improvement on the work undertaken since 1990. Thus, there could be a challenge with asking the public to pay more for food standards, when there was already a Food Safety Act from 1990.

This discussion has suggested that the definition of the 'food safety public good' is crucial. A large part of the original research for this thesis attempted to resolve how the good is defined. This is because, before attempting to value food safety, it is necessary to clearly specify its scope.

6.11. Contingent valuation and the food supply chain

In the food safety context, the contingent valuation method should be used selectively. This is because, as will be shown, studies related to farming, and food manufacturing, could be fraught. Food safety is complicated as it can include issues such as animal welfare. Thus, an investigation could be better applied to the end of the supply chain; namely the sale of food and its consumption.

It is suggested that farmers have put animal welfare measures in place at a cost to themselves (Edwards 2001a). But farmers fear that consumers may overlook this investment. The problem is that until people have a full understanding of the connection between meat and animals then the public may not demand proper animal welfare. This is relevant because “good welfare practice ... will have important consequences for improving food safety” (Mepham 2001).

The aim of an empirical study is to measure willingness to pay. The problem is that if farming was included, as part of the study, then the researcher may become drawn into a debate, say, over whether consumers overlook animal welfare. A

debate which is awkward given that the public is unlikely to have direct experience of farming practices. Issues such as animal welfare may complicate food safety concerns, so respondents may be distracted from making economic trade offs.

People do, though, make trade offs when purchasing consumer goods, such as clothing. This is despite knowing little about how the garment was produced. Perhaps, therefore, people should be able to state a valuation for food safety without full background knowledge. There is a fundamental difference though; clothing can be described as a search good; quality can be discerned from inspection. Moreover, if it is found to be damaged, based on experience, it can often be replaced at no cost. In this way, lack of information on the production process is not relevant. This assumes the discussion is focussed on the quality of the product; the basis upon which the valuation is made (the conditions of clothing workers is another issue). In contrast, foods, such as beef, are credence goods. This is what makes food safety a special case, in terms of valuation. Food safety is rarely capable of inspection, and often adverse effects take time to occur. Moreover, once these ill effects occur they can be irreversible. Consequently, the production process can be fundamental.

Chapter 2 argued that consistent standards are expected by the public. In this situation, the public, when making a food purchasing decision, is often not required to consider food safety as it is taken as a constant. However, a contingent valuation study would treat food safety as a separate attribute from the product, capable of variation. To value food safety, therefore, it would seem necessary to consider farming practices and food manufacturing standards, and variations in the quality of these. Food safety contingent valuation can, therefore, not be compared with the kind of purchase decisions which consumers normally make; where consistent standards are expected. Food safety valuation is potentially a much more difficult thought process which may have to evaluate the start of the food supply chain, about which the public may know little. For that reason the decision making, in the empirical study, should be simplified by concentrating on safety issues related to the consumer's final place of purchase.

The consumer needs information on farming, to make an overall decision on food safety; but the public rarely has this knowledge. Food consumers could be asked to give valuations, related to farming, but they would be questioned in the context of them having largely imperfect information. Indeed, many respondents may be unable to offer willingness to pay responses. For this reason farming, and food manufacturing, could be excluded from the empirical study. This could significantly limit the scope of the valuation study, but the alternative is a poor quality response or a failure to answer.

6.12. The valuation of BSE

The previous analysis that consumers find it difficult to value safety concerns, related to farming, is supported by a French study on BSE (Latouche et. al. 1998). There were a range of problems in this study which appear to be due to the complexity of the subject of BSE. First, many respondents refused to pay because they did not think that higher prices should be paid by consumers. Latouche et. al. (1998:352) admit that the health risk being assessed, which is likely to be related to contaminated beef, is very uncommon. "Normally, food safety is included in the livestock products purchased by the consumer. The disassociation between the two components can seem artificial to the interviewee" (Latouche et. al. 1998:354).

Latouche et al. (1998:354) state that "the hypothetical scenario might be improved and to avoid any misunderstanding respondents have to be better informed". However, there is not a consensus of expert opinion over BSE. Indeed, better information may only highlight the difference between various scientific explanations, which may confuse respondent's views and so their willingness to pay. The other problem is that it may be difficult to separate BSE from other broader issues; such as animal welfare. It is suggested that "BSE questions the whole food and farm system because of contaminated farm animals entering the food chain" (Latouche et al. 1998:354). People may protest and offer a 'zero bid'; as a way of not participating in the survey; which implicitly could be a protest vote against how "the whole food and farm system" is being operated (Latouche et al.

1998:354). If people feel obliged to consider safer beef then they may protest with zero bids. This is a particular problem with the contentious nature of the topic. Alternatively, massive valuations could be elicited because the scope of the good; "the whole food and farm system", could appear unlimited.

The fundamental problem with a contingent valuation on topics like BSE is that such a study will go beyond economic issues, such as what consumer's are willing to pay for food safety to keep utility unchanged. It requires respondents to make a judgement about epidemiology and animal diseases called zoonoses. "Zoonoses are defined as diseases and infections, which are transmitted naturally between vertebrate animals and man" (MAFF 2001: v). A question related to zoonoses, could be too demanding for respondents. For example, apart from BSE, the MAFF report (2001:22) describes anthrax; it is a "peracute" disease which will be unclear to respondents as it does not seem to have a standard dictionary definition. Moreover, anthrax seems too emotive for respondents as the disease causes blood to frequently ooze from the diseased animal's body (MAFF 2001:22). Policies to control zoonoses are public goods, as diseased animals may well have harmful implications for human health if consumed. It would be useful therefore to estimate the demand, or usefulness of these public goods. However, the complexity and controversy over zoonoses particularly for the public, suggests that contingent valuation is not the way to achieve this demand revelation.

A valuation study on a complex subject such as BSE may not conform to economic theory well. An increase in consumer's willingness to pay will lead to an increase in the marginal cost of food safety with the purchase of 'extra units' of safety. For explanation see Swinbank's analysis in chapter 1. It is inappropriate to interpret being willing to pay more to avoid BSE, as purchasing 'extra units' of food safety. This is because it is difficult to specify a direct relationship between expenditure and less BSE; on the margin at least. Although, it should be acknowledged that Swinbank was writing in 1993, before a link was suggested between BSE and CJD in 1996, and did not attempt to apply an equilibrium food safety model to BSE. BSE may be an example of where respondents have a "lexicographic preference"; where it is not possible to make trade-offs and so BSE as a topic is inconsistent

with the standard neo-classical model (Aakkula 1999:100).

6.13. The decision over which food safety concept should be valued

Meat products are likely to be difficult to value, in terms of the reduction of food borne risk, because of animal welfare issues and the complexity of the supply chain. Also, given averting behaviour contingent valuation is better directed, not at food products, but at specific public policies such as the chemical contaminants programme. This is because such programmes have public good properties whereby the whole of the public benefits collectively; and individuals cannot avoid the benefits. In contrast the public can choose whether or not to buy food products and so avoid the valuation question.

The decision over which food safety concerns should be valued can be further discussed. To consider this decision it should first be re-stated that there is a case for the valuation of safety. For example, when governments decide on a road safety scheme rather than a hospital then they are implicitly valuing life (Swinbank 1993:92). Complete food safety is not possible and the huge costs which would be needed to attempt this are better allocated elsewhere. Thus the question of whether food can be completely safe is meaningless. A more relevant question is whether say, beef, is as safe as it can be. This does not seem to be the case with the recommendation that the Over Thirty Month rule should be ended. Unlike the 1980's the increased CJD risk is now understood in advance. The possible increase in death(s) due to a relaxation in BSE safety policy has been acknowledged. Thus the zero - infinity problem, discussed earlier in this chapter, is shown again to be a fundamental challenge in this context.

Aakkula (1999:47) describes a philosophical conflict between a teleological perspective and a deontological one. A teleological theory is that all things or processes were designed to fulfil a purpose. "Teleological theories, including utilitarian ones, place the ultimate criterion of morality in some non moral value. For example, the utility or welfare that results from act(ion)s" (Aakkula 1999:47). Deontology is the science of duty or ethics. "Deontological ethical theories

attribute 'intrinsic' value to features of the act(ion)s themselves. In this sense behaviour violating certain ethical rules is always considered inappropriate and unacceptable, even if it would produce the best possible outcome in terms of monetary welfare measures" (Aakkula 1999:47). Perhaps, the London Underground fire violated 'certain ethical rules' as not enough action was taken to deal with slight fires. Ethical rules were also broken in the context of BSE, such as feeding dead cows to cows.

If the deontological view is taken then the 'ethical rules' need to be confronted, and adhered to. The valuation of risk reduction, particularly in terms of valuing life, is less relevant in this context. Although BSE is perhaps the most significant issue in British food safety policy in the last twenty years, the potential for contingent valuation may be limited. In cases where food borne risks can be seen as an 'occupational hazard' such as common cases of food poisoning, then there are fewer, and less important, ethical rules to break. For example if food has not been cooked long enough and an individual is slightly ill then this is a relatively minor problem. Thus common cases of food poisoning are easier to consider and value.

6.14. Irradiation: a method of reducing food poisoning?

A problem remains with how 'common cases of food poisoning' could be reduced. A 'mechanism' is needed to show how food poisoning could be reduced. Food technologies, such as irradiation, could reduce food poisoning. However, this raises a series of issues. First, there are concerns over who benefits from the technology. Irradiated food could benefit manufacturers and retailers who could store food for longer. If it is industry who is benefiting and consumers who are paying then the public would not be willing to pay for irradiation. Only if the technology is perceived to be beneficial to consumers would irradiation be suitable for valuation, as a way of reducing food poisoning. This is possible as irradiation could reduce food borne risk such as by killing salmonella. However, critics of irradiation would suggest that it avoids the need to tackle problems, such as salmonella, at source on farms. This returns to the complexity of the food system and respondents not being able to understand it.

A second concern is people's perceptions of safety. Government officials have argued that on scientific grounds there was no reason for not approving the irradiation process; whether this is accepted by the public is another matter. Thirdly, the government leaves the ultimate decision making, in terms of whether irradiated food is sold, to the supermarkets. The government has been willing to share authority for food safety with the major food retailers because the state regards the supermarkets as being able to represent consumers (Marsden et. al. 1997:27). The role of the Food Standards Agency is limited, in the context of reducing food poisoning through the use of irradiation. Therefore, irradiation would not be a convincing 'mechanism' to reduce food poisoning.

6.15. Summary of chapter 6

The previous discussion suggests that conveying how food risk could be reduced will be a challenge. Topics such as irradiated food, or genetically modified could be controversial to convey to the public. Credence goods, such as beef after BSE or food containing pesticides, where the effects of food consumption could last well into the future are also contentious. An assessment of food safety, in the context of the whole supply chain, could be problematic too.

A valuation exercise should not be directed at specific food products because people can choose whether or not to purchase them and so avoid a valuation question. Instead a monetary appraisal needs to be directed at a public programme of intervention. Such programmes are collective in nature and so people cannot avoid the benefits and have to confront the question.

Part 3: The research study

Chapter 7: Exploratory research to inform the empirical study

7.1. Introduction to the research study

The previous discussion has not provided unequivocal evidence on the way to undertake this study. Thus there is uncertainty over what would be an appropriate method for the design of willingness to pay research in the case of food safety. Reservations over the reliability of contingent valuation, for food safety, leads to the decision that it would be necessary to undertake some experimental work in order to design the questionnaire for the empirical study. The purpose here, therefore, is to develop a suitable approach for contingent valuation when applied to food safety. This chapter details the start of the exploratory research which was undertaken. Table 7.1 outlines the different stages of the research study

Table 7.1. Explanation of the research design

Preliminary questions: exploring the food safety issues

[Start of chapter 7: Short survey to 65 respondents]

Focus Groups: to refine the food safety concepts

[End of chapter 7: 2 focus groups of 6-8 respondents]

Piloting the food hygiene valuation question

[Chapter 8: 6 sets of questionnaires [iterations] to 10-30 respondents]

Pilot valuation question 1 - 20 respondents

Pilot valuation question 2 - 20 respondents

Pilot valuation question 3 - 20 respondents

Pilot valuation question 4 - 30 respondents

Pilot valuation question 5 - 20 respondents

Pilot valuation question 6 - 10 respondents

[Total number of respondents: 120]

Empirical research

[Chapter 9: 1 final questionnaire of 312 respondents]

The questionnaire was asked at 6 different 'bid' levels of £100, £150, £200, £250, £350 and £450

Likert scale results, willingness to pay results and demographic data

Analysis of the empirical study

[Chapter 10: Qualitative commentary arising from the main empirical study]

[Chapter 11: Cost-benefit analysis with discussion]

In theory there are four stages which need to be followed. These are:

- 1) Selection of the food safety concepts for the WTP question [chapter 7]
- 2) Refinement and improvement of the valuation question [chapter 8]
- 3) Valuation question using the open-ended format [chapter 8]
- 4) Valuation question using the closed-ended format [chapter 9]

First, there is a need to select the food safety concepts which, it is argued, are appropriate for valuation. This involved piloting a preliminary willingness to pay question (7.2 and 7.3) and two focus groups (7.4). The conclusions from this first stage of research are then outlined in section 7.5. Second, once the food safety issues have been clarified it is then possible to refine the valuation question. Several iterations were needed to improve the willingness to pay question (see chapter 8).

In theory, a third open - ended stage is required to help guide the closed-ended study. However, this open-ended stage was not undertaken. This was because; the open - ended approach places too much of a cognitive burden on the respondent. The respondent has to consider what would be an appropriate valuation; whereas in the dichotomous closed-ended approach, the respondent is given a monetary amount and only has to make a yes/no choice. The open-ended approach is not well suited to the food safety context, as safety is not a separate characteristic from the food sold. Respondents do not have the experience of 'purchasing' food safety and this makes it difficult for the public to consider what would be an appropriate valuation. The respondents, in this study, were often not able to provide monetary figures when they gave affirmative responses to the open-ended question. Thus the open-ended format, employed when refining the valuation question, did not yield much numerical data. Therefore, a formal third stage was not undertaken. The starting point for the closed-ended study, the fourth stage, was estimated instead. Chapter 9 outlines the closed-ended study. The reason for using a referendum approach rather than a payment card was discussed in chapter 5.

7.2. Selection of food safety concepts which are relevant for contingent valuation research

7.2.1. Introduction to how the research method was undertaken

Throughout, the survey questionnaire was undertaken as a face-to-face interview. This is because the good can be defined and explained more thoroughly in a face-to-face interview and also non response can be reduced. It is superior to telephone surveys where it is more difficult to maintain the interest of the respondent (Garrod and Willis 1999:137). Face-to-face interviews would be expensive to conduct if undertaken by market researchers. The length of time taken to conduct face-to-face questionnaires is a greater consideration in this study. This reason provides the main justification for relatively small samples of respondents at each stage of the research. Also to prevent the survey from becoming too time consuming, repeat visits were not made.

Face-to-face interviews also enable the researcher to elicit more information from respondents, than perhaps would be possible in a telephone interview. There is greater opportunity to encourage respondents to comment on the questions.

7.2.2. Work related to the preliminary valuation question

These household surveys were undertaken, in 1999, using the National Statistics website as a basis for the research. The National Statistics website (www.statistics.gov.uk) is useful for neighbourhood statistics which rank all 8414 electoral wards nationwide according to various indices such as income and education. This research used the measure, or index, of multiple deprivation which combines the different indices. The survey was done in two electoral wards on Tyneside. Most of the work (46 of the 65 short interviews) was done in a ward which was ranked 7251 out of 8414; with ward 8414 being the most prosperous ward in the country. The rest of the work was done (19/65) in a ward which was ranked 3154 out of 8414. The main purpose here was to undertake some pilot research to help learn what would be appropriate questions for a later, more

detailed, study.

7.2.3. Newspaper readership (see appendix 1)

A question was asked on newspaper readership. The main aim was to find out whether a newspaper readership question could be used in the main empirical study in chapter 9. The purpose would be to discover whether newspaper readership could be related to willingness to pay for food safety; that is whether it could be used as a predictor of willingness to pay. For example, a hypothesis could be that readers of 'middle market' newspapers, such as the Daily Mail and the Daily Express, are more willing to pay for food safety compared to readers of other newspapers. This could be because these newspapers tend to have more 'banner headlines' on 'food scares'. For example, The Daily Mail (1998) highlighted the danger of food poisoning which could encourage its readership to be more willing to pay for food safety. However, this can only be a hypothesis; these two newspapers have headlines for many other policy issues; such as rail safety. Thus with the potential for saturation coverage and with so many public goods which could deserve more money, then perhaps these banner headlines would not have much influence on willingness to pay. Indeed there may even be a negative effect; perhaps with people feeling disillusioned, through the sensationalist coverage, and becoming less willing to contribute towards public services.

The question which was asked to 65 people was: "Which newspaper do you read the most? Respondents were asked this question which was guided by the use of four different categories (A - D) with examples. The categories were inclusive; for example, the Daily Star could have gone in category (A). The Independent or Financial Times could have gone in category (C). Two respondents did not answer this question because they did not buy newspapers and bought television guides or other magazines instead.

The results were:

A) Tabloids [5/63]

- B) Middle Market [9/63]
- C) Broadsheet [34/63]
- D) Local [15/63]

It would be difficult to examine the relationship between 'middle market' readership and willingness to pay, in this survey, because there may not be enough 'middle market' readers. To simplify the analysis, categories A (tabloids) and B (middle market) can be merged. The Mail and The Express could be viewed as tabloids with the difference that they place more emphasis on policy issues than say The Sun. The regional newspapers may have a readership throughout the population because of their local coverage. Thus, taking the local papers out, there is a dichotomy between tabloid and broadsheet newspapers. If this categorisation is used then the results can be split between tabloids and broadsheets. Thus the results become:

Tabloids (including middle market)	: 14/48
Broadsheets	: 34/48

The results from this question suggest that affluent electoral wards have high broadsheet readerships. The usefulness of this question will be shown with the interpretation of the final results.

7.2.4. Food Attributes

A question was asked to stimulate respondents so that they would think about individual food characteristics. The purpose was to find out whether people could perceive food attributes separately. The characteristics for consideration were convenience, freshness and taste. If these food attributes could be perceived separately then the study is easier to implement. This is because people could be encouraged to consider food safety as another, theoretically isolated, food characteristic. If this perceived separation of safety could be achieved then safety

would be easier to value because it would not be embedded, or entangled, amongst other concepts. It would theoretically be a separate concept capable of valuation in its own right.

In this question respondents were asked to choose which food attribute they thought was the most important. The question asked: Out of the following 3 food attributes of convenience[a], freshness [b] and taste [c] which characteristic do you think is the most important?

- a) Convenient food. For example, pre prepared meals
- b) Fresh food. For example, local produce
- c) Tasty food. For example, food with a good flavour

The results were:

- a) 2
- b) 33
- c) 22

both b and c) 6

all) 2

Again, the results are not intended to be representative as they are based on the affluent electoral ward as described above. The relevant finding is that, even under the artificial scenario where food attributes are separated, several people chose more than one characteristic. Some people were unable to separate the food attributes although they were clearly asked to choose which characteristic they thought was the most important. This question is useful because it highlights the difficulty of trying to separate food attributes for valuation purposes. In practice, attributes can be inextricably linked e.g. taste and freshness. This concept of the difficulty of separating, or disaggregating, food attributes, in particular safety, is a recurrent theme throughout the research. A valuation question which attempts to separate food safety into different component parts may be difficult to undertake.

7.2.5. Household food shopping bills

The question was "how much is your weekly household food shopping bill"? This was difficult for people to answer because of substantial food storage and so variable purchasing patterns. However, this is not a great concern. The data from this question is not significant. The purpose of the question is to guide respondent's decision making. Market prices were going to be used as the payment method, for food safety, so weekly food spending could help guide people's willingness to pay amount. The question could help respondents think about what might be an appropriate willingness to pay amount because it would help them think about their expenditure and budget constraints. The question was retained for the main closed-ended study, outlined in chapter 9, for that reason.

7.2.6. The preliminary valuation question

The preliminary valuation question was based on a conclusion from Marsden et. al's work (1997, 1999). They argue that the major grocery chains determine their own standards of food safety which generally exceed the state's baseline standards. They suggest that Environmental Health Officers adopt a different approach, to the regulation of food standards, depending upon whether they are inspecting major supermarkets or the independents. For the major retailers the health officers take an auditing approach. The health officer acts as an external guarantor of the retailers internal quality control procedures. Civil servants at the Department of Health believe that the major supermarkets are largely capable of regulating themselves. Thus the role of local environmental health officers, in the case of the supermarkets, is often merely to oversee their safety procedures (Marsden et. al. 1997:23). However, for the large number of small independent retail outlets the situation is quite different. They have to make efforts to identify, and control hazards, within their operations but are more reliant on Environmental Health Officers for supervision. Thus, Marsden et. al. suggest that state regulation remains important for maintaining food standards in the independent sector (Marsden et. al. 1999:443). Consequently, the customers of small food outlets are

more reliant on Environmental Health Officers to police 'the independents' than the supermarkets. Thus, Marsden et. al.'s conclusion is that the Food Standards Agency should concentrate on the independent sector (Independent 1997b).

This analysis was used as the basis for the valuation question, that supermarket standards can be used as a benchmark, to which the standards of the independent sector could be improved. Previous studies have attempted to value a reduction in risk (Covey et. al. 1998). Attempts to convey less risk, in terms of a reduced probability, have been difficult in a contingent valuation questionnaire.

One of the purposes of this research is to examine whether an alternative approach would be more appropriate for a safety valuation study. Therefore, this survey takes an alternative approach to the more traditional method of the valuation of the reduction in risk. It explores whether 'food safety' can be perceived as an improvement in the independent sector up to the standard of the supermarkets.

The preliminary valuation question is in appendix 1. The question attempted to elicit a willingness to pay response using an open-ended format:

"If you are willing to pay; what is the most you would be willing to pay on top of your weekly food shopping bill?

This open-ended question was substituted by a closed-ended question after 16 open-ended responses were obtained. Data from the open-ended question was used to derive a figure, £8, for the closed-ended question. This process is explained below. The closed-ended question was:

"Would you be willing to pay £8 on top of your weekly food shopping bill: Yes or No?

7.2.7. Results from the preliminary valuation question

Open-ended questions were asked to 16 respondents. Four respondents failed to

give an answer and complained that they did not know how much they would be willing to pay, or that they found the question too difficult to answer. This shows the difficulty of the open-ended question to respondents. Therefore there are only 12 willingness to pay amounts left. These were: £20, £20, £5.50, £6.50, £12, £2.50, £10, £5, £3.80, £2.50, £5.00, £5.00. The average was rounded down to £8. Thus the closed-ended question asked if respondents would be willing to pay £8 a week on top of their weekly food shopping bills.

Closed-ended questions were asked to 49 respondents. At this stage the main aim was to learn lessons to develop the questionnaire.

7.2.8. Newspaper readership and willingness to pay

Statistical analysis, using chi square, can be employed to examine the relationship between newspaper readership and (non) willingness to pay for food safety. The result was not statistically significant at the 5% level (see appendix 1b). Newspaper readership does not appear to act as a good explanatory variable for the public's willingness to pay for food safety. Therefore, the question on newspaper readership was not repeated again. It was concluded that there could be better ways to measure public knowledge or awareness than through newspaper readership.

An alternative method of measuring public knowledge, and potentially the public's understanding of food safety concerns, could be to ask for the respondent's level of education. Indeed, Henson's study on salmonella (Henson 1996) used education as an explanatory variable. The justification for using newspaper readership as a possible explanatory variable, in preference to education, was that qualifications can be a sensitive subject for respondents. Respondents may be less defensive about the newspaper they read, than about their level of education. The problem is that, the result, of the above chi-square, suggests that, newspaper readership could be inferior to education as an explanatory variable. It would appear preferable to use education which was used in Henson's (1996) study.

7.3.1 Issues arising from the preliminary valuation question

This discussion will begin by examining some of the more difficult themes. The first challenge is that the open-ended method may not require enough thought on the respondent's part. People can express their willingness to pay as a percentage, say 5%, on top of their food shopping bill. This perhaps does not require respondents to give sufficient consideration to the task. People only provide a heuristic. Heuristics can be defined as "a system of generally simple rules or procedures which may be applied to a situation with the objective of achieving a satisfactory outcome" (Carthy et al. 1993:98). The respondent provides a simple percentage so although they have answered the question adequately they have not considered a clearly defined additional monetary amount, on top of their shopping bill. Thus, the research method can be challenged for eliciting simplistic responses.

The valuation question can also be criticized on the grounds that respondents may have wanted to challenge the property rights basis of the question. The question's underlying assumption was that food safety needs improvement; otherwise there would be nothing to pay for. For example, a respondent stated that "it (the question) assumes that the food industry isn't safe". Also respondents complained, in reply to the question, that "it (safety) is already in place". People imply that private provision is enough. Public enforcement of food safety standards may not be needed when food purchases are made from supermarkets. Arguably, supermarkets ensure that food standards are adequate.

This raises the challenge of valuing the 'food safety public good'. Major investment in food safety by the supermarkets means that regulation, the public good, is only 'modifying' the market (see 2.3). Enforcement officers may only be checking the supermarkets standards which the supermarkets already monitor themselves (Marsden et. al. 1997, 1999).

Some respondents believed that they do not need additional food safety. Many people were not willing to pay because they tended to be satisfied with the

supermarkets food safety record. In this context, respondents are giving an appropriate response answer when they state that they would not be willing to pay for government intervention. Moreover, supermarket shoppers are paying twice over for food standards; once through their purchases at the till and secondly out of public funds. People seemed to challenge the question on the basis that safety is already included in the [supermarket] price; which it is, in the context of Marsden et al's (Marsden et. al. 1997, 1999) research. This raises the difficulty that Latouche et. al. found (1998:354) that safety is seen as part of the product and it is unfamiliar to see them separated.

Another difficult, possibly intractable, issue is that some people answer the question based on the needs of others. One respondent complained that, although they would pay, the question was unfair on people with low incomes who are unable to pay. Although the question is the same for all respondents, there may be variation in the way it is being answered. Some people may answer the question from their own perspective, whereas a few individuals may consider the needs of others, as the previous example showed.

On the subject of poverty, hypothetical markets, like private markets, have situations where people have different marginal utilities of money. The poor have a higher marginal utility of money making their trade-offs more difficult as they have to give up more, of other goods and services, to 'purchase' increased food safety. It is therefore difficult to question people on low incomes.

However, it was encouraging that the valuation question could generally be answered. This justifies the use of market prices as the payment method, for while many people do not pay income tax virtually everyone pays for food. If people shop at supermarkets then the payment mechanism implies an increase in supermarket prices. However, the question implies that it is takeaways, or restaurants which need to be improved so perhaps food 'eaten out' should increase in price instead. Thus there was a need to improve the valuation question on that point.

Concern can be expressed over the broad scope of the question since farming was included as part of the valuation question. One respondent stated that they would be willing to pay to “support the farmers”. People could feel pleased that they are contributing to farmer’s welfare. The problem is that although the question aims to elicit responses on food safety this may not be what respondents are ‘bidding’ for. People are responding affirmatively because of external issues such as farmer’s welfare. This problem could be avoided by restricting the valuation concept to just food safety.

The definition of safety in the question also presented problems. Respondents were informally invited to comment on the valuation question. This was done by asking the respondent what food concerns they thought needed to be improved. The main finding was that the food safety concept needed to be specified more clearly, because the existing question left the safety concept open to interpretation. For example, one respondent said “you mean GM and that”; whereas other people could have different concerns and base their valuation on those other issues. The question was also criticized as “too generic”. The characteristics of food risk needed to be specified so that respondents could understand which risks were being reduced.

The previous shortcomings can be rectified by narrowing down the food safety concept. Also ambiguous responses can be resolved. For example, one respondent said yes to the willingness to pay question, then qualified their response; saying that “the government may say irradiated food is safe”. This returns to the debate over what is meant by safety. Safety can be defined as a reduction in risk. This view would be that of “the World Health Organisation [which] recommended food irradiation as a technique for preserving and improving the safety of food; that is killing off pathogens (Diehl 1993 in Ritson and Li Wei 1998:254)”. People could be willing to pay for more safety because they think irradiation will make food safer according to the WHO definition. However, this respondent had a different interpretation that ‘safety’ is a concept related to the public’s control over food production. Also that irradiation would not make food safer and perhaps the reverse. In this case, respondents could be willing to pay

for more safety on the assumption that they are in control; that they have influence over the use of potentially harmful technologies, such as irradiation. People would be able to make sure that irradiation is not permitted, or included, as part of reducing the risk of food borne illness. Contentious issues such as irradiated food could be removed from the valuation exercise for the purpose of simplification.

7.3.2. Conclusions from the preliminary survey

The general lesson from this preliminary survey was the need for qualitative research to refine the valuation question. The preliminary survey often elicited brief comments on the suitability of the valuation question. Also brief points were made by respondents on what they thought were relevant food safety issues. The problem was that a detailed insight into public perceptions of food safety was required. This was because the survey had left unclear what food safety concepts were capable of valuation. A method such as focus groups could perhaps differentiate various food safety concepts and assess their relevance for valuation. Focus groups demand that the subject is discussed in depth for at least an hour. The researcher can then learn what issues respondents feel that they are comfortable with. These issues can then be drawn out and assessed to see whether they are appropriate for valuation.

The preliminary survey was nevertheless useful, as it identified how the research needed to be developed. It highlighted the need to describe familiar areas to respondents. It is necessary to describe understandable safety concepts, so that the valuation exercise does not become too involved in contested debates over definitions of food safety. The irradiation of food is a prime example. The survey also emphasised the need for a more specific valuation question. Thus it helped identify what would be needed from qualitative research. The qualitative research would need to identify food safety concepts which the public are familiar with, which they are comfortable with and which can be defined in specific terms. Thus the valuation question was informed by two focus groups, the next area for discussion.

7.4. Focus Groups: to help select the appropriate food safety concepts

7.4.1. Background to the focus groups used in this study

The introduction at the beginning of the thesis stated that the aim of the research was to obtain a monetary valuation, for food safety, which could contribute to policy making. Arguably such a [rational] quantitative input into policy is in contrast to qualitative research. A rational input can be defined as a contribution to policy which is able to focus only on the safety attribute of food and separate it from other food characteristics. Moreover, a rational input implies a cross section of representative views taken from throughout the population. Qualitative research, such as a focus group, is unlikely to be able to focus on a specific food safety attribute or be representative. This is because focus groups are intended to be general discussions to see what issues emerge. They are also time consuming and so it is not possible to have enough respondents from a large sample of the population for the results to be representative

The use of focus groups here needs to contribute to contingent valuation, as an aid to rational decision making. The following discussion outlines how focus groups could assist a contingent valuation exercise. “The focus group is a qualitative methodology that is not intended to provide definite answers to questions”. It can though be helpful in the design of a research instrument, such as contingent valuation, that can provide statistically reliable data (Greenbaum 1998:59). The focus groups will attempt to highlight food safety issues which are of concern to respondents and in particular emphasise those concerns which are controversial. The interpretation of the subjective and qualitative values, from the focus groups, acts as a filter to remove the contentious food safety concerns which respondents find difficult to evaluate. In other words those concerns which could hinder a ‘rational’ economic valuation can be removed. This filtering process, as section 6.11 also argued, suggests that there will not be many food safety issues left for consideration. The hope though is that those concerns which do remain are capable of ‘rational’ valuation. In other words, that people can make trade offs between money and safety, for those food safety issues that remain.

Arguably, focus groups have been under theorised, as much of the literature concentrates on their conduct rather than how they can inform policy (Davies 1999:295). However, if focus groups are to contribute to policy, via contingent valuation in this case, then the conduct of the groups is relevant. Greenbaum (1998:62) outlines some factors which need to be considered for the successful implementation of focus groups. It is suggested that "the more homogeneous the group is, the better the participants will relate to each other". Thus respondents should generate a higher quality of input. It is argued that people from different socio-economic groups or with different educational levels should be in separate groups even if they are all consumers of the same food product. Another relevant feature according to Greenbaum (1998:66), related to the conduct of the group, is the need for interaction among participants. It is thought that interaction should be encouraged to increase the quality of the output from the session. The range of ideas given to the researcher may increase through interaction.

The focus groups, undertaken in this study, were conducted amongst homogenous groups. The groups were a residents group and a church group. The selection of the groups were chosen to make sure that there would be a good interaction between the group members, as the participants knew each other. This helped the continuity of the discussion because people were able to give each other constructive criticism. Both the groups were made up of middle-aged and retired respondents and the socio-economic class of the respondents was from the electoral ward, which was 3154 out of 8414. The groups do not need to be representative of the population as a whole. This is because the groups can be considered as an "informal device for developing more valid and refined [contingent valuation] surveys" (Chilton and Hutchinson 1999:468).

Potential shortcomings of focus groups need to be identified as these help to improve the conduct of the groups and the interpretation from them. Greenbaum (1998:66) suggests that one of the greatest disadvantages of the focus group technique is its subjective nature because it allows observers to interpret what happened during the session. It is thought that the moderator should maintain an objective perspective, throughout the process, so that the final report is an

accurate representation of what happened (Greenbaum 1998:69). Moreover, it is suggested that the analysis should focus on the big picture rather than on individual comments. "The most effective way to evaluate focus groups is to try to identify the few really important findings of the group, considering the group's overall feelings" (Greenbaum 1998:69). Perhaps, one way to be objective and to look at the few important findings is to interpret the groups using a filter based on the literature review on search, experience and credence goods. If the issues are separated between [1] search and experience goods and [2] credence goods then there is a way of classifying the concepts, particularly given that respondents find the credence goods difficult to consider or controversial. The previous identification of irradiated food as a contentious food safety concern is relevant here.

7.4.2. The use of focus groups for environmental policy

Focus groups have been used with contingent valuation, in the context of environmental policy. First, contingent valuation studies can be informed by conclusions from focus groups undertaken prior to valuation studies. Environmental economists have used this qualitative research to provide insights into respondent's attitudes towards particular environmental goods say National Parks (Garrod and Willis 1999:133). Focus groups have also discussed the context of a good; say where flood protection may be needed. Moreover, people have discussed the payment method and how much respondents might be willing to pay (Garrod and Willis 1999:133). Consequently, it seems focus groups can be useful for developing the questions in a contingent valuation study and this is the purpose of the focus groups in this thesis.

However, another option is to use focus groups, after a survey, to test the quality of the valuation. The aim is to find out whether respondents answers are consistent with the question. For example, to assess respondents understanding; or to uncover potential shortcomings of the methodology such as part-whole bias. The overall aim of post-survey focus groups is to discover how useful the survey responses are for decision making (Brouwer et. al. 1999:326).

Problems have been identified with the use of focus groups, in conjunction, with contingent valuation. These shortcomings suggest that focus groups may not contribute significantly to the quality of the overall study. This is because there are contrasts between how focus groups are conducted and how a contingent valuation study is undertaken. Individuals are known to behave differently in group scenarios, compared to situations where they decide alone, which is typical in willingness to pay surveys (Garrod and Willis 1999:133). Also, “in both pre and post focus group meetings participants have more information about the good and about other individual’s responses” (Garrod and Willis 1999:133). Therefore, information yielded from focus groups may be different from that obtained from the contingent valuation study. Respondents may have a better understanding of the good in the focus group context because there is more time, and more people, to debate the issue. This may lead to a false assumption that respondents had the same level of understanding in the contingent valuation situation. This is unlikely to be the case because a questionnaire scenario would offer less time for thought and interaction.

7.4.3. The use of focus groups for food policy

Focus groups can inform contingent valuation, but the integration of these two types of approach will be a challenge for food economists if they want to contribute to policy making. There is a question about how focus groups should be used to inform the later willingness to pay study. Henson’s study (1996:7) on salmonella used focus groups to identify an appropriate format for the willingness to pay question. Respondents were asked how risk reductions should be conveyed in a valuation question. The focus groups, used for this research, serve a different purpose; to find out which food safety issues are capable of being valued. It is possible that salmonella may not be the most appropriate application for contingent valuation, in the context of food safety. The contention here is that the researcher needs to find out what food safety issues are capable of valuation before undertaking any other work. The appropriate format for the willingness to pay question can then be developed by doing more piloting of the valuation

question. This is the subject for chapter 8. At this stage, the basic issues which are capable of valuation need to be identified.

7.4.4. Focus Group data (appendix 2)

Information was obtained by asking people about the food issues which concerned them [appendix 2]. The issues can be divided between credence and non-credence goods as outlined below.

7.4.5. Examples of credence good issues from the focus group

BSE: "By the latest results they've got ... it's just going to keep going and going"
GM food: "They were supposed to be regulating GM food and asking people to say on the labels"

Irradiated food: "The Government says irradiated food is safe"

Chemicals in food: "You can't taste pesticides on food"

7.4.6. Examples of search and experience good issues

The following examples are based on problems which arise through inadequate food hygiene regulation. Marsden et. al. (1999:443) argued that environmental health officers are relevant for the enforcement of food standards at small independent premises such as kebab shops. Therefore, the following are sources of food hygiene problems which environmental health officers could be expected to deal with.

Storage of food: "The correct temperature for refrigeration (is needed)"

Preparation of food: "(It's) people's personal hygiene and food hygiene (that) brings out
the food poisoning"

Cooking of food: "In some restaurants the fish doesn't seem to be cooked sufficiently"

Handling of food: "The trainee was wearing plastic gloves but touched a piece of

meat”

7.4.7. The selection of the food safety concepts

It was clear, from the focus groups, that it would be difficult to evaluate issues, where there is significant uncertainty. In particular, BSE which could be intractable. For example, it was stated that “it’s not wholly propagated through animal feed ... it may start that way ... but it’s been carried on ... through the whole cycle and now it’s in the ground. By the latest results they’ve got across the world it’s going to keep going and going”. It is difficult to ask people to value reductions in risk where it may not be possible to deliver a specified decrease in the BSE risk. Consequently, a contingent valuation question, on BSE, would not be incentive compatible. It would not offer a realistic incentive to the respondent to provide a useful willingness to pay response. Contingent valuation should outline questions on the basis that if a respondent paid X then they would receive Y benefit; but this type of question would not work in the context of BSE.

BSE emphasises the relevance of the literature on risk perception; in particular the uncertainty and ‘dread’ factors. People may not like to think about risks related to BSE. It was stated “isn’t the most important thing the meat situation, as it was and we hope it’s cured”. This response from the focus group, with implied uncertainty, i.e. “we hope it’s cured”, emphasises the credence good nature of beef now. Moreover, if people were to consider BSE then they may be unable to offer a rational value; their valuation may be influenced by previous apparent policy failures. It was stated that “the bad things stick in your mind - the fiasco over scrapie in sheep; we’ve been allowing that to go on for years”. Respondents may not be able to give valuations for a reduction in BSE risk. They may not be able to address the measures that are needed to reduce risk in the present; they may be preoccupied with past failures.

Scepticism of the European Union was mentioned in both the focus groups. This may suggest that it is difficult to value the broader, international issues such as GM food. Respondents imply that ‘Europe’ is remote or even operates against their

interests: “Brussels says we’ve got to have” or “They (the European Union) set the rules but don’t adhere to them”. Also it was stated that “this World Trade Organisation is really getting a grip on people now”. Valuations related to an international issue, such as GM food, may be overly influenced by scepticism of the European Union rather than based on a valuation of food safety. A question related to a broad international issue, such as GM, seems to be an invitation for an embedded response. Both the food issue, GM food, and the governance issue, the European Union, may be included in the valuation decision. Nevertheless, the Food Standards Agency (Krebs 2001) stated that the Advisory Committee’s advice is that GM food is safe; in which case it would be inappropriate to try and value reductions in risk in terms of GM food. The issue of property rights is relevant as respondents cannot realistically be asked to pay more for GM food which is said to be safe.

Finally, there is another opaque food safety concept which is “not being able to taste pesticides”. This raises a fundamental question of how credence goods can be assessed in the context of contingent valuation; and how the public can be asked to value improvements which they cannot sense such as through taste. The corollary is that there is now a case for removing credence goods from the valuation study.

The focus groups highlighted was the need to try and remove political issues from the valuation question. Concern about political issues was a difficult theme in the focus groups. However, an attempt to remove public policy, from a valuation question, would take away the public body, the mechanism, providing the public good. If the mechanism is removed from the valuation question then the public cannot see how the food safety improvement can be delivered. This is discussed in more detail, in the next chapter, where the description of the Food Standards Agency, creates problems for rational valuation. The focus groups expressed concern over political issues; which could influence a willingness to pay response. For example “what worries me is that they (the government) keep on trying to jump on the bandwagon and get everyone revved about it and then suddenly find there’s

something wrong". Perhaps, research methods such as contingent valuation can only be as rational as the given political situation. Willingness to pay, in this context, may well be influenced by the aspirations that the public had for the agency and whether these expectations are met.

Another theme linked to the political context is media involvement which may cause confusion over food safety. It was said that "food poisoning grabs the headlines" which could discourage respondents from considering safety versus money trade offs; and instead focus attention on the media 'story'. This problem could be mitigated by offering the respondent a clearly defined 'public good', in the valuation question: that is a good which people can see being delivered; and which could be unaffected by media attention. For example, the kind of food safety work that the respondent can see being undertaken locally by environmental health officers.

This leads into contingent valuation being used to value just local food hygiene regulation; the enforcement of regulations and the monitoring of food safety related to the storage, handling, and preparation and cooking of food. The advantage of this approach is that it fits in with the classical economic model of food safety. As stated in chapter 1 "the provision of safer food will require the use of more resources [which will be needed if] more hygienic handling procedures [are to be introduced]". It is suggested therefore, that food hygiene regulation is an example of a food safety public good which does conform to the classical economic model and could be valued using contingent valuation. This is unlike food safety public goods which monitor credence goods.

A different theme raised at the focus groups was the Agency's monitoring of local authority standards which would require additional funding. As one respondent said, there would have to be "an audit of the auditors". That is, the Agency is undertaking an audit of the local authorities who are the auditors of the food premises. This implied criticism from the focus groups suggests that the public have concerns about the additional bureaucracy which is being implemented. Moreover, the agency is reliant on Environmental Health Officers who were

already being employed by local authorities. Thus the additional benefit provided by the government, in terms of the Agency auditing and overseeing local authorities may not be clear to the public. This is because they are not receiving a quantifiable benefit as would be the case with a tangible pure public good such as a flood wall.

7.4.8. Main lessons from the focus groups

The ideas from the focus groups have led to a useful conclusion. Food safety issues, such as common cases of food poisoning, can be comprehended by the general public. Respondents may have seen examples of poor food hygiene practice, such as food which has been improperly stored, and have been able to link this to the possibility of mild food poisoning. This basic understanding of the link between poor food hygiene and food poisoning suggests that it is possible to undertake a contingent valuation, using food hygiene as the concept to be improved. Simple examples of food borne risk, which may occur through the improper cooking, preparation, storage and handling of food, could be appropriate for economic valuation.

In contrast, many of the credence goods issues are difficult to evaluate, by the public, in economic terms. The credence good issues raise problems of uncertainty, such as the uncertainty over the severity of the hazard. This makes it difficult for the respondent to specify how much money should be devoted to safety measures. Moreover, the respondent cannot sense the food safety problem, for example through taste, therefore they may not be able to identify whether there is a problem or not. Finally, some credence goods raise problems related to control; that it is unrealistic to ask respondents to pay more for a food which they do not have control over.

7.5. Conclusions from the preliminary experiment and focus groups

The analysis from Holland (1995:25) is now relevant. A simple food safety public good, such as the enforcement of food hygiene regulations, is perhaps not open to

ambiguity in the way that a plot of land could be. Therefore, the public good could be valued like a private market artefact, such as a screw, which has a clearly defined function. "A screw (or a nail) is an item with a particular function; the only question is how many are needed" (Holland 1995:25). The enforcement of food hygiene regulations is intended to be analogous to a screw. The only question is how much, food hygiene regulation, is required which could be elicited through a contingent valuation study.

The link between inadequate food hygiene and common examples of food poisoning is now relevant. Common cases of food poisoning are the closest example, in food safety policy, to a consensus. The Food Standards Agency has estimated the annual cost of all food poisoning at £350 million (Food Standards Agency 2000c) compared to a cost of about £750 million according to an unofficial report (Daily Mail 1998). The point about a consensus, or at least a partial consensus, is that the food poisoning hazards are capable of being costed. Moreover, the costs could be closer if only common cases of food poisoning were considered. This is because there is not the ambiguity involved with major causes of food poisoning. This ambiguity is caused by the uncertainty over temporary versus chronic cases of major food poisoning. This was highlighted in the salmonella in eggs case study.

In contrast there is not a consensus over credence goods because, by their nature, the scientific evidence is inconclusive. A study on credence goods could obtain contrasting valuations because the public may read different scientific forecasts say on the severity of BSE or CJD. People's valuations may vary because of different scientific predictions rather than because of contrasting consumer preferences. The science underlying food safety can be interpreted differently, in the same way that environmental goods, such as land, are open to alternative purposes.

Credence goods pose a similar problem to the land example. In this case, there is a problem over how much of the food safety public good is needed. There is a preliminary issue over epidemiology, given credence goods, which needs to be

addressed before it is possible to undertake a valuation. For example, given BSE and CJD, the seriousness of the disease needs to be determined before respondents can be asked to value reductions in risk. This cannot be done at present, in the context of BSE, because the scientific evidence is inconclusive. At present it is suggested that the epidemiological jury is still out on BSE. The precise length of the incubation period for CJD is still uncertain. There is the zero - infinity problem described in chapter 6. The valuation is zero if the respondent does not perceive any risk from BSE because they may have read scientific reports that the BSE risk is minimal. This zero valuation may occur despite the respondent being willing to pay for public goods to reduce safety risks say from transport accidents. Alternatively, a respondent may give an infinite valuation if they are overly concerned about the BSE risk. This is because they may have read alternative scientific reports which have suggested that many people could die from CJD.

It is possible to attempt to 'value life' i.e. the valuation of the prevention of a statistical fatality. Indeed, the Latouche et. al. (1998) study, attempted a contingent valuation on BSE. The question is the extent to which such a study could realistically inform policy. The emphasis of this research is to undertake work which, although limited to food hygiene regulation, does offer the possibility of informing decision making.

Severe instances of food poisoning could be construed as having credence good characteristics. The case study on eggs is again relevant with the complexity over temporary versus chronic episodes of food poisoning. Egg safety could be seen as a credence good because it is unclear how long a potential consequent illness is likely to last.

This provides another reason for not attempting the valuation of credence goods. For the purposes of valuation, major types of food poisoning such as botulism are not considered. Again, the respondent does not know how serious the food poisoning is going to be, and therefore does not have much guidance on what an appropriate valuation should be. This uncertainty emphasises how economics, in this area, is dependent upon a scientific or epidemiological foundation. To

summarise, it is better to concentrate on common cases of food poisoning where the epidemiology is generally not being contested.

This analysis has been used to mitigate the criticism of the economic valuation of the environment, by academics such as Holland, which could be used to challenge an economic valuation of food safety. The removal of credence goods should reduce some of the criticism of the empirical valuation. The advantage of narrowing down the concepts, to common cases of food poisoning, is that the valuation of food safety should now be possible.

Common cases of food poisoning can be understood in different contexts e.g. across different local authority boundaries. This is unlike e-coli which could have greater significance for people from Scotland given the outbreak in Lanarkshire in 1997. Also understanding of simple food hygiene issues should be consistent across time. This is because; simple cases of food borne illness should lead to ill - health of a known duration. The impact of a minor case of food poisoning can be understood as a stomach upset lasting say 12, 24 or 48 hours.

To summarise, a public good to reduce common cases of food poisoning, can make similar contributions to consumer welfare regardless of location and time. The enforcement of food hygiene regulations has a uniform function which should ensure that it is consistently understood by respondents; making it suitable for valuation. For this reason, in the empirical study outlined in chapter 9, food poisoning is not a credence good but an experience good. It will be defined as an experience good, where the safety of the food can be determined 12, 24 or 48 hours after consumption.

The rationale for the valuation of food hygiene regulation, in the context of common cases of food poisoning, is that arguably the public should be willing to pay for more enforcement. If people eat out more, food poisoning could increase as a gap opens up between [a] the level of eating out and [b] the amount of enforcement. Therefore, more resources are needed for investment in, food safety enforcement, to close this gap. This approach conforms to the conventional view of property

rights that if people want additional food hygiene enforcement, to close this gap, then they will have to pay more. Respondents are not being asked to pay more to keep the situation the same, the new property rights approach, which is a contentious methodology.

The above argument suggests that there is a case for investment in greater standards inspection by Environmental Health Officers. The demand for this investment could be measured through a contingent valuation study. Two shortcomings, though, will be briefly addressed. Firstly, the question has the challenge of being relevant to the public. The 'food safety gap' may be occurring beneath the public's perception. There is concern about higher food poisoning, from the Food Standards Agency, but respondents may not recognise the need for increased investment in safety. For example, at the start of the first focus group people were asked what their main food safety concerns were; the first response was "I think we live in such a sanitised environment that there are very few".

Secondly, if the proposed improvements in food safety were introduced then consumers may have less choice. In theory, improved food hygiene and safety in small food outlets should offer people more choice. The public may trust small food premises more, so they may be more willing to purchase food from them. However, the small outlets would have to comply with regulations, which could increase prices. If prices rose then the small premises could lose competitive advantage, compared to the supermarkets and so go out of business. This may ultimately reduce choice rather than improve it as first thought. This assumes that small shops compete with the supermarkets on price, which is one factor which will affect competition.

Despite these problems, the valuation of food hygiene regulation was attempted. The research up to now has led to a proposed course of study; that by restricting food safety issues to food hygiene then a valuation can be undertaken. Further exploratory studies were completed to refine the food hygiene concept. The first of these is detailed in the next chapter.

Chapter 8: Refinement of the valuation question

8.1. Introduction

This chapter reports on a series of pilot exercises undertaken on Tyneside, in 2000 and 2001, with the purpose of trying to develop the valuation question; given the methodological challenges identified. There were 6 different iterations of the valuation question. In variations 1 to 3 and 6 the pilot questionnaire also included a series of questions to assess respondent's food consumption behaviour and their attitudes towards food safety. These questions were generally asked in the form of a Likert scale to see whether attitudes towards food and safety in particular, are related to willingness to pay. The relationship between the likert scales and willingness to pay is outlined in chapter 9. At this stage the Likert Scales were piloted to make sure that they could be used in the main study. Respondents were asked to answer on a 5 point scale from 1 (strongly disagree) to 5 (strongly agree). The disagreement side of the likert scale was put on the left hand side of the scale to discourage 'yes-saying', whereby respondents automatically agree with the question.

The six iterations are described below. The 6 versions of the pilot questionnaire are in the appendix. In each case the description of the pilot survey is as follows:

- 1) Discussion of food consumption behaviour and attitude questions, where they were included.
- 2) Introduction to the valuation question and the valuation question.
- 3) Results from the valuation question.
- 4) A commentary which includes the justification for aspects of the question.
- 5) The discussion which emerges from the question.

8.2. and 8.3: Iteration 1

8.2.1. Question 1: Location of main food shopping (see appendix 3)

A question was asked to find out where people did most of their food shopping. The purpose of this was to find out how significant the state is when enforcing food standards.

The question asked: where do you do most of your food shopping?

- A) Large supermarket or superstore.
- B) Small supermarket
- C) Local food shop; for example corner shop
- D) Market stall

All respondents (20 out of 20) gave (a) the large supermarket as their answer. The question does suggest that people are purchasing their food, to a large extent, from the major supermarkets. The implication for state intervention is that it is limited given the supermarkets domination of the food purchasing market shown here and their substantial influence in setting standards. Thus, large measures of willingness to pay for state intervention in the food sector should be viewed with caution.

8.2.2. Question 2: Do you think all the food you buy is safe to eat?

The purpose of the question was to measure people's confidence in food safety. The aim was to see whether people feel that they can purchase safe food.

There were 20 responses to this likert scale. The mean was 3.4 and higher than 3 indicates agreement.

8.2.3. Question 3: Do you trust the Government to make sure that food is safe?

The purpose of this question was to measure the public's perception of the government and perhaps also their attitude towards public goods.

From the 20 responses the mean was 2.75

8.2.4. Question 4:

Do you think some of the food industry is more interested in profits than its customers?

The purpose of this question was to identify the public's attitudes towards the food industry. In particular, to try and find out whether people think that the food industry puts its own interests before the public's interests.

From the 20 responses the mean was 4.1

8.2.5. Question 5:

Do you think all food outlets offer the same levels of food safety?

The purpose of this question was to find out whether people perceive differences in the levels of food safety between small and large outlets.

From the 20 responses the mean was 2.28

8.2.6. Question 6

Have you, or anyone in your household had food poisoning recently (in the last 6 months (Yes or No)?

The purpose was to measure personal experience of food poisoning as this could explain willingness to pay for food hygiene. It would be expected that experience of food poisoning would lead to a greater willingness to pay. In theory "the more

concerned an individual is about the potential impact of food poisoning, on their health, the greater the amount they are willing to pay to reduce the risk of food poisoning" (Henson 1996:16). However, Henson suggests that some food consumers have a distorted concept of probability. Some of Henson's respondents expressed the belief that having suffered from food poisoning in the recent past, then this would reduce the probability that they would suffer food poisoning in the future (Henson 1999:16).

The period of 6 months was thought to be acceptable for common cases of food poisoning although very serious cases of food poisoning could traumatisise people for decades. Four people said yes while the other 16 said no. This question was later changed because it was believed that a likert scale would be more appropriate for measuring attitudes.

8.2.7. Question 7

About how much does your household spend each week on food?

From supermarkets?

From any other food outlets?

(including eating out from canteens, restaurants and takeaways)

Again the sole purpose of this question was help respondents think about what would be an appropriate willingness to pay figure. Therefore, the data is not given as the main focus is on question 8, which is the valuation question.

8.3.1. Question 8 (Iteration 1: appendix 3)

The last chapter, which outlined the exploratory research, concluded that it would be appropriate to try and value experience goods. Therefore the aim of the question was to separate experience goods from credence goods. The factors which were meant to be valued were the storage, handling, preparation and cooking of food under the generic heading of food hygiene. These hygiene concepts were separated from the credence goods issues as outlined in the

question below:

Question

The new Food Safety Agency will improve food hygiene.

For example the storage, handling, preparation and cooking of food.

Assume there is no impact on other issues like BSE, Genetically Modified Food, irradiated food and chemicals in food.

Because of the Agency:

1. The food you buy will be less likely to cause food poisoning.
2. Food safety in small shops, takeaways and restaurants would improve to the same level as the big supermarkets.
3. Improvements in food hygiene would have to be made across the whole food industry.
4. This would mean that food prices would go up wherever it was bought.

Question: Are you willing to pay more for your food to get better food safety?

Remember!

This money could be spent on other products or on tastier food.

It's the same food at the same place it's just safer to eat!

If yes, you are willing to pay, what is the most you would expect to pay on top of your weekly shopping bill to support the Food Safety Agency?

Follow up question: Please can you give me a reason for being willing to pay or not".

8.3.2. Willingness to pay results

There were 12 yes responses and 8 no responses. The average willingness to pay from the 12 yes responses was £7.31.

8.3.3 Commentary: the justification for various aspects of the question

The description of the “Food Safety Agency” was an attempt to provide respondents with information on the public good to be valued. It was decided to label the agency a “safety agency” rather than a “standards agency” for clarity. The line stating that there would be “no impact on other issues such as BSE and Genetically Modified Food” was an attempt to discourage respondents from including credence goods as part of the valuation.

Descriptions were then made, points 1-3 above, to give the respondent information on the scope of the public good. The aim was to provide the respondent with an incentive to value it. It was then stated, point 4, “this would mean that food prices would go up wherever it was bought”. This outlined the payment method and indicated that the benefit was conditional, and consequential, upon a payment being made.

The question contained qualifying statements. Respondents were encouraged to remember the alternative ways that they could spend their money. This statement is based on the argument in chapter 1 that people and societies have scarce resources. The aim is to urge respondents to consider the trade offs that they are theoretically making. Safer food has an opportunity cost which is [1] to forgo other products available in private markets or [2] to potentially forgo other food attributes, such as taste, which cost money. For example, money could be spent on enhanced flavourings rather than safety.

The purpose of the slogan “the same food in the same place” was devised to try and get the respondent to focus only on the safety characteristic. The aim was to encourage them, in their mind, to see it as a separate attribute. The other characteristics, such as the type of food and the place where it is bought, are theoretically controlled. The other factors remain fixed while money can be used to improve safety. After all, the purpose of the exercise is to find out how much money people want to spend on additional safety.

The term “most” was used to elicit the whole of the consumer’s surplus. The term “expect” you would have to pay was included to provide context, as it is food bills

which respondents would anticipate having to rise, to pay for the food safety. The use of “expect” gives the impression that the food industry would increase the food prices with the respondent saying what would be a reasonable increase in prices. The “support [of] the agency” is used to indicate that the extra money would go into funding the public good. This does have some practical relevance as the government did propose a levy on food retailers to pay for the Food Standards Agency.

8.3.4. Discussion: lessons which emerge from the question

The discussion is based on the follow up question which was “please can you give me a reason for being willing to pay or not”. The following themes are addressed. First, that people are only able to give short responses and straightforward reasons for their valuation. The second theme is the issue of property rights. The third theme examines the problems caused by the use of market prices as the payment method. The fourth area is that people find it difficult to make valuations. The fifth issue is that some people’s responses offered clear guidance on how to reduce the problems related to the embedding concept. This leads into a summary of how the question could be improved.

The first theme is that a door to door resident’s survey of this type may only yield short responses when people are asked to justify their willingness to pay. For example, it was stated: “food safety and hygiene - I would pay for that”. Also, it was said that “good food is important; the (food production) process is important”. Another example was “to make sure the food you are eating is safer”. The problem here is that people are giving simple yes responses and so their preferences appear not to be well formed. The answers may be more of a yes signal, rather than carefully thought out willingness to pay responses.

A second problem is the difficulty over property rights as some respondents rejected the basis of the question. It was stated that “it (food safety) should be at an acceptable level” and “you should get it anyway, you shouldn’t have to pay more”. This is a rejection of the notion that the public should have to pay extra to

secure an improvement in food hygiene. A respondent argued that “everything [all food safety] should be in place”. The relevant word here is “should” as it may indicate free riding. The respondent could be expecting the food industry to deliver all aspects of food safety when some independent state monitoring may be required. There does seem to be the fundamental challenge that food safety can be perceived as ‘non-negotiable’. A concept which should be fixed at an ‘acceptable level’. Food safety is often judged as though it should not be capable of improvement, even if more resources can be invested in it. This supports Loader and Hobbs (1999:692-3) argument that food safety is seen as a right and not a privilege.

Responses can be ambiguous because of the property rights concept. An example of this was the response: “yes (I would be willing to pay more) but I don’t think I should (pay more to acquire the ‘right’ to food safety) - I (already) buy organic”. The mention of organic food is not relevant if food poisoning is narrowly defined as a micro-biological issue. Thus, the question may not have been well understood. Indeed, the respondent complained about the difficulty of the question. The respondent implied that they are already paying enough for food safety. The private sector, market price, perspective of the question left scope for the respondent to indulge in averting behaviour, e.g. buying organic food, as a way of avoiding having to pay more. The payment method of food prices led the respondent to circumvent the question, by implying that they can meet their safety needs solely through their choice of food purchases. This is analogous to paying for double glazing to mitigate the need for payment for reduced noise pollution. To summarise averting behaviour arises from impure public goods such as food safety regulation. This problem would not occur so easily with a pure public good such as defence expenditure. Respondents are forced to confront a defence valuation question because there is no private alternative.

The third problem is market prices. Although reference is made to the government agency; the emphasis on respondent’s shopping bills elicits a comment on the food industry and not on public goods and their provision. Arguably, if the aim is to measure the consumer’s surplus then the choice of payment method is immaterial.

However, people's views on the food industry will affect their bid values. For example, a no response was justified on the basis that the food industry is making profits already and the implication was that food prices should not be any higher. It was also said that "food hygiene is important but that it (food safety) could be used as an opportunity (for the food industry) to put prices up". Moreover, it was said "let's hope they (the food industry) don't charge more when it (food safety) stays the same". Thus, the use of market prices, as the payment method again leads to problems over the property rights which could affect the valuation. People may feel that they have to pay more even though safety could "stay the same".

A fourth problem is the difficulty people have in providing valuations. There is an ambiguity in people's responses. There are conflicting concerns and it is difficult to see how these can be integrated to reach an overall judgement. For example, a yes response was qualified because the respondent seemed concerned about the budget constraint. They said that they would be willing to pay "a small percentage" extra. However, the justification for being willing to pay, "because you do not put a price on health", appears to contradict the earlier statement. There appears to be a major challenge that respondents are unable to give clear responses. Covey et. al's study (1998) was able to elicit clear willingness to pay values. However, it should be recognised that respondents in that study were paid £20 for participation (at middle 1990's prices). Perhaps, they felt obliged to give clear monetary valuations. In this research, respondents were not offered any financial incentive to participate so perhaps they were more willing to unwittingly challenge the premise of the research. Respondents implicitly criticized the basis of the 'economics of food safety' that it is not possible to "put a price on health". Consequently, the responses here are useful as they give uninhibited challenges to the notion that money can be traded for additional food safety. This perhaps gives an insight into how respondents perceive the valuation of food safety in practice.

The fifth point is on embedding. Helpful information was obtained, which provided some explanations for people's willingness to pay. Some respondents expressed concern for their children e.g. "[I would be] willing to pay more for [my] children";

and would be willing to pay “if food is going to be safer; for the little ones; for the kids; for peace of mind with everything you hear about”. This last response is of concern because the aim of the question was to narrow the food safety concept down to the cooking, handling, storage and preparation of food; in the places where the respondent bought their food. The question described this as the “same food” coming from the “same place” but that it would be “just safer to eat”. However, “everything you hear about” was mentioned. Thus, there is the danger that respondents have included every conceivable food safety issue which can be brought to mind. The embedding concept which was discussed theoretically in the literature, and in the food safety case studies, now appears as a practical challenge in this research. For example, another respondent said that they would be willing to pay “if I knew it was going to be safe - but this may include all factors”. The respondent was interpreting the question generically rather than specifically.

Another respondent gave reasons for not being willing to pay. They said that they were happy with food safety as it was and that concern over GM food was over hyped. Thus, the question was interpreted as a general question on food safety. The discussion here is not on the introduction of novel foods, but that genetic modification may have distracted the respondent from the valuation of food hygiene regulation. The corollary is that the valuation question needed to be improved; particularly given the respondent who mentioned buying organic food which was not directly part of the question.

The question outlined food safety issues which were not supposed to be included in the public’s thinking; “assume there is no impact on BSE, genetically modified food, irradiated food, chemicals in food”. However, by listing these concepts, the question had inadvertently led respondents to contemplate these major issues. Therefore, the next valuation question removed these challenging subjects so another attempt could be made at resolving the embedding problem. The modification of the question could perhaps deal with some of the other problems too.

8.4. and 8.5. Iteration 2

8.4.1.1. Introduction to iteration 2

The first part of the questionnaire was similar to iteration 1. The first part [questions 1-6] was retained to make sure that it could be used in the main study, detailed in chapter 9. Question 1 was changed to a different question which might better explain willingness to pay.

8.4.1.2. Question 1

How many (from 0 to 5) of the following (small food outlets) have you used in the last week?

This question on small food outlets was used on the basis that supermarkets have less need for the services of enforcement officers. It was introduced to examine whether greater use of small food outlets is related to greater demand (willingness to pay) for food safety regulation. The use of the term "last week" was used as it was hoped that respondents could recall the answer quickly. It was hoped that the results would be similar to an average week.

The mean number of outlets visited was 1.74 from 19 respondents. There was one non-response because the respondent had been on holiday.

8.4.2. Question 2

Do you think all the food you buy is safe to eat?

The mean was 3.2 from 20 respondents.

8.4.3. Question 3

Do you trust the Government to make sure that food is safe?

The mean was 2.95 from 20 respondents.

8.4.4. Question 4

Do you think some of the food industry is more interested in profits than its customers?

The mean was 4 from 20 respondents.

8.4.5. Question 5

Do you think all food outlets offer the same levels of food safety?

The mean was 1.88 from 20 respondents.

8.4.6. Question 6

Have you, or anyone in your household had food poisoning recently (in the last 6 months?)

There were 4 yes responses and 16 no responses. Again, with such a small number of people suggesting that they have had food poisoning recently then there is little data to work with. Thus this question was later removed. The question on the respondent's food shopping bill (question 7) remained unchanged throughout the rest of the iterations.

8.5.1. Question 8: (iteration 2: appendix 4)

The aim of the question [in the case of iteration 2] was to focus exclusively on the food hygiene concepts. This was to reduce the 'embedding' problem. In the preliminary valuation question, undertaken before the focus groups, people complained that they had no choice over being willing to pay. Therefore a decision was taken to loosen the assumption that food would be bought "at the same place".

Instead respondents were asked whether they are willing to pay more to shop at a hypothetical supermarket which has 20% less food poisoning. This reduction in food poisoning was based on the Food Standards Agency's target to reduce food poisoning by 20% by 2006 (Food Standards Agency 2000b). Although reference to the Food Standards Agency was omitted because the question is about supermarkets.

Question

The point of this question is to find out if you are willing to pay extra for lower food poisoning.

Assume that a new supermarket, which includes a takeaway and restaurant, is opened up.

This new supermarket has better food hygiene compared to other shops.

It has better monitoring and control of the food businesses which supply it.

So that the storage, handling, preparation and cooking of food is better than existing at food shops.

As a result, the amount of food poisoning, associated with this new supermarket is expected to be 20% lower than in existing food shops.

But, food prices, throughout the supply chain, are higher to pay for these improvements in food hygiene.

Would you be willing to pay more to shop at this new supermarket?

Which is likely to lead to 20% less food poisoning.

If you would be willing to pay more, then, what is the most you would be willing to pay on top of your total food bill?

Follow up question: please can you give me a reason for being willing to pay or not?

8.5.2. Willingness to pay results

The question was open-ended and 3 out of the 10 positive responses were unable to give a valuation with their response. This shows the difficulty in answering the open-ended question. Therefore, the willingness to pay data is not given. However, there were 10 affirmative responses and 10 negative responses out of a

sample of 20 people.

8.5.3. Commentary: the justification for various aspects of the question

The statement, "it (the new supermarket) has better monitoring and control of the food businesses which supply it", is based on the conclusions by Marsden et. al. (1999). They argue that the leading supermarkets have sophisticated systems to oversee their food suppliers. In comparison, it is suggested that independent, often small food retailers do not have the same quality controls over their food suppliers.

8.5.4. Discussion: lessons which emerge from the question

The first issue to address is the fundamental problem with the question. It does not separate food safety from other food purchases. In particular the characteristics of different supermarkets! Second, the recurrent challenges, such as embedding, property rights and the difficulty that respondents have with putting a value on food safety, are then addressed. Thirdly, examples are given where the research method did work.

First, the fundamental problem with the question is that it encouraged respondents to digress from just the food hygiene concept and instead consider supermarket attributes. For example, one respondent said "I use the Co-op and it's no problem". In other words another external factor, that people may like a traditional grocer such as the Co-op, is influencing the interviewee's response; which is supposed to only be about food safety. Another respondent said "I trust the other ones (the other supermarkets) anyway" which is again examining the attributes of the supermarkets which was not the purpose of the question. This exploratory question does though highlight that it is essential to focus the respondent's attention solely on the characteristic of food safety. It is necessary to focus solely on food hygiene and food poisoning as that will make sure that the 'embedding' problem is confined to food safety and not supermarket attributes.

However, the public's understanding of food poisoning was, arguably, still interpreted in a general manner. For example, one respondent said that they would be willing to pay "a bit extra for health as e-coli can cause death". Thus, the question had to be clarified as the question was unclear over whether the subject of e-coli was covered by the question. In the empirical study in chapter 9, a clearer definition was used to define the benefit arising from the hypothetical payment.

A recurrent problem is that respondents reject the notion that the public should have to pay for food safety. In other words, the property rights basis of the question was rejected. For example, it was stated that "I expect food hygiene and food safety from everybody". Moreover, the question was challenged because a respondent believed that responsibility should be taken by the individual. For example: "not particularly (willing to pay), you can't guarantee it, (food safety) it's only as good as the staff (and) it's not the shops, it's the way people (individual food consumers) are cooking". This emphasises that there are food hygiene problems, in people's homes, which are beyond the scope of the state regulation of food outlets. This highlights the impure nature of the public good. Again, people can be reluctant to value risks related to health. One respondent said that they were willing to pay "because health is important" but then qualified their response by saying that "it is difficult to place a value on human life".

However, useful information was obtained. One respondent, which is representative of some other opinion, said: "yes, I would be willing to pay for higher standards for a guarantee and to make sure that food is safe". This is an interesting response because it returns to the concept of whether credence goods can be turned into certified search goods. This concept is doubtful as it seems unlikely that food safety can be "guaranteed".

Some non responses were obtained, which were genuine with regard to food safety. For example, one respondent said that they had no food poisoning and so were not willing to pay. Another said that there was a satisfactory level of hygiene anyway while another said that they could not afford to pay more. These reasons for not being willing to pay were used in the final version of the valuation question

in the main study in chapter 9. These valid non-responses provided here were used in the main study, to test the validity of the non-responses, in the main empirical study.

8.6. and 8.7. Iteration 3

8.6.1.1. Introduction to iteration 3

Questions 1 to 5 remained unchanged. Question 6 was changed to a likert scale as such a question, could be a better indicator of attitudes towards food poisoning.

8.6.1.2. Question 1

How many of the following have you used in the last week?

The mean was 1.63 from 19 respondents. The other respondent did not know.

8.6.2. Question 2

Do you think all the food you buy is safe to eat?

The mean was 3.23 from 20 respondents.

8.6.3. Question 3

Do you trust the Government to make sure that food is safe?

The mean was 2.55 from 20 respondents.

8.6.4. Question 4

Do you think some of the food industry is more interested in profits than its customers?

The mean was 3.9 from 20 respondents

8.6.5. Question 5

Do you think all food outlets offer the same levels of food safety?

The mean was 2.1 from 20 respondents.

8.6.6. Question 6

Do food safety issues, such as food poisoning, influence where you do your food shopping?

Disagree Strongly 1	Disagree 2	Neither 3	Agree 4	Agree Strongly 5
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This question aimed to improve on the previous version of question 6. The question aimed to uncover whether the location of people's food purchasing decision is affected by the need to avoid food poisoning. The mean was 3.65 from 20 respondents.

8.7.1 Question 8 (iteration 3:appendix 5)

The purpose here was to have a question which is more relevant to the public good in question. Thus, the description describes the government as working with the food industry.

Question

The government has brought in a new Food Safety Department called - The Food Standards Agency

One of the aims (of this) is to improve hygiene in food outlets. So that, by 2006,

food poisoning will be reduced by 20%.

Food hygiene will be improved as the Government will be working with the food Industry and local councils to improve the Storage Handling Preparation and cooking of food up to the point of sale in the food outlets where you buy your food.

To pay for these improvements in food hygiene, food prices would go up wherever it was bought.

But, this would make sure small food shops were brought up to the same standard as the big supermarkets.

Would you prefer to pay the same amount for food as you do now?

With no reduction in food poisoning. Or

Would you be willing to pay more?

So that food poisoning, in the places where you buy your food, is reduced by 20%.

If you would be willing to pay more, then what is the most you would be willing to pay on top of your total food bill?

Follow up question: please can you give me a reason for being willing to pay or not?

8.7.2. Willingness to pay results

There were 13 respondents who were willing to pay; 8 stated an agreement but with no valuation while 5 stated an agreement with a valuation. There were 6 no responses while one respondent said that that they felt they had no choice over their answer. It would be unwise to draw any conclusions from these 20 responses as will be argued in the discussion section.

8.7.3. Commentary: the justification for various aspects of the question

This question attempted to make sure that only safety attributes were considered. The statement: “the places where you buy your food” was used so that the location of food purchasing was held constant in the question. Therefore this would stop respondents from digressing onto supermarket attributes. The question also attempted to be relevant by outlining the Food Standards Agency’s target for the reduction of food poisoning.

The scope of the public good was described as “up to the point of sale” to stop people interpreting the question as if it included cooking in their own home. However, perhaps this provides too much detail in the context of a relatively short questionnaire. Again it was stated “to pay for these improvements in food hygiene, food prices would go up wherever it was bought”. This was done to make the question coercive so that improved safety is contingent upon extra payment. Thus the aim was to make sure that the payment for safety concept was confronted. This was in theory at least, so the respondent could not avoid payment by suggesting that they would buy their food from elsewhere. Again the question reverts to “this would make sure small food shops were brought up to the same standard as the big supermarkets”. The use of the term “would” is definite whereas the term “likely” used before [8.5.1] is ambiguous.

8.7.4. Discussion: lessons which emerge from the question

Four issues will be discussed here. The first issue is the coercive nature of the question which left respondents feeling that they did not have a choice. Second, is the theme of property rights. The third point is the difficulty of valuing health. Fourth, useful information was obtained although there is the challenge that some consumers do not believe that food safety can be guaranteed.

The coercive element of the question - “food prices would go up wherever it was bought” led people to complain about insufficient choice. Indeed one respondent said “do I have any say; they (the food industry) have a control over food prices. I suppose yes, just have to pay for it”. Another said that they would be willing to pay

1% extra on top of their food shopping bill because it needs investment. Although this could be a sensible amount; it could alternatively be an attempt by the respondent to reduce the amount they feel they are 'obliged to pay'. In other words, what is being measured is what people think they are supposed to pay or feel that they obliged to pay, rather than what they are willing to pay. If this is correct then there is an over-estimation of the value of the 'food safety public good'. The problem here is that the open-ended question seems to leave people feeling that they have little choice. It is not contributing much in terms of quantitative willingness to pay amounts for that reason. Thus the open-ended question here serves a purpose only for refining the eventual study question.

Again respondents criticized the property rights basis of the question that people should have to pay more for safety. For example, one respondent stated that "it [food safety] has nothing to do with money". Another said, "You shouldn't have to pay more; customers should have proper (food) handling to start off with". This implies that the public should have the 'right' to food hygiene standards from the outset. Another respondent stated that "it's (food standards) highly priced as it is for the standard you get now".

Another problem is that although some people are willing to pay they are not able to put a value on improved safety. Perhaps they are over preoccupied with their beliefs, so they are unable to offer a valuation. This is a concern when people have friends or family who have been affected by food poisoning. One respondent said: "yes food poisoning is not a good thing; my son suffered from food poisoning from cooked sausages". Another said "I know someone who nearly died of food poisoning". Thus sensitive health issues may discourage respondents from offering monetary valuations on food safety.

The above sections highlighted some concerns that respondents had with the question. However, the research method can yield responses where people can give reasons for or against payment which do not criticize the question. For example, one respondent said that they would not be willing to pay because "the causes of food poisoning are not enough to cause great concern". Another respondent stated a willingness to pay of £2 - £3 extra for the benefit of improving

small food premises in terms of storage or preparation e.g. in “takeaways where chips and kebabs are sold because some salad was off so I would pay more”. Some respondents can understand the question properly and give a proportional valuation given the justification for their answer.

The concern is that these responses do not occur frequently enough to justify the use of the research method. In particular, there is the perennial difficulty of being able to define food safety exactly. For example one respondent said that they were not be willing to pay; but would be if it (food) was definitely safer; if it (safety) was at a definite standard. Again, there is the issue of “guarantees” as one respondent said no because “if they were willing to pay then they would want a guarantee but you cannot say it would be guaranteed to be 20% lower (in food poisoning)”

8.8. and 8.9. Iteration 4

8.8. Introduction to iteration 4

No likert scales were used at this stage. This was because the sole aim was to improve the valuation question. The household food expenditure question was retained to guide the willingness to pay response.

The previous approach to the question was continued because it had the advantage of being relevant to respondents. This is because additional food hygiene regulation is capable of being delivered by the food agency working with local councils. It does not require institutional changes which could be difficult to implement. The question does not need changes to be made to the structure of the food industry, such as bans on the imports of foods characterised as credence goods.

The purpose of this question, initially, was to obtain some open-ended values which could be used as figures for the closed-ended question in the main study. However, in the event it was necessary to further refine the question.

8.9.1 Valuation question (iteration 4: appendix 6)

A national agency has been set up to deal with food safety.

One of its aims is to improve hygiene in food outlets.

Food hygiene could be improved by the new agency working closely with local councils.

This will improve the storage, handling, preparation and cooking of food in the food outlets where you buy your food.

These improvements in food hygiene: would make sure that small food outlets were brought up to the same standard as the big supermarket.

But food prices would have to go up, wherever it was bought, to pay for these improvements

Would you be willing to pay these higher prices, for better food hygiene?

Yes, I would be willing to pay higher prices for better food hygiene.
[Remember this extra money could be spent on other goods and services instead]
No, I would not be willing to pay higher prices for better food hygiene.
[This might be because you are satisfied with current levels of food hygiene]
If you would be willing to pay higher prices for better food hygiene:
What is the most you would be willing to pay on top of your weekly household food shopping bill? [Please state money amount]
Follow up question: please can you give me a reason for being willing to pay or not?

8.9.2. Commentary

Food poisoning was not mentioned explicitly to avoid the emotive issues, such as friends and family suffering from major food poisoning, which arose from the last valuation question. The “20% reduction in food poisoning” was removed as it could complicate the question as people may become overly concerned with the percentage. Moreover, the literature on embedding would suggest that it may not make any difference whether the percentage was 20% or 40%. If there is a part-whole bias operating then 20% may be interpreted in the same way as 40%. The Food Standards Agency was not described directly as people may pause too much to try and think about its role. The description of the Agency may distract the respondent from the main valuation part of the question. The question was clarified so that there was a clear yes or no choice to the question. This was to try and make sure that people felt that they had a choice when answering the question. The “please state money amount” was added to the end of the question to try and get the respondents to think about a clear monetary amount rather than just a percentage.

8.9.3 Willingness to pay results

There were 30 responses at this stage as there were many no responses where the question was rejected. There were 16 yes responses although 4 were willing to pay without being able to give a monetary figure. The mean willingness to pay

was £8.87 from the remaining 12 yes responses. There were 11 no responses and 3 responses where people did not know; one of which stated that they did not feel that had had choice over the answer.

8.9.4. Discussion

This question needed to be changed for two main reasons. First, too much emphasis was put on small food premises. Second, the question needed to be modified to give respondents more choice over whether they were willing to pay.

The emphasis on small food premises led to many respondents not being willing to pay. For example, it was stated, "I wouldn't pay more (for improvements) at small food shops. We shop cost effectively at supermarkets". Moreover, one respondent complained "but I spend a lot at supermarkets already. The reason why I don't shop at small food outlets - isn't because they're not clean. It's because of the availability of supermarkets. I would spend more [in independent food outlets] if there were more local food premises". Thus, although Marsden et. al. (Independent 1997b) suggest that the agency should direct its efforts towards the small, independent sector; there does not seem to be much support for the public paying more to finance the agencies activities related to small business. People feel that additional money to improve the independent sector is not worth it or unnecessary because the number of small food premises is limited.

Respondents found it difficult to answer the question. It seems this would be the case regardless of how many times the question was improved. One example, of such difficulty, is as follows: "yes, (for) better food hygiene, but (I) would expect those things to be all right anyway. Small food outlets could be better anyway because they're handling food, making their own produce from raw ingredients, whereas the supermarkets rely on their suppliers for their food. That's as clear as mud". The complexity of the food chain makes it difficult for respondents to value improvements in food safety. The description of handling is meant to limit the concept to the small food outlets. However, its interpretation was broadened to include the food supply chain.

Second, respondents felt that the question did not offer them enough choice over being willing to pay. One respondent criticized the question saying that “you wouldn’t get a choice (over paying more); it (the agency) has been set up”. The question attempted to provide a realistic mechanism, the agency, to show how the food safety benefit could be delivered. This should have offered a credible scenario to respondents but the drawback was that it led respondents to believe that a decision had already been made. Although, the agency was only described indirectly, it appeared to have an influence on willingness to pay. For example, one respondent who rejected the valuation question said “you can’t say how much people would pay; with these independent agencies; with these quangos trying to pass the buck; as it was in the 1980’s”. Other respondents asked who the money would be [theoretically] paid to. The problem is that the delivery of the public good, through the agency or quango, affects the respondent’s judgement of the question.

Perhaps, respondents need to be given more time and more information than is possible in a contingent valuation study; given that respondent’s preferences may not be well formed. For example it was said “I would pay 5-10% more - although I haven’t thought about it to be perfectly honest”. Again, the respondent may not have thought about the valuation of food safety because it is unusual, and perhaps artificial, to see safety as a separate attribute capable of being valued.

8.10. and 8.11. Iteration 5

8.10. Valuation question (iteration 5: appendix 7)

Again, there were no likert scales while the question on food purchasing spend remained unchanged. Responses were obtained from 20 respondents.

8.11.1. Question

Food hygiene, in the question, means the storage, handling, preparation and cooking of food.

To improve consumer choice and food safety a new food agency has been brought in.

It is possible that the agency could bring in new regulations on food hygiene.

This would bring standards of hygiene in small food outlets up to the level of the big supermarkets.

So food hygiene would be improved mainly at the small food outlets.

Food hygiene in the big supermarkets and major restaurants would also be monitored.

It would lead to increased food costs, wherever it was bought.

Not just at the corner shop and local cafe but also at the big supermarkets and restaurants.

Based on this: what is the most, if anything; you would be willing to spend on top of your food bill in a year?

Follow up question: please can you give me a reason for being willing to pay or not?

8.11.2. Commentary

The question was amended to try and provide respondents with choice over their answer. The question stated that "it is possible that the agency could bring in new regulations on food hygiene". The question was broadened out to cover small premises and also large supermarkets so respondents would think that the

question was relevant, as it covered all food outlets. It was stated: "food hygiene in the big supermarkets and major restaurants would also be monitored". Moreover, to try and make the question consequential and coercive; the following line was introduced "(food costs would be increased) not just at the corner shop and local cafe but also at the big supermarkets and restaurants". The argument is that if the large food outlets are to be monitored then costs would rise as a consequence, and would have to rise otherwise the improvement would not be delivered.

To reduce embedding; the concept of food hygiene was defined at the start of the question. Thus, the start of the question was clarified, and narrowed down to "food hygiene in the question means the storage, handling, preparation and cooking of food". Also, for the purpose of clarity an explanation was given of the Agency's objectives. This line in the question was: "to improve consumer choice and food safety a new food agency has been brought in".

The question was changed from yes/no to "what is the most you would be willing to pay, if anything". This was done to try and obtain open-ended responses

8.11.3. Willingness to pay results

There were 20 responses; of which 11 were willing to pay and gave monetary amounts. The mean willingness to pay was £6.45. There were also 3 yes responses but no valuation; 4 no responses and 2 don't know response.

8.11.4. Discussion

Issues which emerged were property rights, embedding, and food poisoning as an experience good and that people find it difficult to value safety.

In particular, respondents seemed to reject the property rights associated with the question; that the public does not 'own' the right to hygiene and should have to pay more to acquire that right. One respondent strongly rejected being willing to pay for the food agency and strongly refuted the notion that consumer choice would be

improved. "It's just an excuse to get you to pay more. The hygiene is fine. You pay whatever, you need for your family; whatever, it takes". However, when probed the respondent would not pay anything more for extra food hygiene. "No, you're paying more for something you can't see". This is a concern, for the success of the research method, because although the concept has been narrowed down; the respondent still believed that they cannot see or perceive improvements to food hygiene. Another respondent strongly rejected the question by forcefully criticizing the food environment: "I think it's too clean now". A different aspect of the property rights theme was when another member of the public said they would be willing to pay 10% extra for "any improvement, because I've got 3 young children. But it has got to be worth it". Thus, there is the challenge that consumers cannot clearly 'purchase' the right to food safety because they are unsure whether additional money would 'be worth it'. This is unlike purchasing the right to a clearly defined private market good say satellite television; where it is possible to purchase the 'right' to the transmission.

The embedding issue also remained a perennial challenge. One respondent reported that they would be willing to pay because "there's too much pressure being put on suppliers and food retailers at the expense of the health of the nation". There were more clearly defined responses e.g. "to make sure that the food is handled properly [in the food outlets] and so that you wouldn't catch anything from it". However, if respondents are aware that food poisoning is being caused by poor food hygiene practices in the food outlets then they can perceive such food poisoning as an experience good. For example, another respondent said "I wouldn't (be willing to pay). If the shop wasn't hygienic I wouldn't go in there. The big supermarkets are inspected regularly anyway". Thus, perhaps there is little need for state intervention as the public can simply "not go into" any below standard food premises. If this is the case, then the market can correct itself automatically as food outlets which are unsafe will close. This is because the demand for the food products sold will fall if people 'experience' food poisoning as people will purchase their food elsewhere.

Finally, many people find it difficult to answer open-ended questions. For example,

one respondent said “there wouldn’t be a ceiling on it (payment) for food hygiene”. Also, another said “yes ... for food hygiene if it was better; but I can’t answer in direct figures”. Lastly, one respondent said “whatever it takes ... you’re questions are too open-ended”. At this stage, it was clear that open-ended questions would not yield sufficient quality data for this stage of the exercise to be continued. Therefore, a closed-ended question was devised.

8.12. and 8.13. Iteration 6

8.12. Introduction

There were 10 valid responses at this stage. The purpose of this valuation question was to pilot the main empirical study. The likert scale questions were asked at this stage. A closed-ended referendum style format was employed. The question offered a clearer delineation of the issues with headings of [1] a definition, [2] the background and [3] the question. The question was devised using a polychotomous choice approach to provide respondents with the choice they needed.

The shopping bill section of the question was changed from a week to a year. This was because the responses to the valuation question, based on a weekly shopping bill, were viewed as excessive. A payment figure of around £8 a week would appear excessive in the context of other goods and services forgone. Perhaps, it is 'too easy' to give a relatively low figure of £8. Therefore the question was changed to what is the most, if anything, you would be willing to spend on top of your food bill in a year.

8.13.1. Valuation question (iteration 6: appendix 8)

Definition

Food hygiene covers the storage, handling, preparation and cooking of food.

Background

A national food agency has been set up.

It is possible that it will bring in new regulations on food hygiene.

These new regulations, if introduced, would monitor the standards of hygiene in small food outlets.

Food hygiene in the big supermarkets and major restaurants would also be looked

at.

The hygiene of all the food you buy would be at the standard you expect from the big supermarkets.

But improved food standards would lead to increased food costs at every outlet -

From the corner store to the supermarket

From the local cafe to major restaurants.

Question

Would you be willing to spend an extra £100 per year?

On top of your food spending for improved food hygiene?

This money, for investment in food hygiene, could be spent on other goods and services instead.

- 1) Definitely No
- 2) Probably No
- 3) Probably Yes
- 4) Definitely Yes

Please give a reason for your answer to the question.

No reasons

- 1) I am satisfied with the food hygiene available.
- 2) I don't think extra spending on food hygiene would be worth it.
- 3) The food outlets should pay for improvements in food hygiene.
(I do not want to pay for independent enforcement of food outlets).

4) Other - PLEASE STATE

Yes reasons

- 1) It could give me more choice over where I buy my food.
I would be more likely to use small food outlets.
- 2) I think food hygiene needs to be better [more consistent] at the large food outlets.
- 3) Other - PLEASE STATE

8.13.2. Commentary

The question was clarified e.g. "the hygiene of all the food you buy would be at the standard you expect from the big supermarkets". This was in preference to describing a situation where small food outlets are improved to the level of the supermarkets. The question asked about willingness to pay, on top of food expenditure, in a year. This was done because people appear too willing to pay, when they are being asked about a minor amount of money. For example, a small percentage on top of their food shopping bill.

The no reasons were derived from appropriate negative responses from the open-ended survey. The third no reason was an attempt to reduce the 'yes saying' where respondents automatically agree with the question. The purpose of this was to give people the opportunity to say no, to cut down on too many yes responses; otherwise the benefit estimation could be excessive. It could be viewed as an invalid no response and as 'free riding' by expecting only the industry to pay. Also it could be viewed as a valid no response as the statement was qualified with: "I do not want to pay for independent enforcement of food outlets". This statement, which is open to interpretation, is discussed in chapter 9.

8.13.3. Willingness to pay results

There were 10 valid responses; of which 6 were yes responses and 4 were no responses. There was also a yes response followed by a no reason.

8.13.4. Discussion

There was useful feedback which described the ease of understanding: "I've never seen one like that before, it's much easier than the normal questionnaires". This was helpful as it showed that it was possible to design a questionnaire, as a [low] common denominator, so that it could be understood throughout a cross section of the population.

Also, one respondent said "(food) it needs to be monitored - it's not just about improvements - its not just about paying more". This was useful for the development of the valuation question. The problem with "improved standards" is that people often believe that they should have the 'property right' to food safety standards already. It was previously argued that respondents perceive safety as a right and not a privilege. Thus, it should be recognised that the property rights concept poses a significant challenge to the research method. Perhaps, therefore, the best that can be done is to ask people if they want more consistent standards rather than improved standards. This is because it may not infringe the public's property rights. However, the conventional property rights basis for the question is that people should pay more money for an improvement in the public good. Thus, there is now a challenge of whether people would be willing to pay at all for consistent standards. The concept of consistent standards may not be perceived to be any different from the status quo.

Finally, an inconsistency in respondent's answers was noticed. This occurred when a respondent said yes, willing to pay, but then chose a no reason. Thus there was a justification for outlining the no reasons as part of valuation question. The no reasons would be put before the "would you be willing to spend question" to legitimise a no response, and to aim to remove the inconsistency. These lessons were incorporated into the main empirical study which is the next area for

discussion.

Chapter 9 Main Empirical Study

9.1. Questionnaire discussion

This chapter outlines the main closed-ended study which attempted a valuation of the food safety public good. The contingent valuation exercise outlined in this thesis was rigorous. It is analogous to a laboratory experiment where all other factors are held constant except for food hygiene standards; which can be varied. The assumption was that the value of more consistent standards can be measured. In practice there are many factors which affect the contingent valuation exercise and make the measurement of “consistent” standards problematic. These factors are discussed in chapter 10.

9.2. The questionnaire (Appendix 9)

Chapter 8 explained the reasons for incorporating questions 1 to 6 into the questionnaire. In particular, questions 2 to 5 worked sufficiently well to be retained throughout the piloting stages. Question 7 on the shopping bill was kept to guide the willingness to pay amount. The purpose of questions 8 through to 13 is now outlined and considered below.

Question 8

Definition

Food hygiene, in the question, is only about the storage, handling, preparation and cooking of food only in the food outlets. These outlets are small food shops, small takeaways or cafes, big supermarkets and major restaurants.

The question refers only to common cases of food poisoning lasting less than 24 hours.

Background

A national food agency has been set up.

It is possible that it will bring in new regulations on food hygiene.

These new regulations would monitor the standards of hygiene in small food outlets.

Food hygiene in the big supermarkets and major restaurants would also be looked at.

The hygiene of the food you buy would be at the standard you expect from the big supermarkets.

But consistent standards would lead to increased food costs at every outlet.

Background continued

Reasons can be given against spending more money on food hygiene.

Here are some reasons against spending more money.

I am satisfied with the food hygiene available.

I don't think extra spending on food hygiene would be worth it.

I think the food outlets should pay for all the checking of food hygiene. I do not want to pay for independent enforcement of food outlets.

Remember that money spent on consistent food hygiene could be spent on other goods and services instead.

Question

Would you be willing to spend an extra £100 per year?

On top of your food spending for consistent food hygiene?

- 1) Definitely No
- 2) Probably No
- 3) Probably Yes
- 4) Definitely Yes

Please give 1 reason for your last answer

Reasons if you said no

- 1) I am satisfied with the food hygiene available.
- 2) I don't think extra spending on food hygiene would be worth it.
- 3) The food outlets should pay for all the checking of food hygiene.
I do not want to pay for independent enforcement of food outlets.
- 4) Other reason - please state

Reasons if you said yes

- 1) It could give me more choice over where I buy my food. I would be more likely to use small food outlets.
- 2) I think food hygiene needs to be more consistent or more reliable at the large food outlets.
- 3) Other reason - please state

Question 9 Household Composition

How many people in your household are?

- A) under the age of 5 :
- B) between the ages of 5-16 :
- C) 16+

Question 10 Age Group of respondent

A) 16-24	B) 25-34	C) 35-44
D) 45-54	E) 55-65	F) 66+

Question 11 Education of respondent

Which of these categories best describes the stage where you left education or where you have reached in your education?

- A) Completed Secondary Education
- B) [G]CSE / O Level / GNVQ
- C) BTEC / A Level / Advanced GNVQ
- D) Certificate / Diploma e.g. HNC / HND
- E) Professional Qualification
- F) Degree / Higher Degree

The letters were numbered as follows: A [1], B [2], C [3], D [4], E [4.5], F [5]. E was numbered as 4.5; a professional qualification was thought to be of a level between a diploma and a degree.

Question 12

What is the occupation of the main income earners in the household?

Householder 1:

Householder 2:

Question 13 Income of household

What is the total household income before tax?

A)	less than	£ 10,000	E)	£40,000	-	£49,999	
B)	£10, 000	-	£ 19,999	F)	£50,000	-	£59,999
C)	£20,000	-	£ 29,999	G)	£60,000	+	
D)	£30,000	-	£ 39,999				

The final chosen valuation question, for question 8, requires further justification. Henson (1996:3) suggests that there are a range of features which should be incorporated. It is suggested that respondents need to be carefully informed about

the public good. The emphasis on consistent food hygiene standards should mean that respondents should only give attention to that concept, which should reduce the problem of embedding. The definition of food hygiene was restricted to the four aspects listed and limited to only the outlets where the food is sold. For example, food which is not stored at the correct temperature in a takeaway is an issue which would conform to the definition. The purpose of the description was to try and stop people from generalising and thinking about more serious examples of food poisoning which could be traced back to farms.

Chapter 8 suggested that people were sensitive about food poisoning and serious cases of illness in particular. However, the term "food poisoning" needed to be included in the valuation question. This was because respondents had to be made clear about the limited scope of the benefit. This was achieved through the description of the duration of the food poisoning. It was stated that illness lasting less than 24 hours would be dealt with. Again the purpose was to try to avoid the 'part whole bias'. In theory, respondents should only be willing to pay for the narrow concept given. Respondents should know exactly what they are paying for; a reduction in common cases of food poisoning defined as lasting less than 24 hours.

The question did not make the suggestion that all food hygiene issues would be resolved. It only outlined that hygiene standards would be at the standard the respondent expects from the supermarkets. This is an attempt to convey a level of food hygiene which is understandable to respondents. This level or 'benchmark' is a standard which people can understand in the supermarkets; in terms of the food hygiene, in the supermarkets, being a search or an experience good. The question was therefore an attempt to elicit the extent to which people are willing to pay for standards which can be monitored.

The payment method also needed to be articulated properly. This was achieved through the method of market prices which showed that shopping bills would have to rise to pay for the benefit. The budget constraint also needed to be emphasised. This was addressed through a statement on the trade offs that respondents are

making; that money spent on food hygiene “could be spent on other goods and services instead”.

The shopping bill question, question 7, was intended to act as a budget constraint. It was meant to guide the amount that the respondent could afford to pay. The purpose was to encourage people to think about the opportunity costs of spending money on food hygiene. The opportunity costs are the goods and services being forgone if respondents are willing to pay for food hygiene.

The refinement of the valuation question, in chapter 8, clarified the context for payment. The food hygiene concept statement covers both small and large food outlets which should be pertinent to all respondents, because it covers all shopping patterns. Moreover, the question was made relevant as respondents should not be able to circumvent the question. They are not able to state that they would buy food from a supermarket rather than a small shop to avoid the cost. The respondent if they are willing to pay has to pay, regardless of the size of the outlets. This is because the statement “increased food costs at every [food] outlet” was used.

The question was constructed to make sure that respondents gave a consistent answer to the willingness to pay question. This was achieved by listing the “no reasons” as part of the question. The end of chapter 8, suggested that this approach was needed. This was to avoid the problem of a respondent saying yes, they would be willing to pay, and then choosing a no reason. The aim was to give respondents a choice of not being willing to pay. The purpose was to legitimise a no response and, in particular, to make sure that respondents did not feel that they were obliged to pay. The exploratory work suggested that the question should make sure that people do not feel that they have to pay. Otherwise the researcher is measuring ‘obligation to pay’ rather than ‘willingness to pay’.

The use of the “definitely no”, “probably no”, “probably yes” and “definitely yes” format is an example of a polychotomous approach, where there are multiple choices. This is rather than a dichotomous choice question which is just yes or no.

The advantage of the polychotomous format is that it gives respondents the opportunity to express the intensity of their preferences (Garrod and Willis 1999:136).

The question referred to the food agency. The aim was to add realism to the question so that the respondent could understand what the good is and what they are paying for. That is a food agency to deliver food hygiene enforcement. Descriptions such as a “government agency” or the “Food Standards Agency” were omitted to try and make sure that respondents would focus on the valuation exercise and not on political issues related to government agencies. The purpose was to try to prevent digression, such as onto a discussion about quangos.

After the valuation question, a follow up question was asked to explore respondent’s reasons for their answers. The third no reason was capable of being interpreted as both an invalid no response, a ‘free ride’, but also a legitimate no response. It could be a ‘free ride’ because the respondent could say that “the food outlets should pay”. In this way, the respondent receives the benefit without having to pay, on the assumption that the costs are not passed on. The end of the statement: “I am not willing to pay for independent enforcement” suggests that the respondent is not willing to pay for the public good. This could be interpreted as a legitimate no response.

It could have been possible to insert a “don’t know” response as part of the polychotomous choices. However, this was not done because it could have encouraged people to say “don’t know” too easily which could have hindered the later analysis. The analysis could have suffered from too much ambivalence and so insufficient clear data.

The willingness to pay figure was set at £100. This was a first estimate which was increased at later stages. This was meant to be undertaken in accordance to the procedure outlined in section 5.12. However, the outcome of chapter 8 was only the refinement of the valuation question. Therefore the best that could be done, at this stage, was to estimate the willingness to pay figure. Substantial sums of

money starting from £100 were used because the questionnaire used the concept of a yearly payment. A hypothetical yearly payment was preferable to a weekly payment. This was because a weekly payment would imply too small an amount, such as £8 a week, which is perhaps too likely to lead to an affirmative answer. In contrast a larger, yearly amount may be more meaningful to respondents and encourage them to think more seriously about their answer. Respondents were asked whether they would be willing to pay for the 'food hygiene public good' at different increments of £100, £150, £200, £250, £350 and £450.

After the valuation question five demographic questions were asked. The aim was to find out whether there was a statistically significant relationship between the demographic variables and the stated willingness to pay for consistent food standards. The main aims of question 9 were to find out how many people in the household, if any, were aged under the age of 5; and between the ages of 5 and 16. The purpose was to examine whether there was a statistically significant relationship between the number of children in the household, particularly young children, and willingness to pay for a reduced level of food poisoning. If there was such a relationship then it would be worthwhile looking at some of the reasons for such a relationship. For example, a hypothesis could be suggested that concerned parents are willing to pay for the health of their children.

Question 10 asked for the age of respondents to examine whether certain age groups were willing to pay more for food safety. If this is the case then it is possible that certain age groups could have a greater awareness of food safety or a greater concern about the impact of food poisoning on health (Henson 1996:18). In Henson's study there was a negative relationship between age and willingness to pay for safer food, suggesting that younger consumers are more concerned about food safety (Henson 1996:18). The age groups, in this study, were based on a 1991 census fact sheet from a local authority on Tyneside.

Question 11 asked for the educational level of the respondent to see whether education had a statistically significant influence on willingness to pay. Henson's results suggested that the level of education was found to be negatively correlated

with willingness to pay to reduce the risk of food poisoning (Henson 1996:18). This could be because individuals who have a higher level education are likely to be better informed about food poisoning. Therefore they may be less concerned, or worried, about the risk (Henson 1996:18). It is suggested that people who are educated may perceive a relatively minor risk of food poisoning, and therefore a significant willingness to pay would not be justified (Henson 1996:18). However, Henson suggests that other studies have demonstrated a positive relationship between higher levels of education and willingness to pay. Thus, the relationship between education and willingness to pay is not conclusive. The question on education, in this study, listed professional qualifications as an option. This was so that people with professional qualifications could answer the question even if they have few, and perhaps no formal, academic qualifications.

The purpose of question 12 was to discover whether there was a correlation between the occupations of the main income earner(s) in the household and the 'willingness to pay' of the respondent. It was useful to examine whether certain occupations are more willing to pay. This was because it could help explain whether certain types of occupation have a greater interest or concern with food safety.

The last question, number 13, on income needed to be part of the questionnaire as it was likely to be the best explanatory variable of willingness to pay. The relevance to willingness to pay is clear because it provides a measure of whether people can afford the public good. Henson suggests that there is a significant positive relationship between income and willingness to pay. "Consumers with higher incomes are obviously more able to pay a higher price for safer food products and have a lower marginal utility of money income" (Henson 1996:18). They forgo or 'trade off' fewer alternative goods and services than poorer people. Henson suggests that this is "in accordance with virtually all studies" (Henson 1996:18). The question was left to the end of the questionnaire because it is the most sensitive issue. The reason for doing this was that if the respondent did not want to answer and rejects the questionnaire, then the interviewer is not forgoing the respondent answering any additional questions. The danger is that if the

interviewer asks this sensitive question, at the beginning of the questionnaire, then the respondent could become annoyed and not answer any more questions.

It was stated (The Times 2000) that plans to force people to give details of their income, in the 2001 census, were abandoned because of fears that many people would refuse to comply. The objections were particularly strong in inner cities, where 15 per cent of the people surveyed, said they did not want to answer a question on income. Thus, eliciting a response on income would be difficult. However, such a question is needed as chapter 7 outlined that it is not possible to elicit income indirectly e.g. from respondents shopping bills.

9.3.1. The reasons for the style and length of the questionnaire

A face-to-face interview was appropriate. The lower response rate from postal questionnaires (Morris 1989:46), compared to face-to-face interviews, is the justification for a face-to-face interview.

A relatively short questionnaire can be justified for 3 related reasons. First, the research was undertaken as cold calling to avoid the complexity of repeat calls. Questions were answered at the time of the 'cold call'. To improve the response rate of the 'cold calls', a short questionnaire was appropriate. Respondents may have rejected the questionnaire if it was too long. Secondly, to encourage full completion of the questionnaire from difficult to reach groups such as single young men and the elderly (Times 2001). Given the challenge of reaching such groups, it was particularly important to keep them interested. Third, the valuation question was involved and unfamiliar so respondents needed to be given the opportunity to discuss the question and ask for clarification if necessary. The valuation question would take a few minutes to consider properly. This only left time for a small number of likert scales and demographic questions, if the respondent's interest was to be retained.

9.3.2. Sample size and the administration of the questionnaire

The willingness to pay amounts (or bids) needed to be varied across a range. Samples of 50 people were needed at each bid level. In other words, 50 people were asked if they were willing to pay at the £100 level; 50 people were asked if they were willing to pay at the £150 level etc. The sample was 312, slightly more than necessary (i.e. 300, 50 with 6 bid amounts). This was because a few extra respondents were questioned to try and obtain responses from the younger age groups to improve the representativeness of the sample. In particular, to try and increase the number of responses from young people aged under 25. Also there were few responses from parents with young children presumably because they felt they were too preoccupied with their children to give up their time to do a questionnaire.

9.4. Demographic data

The purpose of the collection of demographic data is to allow some comparisons to be made between the 1991 census and the survey data; to examine the representativeness of the sample.

The electoral ward was chosen for accessibility and also it was close to the national median, in terms of the rank index of multiple deprivation. The ward was number 4647 out of 8414 wards (Office of National Statistics website 2001). The two main demographic factors to be addressed, at this stage are age and social class by occupation. The percentage of people in each age category is as follows:

16-24	25-34	35-44	45-54	55-64	65+
13%	18%	17%	15%	10%	27%

This compares with figures from the survey of:

16-24	25-34	35-44	45-54	55-64	65+
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6.8%	16.9%	21.8%	17.9%	15.9%	20.8%
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The first and last group are under-represented but apart from those 2 age groups the sample is fairly accurate.

The data for social class, based on occupation, was as follows:

Professional Technical (A)	Managerial (B)	Clerical (C1)	Skilled Manual (C2)	Partly Skilled (D)	Unskilled (E)
8%	42%	14%	26%	8%	2%
A and B = 50%		C1 and C2 = 40%		D and E = 10%	

The data from the sample was as follows:

A and B = 56%	C1 and C2 = 33%	D and E = 11%
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The sample therefore over-represents the A-B grouping and under-represents the C1-C2 occupational set but not significantly. Moreover, the census data was ten years old; as a comparison is being made between 1991 and 2001. The ward is affluent by Tyneside standards (Office of National Statistics 2001) as there are significant numbers of professional people in the ward. However, there are enough C1-C2 [clerical or skilled manual] workers for comparisons to be made between the professional and semi-skilled occupational groups.

To try and make sure that the survey was representative, stratified random sampling, was examined. The total population to be sampled is divided into equal age groups. If there are six age groups then 300 people would be interviewed with 50 in each category. Strictly speaking the number interviewed in each age group should be in proportion to its known size, relative to the total population (Waugh

1990:140). Thus, if the known size of the 16-24 year old age group in the electoral ward is 13% then there should a minimum of 6 respondents from that age group in each [minimum] sample of 50. In practice this was not possible to achieve. This was due to the difficulty of finding members of that age group who were either present, when the survey was undertaken, or willing to participate. It was not possible to have a representative sample in wealth terms because there is insufficient data on income. In terms of the proportions, of the different occupations, at the different bid levels, the data was as follows:

£100 bid level:	Managerial / Professional (Occupation=1)	26/55=47%
	Clerical / Skilled Manual (Occupation=2)	12/55=22%
	Retired/student / low waged (Occupation=3)	17/55=31%
£150 bid level:	Managerial/ Professional (Occupation=1)	22/49=45%
	Clerical/ Skilled Manual (Occupation=2)	10/49=20%
	Retired/ student / low waged (Occupation=3)	17/49=35%
£200 bid level:	Managerial / Professional (Occupation=1)	17/50=34%
	Clerical / Skilled Manual (Occupation=2)	13/50=26%
	Retired / student / low waged (Occupation=3)	20/50=40%
£250 bid level:	Managerial / Professional (Occupation=1)	23/51=45%
	Clerical / Skilled Manual (Occupation=2)	14/51=27%
	Retired/ student / low waged (Occupation=3)	14/51=27%
£350 bid level:	Managerial / Professional (Occupation=1)	18/49=37%
	Clerical / Skilled Manual (Occupation=2)	14/49=29%
	Retired/ student / low waged (Occupation=3)	17/49=35%
£450 bid level:	Managerial / Professional (Occupation=1)	22/50=44%
	Clerical / Skilled Manual (Occupation=2)	13/50=26%
	Retired/ student / low waged (Occupation=3)	15/50=30%

9.5. Willingness to pay at different valuation amounts

The figure chosen for the first bid level was £100 per year. This was an estimate of what the public could be willing to pay because a full open-ended survey was not undertaken. The justification for this was in chapter 8. The aim was to find out whether the number of yes responses to the £100 figure was equal to the number of no responses as this would show that the median willingness to pay was about the £100 mark.

The median is chosen because the mean would be affected by large valuations at the upper end of the willingness to pay distribution. For example, mean willingness to pay would be affected by a respondent stating that they would be willing to pay, say £10,000, per year, for food hygiene. Moreover, the median is the amount of money which a one person one vote system would allocate to the public good. This is because the median bid reflects the value of the median voter who decides on an issue in a simple majority voting system (Garrod and Willis 1999:139-40).

The number of yes responses to the number of no responses, at the £100 level, was 47 (yes) and 9 (no). Since the number of yes responses outnumbered the number of no responses then the bid amount was increased to £150 and then to £200, £250, £350 and £450. The number of no responses only equalled or exceeded the yes responses at the £450 level. The aim was to find out the valuation figure where the number of no responses is higher than, or equal to the number of yes responses. This valuation indicates that the median willingness to pay will not be higher than this figure and that another increment in the valuation or bid amount was not necessary.

Willingness to pay results were obtained at the following valuation amounts:

The £100 bid amount: 47 (yes), 9 (no)	total - 56
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The £150 bid amount: 34 (yes), 16 (no)	total - 50
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The £200 bid amount: 31 (yes), 22 (no), 2 did not answer total - 55

The £250 bid amount: 30 (yes), 20 (no), 1 did not answer total - 51

The £350 bid amount: 27 (yes), 23 (no), total - 50

The £450 bid amount: 22 (yes), 28 (no), total - 50

Grand total - 312

9.6. The remainder of the questionnaire

The last section outlined how the study was undertaken with valuation amounts varied from £100 to £450. A more detailed analysis is undertaken later. This section provides the descriptive statistics associated with the questions. Also the results are summarised. There were 144 (46.5%) male respondents and 166 (53.5%) female respondents out of a total of 310. There were 2 missing data items.

Question 1:

How many of the following food outlets have you used in the last week?

- A) Small food shop / corner shop
- B) Takeaway
- C) Cafe / Restaurant
- D) Canteen

Outlets	Frequency
- 0	- 57
- 1	- 97
- 2	- 102
- 3	- 44
- 4	- 7

There were 5 missing items for this question. The mode was 2 food outlets.

Question 2 :

Note that questions 2 to 6 were asked both to get a qualitative answer to the question and a response on the likert scale(s).

Do you think all the food you buy is safe to eat?

Disagree Strongly	Disagree	Neither	Agree	Agree Strongly
5	128	47	127	5

There were no missing items. The rounded up mean was 3 (neither); on a scale of 1 to 5 as outlined in the previous chapter. Therefore, the responses show an interesting equality between agree and disagree responses.

Question 3: Do you trust the Government to make sure that food is safe?

Disagree Strongly	Disagree	Neither	Agree	Agree Strongly
24	146	52	88	1

There was 1 missing item. The mean was 2.79 which shows that most respondents disagreed with the question.

Question 4

Do you think some of the food industry is more interested in profits than its customers?

Disagree Strongly	Disagree	Neither	Agree	Agree Strongly
0	12	19	197	83

There was 1 missing item. The mean was 4.13 which shows that most respondents agreed with the question.

Question 5: Do you think all food outlets offer the same levels of food safety?

Disagree Strongly	Disagree	Neither	Agree	Agree Strongly
62	223	11	15	0

There was 1 missing item. The mean was 1.93 which shows most respondents disagreed with the question.

Question 6

Do issues such as food hygiene influence where you buy your food?

Disagree Strongly	Disagree	Neither	Agree	Agree Strongly
0	21	20	198	73

There were no missing items. The mean was 4.03 which shows most respondents agreed with the question.

Question 7

How much does your household spend each week on food?

From supermarkets and from any other food outlets - including eating out from canteens, restaurants and takeaways.

The most frequent response (the mode) was £100 with 44 observations. This summary statistic is relevant because there were many different spending amounts. There were 15 missing items.

Question 8 (Valuation question)

This was the willingness to pay question which requires further later analysis. The categories of responses were as follows:

Definitely no : 47

Probably no : 77

Probably yes : 125

Definitely yes: 61

There were 2 missing items.

Question 9a

Household Composition: How many people in your household are?

Under the age of 5:

Number -	0	267
	1	33
	2	9

There were 3 missing items

Question 9b

Household Composition: How many people in your household are?

Between the ages of 5-16 :

Number -	0	235
	1	44
	2	25
	3	5

There were 3 missing items.

Question 9c

Household Composition: How many people in your household are?

Aged over 16:

Number -	1	51
	2	183
	3	51
	4	20
	5	3

There were 4 missing items.

Question 10

Which of the following age groups is the correct one?

A) 16-24 [21]	B) 25-34 [52]	C) 35-44 [67]
D) 45-54 [55]	E) 55-64 [49]	F) 65+ [64]

There were 4 missing items.

Question 11

Education of respondent:

Which of these categories best describes the stage?

where you left education or where you have reached in your education

- A) Completed Secondary Education [62]
- B) [G]CSE / O Level / GNVQ [63]
- C) BTEC / A Level / Advanced GNVQ [30]
- D) Certificate / Diploma e.g. HNC / HND [35]
- E) Professional Qualification [23]
- F) Degree / Higher Degree [79]

There were 20 missing items.

Question 12

What is the occupation of the main income earners in the household?

Professional / Managerial (AB) :- 131

Clerical / Skilled Manual (C1/C2):- 77

Partly Skilled or Unskilled Manual [27] / Student / Retired [74] (D/E):- 101

There were 3 missing items.

Question 13: Income of household

What is the total household income before tax?

- A) Less than - £ 10,000 [27]
- B) £10, 000 - £ 19,999 [44]
- C) £20,000 - £ 29,999 [60]

- D) £30,000 - £39,999 [59]
- E) £40,000 - £49,999 [35]
- F) £50,000 - £59,999 [16]
- G) £60,000 + [7]

There were 64 missing responses.

9.7. The estimation of willingness to pay

All the data from the main empirical study is provided in appendix 10. A logit model was used to estimate willingness to pay. The logit model uses a theoretical relationship between the independent and dependent variables that resembles an S shaped curve. At very low levels of the independent variable [say low ranking occupation]; the probability [of the respondent being willing to pay] is close to zero. “As the independent variable increases, the probability increases up the curve, but then the slope starts decreasing so that the probability will approach one but never exceed it” (Hair et. al. 1998:277). The most relevant variables which need to be considered are:

Question 2: the belief in safety variable and

Question 12: the occupation variable

The occupation variable was statistically significant (0.88 in model 1). This variable is relevant because it acts as a proxy for income; which cannot be used because of the high incidence of non response to the income question. The variable on whether respondents believe that food is safe was statistically significant (-0.55 in model 2). The belief that food is not safe, hence the negative sign, helps predict willingness to pay.

Model 1 Model 2 Model 3

Intercept	-0.684 (-1.39)	-0.057 (0.11)	-1.258 (-1.96)
Bid amount	-0.004 (-3.81)	-0.004 (-4.07)	-0.004 (-4.00)
Food safe (Q2=4 or 5)		-0.552 (2.12)	-0.466 (-1.71)
Food spend		0.018 (4.21)	0.010 (2.01)
Influence (Q6=4 or 5)		0.716 (1.86)	0.769 (1.93)
Household Size	0.8509 (4.42)		0.670 (3.12)
Total Kids	-0.7973		-0.808
Age 16 or under	(-3.09)		(-3.03)
Job (job=1)	0.8863 (3.19)		0.800 (2.82)
Log likelihood	-171.07	-175.50	-165.69
% Correctly predicted	68.1	67.1	71.5
% Yes correctly predicted	47.9	46.2	55.6
% No correctly predicted	81.5	80.9	82.0

Median WTP	£253.99	£247.95	£451.77
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The first logit model used the variables of:

Bid amount (£100, £150 etc)
Household size,
The number of children aged under 16 and
Occupation or job

This suggested the median willingness to pay was £253.99.

The second logit model used the variables of:

Bid amount,
Whether respondents believed food was safe,
The household weekly food spend,
Whether food hygiene influenced food shopping patterns.

This suggested that the median willingness to pay was £247.95.

The third logit model used the variables of:

Bid amount
Whether respondents believed food was safe,
The household weekly food spend,
Whether food hygiene influenced food shopping patterns.
Household size,
The number of children aged under 16 and
Occupation or job

This suggested that the median willingness to pay was £451.77

In model 3 a different assumption is made. It is assumed unrealistic that food outlets will pay for all the checking of food hygiene. Therefore people who gave that reason, for not being willing to pay, can be removed from the model. It is viewed as an invalid justification for not paying. With 50 observations removed then the median increases from about £250, in the first 2 models, to £451.77, in model 3.

9.8.1. Belief in food safety - cross tabulation

The question on belief in food safety is relevant (Do you think all the food you buy is safe to eat?). The following cross - tabulate [1] age and [2] occupation against belief in food safety:

1)		Do you think all the food you buy is safe to eat?			
Age Group		Disagree	Neither	Agree	Total
16-34	Count	25	15	33	73
	Expected	31	11.1	30.8	73
35-54	Count	52	27	43	122
	Expected	51.9	18.6	51.5	122
55+	Count	54	5	54	113
	Expected	48.1	17.2	47.7	113
Total	Count	131	47	130	308
Total	Expected	131	47	130	308

The Pearson chi-square value was 18.1 compared to 13.28 (the level of significance at the 0.01 level for 4 degrees of freedom) and is therefore statistically significant at the 1% level.

2) Do you think all the food you buy is safe to eat?

Occupation		Disagree	Neither	Agree	Total
Professional	Count	60	26	45	131
Managerial	Expected	55.5	19.9	55.5	131
Clerical	Count	25	15	37	77
Skilled	Expected	32.6	11.7	32.6	77
Manual					
Student	Count	46	6	49	101
Retired	Expected	42.8	15.4	42.8	101
Part / Unskilled Manual					
Total	Count	131	47	131	309
Total	Expected	131	47	131	309

The Pearson chi-square value was 14.3 compared to 13.28 (the level of significance at the 0.01 level for 4 degrees of freedom) and is therefore statistically significant at the 1% level.

Attitudes towards food safety may be relevant to willingness to pay. This is because people who think food is not safe (question 2), seem to be those who are willing to pay for safety (see discussion on logit models). Presumably those who think that food is not safe believe that there is a need for investment in safety measures. However, the chi-square has shown that it is occupation and age group which appear to influence whether people think food is safe or not. It was found that middle aged professional people tend to think that food was not safe. The middle aged professionals are likely to have higher incomes due to their more

highly paid occupations and their career progression. Therefore, this category of people is likely to be able to afford additional food safety. Thus, the significant relationship is between income and willingness to pay.

The relationship between belief whether food is safe or not (variable X) and willingness to pay (variable Y) may appear to be related only because both may be influenced by a third variable (Z) which is occupation and so income. Thus Z (occupation - which is also a proxy for income) is an extraneous variable which may influence X (beliefs about food safety) and Y (willingness to pay). Thus the relationship between X (beliefs about food safety) and Y (willingness to pay) is somewhat spurious. It could, for instance, have been the case that some people thought food was not safe but were too poor to be willing to pay for additional safety measures. Finally, Z (occupation) may influence X (beliefs about food). For example, middle aged professionals are more likely to read broadsheet newspapers (see chapter 7). This may be due to the cost of the broadsheets. Although it may be better explained by the interest or educational level of someone with a professional occupation. Therefore they will have a greater understanding of 'credence good attributes' which may cause them to believe that food is not safe. This category of respondent may be concerned about not knowing whether food is safe, well after consumption.

9.8.2. Trust in government food safety policy cross - tabulation

The question on trust in government (Q3) is relevant (Do you trust The Government to make sure that the food you eat, or your family eats, is safe?). The following cross-tabulates occupation against trust in the government.

Trust in government to make sure food is safe?

Occupation	Disagree	Neither	Agree	Total
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199

Professional	Count	80	22	29	131
Managerial	Expected	71.5	22.1	37.4	131
Clerical	Count	35	13	29	77
Skilled	Expected	42	13	22	77
Manual					
Student	Count	53	17	30	100
Retired	Expected	54.5	16.9	28.6	100
Part / Unskilled					
Manual					
Total	Count	168	52	88	308
Total	Expected	168	52	88	308

The Pearson chi-square value was 6.43 compared to 9.49 (the level of significance at the 0.05 level for 4 degrees of freedom) and is therefore *not* statistically significant at the 5% level.

9.8.3. Consistency of food outlets cross-tabulation

Question 5 is relevant: all food outlets offer the same levels of food safety? The following cross-tabulates age against belief in the consistency of the food outlets.

		All food outlets offer the same levels of food safety			
		Strongly		Neither /	
Age Group		Disagree	Disagree	Agree	Total
18-35	Count	18	45	10	73
	Expected	14.5	52.8	5.7	73
36-55	Count	26	90	6	122
	Expected	24.2	88.2	9.5	122
56+	Count	17	87	8	112
	Expected	22.3	81	8.8	112
Total	Count	61	222	24	307
Total	Expected	61	222	24	307

The Pearson chi-square value was 8.45 compared to 9.49 (the level of significance at the 0.05 level for 4 degrees of freedom) and is therefore *not* statistically significant at the 5% level.

9.9. Discussion of demographic and attitudinal questions

The demographic questions showed variations in their usefulness to the research. The question on household composition (question 9) was limited by non-response from the parents of young children, who were often unwilling to participate in the questionnaire. The age group variable did not have a statistically significant relationship with willingness to pay. In particular, there was a shortage of

respondents in the youngest age category. This conforms to the earlier observation that young men could be under-represented in the census. A young man in this study said: "I'm not interested - I'm not going to get paid".

The education variable was also not statistically significant with willingness to pay. There are three concerns which could be relevant. These concerns suggest that education may be a poor explanatory variable of willingness to pay. First, many of the older respondents did not believe that the question was relevant because many did not have formal academic qualifications. Second, the value of an ordinary level (O level or GCSE) qualification may have changed over time so education may not be a consistent measurement standard. If this is the case then it is not surprising that education does not have a statistically significant relationship with willingness to pay. Third, there was the challenge of how to deal with professional qualifications. Professional qualifications were included because respondents stated the question was not relevant without them being included. Thus, this study of a cross section of the public on Tyneside was more complex than Henson's (1996) study which was based on people working at Reading University. Employees of a university are likely to accept the level of academic education as an acceptable question, whereas the general public on Tyneside are likely to be more sceptical. There was some mild criticism from respondents who felt that the question was not relevant or somewhat unfair. For example, one respondent said "you're trying to qualify me". The respondent may have been less defensive about their choice of newspaper. However, that variable too did not seem to be correlated with willingness to pay in the exploratory research.

The occupation variable did show a statistically significant relationship with willingness to pay. It is likely that the income variable would also have shown such a relationship, on the basis that occupation and income variables are correlated themselves. This is because people in professional occupations tend to have higher incomes. However, there were too many missing data items to test the relationship between income and willingness to pay properly. In particular, self employed people invariably failed to answer the income question, regardless of whether they were manual workers or company directors. This helps to explain why the government made the decision not to include income as part of the

census.

Part 4: Discussion and conclusions from the research

Chapter 10: Discussion of themes which emerge from the study

10.1: Conclusions from questions 1 to 6

This chapter outlines some lessons that can be drawn from the main questionnaire and the experience of undertaking a substantial contingent valuation study. This section provides some qualitative information derived from the first 6 questions. The purpose is to provide a discussion which elaborates on the data provided in the last chapter. Respondents were given the opportunity to comment on their answer and some comments provided useful insights as outlined below.

The second question: “Do you think all the food you eat is safe?” was particularly useful as the results chapter identified. Also by leaving the situation open to interpretation, respondents unwittingly provided some interesting insights into public perception. In particular, there was a difference between respondents viewing food safety in terms of search and experience goods or credence goods.

Some respondents appeared to interpret food safety as a search or experience good. A typical response was to agree and then say “I wouldn’t buy it if it wasn’t safe”. Thus, the respondent is assuming that they know whether the food is safe or not before purchase. A variation on this was (agree) “I wouldn’t buy it if I didn’t think it was safe”. Again, the public assume knowledge here; although this second answer appears to be about the respondent’s foresight. Perhaps because it was believed that credence goods can be turned into certified search characteristics. A clearer example of this process was “(agree) all the food I buy is (safe). I read descriptions on labels to ensure food safety”. To summarise, the previous quotations express the view that the public is able to choose safe food. It is interesting to note that specific food safety problems were not mentioned rather an ability to take control and to exercise choice. For example, “agree (because) I don’t shop at dodgy places” and also (agree strongly) “I’m very careful about what I buy” and finally (agree) “because I choose to buy it”.

In contrast, perhaps concern over the food system led to some disagreement

responses. For example, (disagree) "I'm as safe as I can be" which suggests that there are safety factors which are beyond people's control. This leads into public responses which interpret the question as being about credence goods. These credence goods implicitly are not trusted through a certification authority and so cannot be turned into a credence good with search characteristics. Many credence attributes were raised e.g. "You can't prove it to be safe in the long run". Specific examples include "(disagree) some food has too many preservatives" and "it depends what you think about pesticides; I'm not sure all food is safe". Moreover, specific food products were identified. For example, (disagree) "I like to think so but not really, you take a lot on trust (such as) meat, fish and eggs".

To summarise, in simple terms, there is a dichotomy between people who [1] view food as safe and [2] those that do not. The former group appear to believe that food safety can be interpreted as a search good, an experience good or a credence good capable of being viewed as a certified search attribute. Another reason why people may believe food is safe is that they have confidence in the food they eat. Perhaps, some people feel that they do not need to go into much depth when considering their food consumption. For example, it was said (agree) "I buy it and eat it but don't look at labels". The latter group, are people who seem to think that some food has credence good characteristics. Perhaps, this second group are making more considered decisions such as the identification of long term concerns such as preservatives and pesticides. From the results, in the last chapter, it appears that people who are concerned about, the characteristics of credence goods tend to be in the highest occupational categories [A-B professional - managerial] and the middle age range. This combined group of middle aged - professionals could have implications for how much the population as a whole is willing to pay. This is because they are likely to be a group with substantial incomes. They are likely to be well paid from their occupation but also are likely to be earning well due to their career experience. They are concerned about food safety so they could be willing to pay as they can afford to do so. However, this group may also not trust the government or the food industry and so may not be willing to pay because they do not feel they would receive value for money.

There are two other relevant conclusions from the second question. First, some of the agreement responses were qualified. For example, a typical response was an agree followed by “hope it is”. This shows a lack of certainty despite agreement. The following disagreement may suggest that some of the “agrees” may not be so certain: “(disagree) I would like to think so but I’m a bit sceptical”. Second, food perceptions were being shaped by the media. For example, one respondent said “(disagree) until you hear that’s its not safe; until you hear about things”. Also, “(disagree) just seen on news - food poisoning (campylobacter) in chicken”. Thus, the media can be responsible for more concerned decision making, by the public, over food consumption.

This has implications for the Food Standards Agency. Public attitudes could be influenced by the level of media coverage of food safety. For example, if another issue dominated the news agenda then it is possible that concern over safety could decline. Thus media interest may be as important a factor, in determining the level of concern over food safety, as any initiatives undertaken by the Food Standards Agency.

The likert scale measuring trust in the government suggested that the public does not trust the government on food safety. However, this conclusion requires some qualification on the basis of people’s qualitative attitudes. First some respondents did not see the government as fully responsible for food safety. For example, it was said “I don’t know if it’s up to the government; (but) they do have food standards”. Also, “it’s not their business ... they can’t guarantee that it is (safe)... they try their best”. Thus, these respondents support the literature that food safety is not a pure public good.

There were also stronger challenges to the assumption behind the question, that the government’s role is relevant. It was stated that “it’s my responsibility and not the governments” and “you’ve got to trust yourself not someone else”. Perhaps, these quotations emphasise the difficulty that the government faces over the level of food safety that is demanded by the public. The quotations raise the question of

who should provide and pay for independent enforcement; defined as enforcement undertaken outside of the food industry. In contrast, the provision, and so valuation, of pure public goods such as national defence would be easier for the Government to undertake. This is because national defence is provided at a national level and so issues about individual responsibility are clearly not relevant.

If the assumption is that the government is responsible for food safety then the general disagreement is accurate. For example, one respondent stated (disagree) “pesticides were found in fruit last week (middle of August 2001)”. This shows how media interest in a credence good can reduce trust in government. Perhaps, credence goods make food safety more of a challenge for public authorities. This is because fruit becomes such a good once it is applied with pesticides. The corollary is that research is needed on the reasons for food safety concern. Food safety research which just measures attitudes may be insufficient.

The qualitative responses to question 5: “Do you think all food outlets offer the same levels of food safety?” supports the numerical data. This is because the responses were generally unequivocal. A typical response was that “money is the prime factor ... the first loyalty is to shareholders”. Again media attention of extreme examples of malpractice may have influenced responses to this question. For example, “(agree strongly) a company ... they were selling condemned chicken into the food chain”. Few people disagreed and were willing to “give benefit of the doubt”.

There was some agreement, with question 5, such as “there is an excellent standard from small shops... people in small places are good because they need to keep their reputation”. However, most sentiment was against e.g. (disagree) “it (food safety) varies a lot ... big shops have the same levels of food safety but small places leave a lot to be desired”. The responses to this question may help to explain why there may be a lack of trust in government as indicated by the responses to the last [4th] question. In response to the [5th] question, [Do you think all food outlets offer the same level of food safety?], it was stated (disagree) “that’s what the government says”. The government may be perceived as trying to

achieve an unrealistic policy of consistent food standards across all food outlets.

To summarise, the results suggest that respondents believe that there is inconsistency between different food outlets. This concern, particularly with small outlets, may not translate into a willingness to pay for 'food safety public goods'. This is due to worries over the property rights; that is, it may be unclear to the public what benefit they are receiving say from more enforcement. It appeared that some people used small outlets so infrequently that they "don't know about small outlets and never find out". This returns to the theme of people not using small food outlets and so potentially not benefiting from their regulation. The responses to question 6, led to overwhelming agreement. However, there were some interesting insights into perceived differences between different food outlets. For example, (agree) "I go to the supermarket to avoid food poisoning" and (agree) "if it's takeaways - yes (I am influenced) - if it's supermarkets - no".

10.2. Conclusions from the valuation question

There are 7 themes to be discussed for the rest of the chapter

- 1) Respondents criticisms of the valuation question.
- 2) The payment method of market prices and averting behaviour.
- 3) The issue of embedding or part-whole bias.
- 4) The budget constraint and the consumer cost of the proposed policy.
- 5) Reasons for the public being willing to pay or not.
- 6) Property rights and trust in the food system

10.3.1. Criticisms of the valuation question

Chapters 7, 8 and 9 prepared and researched the valuation question carefully. However, the main questionnaire revealed that there are still problems, even with the most careful and rigorous approach that was feasible.

The decision to list the no responses, before the willingness to pay question, was

criticized. For example, one respondent complained that the question was “loaded”. The question was devised so that people would not make a contradictory response that is, being willing to pay and then choosing a no reason. This was the problem identified at the end of chapter 8.

Also the third no reason was challenged e.g. “they (food outlets) are more likely to put the price up so number 3 doesn’t make sense; it wouldn’t happen; I still think I’d be paying more”. The third no reason can be interpreted in two ways. First, as the respondent states, that the reasoning does not make sense. Those respondents who choose it as a reason are looking to avoid the payment (free ride) when in practice the benefit would have to be paid for if the safety is demanded. Second, “the third no reason” can be regarded as a legitimate reason for not paying. This is because the respondent has said that the food outlets should pay which means that improvements may not be made. The respondent has also implied that they are not willing to pay for independent enforcement. Results were given, in the last chapter, on the basis of both interpretations.

The second yes reason was also criticized as it was said that: “it wouldn’t give more choice because there are few small shops”. This is relevant because it emphasises that the benefit, of more rigorous food hygiene enforcement, may be insignificant. This is because, in terms of food shopping, most people shop at the supermarkets so better monitoring of small shops could be of little relevance to consumers.

10.3.2. Public responses to the valuation question

The payment method of market prices, and the attempt to put the question in the context of the market for food, was discussed in chapter 7. It will be referred to again now because it can have a major influence on how people respond to the valuation question. For example, a “definitely no” response was given because it was thought that “the food companies make a lot of profit themselves”. Another example was “the shops make enough profit; it (food safety investment) should come out of (their) profit”. The researcher cannot neutrally elicit responses from

the public. The public's willingness to pay is dependent upon how the question is framed. In this case the results are guided by the context of the market for food and the payment method of food prices. If the scenario had been willingness to pay higher taxes then the results could have been different.

The payment method, of market prices, was challenged as one respondent said that it should have been taxation: "shouldn't it be willing to pay for more taxes; if you're talking about more regulations". In response it was stated that it could be difficult to ask people if they would be willing to pay more taxes. The respondent replied by saying "so you've come round the back door?" implying that the question was offering a disguised charge.

The private market context also had the effect of letting respondents avoid the valuation exercise. Averting behaviour was present and so people were able to avoid paying. For example, there was a definitely no response: "I tend to shop to avoid food poisoning". Also, the market context, may not address the valuation of public goods. For example, reasons were given for non-payment such as "it's the government's responsibility otherwise it's impossible to afford. Also "government support is needed for small shops so they could meet the consistent standards ... initial support is needed". This shows the difficulty of trying to value an impure public good as people can avoid the question.

The valuation of food safety is a challenge when the responsibility for food safety is shared across the food system. Some respondents highlighted this issue e.g. "it's not just about handling the food in the premises it's about what you do when you take it home; it (the question) should be about the household too; you need more time for preparation; it's (this aspect of food safety) not a monetary issue. In contrast a valuation of rail safety may be easier to undertake. This is because the public fully 'contracts out' responsibility for safety to the rail industry and so responsibility for safety cannot be put on the public.

10.3.3. Part-whole bias

This section is about responses which went beyond the scope of the question. Some respondents were not able to concentrate only on the “part” of the issue in question. Instead some people generalised to consider the “whole” or broader concepts, of food safety. For example, “you get a bug two or three times a year so you need to be certain (about food hygiene) as some food poisoning is very serious”. Another example was “yes I landed up ill for 3 days with a health risk. I had food poisoning and it was from food bought in”. The question was also interpreted on the basis of “dread” risks which lead to death; which goes well beyond the confines of the question. A respondent said no because the question did not cover BSE, even though they may have received some benefit from additional food hygiene regulation. The question stated that food poisoning, in this context, would last 24 hours or less but this was not being universally understood or accepted.

The question was also interpreted too broadly in another way. Food safety was not confined to the outlets where the products are sold. For example it was stated: “some food factories open your eyes; some are immaculate while others leave a lot to be desired. One thing I’ll never eat is a kebab (because) it comes into the factory as frozen mutton and then gets processed”. Perhaps, the question was viewed as an artificial concept. Some respondents may have thought that they should answer the question in the context of the whole food supply chain.

10.3.4. The budget constraint

A skewed distribution of willingness to pay responses towards higher bid values can occur. This is because respondents fail to appreciate their budget constraint. In a consumer situation, say in a supermarket, people have to sacrifice money for quality according to their ‘limited income’. However, in this type of stated preference survey people appear to be more reluctant to make such trade offs. Perhaps because they do not have to confront their budget constraints. For example, it was stated: “I spend £50 a week (on food) but here’s me (saying I would be willing to be) spending hundreds on food hygiene. It’s so important that I could spend a £1,000”. Another example, was when someone said “you can’t spend enough” which was then qualified; “but probably not when said like that”.

Ambivalent statements such as this can make it difficult to interpret people's responses. It is not always clear how much people are willing to pay and even whether they are willing to pay at all.

In defence of the research method, the variations in the bid amount did have some affect on people's willingness to pay. The increments in bid amounts did encourage people to think about how much they valued food safety. For example, at the higher bid levels a typical response was "I would be willing to spend more but that is on the high side for consistent food hygiene".

10.3.5. Reasons for and against willingness to pay

Some of the respondents who were willing to pay gave general reasons such as "that sounds sensible" and "food hygiene is very important". Although sometimes there were detailed reasons for willingness to pay such as "for quality they (the food outlets) would pay more attention to what they were doing. Another justification was that: "cheaper food outlets are less likely to maintain consistent standards".

It appeared that when people took more care to understand the narrow definition of the question then they were more likely to say no. In other words, those who are less willing to pay for food safety seem to be those who spend more time thinking about the question. For example, a more well thought out response stated "it wouldn't require [the bid amount] to make those improvements". However, a more detailed study would be needed to test this hypothesis; that not being willing to pay is partly caused by people taking more time to consider their response. This would involve having to time people's responses and compare it to their willingness to pay.

10.3.6. Property rights

Respondents were concerned that food hygiene regulation was already being undertaken and that they should not have to pay more for it. Thus, in response to

the willingness to pay question, there was the reply that "isn't that (food hygiene regulation) already being done by the environmental health (officers)".

The rejection of the property rights basis for the question is a major concern. In general, this is about people believing that food hygiene regulation is already in place and so investment is not required. For example: "I thought it (regulation) was done already ... £100 could buy a lot of wine (an example of the other goods and services that money could be spent on). I've never had food poisoning in my life but still probably yes". If the respondent believes that safety is already being provided then they have, or own, the (property) right to the work undertaken by environmental health officers. Thus they do not need to acquire that right which makes it doubtful that they would be willing to pay. Moreover, if the respondent "never had food poisoning" there is another reason to question the yes response. If the respondent has not suffered then there is doubt over their demand for a remedy. Another example of doubt can be seen by the following quote. "I would be willing to pay; I need the hygiene; but there shouldn't be a trade off". The criticism of the trade off implies that the public should not have to pay more. This again suggests that the respondent would not be willing to pay.

In contrast, "no" responses are clear stated preferences but they do highlight the difficulty in the valuation of food hygiene regulation. There were no reasons such as: "money should be spent on monitoring rather than (consistent) standards; no improvements are needed". This implies that money should be spent on the existing monitoring but that extra money is not needed. Another no response was that "statutes are there but more could be done". The implication is that the respondent believed that better enforcement of food standards was needed. Although the respondent thought that more action could be taken; they did not think that additional investment could be justified because the existing laws are not being implemented well enough. A similar point was made: "there are enough regulations if people adhere to them so I'm not willing to pay".

The significant feature of these no responses is their ambivalence. There is a need for food safety but people are unwilling to pay for it. This is because the

property rights issue is fraught; food premises are expected to be hygienic from the outset. The following quote emphasises this point: "I worked as an electrician in takeaways and they had grease from workers overalls in them (implying that the food selling places were generally unclean). Some takeaways - you've never seen the state of them ... but they should be clean already. If you paid extra money then it could be spent on what should be being done already". Another quote makes a similar point: "I know what to look for - I'm an ex Home Economics teacher ... I can watch for poor food; but would the man in the street; we shouldn't have to look out for it (the safety); it should be done automatically. It's a matter of principle rather than spending more on top - the cost we pay should cover everything". Again people feel that cleanliness should be practiced already.

A respondent implied a solution to the property rights problem: "standards should be kept, and if they are people shouldn't have to pay more. You should have a license for restaurants to open". However, such a licensing solution was implicitly attempted by government to fund the Food Standards Agency but seen as impractical.

Also a no response was justified on the basis that: "years ago you could taste and smell food". The implication is that perhaps in the past there was less need for food hygiene regulation. If this is the case then this is an intriguing response because it suggests food was more of a search or an experience good in the past. Perhaps by implication it is more of a credence good now.

10.3.7. Trust

The concept of trust provides several reasons why people's stated willingness to pay can be questioned. For example, "yes but I would have to see what I was getting for my money". The respondent cannot "see" the benefit of the public service. Thus the valuation of food safety is more difficult than the 'public good' provided by say the Highways Agency where the service provided can be observed e.g. road building or maintenance. There is a demand for transparency. For example: "for peace of mind, some of these restaurants could / should have an

open door policy; so people can see the inside of a restaurant before eating. People want satisfaction that it was all clean and safe".

There are also doubts over inspection policies: "yes, I would be willing to pay but would it (the agency staff) be able to go in (premises) unannounced and do spot checks". Moreover, one respondent said: "probably yes, (but) you don't know how money is being used. The TV has highlighted hygiene in the kitchens and back lanes. I don't know what hygiene is like in the back lanes". Also there was a: "probably yes - but you can't see the back of the restaurant". There is the general concern about the back of food premises where food is stored. To summarise, there is a need for the services provided by environmental health officers but there are doubts over "transparency" in the delivery of the public good. As one respondent said "it's an up in the air question - I don't know whether it's been looked at".

Also, there is a trust issue that people would be willing to pay "if it (food safety) was guaranteed". This raises the challenge about the level or standard at which food safety can be guaranteed. A fundamental point made by a food tester was that: "the public doesn't know what to expect". The average member of the public could say "probably yes - it would have to be a marked improvement for that sort of money" but there is the challenge to quantify a "marked improvement".

Another respondent said: "definitely yes - if it was absolutely consistent" but such a complete guarantee of food safety is unrealistic. The concern about guarantees is that people are describing uncertainty (an "if") so there is doubt, in the respondent's mind, over whether a guarantee could be delivered in practice. For example, "all outlets have to look at safety carefully. Wherever you went it would be lovely if everywhere was guaranteed with more hygiene. Big do (look at hygiene) but it should be everybody else ... in the home as well". In practical terms food safety guarantees are quite unlike other guarantees such as for private goods such as home appliances which can be replaced. In contrast public health cannot be replaced as it were. However, with experience goods and less serious forms of food poisoning then a food safety "guarantee", or re-assurance, is less

contentious. This is because the consequences of food borne illness are less serious which is why experience goods are more appropriate for valuation.

However, there is evidence of the public making their own decisions to avoid some of the food hygiene problems associated with search or experience goods. For example, it was said that "people shop at the major supermarkets for re-assurance; but there are some very poor takeaways in other parts of Tyneside. That's why parents like a [major fast-food] restaurant because they can see into the kitchens and they know the handling of the food is satisfactory". In this case, the "market" for food safety is operating adequately in which case intervention would not be required or willingness to pay.

Finally observations were made about the food supply chain. Although this is an embedded response there are some views here which support some of the ideas previously outlined. It was stated that "yes (willing to pay) but you don't know what goes on behind the scenes. I would buy direct from a farmer there's more trust in that". Also: "I don't know what's going into food; I wouldn't buy pies". Moreover respondents complained that enforcement needs to: "concentrate on (the) basics of hygiene but also look further back in the food chain". It was also said that the question should cover more than food hygiene. For example: "(no) it's not hygiene - but further back than supermarkets". The purpose of the study was only to look at the outlets selling food. However, some respondents wanted to dispute this aim. Perhaps, it is unrealistic to separate different elements of the food supply chain and to only consider food safety in the places selling the food. Perhaps, there are some fundamental questions about "what is going on behind the scenes" in the food industry; and policy should address these concerns and examine the whole food supply chain.

Chapter 11: Discussion of quantitative results from the study.

11.1. Cost - benefit analysis

The last chapter examined the qualitative themes which emerged from the study. This chapter assesses the quantitative results from the willingness to pay question (question 8). An assessment can then be made of the usefulness of contingent valuation in the food safety context.

The narrow scope of the benefit being offered, in the food hygiene study meant that it was necessary to set the bid amounts at relatively low levels. Often these low amounts were not a sufficient incentive to encourage people to say no. Thus there were a large number of yes responses particularly at the £100 and the £150 levels.

The median willingness to pay was found to be approximately £250 in the study, assuming the third no reason is a legitimate response. This was based on the context of a mild case of food poisoning which lasts less than 24 hours. An assumption could be made that an individual suffers one bout of food poisoning, lasting less than a day, in a year. The individual loses 8 hours of working time in the day that they get food poisoning. Therefore, they would need to be earning at least £31.25 an hour to justify a willingness to pay amount of £250. If the willingness to pay method of valuation was to be compared to the economic cost measured by lost working time; then the willingness to pay figure is a large amount. This is in the context of an hourly wage rate of say £10 or £20 an hour. Although, of course, it would be possible for an individual to suffer more than one case of food poisoning in a year.

The purpose of the previous discussion was to explain why a monetary amount of £250 could be regarded as an excessive level of willingness to pay. The problem is that this figure may not, in fact, indicate what people would pay for food safety. The public good presented, of more consistent food standards, was generally recognised as a good which was useful to obtain. The food hygiene study

presented here develops the work of Covey et al (1998). It narrowed down the food safety concept to the simplest set of ideas which could have been used in such a study. The question made sure that a cross section of the population could understand the question. If the question could be well understood then respondents should have been able to give a proportionate [low] valuation based on the [narrow] scope of the question. However, this aim was not completely achieved. Instead this study has confirmed the results found by Covey et. al. (1998:254) that part-whole bias, or the “embedding problem” is a constraint on the usefulness of contingent valuation in this context.

The £250 willingness to pay [a year] figure could be placed in context. The £250 a year figure could be multiplied by 23.5 million households' nationwide (Griffith et al. 1999:113). This comes to 5.9 billion. This is a very high figure in the context of the Food Standards Agency's funding. This is £87m net, per year, for April 2001-04 (Food Standards Agency 2000b). However, the valuation could have been the same regardless of whether the food safety definition was limited, or whether a broader concept was employed such as food poisoning leading to prolonged illness. It is useful to examine why some respondents gave an embedded response. The process of “bounded rationality” is relevant as it may explain how respondents answered the question. Perhaps, many respondents understood that the public good was “a good thing” and then processed the question in terms of whether they could afford the good or not.

11.2. Discussion of cost-benefit result

To return to the concept of an excessive willingness to pay level. The questionnaire situation is the only opportunity respondents have got to ‘purchase’ the food hygiene public good. Thus respondents may feel that they have to capitalise on this unique opportunity, and they can only do this by giving an affirmative response. Another concern is that people may give a yes response because they do not consider the consequences of an affirmative reply. They may just think of the moral satisfaction, or warm glow, of having the good without considering the implications of payment. Also, the questionnaire omitted a “don’t

know" response so people may have given an affirmative [warm glow] answer when they may have preferred to give a 'don't know' response. These explanations suggest that the median willingness to pay amounts, of about £250, may not be an accurate reflection of what people are willing to pay.

A conclusion can be drawn about why respondents find closed-ended questions easier to answer than open-ended questions. If a closed-ended question offers a favourable public good at an affordable price then the respondent simply gives an affirmative response. If the public good is undesirable or too expensive then the respondent gives a negative response. An open-ended question is more difficult to answer because it does not indicate to respondents whether they can afford the public good or not.

Another concern was that comments were made which can be summarised as "you can't put a value on life". This suggests that respondents are concerned about being asked to monetarise health improvements. Perhaps, some of the no responses, from the food hygiene study came from people who objected to having to put a valuation on a public programme which is needed for health purposes. "No" responses could be explained by respondent's dislike of the methodology. Although this dislike of 'valuing life' does not necessarily mean that respondents do not want food safety initiatives. To summarise the researcher may not be able to fully estimate the demand for the public good. This is because respondents may become preoccupied with the 'value of life' issue and this could affect the quality of the demand revelation exercise.

Another problem is that there is not the 'actual' data with which to compare these survey results. It is difficult to interpret these results because generally there are not referenda in Britain, which ask people whether they are willing to pay for public goods. In a rare British example, in Bristol, more than half of people voted for local spending to remain unchanged rather than 3 other options which would have resulted in a 2%, 4% or 6% rise in council tax (BBC 2001). Moreover, Switzerland's experience suggests that referenda, upon which the contingent valuation method can be based, leads to lower taxation. In Switzerland, many of

the country's regions have to hold 'willingness to pay' ballots before implementing new spending projects. In the regions where referenda were held, spending was 17% less than in the areas which did not hold them (Guardian 2002). These examples show that in practice people are less willing to pay for public services than might be expected from the results of this food hygiene valuation exercise.

In the context of this hypothetical contingent valuation study there is a need to make the research more realistic; in terms of trying to construct a 'real life' trade off between money and safety. Perhaps people could be asked if they would be willing to accept food which is closer to the sell by date in exchange for a lower price. This is a real situation as supermarkets discount food which is close to the sell by date. However, asking a question like this would be fraught because it is a willingness to accept question. If food is close to the expiry date then the price has to be very low to encourage purchases. Thus such a study is soon at the stage, where the food is at the expiry date and people will not buy it.

Another way that the food hygiene scenario could have been more authentic would have been to simulate a 'laboratory experiment'. People could be shown a video of the benefits of food hygiene regulation and if they are willing to pay for these benefits then respondents could hypothetically pay. However, there is a fundamental problem of explaining to respondents what would happen if they were not willing to pay, for measures to reduce mild cases of food poisoning lasting less than a day. Clearly it would be unethical to give respondents food poisoning if they were not willing to pay. Moreover, chemical contamination is a much more difficult concept with the consequences being more severe e.g. cancer; and then there are other serious concerns such as BSE! Thus it does not appear to be possible to undertake a simulated market experiment in a food safety situation. The corollary is that it is difficult to examine the criterion validity of contingent valuation when applied to food safety. It is unlikely to be possible to compare food safety contingent valuation estimates with actual markets, or simulated market experiments (Garrod and Willis 1999:142).

Methodological problems, such as embedding, suggest that a more sophisticated

stated preference method is needed instead of contingent valuation. For example, a choice experiment could be adopted. Choice modelling is more sophisticated than contingent valuation because a food concept can be broken down into the range of elements which it comprises (Burton et. al. 2001:481). This should avoid the embedding problem. In the earlier research described, food hygiene was described as 4 factors combined together. In a choice experiment it could be possible to trade off each of the 4 factors [cooking, storage, preparation and handling] against money. However, many food concerns could still be inappropriate for valuation using a choice experiment. The research has shown that people often have little understanding of how food retailers, food manufacturers and farms operate. This is because the public invariably is not employed in the food industry. In particular, only 2% of the population is employed or has direct involvement with farming (Edwards 2001). Therefore they are unable to consider, in much detail, what certain food safety initiatives are worth. Moreover, in general, the public does not have access to farms and food factories so they do not have the basis for making a food safety valuation which covers the whole food system. Thus, a more sophisticated methodology will still face the problem of the public's lack of understanding of the food system, which made the contingent valuation study such a challenge.

Chapter 12 Conclusions

The introduction to the thesis is now relevant as it discussed the purpose of the research. This was to find out whether (1) *a monetary valuation could be placed on particular food safety measures?* A valuation was achieved [in this thesis] using a limited food safety concept, related to common cases of food poisoning and the need for consistent food hygiene regulation. The research was appropriate as the food safety concept was suitably limited to food hygiene.

The challenge is (2) *the extent to which such valuations can contribute to policy making?* Arguably economics does not make a significant contribution to the allocation of resources, in this area of food safety policy. The public's valuation of food safety does not seem to be able to differentiate between the scopes of different government initiatives. A programme to reduce chronic cases of food poisoning may be given a similar value, to an initiative to decrease common cases of food poisoning. If results such as these are obtained then they are not of great contribution to the policy maker.

In terms of the methodology, the use of stated preference [see chapter 3] instead of revealed preference was preferable. Stated preference does allow the researcher to "tailor" the questionnaire to meet their needs. It is possible to explicitly ask the public about specific improvements in particular types of safety. Thus a specific question, in this case on food hygiene, can be constructed. Also the contingent valuation study [chapters 7-9] produced consistent results. The open-ended survey [used in chapters 7 and 8] produced average willingness to pay values of £8 a week. The closed-ended survey [used in chapter 9] produced a willingness to pay value of between £400 and £450 a year. This is because the no's only outnumbered the yes' at the £450 level.

However, there are many food safety concerns [outlined below] which go beyond just obtaining a monetary valuation for food safety. Such concerns can hinder the public's ability to provide a useful valuation of food safety for policy makers.

12.1. Risk Perception and involuntary hazard

1.1. There is a challenge of how to evaluate an involuntary hazard. Respondent's willingness to pay for food safety may be linked to their feeling of control over the food system.

1.2. Concerns were raised, in the study, over the hygiene practices of the food industry. Respondents were frequently perturbed about what was "going on behind the scenes".

1.3. The public want to observe and influence the safety practices of the food industry. Thus, there remains the challenge of how to incorporate the demand for 'control over the food system' into a food safety valuation of this kind.

12.2. Information Asymmetry and the challenge from credence goods

2.1. It is easier to value aspects of food safety, such as experience goods, that are of the least value to the public.

2.2. It is easiest to value simple cases of food poisoning than more serious cases of disease such as BSE or cancer; which have credence good characteristics.

2.3. This presents a challenge to food safety policy. The Food Standards Agency was primarily established to deal with far - reaching hazards such as BSE. Thus the valuation of policies, to reduce say the BSE hazard, would be useful but does not appear to be forthcoming.

2.4. There is a 'catch 22' situation with credence good attributes such as pesticides.

2.5. The public cannot 'taste' the pesticides so they do not have the understanding to make a valuation. It is difficult for the public to answer because

they do not know what standards to expect, in terms of pesticide residues.

2.6. If the public could 'taste' pesticides, and the risks from the pesticides were known, then the food would be a search good in which case the need for food safety regulation would be largely redundant.

2.7. The study gave the contingent valuation question the best chance of working by restricting the concept. Common cases of food poisoning was an appropriate concept, for valuation, as the definition was capable of being understood. Moreover, people did not say that illness lasting less than 24 hours was priceless, as might be expected with credence good attributes.

12.3. Public goods: the 'impure' nature of the food safety public good

3.1. Since food safety is not a 'pure public good' then respondents felt that they could avoid the payment scenario presented to them.

3.2. Respondents felt that they could obtain or 'purchase' food safety from the private sector and the supermarkets. The supermarkets were often sufficiently trusted that it was implied that intervention was not required.

3.3. The payment scenario of asking the public to pay more for the 'food safety public good' is fraught. The public could feel that they have to pay twice. First, in terms of private averting behaviour, to minimise individual or household risks, by shopping at the major supermarkets. Second, in terms of paying for the government to address the hazard.

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Appendix 1: Outline of questions for section 7.2

Newspaper readership

A question was asked on newspaper readership: "Which newspaper do you read the most?"

- A) Tabloids e.g. The Sun / The Mirror
- B) Middle Market e.g. Daily Mail / Daily Express
- C) Broadsheet e.g. Guardian / Times / Telegraph
- D) Local e.g. The Journal / Evening Chronicle

Food Attributes

This question asked: out of the following 3 food attributes of [a] convenience, [b] freshness and [c] taste, which characteristic do you think is the most important?

- a) Convenient food. For example, pre prepared meals
- b) Fresh food. For example, local produce
- c) Tasty food. For example, food with a good flavour

Food Shopping Bill

A question was asked, before the valuation question, to help people think about their willingness to pay for food safety. The question asked how much people spend on their food shopping. The question was "how much is your weekly household food shopping bill?"

The (preliminary) valuation question was:

"People spend money, as part of their shopping bill, to have tasty or convenient food. Also, money spent on food at supermarkets is used so that supermarkets can have high standards of food safety. It is possible that other areas of the food

industry e.g. farmers, food processors, takeaways or canteens do not have such high standards of safety. Would be willing to pay more money on top of your weekly food shopping bill; to make sure that other areas of The food industry are brought up to the same high standards as the supermarkets?

Variation 1: If you are willing to pay; what is the most you would be willing to pay on top of your food shopping bill? [open-ended approach]

Variation 2: Would be willing to pay [N] on top of your food shopping bill yes or no [closed-ended approach; N is based on the open-ended question]

Appendix 1b

	Willingness to Pay (Yes)	Willingness to Pay (No)	Total
Broadsheet Readership	25 (observed) 22 (expected)	9 (observed) 12 (expected)	34
Non - Broadsheet Readership	15 (observed) 18 (expected)	14 (observed) 11 (expected)	29
Total	40	23	63

Calculation of chi-squared 2*2 table

Observed	Expected	$((O-E)-0.5)$	$(O-E)^2$	$(O-E)^2/E$
25	22	2.5	6.25	0.28
15	18	-2.5	6.25	0.35
9	12	-2.5	6.25	0.52
14	11	2.5	6.25	0.57
Total				1.72

Degrees of freedom = $(r-1)(c-1)$ i.e. $(2-1)(2-1)$ = 1

Significance at 5 per cent level i.e. (0.05) = 3.84

Thus the result from the chi-square was 1.72 which is less than 3.84 (the significance level at the 0.05 level). A hypothesis of independence can be supported. Willingness to pay appears to be independent of newspaper

readership.

Appendix 2: Focus group schedule

Section 1: Concern over food safety

- 1) What are your main food safety concerns?

Think about asking them what they have done personally to address these concerns - stopped eating beef after BSE. Do they buy organic vegetables? How do they deal with the threat of food poisoning?

- 2) Have you any safety concerns about where you buy your food?

Ask them whether they think supermarkets offer safer food than independents to assess Marsden / Flynn hypothesis. Also, ask about small independent shops (of different quality), takeaways and canteens e.g. what do you think about food safety in takeaways?

- 3) Do you believe the Government is addressing your food safety concerns?

Yes or No If Yes why / If No why.

Section 2: Knowledge of Food Standards Agency

- 1) Do you know what The Government is doing regarding food safety?
- 2) Do you know what initiatives the Government is introducing to try and deal with food safety?
- 3) Have you heard of The Food Standards Agency?
Or have they heard of the “food safety” Agency?
- 4) Do you know what the job or role of The Food Standards Agency is?

Ask them on what basis they have those views.

Outline the role of the Agency

[Its priority should be to oversee the independent sector of the grocery trade and encourage public understanding of food hygiene].

Section 3: Contentment or dissatisfaction with government food safety policy

1) Do you think The Agency is properly addressing your food safety concerns?
Ask them what in particular they agree with or disagree with.

2) What else do you think The Government should be doing about food safety?

Ask them how they think the remit should be extended. Ask about common food hazards like food poisoning which may be overlooked e.g. should the Agency be doing more to reduce food poisoning ?

3) Who do you think will benefit from The Food Standards Agency?

Do you think consumers will benefit or do you think it is more for the benefit of industry (ask them which type), or for the benefit of politicians or government?

Section 4: Willingness to Pay

1) To support the work of the Food Standards Agency (outlined before) would you be willing to pay more?

If yes then ask those who would pay more, why they think it is reasonable for them to pay more?

If no then what are their reasons

2) Who do you think should pay for food safety consumers, taxpayers or the

food industry?

If the food industry then say that consumers will end up picking up the bill?
If they say they don't want The Agency then probe by saying that they won't get the benefit from the agency (to see whether they really are willing to pay?)

Section 5: Food Standards Agency traded off against other public services

1) Should money spent on The Food Agency, instead be spent on other public services?

Mention smaller public goods such as national parks or nursery education before mentioning more significant public goods like health care e.g. hip operations.

2) Should money spent on other public services, instead be spent on The Food Agency?

Appendix 3: Valuation question number 1

Question 1 Where do you do most of your food shopping?

- A) Large supermarket / Superstore
- B) Small supermarket
- C) Local food shop e.g. corner shop
- D) Market stall

Question 2 Do you think all the food you buy is safe to eat?

Disagree Strongly	Disagree	Neither	Agree	Agree Strongly
1	2	3	4	5

Question 3 Do you trust the Government to make sure that food is safe?

Disagree Strongly	Disagree	Neither	Agree	Agree Strongly
1	2	3	4	5

Question 4

Do you think some of the food industry is more interested in profits than its customers?

Disagree Strongly	Disagree	Neither	Agree	Agree Strongly
1	2	3	4	5

Question 5 Do you think all food outlets offer the same levels of food safety?

Disagree Strongly	Disagree	Neither	Agree	Agree Strongly
1	2	3	4	5

Question 6

Have you, or anyone in your household had food poisoning recently (in the last 6 months?)

Yes or No

Question 7

About how much does your household spend each week on food?

From supermarkets?

From any other food outlets? (including eating out from canteens, restaurants and takeaways)

Question 8 (Valuation question)

The new Food Safety Agency will improve food hygiene.

For example the storage, handling, preparation and cooking of food.

Assume there is no impact on other issues like BSE, Genetically Modified Food, irradiated food and chemicals in food.

Because of the agency:

1. The food you buy will be less likely to cause food poisoning.

2. Food safety in small shops, takeaways and restaurants would improve to the same level as the big supermarkets.
3. Improvements in food hygiene would have to be made across the whole food industry.
4. This would mean that food prices would go up wherever it was bought.

Question:

Are you willing to pay more for your food to get better food safety?

Remember!

This money could be spent on other products or on tastier food.

It's the same food at the same place It's just safer to eat!

If yes, you are willing to pay, what is the most you would expect to pay on top of your weekly shopping bill to support the Food Safety Agency?

Follow up question: please can you give me a reason for being willing to pay or not.

Appendix 4: Valuation question number 2

Question 1

How many of the following have you used in the last week?

A)	Small food shop / corner shop	C)	Cafe / Restaurant
B)	Takeaway	D)	Canteen

Question 2

Do you think all the food you buy is safe to eat?

Disagree	Disagree	Neither	Agree	Agree
Strongly				Strongly

1 2 3 4 5

Question 3

Do you trust the Government to make sure that food is safe?

Disagree	Disagree	Neither	Agree	Agree
Strongly				Strongly

1 2 3 4 5

Question 4

Do you think some of the food industry is more interested in profits than its customers?

Disagree	Disagree	Neither	Agree	Agree
----------	----------	---------	-------	-------

Strongly

Strongly

1 2

4 5

Question 5

Do you think all food outlets offer the same levels of food safety?

Disagree

Disagree

Neither

Agree

Agree

Strongly

1 2

4 5

Question 6

Have you, e

Have you, or anyone in your household had food poisoning recently (in the last 6 months?)

Yes or No?

Question 7

About how much does your household spend each week on food?

From supermarkets?

From any other food outlets

(including eating out from canteens, restaurants and takeaways?)

Question 8

The point of this question is to find out if you are willing to pay extra for lower food poisoning.

Assume that a new supermarket, which includes a takeaway and restaurant, is opened up.

This new supermarket has better food hygiene compared to other shops.

It has better monitoring and control of the food businesses which supply it. So that the storage, handling, preparation and cooking of food is better than existing food shops. As a result, the amount of food poisoning, associated with this new supermarket is expected to be 20% lower than in existing food shops. But, food prices, throughout the supply chain, are higher to pay for these improvements in food hygiene. Would you be willing to pay more to shop at this new supermarket? Which is likely to lead to 20% less food poisoning? If yes, you are willing to pay, what is the most you would expect to pay on top of your weekly shopping bill to support the Food Safety Agency?

Follow up question: please can you give me a reason for being willing to pay or not.

Appendix 5: Valuation question number 3

Question 1: How many of the following have you used in the last week?

A)	Small food shop / corner shop	C)	Cafe / Restaurant
B)	Takeaway	D)	Canteen

Question 2

Do you think all the food you buy is safe to eat?

Disagree Strongly	Disagree	Neither	Agree	Agree Strongly
1	2	3	4	5

Question 3

Do you trust the Government to make sure that food is safe?

Disagree Strongly	Disagree	Neither	Agree	Agree Strongly
1	2	3	4	5

Question 4

Do you think some of the food industry is more interested in profits than its customers?

Disagree Strongly	Disagree	Neither	Agree	Agree Strongly

1 2 3 4 5

Question 5

Do you think all food outlets offer the same levels of food safety?

1 2 3 4 5

Question 6

Do food safety issues, such as food poisoning, influence where you do your food shopping?

Disagree Disagree Neither Agree Agree
Strongly Strongly

1 2 3 4 5

Question 7

About how much does your household spend each week on food?

From supermarkets?

From any other food outlets

(including eating out from canteens, restaurants and takeaways?)

Question 8

The government has brought in a new Food Safety Department called - The Food Standards Agency

One of the aims (of this) is to improve hygiene in food outlets. So that, by 2006, food poisoning will be reduced by 20%.

Food hygiene will be improved as the Government will be working with the food Industry and local councils to improve the

Storage

Handling

Preparation and

Cooking of food up to the point of sale

in the food outlets where you buy your food.

To pay for these improvements in food hygiene, food prices would go up wherever it was bought.

But, this would make sure small food shops were brought up to the same standard as the big supermarkets.

Would you prefer to pay the same amount for food as you do now?

With no reduction in food poisoning. Or

Would you be willing to pay more?

So that food poisoning, in the places where you buy your food, is reduced by 20%.

If you would be willing to pay more, then what is the most you would be willing to pay on top of your total food bill?

Follow up question: please can you give me a reason for being willing to pay or not?

Appendix 6

Question 1

About how much does your household spend each week on food?

From supermarkets?

From any other food outlets

(including eating out from canteens, restaurants and takeaways?)

Question 2: Valuation question number 4

A national agency has been set up to deal with food safety.

One of its aims is to improve hygiene in food outlets.

Food hygiene could be improved by the new agency working closely with local councils.

This will improve the storage, handling, preparation and cooking of food in the food outlets where you buy your food.

These improvements in food hygiene: would make sure that small food outlets were brought up to the same standard as the big supermarket.

But food prices would have to go up, wherever it was bought, to pay for these improvements.

Would you be willing to pay these higher prices, for better food hygiene?

Yes, I would be willing to pay higher prices for better food hygiene.

[Remember this extra money could be spent on other goods and services instead]

No, I would not be willing to pay higher prices for better food hygiene.

[This might be because you are satisfied with current levels of food hygiene]

If you would be willing to pay higher prices for better food hygiene:

What is the most you would be willing to pay on top of your weekly household food shopping bill? [Please state money amount]

Follow up question: please can you give me a reason for being willing to pay or not.

Appendix 7

Question 1

About how much does your household spend each week on food?

From supermarkets?

From any other food outlets

(including eating out from canteens, restaurants and takeaways?)

Question 2: Valuation question number 5

Food hygiene, in the question, means the storage, handling, preparation and cooking of food.

To improve consumer choice and food safety a new food agency has been brought in.

It is possible that the agency could bring in new regulations on food hygiene.

This would bring standards of hygiene in small food outlets up to the level of the big supermarkets.

So food hygiene would be improved mainly at the small food outlets.

Food hygiene in the big supermarkets and major restaurants would also be monitored.

It would lead to increased food costs, wherever it was bought.

Not just at the corner shop and local cafe but also at the big supermarkets.

Based on this: what is the most, if anything; you would be willing to spend on top of your food bill in a year?

Follow up question: please can you give me a reason for being willing to pay or not?

Appendix 8: Valuation question number 6

Question 1 How many of the following have you used in the last week?

A) Small food shop / corner shop	C) Cafe / Restaurant
B) Takeaway	D) Canteen

Question 2 Do you think all the food you buy is safe to eat?

Disagree	Disagree	Neither	Agree	Agree
Strongly				Strongly

1	2	3	4	5
---	---	---	---	---

Question 3 Do you trust The Government to make sure that food is safe?

Disagree	Disagree	Neither	Agree	Agree
Strongly				Strongly

1	2	3	4	5
---	---	---	---	---

Question 4

Do you think some of the Food Industry is more interested in profits than its customers?

Disagree	Disagree	Neither	Agree	Agree
Strongly				Strongly

1	2	3	4	5
---	---	---	---	---

Question 5

Do you think all food outlets offer the same levels of food safety?

Disagree Strongly	Disagree	Neither	Agree	Agree Strongly
1	2	3	4	5

Question 6

Do issues such as food hygiene influence where you buy your food?

Disagree Strongly	Disagree	Neither	Agree	Agree Strongly
1	2	3	4	5

Question 7

How much does your household spend each week on food?

- A) Supermarkets
- B) From any other food outlets?

Including eating out from canteens, restaurants, and takeaways

Question 8

Definition

Food hygiene covers the storage, handling, preparation and cooking of food.

Background

A national food agency has been set up.

It is possible that it will bring in new regulations on food hygiene.

These new regulations, if introduced, would monitor the standards of hygiene in small food outlets.

Food hygiene in the big supermarkets and major restaurants would also be looked at.

The hygiene of all the food you buy would be at the standard you expect from the big supermarkets.

But improved food standards would lead to increased food costs at every outlet -

From the corner store to the supermarket

From the local cafe to major restaurants.

Question

Would you be willing to spend an extra £100 per year?

On top of your food spending for improved food hygiene?

This money, for investment in food hygiene, could be spent on other goods and services instead.

- 1) Definitely No
- 2) Probably No
- 3) Probably Yes
- 4) Definitely Yes

Please give a reason for your answer to the question.

No reasons

- 1) I am satisfied with the food hygiene available.
- 2) I don't think extra spending on food hygiene would be worth it.
- 3) The food outlets should pay for improvements in food hygiene.
(I do not want to pay for independent enforcement of food outlets).
- 4) Other - PLEASE STATE

Yes reasons

- 1) It could give me more choice over where I buy my food.
I would be more likely to use small food outlets.

- 2) I think food hygiene needs to be better [more consistent] at the large food outlets.
- 3) Other - PLEASE STATE

Question 9 Household Composition

How many people in your household are?

A) under the age of 5 :
B) between the ages of 5-16 : C) 16+

Question 10 Age Group of respondent

A) 18-25 B) 26-35 C) 36-45
D) 46-55 E) 56-65 F) 66+

Question 11 Education of respondent

Which of these categories best describes the stage
where you left education or
where you have reached in your education?

A) Completed Secondary Education
B) [G] CSE / O Level / GNVQ
C) BTEC / A Level / Advanced GNVQ
D) Certificate / Diploma e.g. HNC / HND
E) Professional Qualification
F) Degree / Higher Degree

Question 12

What is the occupation of the main income earners in the household?

Householder 1:

Householder 2:

Question 13 Income of household

What is the total household income before tax?

A)	less than - £ 10,000	E)	£40,000 - £49,999
B)	£10,000 - £ 19,999	F)	£50,000 - £59,999
C)	£20,000 - £ 29,999	G)	£60,000 +
D)	£30,000 - £39,999		

Appendix 9: The final version of the valuation question

Preamble (Introduction to the questionnaire used for face-to-face interviews)

"Hi, I'm Chris Packham and I'm doing some *food research for Newcastle University* - would you like to answer a few questions? (emphasize words in italics)"

If yes, or undecided state "it should only take about five minutes" and show card confirming student status: This is to confirm that Christopher Packham is registered as a postgraduate student at Newcastle University. He is investigating the public's attitudes to various aspects of food safety.

If respondent seems fairly keen also state "I'm interested in finding out if you've got any comments on the questions". Otherwise just run through the survey and get the quantitative data.(Give folder to respondent with questions in - let them read the question while I can also read it to them)

Question 1 How many of the following have you used in the last week?

A) Small food shop / corner shop	C) Cafe / Restaurant
B) Takeaway	D) Canteen

Question 2 Do you think all the food you buy is safe to eat?

Disagree	Disagree	Neither	Agree	Agree
Strongly				Strongly

1 2 3 4 5

Question 3 Do you trust The Government to make sure that food is safe?

Disagree	Disagree	Neither	Agree	Agree
Strongly				Strongly

1 2 3 4 5

Question 4

Do you think some of the Food Industry is more interested in profits than its customers?

1 2 3 4 5

Question 5

Do you think all food outlets offer the same levels of food safety?

1 2 3 4 5

Question 6

Do issues such as food hygiene influence where you buy your food?

1 2 3 4 5

Question 7

How much does your household spend each week on food?

From supermarkets and from any other food outlets - including eating out from canteens, restaurants and takeaways.

Question 8

Definition

Food hygiene, in the question, is only about the storage, handling, preparation and cooking of food only in the food outlets. These outlets are small food shops, small takeaways or cafes, big supermarkets and major restaurants.

The question refers only to common cases of food poisoning lasting less than 24 hours.

Background

A national food agency has been set up.

It is possible that it will bring in new regulations on food hygiene.

These new regulations would monitor the standards of hygiene in small food outlets.

Food hygiene in the big supermarkets and major restaurants would also be looked at.

The hygiene of the food you buy would be at the standard you expect from the big supermarkets.

But consistent standards would lead to increased food costs at every outlet.

Background continued

Reasons can be given against spending more money on food hygiene.

Here are some reasons against spending more money.

I am satisfied with the food hygiene available.

I don't think extra spending on food hygiene would be worth it.

I think the food outlets should pay for all the checking of food hygiene. I do not want to pay for independent enforcement of food outlets.

Remember that money spent on consistent food hygiene could be spent on other goods and services instead.

Question

Would you be willing to spend an extra £100 per year?

On top of your food spending for consistent food hygiene?

- 1) Definitely No
- 2) Probably No
- 3) Probably Yes
- 4) Definitely Yes

Please give 1 reason for your last answer

Reasons if you said no

- 1) I am satisfied with the food hygiene available.
- 2) I don't think extra spending on food hygiene would be worth it.
- 3) The food outlets should pay for all the checking of food hygiene.
I do not want to pay for independent enforcement of food outlets.
- 4) Other reason - please state

Reasons if you said yes

- 1) It could give me more choice over where I buy my food. I would be more

likely to use small food outlets.

- 2) I think food hygiene needs to be more consistent or more reliable at the large food outlets.
- 3) Other reason - please state

Question 9 Household Composition

How many people in your household are?

- A) under the age of 5 :
- B) between the ages of 5-16 :
- C) 16+

Question 10 Age Group of respondent

A) 16-24	B) 25-34	C) 35-44
D) 45-54	E) 55-65	F) 66+

Question 11 Education of respondent

Which of these categories best describes the stage?

where you left education or

where you have reached in your education

- A) Completed Secondary Education
- B) [G]CSE / O Level / GNVQ
- C) BTEC / A Level / Advanced GNVQ
- D) Certificate / Diploma e.g. HNC / HND
- E) Professional Qualification
- F) Degree / Higher Degree

Question 12

What is the occupation of the main income earners in the household?

Householder 1:

Householder 2:

Question 13 Income of household

What is the total household income before tax?

A) less than - £ 10,000	E) £40,000 - £49,999
B) £10, 000 - £ 19,999	F) £50,000 - £59,999
C) £20,000 - £ 29,999	G) £60,000 +
D) £30,000 - £39,999	

Appendix 10

The explanation of the questions is below and the data is outlined on the following pages.

Question 1 Outlets visited

Question 2 Safe to eat

Question 3 Trust Govt.

Question 4 Profit > Customer (Profit motive greater than customer interest)

Question 5 Outlets same level

Question 6 Hygiene Influences

Question 7 Total Spend (Total household food shopping bill in a week)

Question 8 WTP Yes / No

Question 8 WTP Reason

Question 9 Number [of people in the household] Age[d] <5

Question 9 Number [of people in the household] Age[d] 5-16

Question 9 Number [of people in the household] Age[d] Over 16

Question 10 Age Group (of the respondent)

Question 11 Education (of the respondent)

Question 12 Job (or occupation of the respondent)

Question 13 Income (of the household)

Bid = £100		Outlets visited	Safe to eat	Trust Govt.	Profit > Customer	Outlets same level	Hygiene Influences	Total Spend	WTP Y / N
	Gender								
1	1	2	2	1	5	2	3	200	4
2	0	1	4	3	4	2	2	80	4
3	0	1	2	3	5	2	2	70	3
4	0	0	2	3	4	2	2	35	1
5	0	2	2	4	4	2	4	50	3
6	1	1	4	4	4	2	4	50	3
7	0	1	2	2	5	1	4	80	4
8	1	0	2	2	5	1	3	.	2
9	0	3	5	2	4	2	4	75	3
10	1	1	2	.	5	3	4	40	2
11	1	1	2	2	4	2	4	80	1
12	1	1	2	2	4	2	3	80	4
13	1	1	4	2	4	2	4	175	3
14	0	1	4	2	4	2	4	70	4
15	0	2	4	4	4	2	4	60	3
16	0	1	3	2	4	2	4	30	3
17	0	3	4	2	5	2	5	100	4
18	0	1	3	2	5	2	2	100	3
19	1	1	2	1	5	2	5	80	4
20	1	2	2	2	4	2	4	100	4
21	1	2	2.5	2	5	2	5	40	3
22	0	1	4	4	3	2	4	60	3
23	1	2	4	2	5	1	5	100	4
24	1	2	4	3	5	2	4	40	3
25	0	0	4	4	3	2	4	100	4
26	0	2	2	2	5	2	4	65	3
27	0	1	1	1	5	1	4	70	4
28	0	1	2	2	4	1	5	60	4
29	0	0	3	2	3	1	4	150	2
30	0	0	4	2	2	1	5	.	3
31	1	1	2	1	5	1	5	175	4
32	1	1	4	4	4	2	4	20	2
33	0	1	4	2	4	2	2	90	1
34	0	1	3	3	2	2	4	160	4
35	1	3	2	2	5	1	5	65	3
36	1	2	2	2	5	2	4	100	4
37	0	1	2	4	4	2	4	65	3
38	1	3	4	3	4	1	5	170	3
39	0	1	4	4.5	4	4	4	25	4
40	0	2	2	4	4	2	3	85	3
41	0	2	3.5	2	4	2	4	120	3
42	1	0	4	3	4	2	4	100	3
43	1	2	2	4	.	2	5	100	4
44	1	0	2	2	4	2	4	20	1
45	0	2	3	3	4	2	5	100	3
46	0	1	2	3	4	2	4	.	2
47	0	2	2	2	5	1	5	200	4
48	1	2	3	2.5	4	2	4	30	3
49	0	1	3	4	3	2	4	.	2

50	1	0	4	1	4	2	4	50	1
51	0	2	3	4	4	2	4	42.5	4
52	0	2	4	4	4	2	2	70	4
53	1	3	3	2	5	2	4	110	3
54	0	0	4	2	5	2	4	50	2
55	1	2	4	4	4	2	4	80	3
56	1	4	2	2	4	2	4	100	3

Bid = £150		Outlets visited	Safe to eat	Trust Govt.	Profit > Customer	Outlets same level	Hygiene Influences	Total Spend	WTP Y / N
	Gender								
1	1	2	3	3	4	2	4	50	3
2	0	1	4	4	4	2	4	55	3
3	0	2	4	4	5	1	4	55	3
4	0	4	4	4	4	2	4	35	4
5	1	2	2	1	5	1	5	15	1
6	1	3	3	1	4	2	5	80	3
7	0	1	3	3	5	1	4	70	3
8	1	2	2	4	4	4	4	40	2
9	0	1	4	2	4	2	4	80	4
10	1	.	2	4	4	2	4	40	2
11	1	1	4	2	5	2	4	30	1
12	0	3	4	4	5	1	4	50	1
13	0	3	3	1	5	1	2	25	2
14	0	1	4	3	4	2	4	80	3
15	1	2	2	2	5	2	4	.	3
16	1	0	4	4	4	2	5	55	3
17	1	3	2	2	4	2	5	150	4
18	1	1	2	2	4	2	4	60	1
19	0	2	4	4	5	2	3	100	3
20	0	2	4	2	4	4	3	60	3
21	0	3	2	2	4	1	5	100	3
22	0	0	4	4	5	2	5	50	4
23	1	2	4	2	5	2	4	100	4
24	0	1	2	2	4	2	4	60	3
25	0	3	3	3	4	4	3	100	2
26	0	1	3	1	4	1	4	80	3
27	1	2	2	1	5	2	3	50	2
28	1	1	4	4	5	2	5	27.5	3
29	.	1	3	2	4	2	4	50	2
30	0	0	3	3	2	2	4	35	3
31	0	1	3	2	4	2	2	100	3
32	1	3	2	2	5	1	2	65	2
33	0	1	2	2	5	1	4	110	2
34	0	3	2	3	4	2	2	100	3
35	0	2	4	3	4	1	4	55	1
36	1	2	4	3	4	2	4	70	2
37	1	4	3	3	3	3	4	100	3
38	1	0	2	2	4	2	5	70	2
39	1	1	4	2	5	1	4	150	1
40	1	1	2	2	5	1	4	100	4
41	1	0	4	2	4	2	4	45	4

42	0	1	4	3	2	1	4	.	2
43	1	2	4	4	4	4	4	.	4
44	1	2	2	2	4	2	5	60	4
45	0	0	2	2	5	2	4	65	4
46	1	1	2	3	3	2	5	50	3
47	1	1	2	2	5	2	5	60	4
48	1	0	2	2	5	1	5	35	3
49	0	0	4	4	3	.	5	35	3
50	0	2	4	4	4	2	4	60	4

Bid = £200		Outlets visited	Safe to eat	Trust Govt.	Profit > Customer	Outlets same level	Hygiene Influences	Total Spend	WTP Y / N
	Gender								
1	1	0	2	3	4	2	4	.	3
2	1	0	4	2	4	2	4	15	.
3	0	2	2	3	4	2	4	80	4
4	0	2	4	3.5	4	2	4	70	3
5	1	0	4	4	4	2	4	60	2
6	1	2	4	4	4	2	4	120	3
7	1	3	2	2	4	2	5	50	4
8	1	2	4	4	4	2	4	30	2
9	1	2	2	2	4	2	4	50	2
10	0	1	2	2	5	2	3	40	1
11	1	3	4	4	4	4	4	60	1
12	0	2	1	2	4	2	4	133	4
13	0	2	4	4	5	2	5	50	3
14	0	0	4	2	4	2	2	70	4
15	1	4	2.5	3	4	2	4	40	3
16	0	4	4	2	5	1	4	85	2
17	0	2	2	4	4	2	4	25	1
18	1	1	4	2	4	2	4	35	1
19	1	2	4	4	4	4	4	25	1
20	1	1	4	2	4	2	4	60	3
21	1	2	4	4	4	2	4	50	2
22	1	3	2	2	5	1	5	30	3
23	1	0	2	4	4	2	4	55	3
24	1	0	2	2	4	2	4	60	2
25	1	3	4	2	2	2	4	80	3
26	1	1	4	2	5	2	5	30	2
27	1	2	4	4	4	2	3	35	1
28	0	2	5	4	4	1	4	40	3
29	1	1	3	2	5	2	4	40	2
30	1	0	2	1	4	2	5	50	2
31	0	2	4	4	4	2	4	100	4
32	0	2	3	2	5	3	4	60	2
33	0	2	3	3	4	2	5	25	2
34	1	0	3	3	4	2	4	100	3
35	1	3	2	2	4	2	5	90	4
36	0	1	4	4	5	4	5	80	2
37	1	2	4	4	4	2	4	40	1
38	0	0	4	2	4	2	4	.	3
39	1	2	4	4	4	2	4	40	3

40	0	2	4	4	4	2	3	40	2
41	1	2	2	2	5	2	5	25	3
42	0	2	3	2	4	1	5	100	3
43	0	1	3	2	3	2	4	85	3
44	1	2	3	2	4	2	5	95	4
45	0	1	4	3	4	2	4	20	2
46	1	3	4	4	2	2	4	100	4
47	1	2	4	3	4	2	4	120	2
48	1	2	2	2	4	2	4	65	4
49	1	3	3	2	5	2	5	100	4
50	1	0	3	2.5	4	2	5	70	3
51	0	1	2	2	5	2	5	50	3
52	1	1	2	2	4	2	4	130	4
53	0	2	2	2	4	2	4	140	1
54	1	0	2	2	5	2	4	40	3
55	0	2	4	2	4	1	4	30	4

Bid = £250		Outlets visited	Safe to eat	Trust Govt.	Profit > Customer	Outlets same level	Hygiene Influences	Total Spend	WTP Y / N
	Gender								
1	0	1	2	2	4	2	4	60	4
2	1	2	2	2	5	2	4	70	3
3	1	0	4	2	4	1	4	30	3
4	1	.	4	4	4	2	4	120	4
5	1	3	2	4	4	2	4	100	1
6	1	0	4	4	2	2	4	35	1
7	1	2	2	3	4	2	4	100	3
8	1	0	5	3	4	1	5	90	1
9	0	0	1	1	4	2	4	20	2
10	1	3	3	3	4	1	5	45	2
11	1	1	2	1	5	1	5	50	3
12	1	4	2	3	5	1	4	130	3
13	1	3	4	2	4	4	5	90	3
14	1	2	2	2	4	1	5	90	3
15	0	1	2	4	4	2	5	37.5	2
16	0	2	4	2	4	2	4	60	3
17	1	2	1	2	4	2	4	100	2
18	0	1	1	3	5	1	4	40	2
19	1	2	2	2	4	2	4	100	1
20	1	2	4	4	4	2	4	100	3
21	1	2	5	4	3	2	5	100	2
22	0	2	4	2	4	2	5	75	4
23	0	2	4	4	4	3	4	150	3
24	0	1	4	4	2	2	4	35	1
25	0	0	4	4	4	2	3	50	2
26	0	2	3	3	4	2	3	80	3
27	1	1	3	2	4	2	5	70	3
28	1	1	2	4	4	2	4	30	2
29	0	0	2	2	5	2	4	50	1
30	0	1	2	2	5	3	2	15	1
31	1	1	4	3	3	4	4	50	2
32	1	.	4	3	4	2	4	100	2

33	1	1	2	4	4	1	4	105	3
34	1	.	4	4	4	3	3	.	.
35	1	1	4	2	4	2	4	45	3
36	1	3	2	2	4	2	4	80	3
37	1	2	2	1	4	2	4	100	4
38	1	3	4	2	5	1	5	100	4
39	0	3	2	2	4	1	4	80	3
40	0	1	4	3	2	4	5	65	2
41	0	2	2	2	5	1	5	40	3
42	1	0	4	4	4	2	4	65	2
43	1	3	4	4	3	2	4	90	3
44	1	2	4	4	4	2	4	30	3
45	0	2	4	4	2	2	3	100	3
46	0	1	4	3	4	2	2	50	2
47	0	1	2	2	4	2	4	50	3
48	1	0	2	2	5	2	4	90	4
49	0	1	4	4	4	4	4	42.5	4
50	1	2	4	4	4	2	4	50	2
51	0	2	2	2	4	1	4	70	3
Bid = £350		Outlets visited	Safe to eat	Trust Govt.	Profit > Customer	Outlets same level	Hygiene Influences	Total Spend	WTP Y / N
	Gender								
1	1	0	3	2	4	2	4	50	3
2	1	1	4	4	4	2	4	60	2
3	0	1	4	4	4	2	4	50	2
4	1	1	2	1	4	1	4	50	3
5	1	1	4	4	4	2	4	80	1
6	0	3	2	4	5	2	4	100	3
7	1	0	2	2	4	2	4	20	3
8	0	1	4	2	3	1	5	.	4
9	0	2	2	2	4	2	2	50	3
10	1	2	2	2	4	2	5	100	1
11	0	2	2	2	4	2	4	50	2
12	0	3	2	1	5	2	4	120	3
13	1	1	2	3	4	2	4	80	3
14	0	3	4	4	4	2	4	70	1
15	1	1	3	3	4	2	4	70	2
16	1	0	2	2	4	2	5	50	3
17	0	3	2	1	5	1	5	100	2
18	0	2	2	1	5	2	4	47.5	2
19	0	3	2	1	4	1	5	15	1
20	0	3	3	4	4	1	5	70	3
21	0	3	3	3	4	2	3	50	2
22	1	3	3	4	3	3	4	40	3
23	1	2	2	2	4	2	4	40	3
24	0	3	2	1	5	1	5	80	1
25	1	3	2	1	4	2	4	60	3
26	1	1	2	2	4	2	4	70	3
27	0	1	2	1	4	1	4	50	1
28	.	1	2	1	5	2	4	47.5	3
29	0	2	2	2	4	2	4	50	2
30	1	3	2	2	4	2	4	75	2

31	0	2	4	4	4	4	4	85	3
32	1	1	4	4	5	2	4	65	3
33	0	3	2	2	4	2	4	50	2
34	0	3	3	2	5	2	4	60	1
35	1	2	2	2	4	1	5	70	3
36	1	2	4	3	4	2	4	90	4
37	1	2	2	2	4	2	4	75	3
38	0	2	4	4	3	2	4	80	4
39	0	0	2	2	5	2	4	50	3
40	1	0	2	2	4	2	4	25	2
41	1	0	3	3	5	1	2	17.5	1
42	0	3	3	3	5	1	5	85	1
43	0	1	2	2	4	2	4	70	3
44	0	1	2	2	5	1	5	45	4
45	0	2	4	2	4	2	5	80	3
46	0	1	3	4	3	2	4	90	3
47	1	3	4	2	4	1	4	150	2
48	0	1	4	4	4	2	4	100	3
49	1	2	4	3	4	2	4	50	2
50	1	0	4	2	2	2	4	.	2

Bid = £450		Outlets visited	Safe to eat	Trust Govt.	Profit > Customer	Outlets same level	Hygiene Influences	Total Spend	WTP Y/ N
	Gender								
1	0	2	4	4	4	3	3	200	2
2	1	.	2	2	5	3	5	150	2
3	1	2	3	3	4	1	5	87.5	1
4	1	0	2	2	4	2	4	100	2
5	0	0	4	4	3	3	2	27.5	1
6	1	1	2	2	4	2	5	80	4
7	0	2	3	2	4	1	4	120	3
8	1	1	2	2	5	2	4	60	3
9	0	1	2	2	4	2	4	150	3
10	1	1	4	4	3	2	4	80	1
11	1	1	2	2	4	2	4	45	3
12	1	1	2	3	4	2	4	70	3
13	0	1	2	2	4	2	2	45	1
14	0	0	2	2	4	2	4	10	1
15	1	0	4	4	4	2	4	40	2
16	1	0	2	2	4	1	4	90	2
17	0	1	4	2	4	4	3	100	4
18	1	2	4	4	4	2	2	30	2
19	1	2	3	3	4	2	4	57.5	3
20	0	1	4	4	4	2	4	50	1
21	1	1	4	3	4	2	4	35	2
22	0	1	4	4	5	2	4	60	2
23	1	1	4	2	2	2	4	.	4
24	0	2	2	2	4	1	5	.	2
25	1	2	2	2	4	2	4	40	2
26	0	0	2	1	5	2	4	130	3
27	1	2	3	4	4	2	4	100	3
28	1	2	3	2	5	1	5	150	4
29	1	1	4	3	3.5	4	3	75	2
30	0	1	2	2	4	2	2	80	2
31	1	0	2	2	4	1	5	50	3
32	1	2	4	2	5	2	5	100	4
33	0	3	3	3	5	1	5	80	4
34	1	2	4	3	4	3	5	55	1
35	0	0	4	4	4	2	4	25	1
36	1	2	3	2	5	2	4	100	3
37	1	2	4	4	4	2	4	100	3
38	0	3	2	2	4	2	4	100	3
39	0	1	2	2	4	2	4	70	2
40	0	2	5	4	4	2	3	.	3
41	1	4	4	2	4	1	5	50	1
42	0	0	4	2	3	2	4	37.5	1
43	0	2	2	2	4	2	2	65	3
44	0	0	4	2	4	2	5	90	3
45	0	1	4	2	4	2	4	20	2
46	1	1	4	3	4	2	4	90	1
47	1	0	2	2	4	2	4	60	3
48	1	0	2	4	5	2	4	90	2

49	1	0	4	4	5	2	4	40	2
50	0	0	4	4	3	2	4	60	1

Reason	WTP	No.			Age Group	Education	Job	Income	
		Age <5	Age 5-16	Over 16				BID	LEVEL
1	3	0	0	3	4	2	1	.	.
2	1	0	0	3	4	4	1	3	3
3	2	0	0	2	5	2	3	3	3
4	1	0	0	2	6	1	3	1	1
5	2	0	0	2	4	5	2	.	.
6	3	0	0	2	5	1	1	4	4
7	3	1	1	2	2	4	1	3	3
8	3	.	.	.	.	.	.	.	.
9	.	1	0	2	3	3	2	.	.
10	3	0	0	2	6	4.5	3	.	.
11	2	0	1	3	4	1	1	5	5
12	1	0	2	2	3	2	1	5	5
13	3	0	2	2	3	1	3	.	.
14	2	0	0	2	6	5	3	6	6
15	2	0	0	2	5	3	1	3	3
16	1	0	2	2	3	4.5	1	3	3
17	1	0	3	3	3	2	1	5	5
18	2	1	0	2	2	4	1	4	4
19	2	1	0	2	2	4.5	1	7	7
20	1	0	1	4	4	5	1	4	4
21	1	0	0	2	4	5	1	3	3
22	1	0	0	3	5	1	1	.	.
23	2	1	0	3	3	4	1	5	5
24	2	0	0	1	6	1	3	2	2
25	1	0	0	2	6	1	3	.	.
26	1	2	0	2	3	5	1	.	.
27	2	0	1	2	3	5	1	4	4
28	3	0	0	2	4	2	1	.	.
29	2	0	0	3	4	2	1	7	7
30	.	0	0	1	6	4.5	3	.	.
31	2	0	0	2	2	2	2	.	.
32	1	0	0	1	5	4.5	3	1	1
33	1	0	0	2	5	2	1	4	4
34	2	0	0	4	4	3	3	3	3
35	1	1	1	2	2	4	1	4.5	4.5
36	1	0	2	3	3	5	1	5	5
37	2	0	1	2	4	2	2	5	5
38	2	0	0	2	5	5	3	3	3
39	3	0	0	2	5	1	3	1	1
40	2	0	0	2	5	1	2	.	.
41	1	0	2	2	3	2	1	4	4
42	3	0	0	3	3	2	2	5	5
43	2	0	0	4	1	2	1	.	.
44	3	0	0	1	6	1	3	1	1
45	2	1	0	2	3	2	2	2	3
46	1	0	0	2	6	1	3	1	1
47	3	0	2	3	5	5	1	5	5
48	2	0	0	2	2	3	2	4	4

49	1	0	0	2	3	1	3	1
50	1	0	0	2	6	1	3	1
51	2	0	1	3	1	2	2	.
52	1	0	1	3	1	3	2	.
53	1	0	2	2	3	2	2	4
54	2	0	0	2	6	1	3	3
55	2	0	0	4	2	5	1	4
56	2	0	0	3	1	3	2	.

Reason	WTP	No.			Age Group	Education	Job	Income £150
		Age <5	Age 5-16	Over 16				
1	2	1	0	1	3	4	1	3
2	1	2	0	2	1	4.5	1	3
3	1	0	0	2	2	3	1	5
4	1	0	0	1	5	5	1	3
5	4	0	0	1	2	5	1	3
6	2	0	2	3	4	4.5	1	7
7	2	1	1	2	3	1	2	2
8	3	.	.	.	.	.	.	.
9	2	0	0	2	5	4.5	3	3
10	3	0	0	2	6	1	3	2
11	2	0	0	1	6	1	3	.
12	3	0	0	1	3	4.5	1	7
13	3	0	0	1	3	3	2	2
14	2	0	0	4	6	4	3	2
15	.	0	0	1	6	2	3	2
16	3	0	0	2	5	1	3	2
17	1	0	1	4	3	4.5	1	3
18	2	0	0	2	5	1	3	2
19	3	0	0	2	5	4.5	2	.
20	2	1	1	2	2	5	1	5
21	2	1	0	2	2	5	1	4
22	2	0	0	2	4	3	2	2
23	1	0	1	5	4	1	2	3
24	2	0	1	4	4	5	2	3
25	1	0	0	3	1	3	2	.
26	2	0	1	3	5	4	1	3
27	4	0	0	2	5	4	2	3
28	2	0	0	2	6	4	3	2
29	2	0	0	2	6	.	3	.
30	1	0	0	1	4	5	1	4
31	1	0	0	3	5	5	3	.
32	4	0	0	2	4	5	1	5
33	2	0	1	3	3	5	1	5
34	2	1	0	2	2	5	1	5
35	1	0	0	2	2	5	1	.
36	1	1	0	2	2	5	1	4
37	3	0	2	2	6	2	1	4
38	1	0	0	2	3	4.5	2	5
39	.	0	3	2	4	4.5	1	3
40	1	0	1	1	4	4.5	1	3

		0	0	1	.	4.5	3	.	.	.	
41	2	0	0	2	5	4.5	1	3	3	.	
42	3	0	0	1	.	4.5	1	3	3	.	
43	2	0	0	3	6	5	3	3	3	.	
44	3	0	0	4	4	4	1	1	1	.	
45	2	0	2	4	4	4	3	3	2	.	
46	1	0	0	2	5	4.5	3	3	3	2	
47	3	0	0	2	5	4	3	3	3	.	
48	1	0	0	3	5	4	3	3	3	.	
49	1	0	0	1	5	5	3	3	3	3	
50	1	0	0	2	5	3	2	2	4	4	
	WTP	No.	No.	No.	Age	Education	Job	Income			
Reason		Age <5	Age 5-16	Over 16	Group	BID	LEVEL	£200			
1	2	0	0	1	6	2	3	1			
2	.	0	0	1	6	1	3	1			
3	2	1	0	2	3	4	3	3			
4	3	0	0	2	2	5	2			.	
5	1	0	0	2	1	3	3			2	
6	2	0	0	3	5	1	3			.	
7	3	0	0	2	4	2	3			1	
8	2	0	0	2	2	5	2			4	
9	3	0	0	1	6	1	3			2	
10	2	0	0	2	6	1	3			2	
11	1	0	0	1	4	1	1			.	
12	3	0	0	4	4	1	2			4	
13	2	0	0	2	4	2	1			4	
14	3	0	0	2	3	3	2			3	
15	2	0	1	1	4	4.5	1			2	
16	1	1	0	2	2	4	1			4	
17	3	0	0	1	6	.	3			1	
18	3	0	0	2	4	1	3			1	
19	4	0	0	2	2	4	2			4	
20	3	0	1	2	3	2	2			2	
21	2	0	0	2	6	1	3			2	
22	3	0	0	2	3	5	1			2	
23	1	0	0	3	5	1	3			.	
24	3	0	0	2	6	1	3			1	
25	2	0	0	3	5	2	3			2	
26	3	0	0	2	6	.	3			2	
27	4	0	0	1	5	1	3			1	
28	3	0	0	1	2	5	1			3	
29	3	0	0	1	3	5	2			3	
30	3	0	0	3	5	1	1			3	
31	2	0	0	2	1	.	2			4	
32	3	0	0	2	2	1	2			2	
33	3	0	1	.	1	2	1			.	
34	2	0	0	4	4	2	2			.	
35	2	0	2	2	4	5	1			3	
36	4	0	0	3	4	4	1			5	
37	1	0	0	1	3	5	1			3	
38	1	0	0	1	6	.	3			1	
39	1	0	0	3	6	2	3			.	

40	3	0	0	2	2	5	2	4
41	3	0	0	1	6	5	3	4
42	3	0	0	2	3	5	1	7
43	3	0	0	2	4	4	1	4
44	3	0	1	3	3	5	1	.
45	1	0	0	2	5	5	3	3
46	1	0	0	5	6	1	1	6
47	1	0	1	2	3	5	2	.
48	1	0	0	2	4	5	1	7
49	2	1	1	2	3	2	2	5
50	2	0	0	2	3	1	1	5
51	2	0	0	4	6	4	1	3
52	2	0	0	2	4	2	3	3
53	4	0	2	2	4	5	1	5
54	2	0	0	4	4	2	2	3
55	2	0	0	2	2	2	1	4

Reason	WTP	No.			Age Group	Education	Job	Income
		Age <5	Age 5-16	No. Over 16				
1	2	0	0	3	2	2	1	6
2	2	0	0	2	2	5	1	6
3	2	0	0	1	5	4	3	1
4	1	0	1	3	4	3	1	5
5	3	0	0	3	4	1	2	4
6	2	0	0	1	6	.	3	1
7	3	2	0	2	3	3	1	6
8	3	0	0	2	5	2	2	3
9	2	0	0	1	3	4.5	1	5
10	3	2	0	2	2	2	2	4
11	2	0	0	2	2	5	1	.
12	1	0	3	2	3	5	1	3
13	3	1	1	2	2	2	2	.
14	2	1	2	2	3	5	1	5
15	2	0	0	3	6	2	3	3
16	1	0	0	3	4	1	2	2
17	3	1	2	2	3	4	1	4
18	3	0	0	2	6	6	3	2
19	3	1	0	1	3	5	1	4
20	2	1	0	4	4	1	2	3
21	2	2	0	2	2	4	1	5
22	2	0	2	2	2	5	1	6
23	3	0	0	5	1	1	2	.
24	1	0	0	1	3	1	2	2
25	3	1	1	2	3	3	2	3
26	2	1	0	2	3	5	1	.
27	3	0	0	2	2	5	1	6
28	2	0	0	1	6	1	3	.
29	3	0	0	2	6	1	3	1
30	4	0	0	1	6	1	3	3
31	1	0	0	2	6	1	3	1
32	2	0	3	3	3	2	2	4

33	3	2	0	2	2	5	1	4
34	.	.	.	.	6	.	3	.
35	1	0	0	2	3	5	1	4
36	2	0	1	3	1	3	2	5
37	2	0	3	2	3	5	1	4
38	1	0	0	4	4	2	1	6
39	3	0	0	2	6	4.5	3	5
40	2	0	2	1	1	1	2	2
41	1	0	0	2	5	2	3	2
42	3	0	0	2	6	4	3	2
43	1	0	2	2	3	4	2	5
44	3	0	0	1	6	.	3	1
45	3	0	1	4	1	4	1	.
46	4	0	2	1	4	1	1	2
47	2	0	0	1	3	5	1	4
48	1	0	0	4	3	2	1	3
49	1	0	0	2	6	.	3	2
50	3	1	0	2	2	3	2	4
51	2	1	0	2	2	5	1	4

WTP Reason	No.			Age Group	Education BID	Job LEVEL	Income £350	
	Age <5	Age 5-16	Over 16				£350	£350
1	2	0	2	6	1	3	2	2
2	1	0	2	1	2	2	2	4
3	1	0	2	6	4	3	2	.
4	2	0	2	6	1	3	.	.
5	1	0	2	5	.	3	3	2
6	3	0	4	1	3	1	.	.
7	2	0	1	6	.	3	1	1
8	3	0	3	4	.	.	.	.
9	3	0	2	2	2	2	2	4
10	3	0	2	2	3	2	2	4
11	3	0	2	3	2	2	2	4
12	2	1	3	3	4	1	1	5
13	2	1	2	2	5	1	1	5
14	3	0	2	2	4	2	2	6
15	3	0	1	3	2	2	2	1
16	2	0	3	4	5	1	1	3
17	3	0	2	5	5	3	3	4
18	3	0	2	6	4	3	3	2
19	2	0	2	5	4.5	3	3	2
20	2	0	2	2	3	1	1	.
21	3	0	2	2	2	1	1	4
22	2	1	2	2	3	2	2	4
23	2	0	1	6	1	3	1	1
24	3	2	1	2	5	1	1	3
25	3	0	2	6	.	3	1	.
26	2	0	2	1	3	1	1	5
27	3	0	1	6	1	3	1	1
28	3	0	1	6	1	3	1	.
29	2	0	3	5	1	2	2	2

30	3	0	0	0	1	2	3	5	2	2	5	4
31	3	2	0	0	2	2	2	2	5	2	1	5
32	1	0	0	1	3	4	5	3	4	2	2	3
33	3	0	0	0	2	3	3	3	4	1	1	4
34	2	0	1	1	2	3	4	4	4	2	2	3
35	2	0	1	0	3	3	3	3	5	1	1	5
36	2	0	0	0	2	4	6	5	5	2	2	2
37	3	0	0	0	2	2	2	5	5	1	1	6
38	3	1	0	0	2	4	5	5	5	3	3	4
39	2	0	0	0	3	5	5	5	5	3	3	3
40	3	0	0	0	1	6	6	6	6	3	3	1
41	4	0	0	0	1	2	2	4	4	2	2	4
42	3	2	0	0	2	2	2	5	5	1	1	4
43	1	0	0	0	2	6	6	5	5	2	2	2
44	1	0	0	0	2	3	3	5	5	1	1	4
45	3	0	2	2	2	2	2	2	4	2	2	2
46	3	0	2	2	2	3	3	3	4.5	2	1	5
47	1	0	1	2	2	3	4	4	2	1	1	4
48	2	0	0	0	2	1	1	3	3	1	3	7
49	1	0	1	1	3	2	6	6	1	3	3	.
50	3	0	0	0	2	6	6	6	1	3	3	.

Reason	WTP	No.			Age Group	Education	Job	Income	
		Age <5	Age 5-16	Over 16				BID	LEVEL	£450
1	2	0	0	3	1	3	2	.	.
2	3	0	2	2	3	2	2	4	.
3	3	0	1	2	3	3	1	.	.
4	2	0	0	2	5	2	3	.	.
5	1	0	0	2	6	.	3	.	.
6	2	0	0	2	4	2	2	4	.
7	1	1	1	2	4	5	1	4	.
8	3	0	0	2	5	5	1	6	.
9	3	0	2	2	3	2	2	.	.
10	3	0	2	2	3	2	2	4	.
11	3	0	0	2	5	.	3	2	.
12	3	0	1	2	4	3	1	3	.
13	2	0	0	2	6	1	3	3	.
14	3	0	0	2	5	1	3	1	.
15	4	0	0	1	6	5	3	2	.
16	3	0	2	2	4	2	1	6	.
17	3	0	0	2	4	4	1	6	.
18	3	0	0	2	3	5	1	4	.
19	1	0	0	2	1	3	2	3	.
20	3	0	0	2	6	1	3	3	.
21	4	0	0	2	3	5	1	5	.
22	4	1	1	2	2	5	1	6	.
23	3	0	0	1	6	1	3	2.5	.
24	3	0	0	2	5	5	3	3	.
25	4	0	0	1	6	1	3	3	.
26	2	0	1	4	4	2	2	.	.
27	2	1	0	2	3	2	1	4	.
28	2	0	0	3	1	5	1	.	.
29	4	0	0	2	4	2	3	3	.
30	1	0	0	3	1	2	1	.	.
31	1	0	0	4	4	3	1	2	.
32	3	0	0	3	4	4	1	5	.
33	3	0	0	2	3	5	1	6	.
34	3	0	0	2	5	.	3	3	.
35	4	0	0	1	6	4	3	2	.
36	1	0	0	4	4	5	1	6	.
37	1	0	1	2	3	5	1	4	.
38	2	1	1	2	3	5	1	4	.
39	3	0	1	3	4	5	1	5	.
40	2	0	0	3	2	5	2	4	.
41	4	0	1	1	3	4.5	1	3	.
42	1	0	0	1	6	.	3	1	.
43	1	0	0	3	2	2	2	3	.
44	2	0	0	2	5	1	2	3	.
45	3	0	0	2	2	5	1	4	.
46	1	0	1	3	3	2	2	2	.
47	2	0	0	2	4	1	1	.	.
48	4	0	0	3	5	2	2	2	.

49	3	0	0	2	5	2	2	.
50	3	0	0	2	5	2	3	3