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Food for Thought: Consumer Perspectives of the Environmental Impacts of Food Choices

A thesis submitted in fulfilment of the requirements of the degree

Doctor of Philosophy

from

UNIVERSITY OF WOLLONGONG

by

LYNDA KRIFLIK

Masters in Education, Graduate Diploma in Environmental
Management

GRADUATE SCHOOL OF PUBLIC HEALTH

2004

Publications From This Research

The research documented in this thesis has been published and presented as following:

Kriflik, L., & Yeatman H., (2003) "What consumer responses to food based risk can teach us", *Applied Environmental Science and Health* 2003, Vol 1, No.2, p.119-127.

Kriflik, L., & Yeatman H., (2004) "Food Scares and Sustainability: A Consumer Perspective", *Health, Risk and Society* 2005, Vol 7, No.1

Kriflik, L., (2004) *Critical Social Science As A Way Of Exploring Health and Environment*, in Wright, J., (ed.) *Researching in Sport, Physical and Health Education*, Conference Papers, University of Wollongong, pp105-121

Kriflik, L., & Yeatman, H., (2004) "The Environment and Food Safety: A Consumer Perspective", XIVth International Congress of Dietetics 28-31 May 2004, Chicago, USA.

Kriflik., L., & Yeatman, H., (2004) "Consumer Responses to the Environmental Health Risks of the Food System", *From Agriculture to Culture* 9-13 June 2004, New York, USA Joint Annual Conference for the Nth American Agriculture, Food and Human Values Society and the Association for the Study of Food and Society

Kriflik., L., & Yeatman, H., (2004) "Consumer responses to the environmental health risks of the modern food system" *AGRI-FOOD XI*; 2004 Annual Meeting of the Agri-Food Research Network 9-11 June 2004, Canberra

Abstract

There is a paucity of information on how consumers perceive environmental risk as impacting on food supply and the relationship of food choices to this risk. Twenty six participants were recruited in the Illawarra region of New South Wales to be involved in this study, which was conducted over a period of eighteen months. A methodology drawing on critical social science theory was used to explore the participants' understanding of the food system and to document the influence of critical reflection over time on participants' food choices. This approach differs from surveys of consumer opinions in that, after setting the initial agenda, it allows for the participants' concerns to become the focus. For health professionals this provides a rich source of information on people's concerns about the food system and also the priority of these for the individual. Such information is invaluable for the development of collaborative projects that aim to address environmental health risks within the food system from the consumer perspective.

Acknowledgements

I wish to thank my supervisor, Dr Heather Yeatman, for her invaluable assistance in guiding me through the research process. Her insight and editorial comment greatly clarified and strengthened the presentation of this research. I would also like to thank Dr Fiona Borthwick for her critique and advice on ensuring this was constructed as an academic argument and yet one that was accessible to the reader.

My thanks also to the Faculty of Health and Behavioural Science for financial assistance that enabled me to attend two conferences in the United States to present my research. This help was very much appreciated.

A special thanks to my family for putting up with my obsessive and focussed behaviour while writing, I know that this constrained my involvement in the family activities which we value so much.

Contents

1	Food for Thought - An Overview	10
1.1	Introduction.....	10
1.1.1	Purpose.....	12
1.1.2	Objectives.....	13
1.1.3	Value.....	13
1.2	Rationale for the Research.....	14
1.2.1	Researcher's Position	15
1.3	Definitions and Thesis Structure.....	16
1.3.1	Definitions.....	16
1.3.2	Thesis Structure.....	17
2	The Food System and Environmental Health; Literature Review and Background.....	21
2.1	Introduction.....	21
2.2	The Imperative for a Social Ecology Framework.....	24
2.3	The Food System, Social Change and Public Health.....	30
2.4	Consumers, Trust and the Food System; Existing Research.....	42
2.5	Controversial Technology and the Food System.....	47
2.6	Public Health; The Need for a Holistic Approach to Food System Risks	49
2.6.1	Challenges to Adopting this Holistic Approach.....	50
2.7	Summary.....	51
3	Theoretical Framework	53
3.1	Risk and the Individual in Modern Societies.....	53
3.2	Transferring the Responsibility for Risk to the Individual.....	56
3.2.1	Views of Risk	59
3.2.2	Trust and Risk	62
3.3	Consumption and Reflexivity; the Risks of Choice.....	67

3.3.1	A Continuum of Consumer/Citizen Behaviours.....	71
3.3.2	Consumer Sovereignty	75
3.4	Summary	78
4	Methodology	80
4.1	Introduction.....	80
4.1.1	Approaches to Qualitative Data	80
4.1.1.1	The Role of the Researcher	83
4.2	The Research Process	84
4.2.1	Location	84
4.2.2	The Recruitment Process	84
4.2.3	The Interview Process and Questions	86
4.2.3.1	Interview Methods	86
4.2.3.2	Stage 1: Individual Interview	87
4.2.3.3	Stage 2: Round One of the Focus Groups.....	90
4.2.3.4	Stage 3: Round Two of the focus groups.....	91
4.3	Data Management and Analysis	93
4.4	Conclusion	95
5	Findings - 'Give Me Something to Expand My Mind About'	97
5.1	Preamble	97
5.2	Introduction.....	99
5.3	The Individual Interviews.....	101
5.3.1	Agricultural Intensity, Food Quality and the Environment	102
5.3.2	Food Safety and the Environment	105
5.3.3	Waste	109
5.3.4	Summary of Individual Interviews	113

5.4	Round One of the Focus Groups.....	114
5.4.1.1	Summary and Questions	122
5.5	Round Two of the Focus Groups	123
5.5.1.1	Summary	127
5.6	Reflections on the Process.....	128
5.6.1	The Participant Perspective.....	128
5.6.2	Participant Views on The Process	130
5.7	Conclusion.....	131
6	Risk, Trust and Control in the Food System	134
6.1	The Food System, Governance, Risk and Trust	136
6.1.1	Governance and Standards.....	143
6.2	Economics or Health	148
6.2.1	Economics and Equity in the Food System	152
6.3	Imposed Risks and Information.....	157
6.4	Research, Science and Food Risk	162
6.5	Power, Influence and the Media	168
6.6	Conclusion.....	172
7	Acting to Reduce Risk	175
7.1	Introduction.....	175
7.2	Food Citizenship	177
7.2.1	The Politics of Food System Risk	177
7.2.2	Consumer Sovereignty and Citizenship Behaviour.....	181
7.3	Motivations for environmentally responsible behaviour	184
7.3.1	Change, Confidence and Other Priorities	187
7.4	Mapping Responses to the Food System.....	190

7.4.1.1	Tom	195
7.4.1.2	Livia	197
7.4.1.3	Lila	198
7.4.1.4	Sharon	199
7.4.1.5	Ambrose	201
7.5	Conclusion	203
8	Summary and Final Considerations	205
8.1	Introduction.....	205
8.2	Participants' Perspectives on The Food System and Associated Risks.....	208
8.3	Participant Response to the Individualisation of Risk.....	211
8.4	Significance to the Health Sector.....	214
8.5	Limitations and Areas for Further Exploration.....	217
8.6	The Way Forward	219
9	Appendices	223
9.1	Appendix A - Recruitment Advertisement.....	223
9.2	Appendix B - Participant Information Sheet	224
9.3	Appendix C - Participant Consent Form	225
9.4	Appendix D - Participant Contact Details and Background.....	226
9.5	Appendix E - Semi Structured Individual Interview Questions	227
9.6	Appendix F - Summary of Round 1 Interviews.....	229
9.7	Appendix G – Participant Details	231
9.8	Appendix H - Invitation Letter for Focus Group 1	232
9.9	Appendix I – Focus Group Responses	233
9.10	Appendix J- Summary of Round 1 Focus Groups	235
10	References.....	237

List of Tables and Figures

Table 2.1 Food Production Impacts	38
Figure 2.1 Waste Composition	40
Figure 3.1 Citizenship Continuum	72
Table 4.1 Coding Structure	94
Figure 7.1 Food System Influences and Responses Model	194

List of Abbreviations

BSE... Bovine Spongiform Encephalopathy

FSANZ... Food Safety Australia and New Zealand

WHO... World Health Organisation

1 Food for Thought - An Overview

1.1 *Introduction*

This research aims to investigate the belief by many Australians that the food system can continue to provide healthy, abundant food indefinitely. This belief is challenged through reference to the increasing numbers of food scares and unsustainable damage to the environment. Modern food production has evolved as a result of technological advances and, to a large extent, there has been uncritical acceptance that the benefit for society is quantities of safe, cheap food. It has become apparent, however, that there have been significant environmental impacts as a consequence of these technologies, and these affect population health. Public health agencies have a responsibility for drawing attention to the links between health and the environment. This extends to facilitating the active involvement of all stakeholders, including consumers, to transform the food system so that health risks are minimised and the food system moves towards sustainability.

The environment is more than the physical surroundings, it is the source of the essentials for life and a healthy environment is crucial for public health. When farming activity adversely affects the environment the tendency has been for science and technology to attempt to resolve the problem in isolation, without consideration of the important perspective that can be offered by those working in public health. The health sector deals with people who have suffered the consequences of adverse food production impacts and can provide guidance on how people may be affected by changes to the food system. The suggested alternative to resolving food system impacts is the adoption of a social ecology

framework that considers the combined interactions of health, environment and behaviour. In this way all elements of a system are considered and there is opportunity for anyone who is affected by a given proposal to be part of deciding whether it is feasible or risky. It has long been recognised that communities need to own and be part of problem resolution (World Health Organisation 1986) and the ecological approach is collaborative in its inclusiveness of the views of the general public. Currently there is limited research on how people modify behaviour in response to complex environmental issues that affect health.

The area of food safety and security is one where new challenges have emerged and where consumer choice may be moderated by perceptions of risk to health and the environment. Longevity has increased for Western populations and to an extent this can be linked to a generally safe and accessible food supply. The sustainability, or security, of this food supply is, however, being subjected to increasing scrutiny. For consumers, however, the food system has become progressively more complex and remote. The extent to which consumers are aware of and act to control environmental impact through choice is an area of interest to health professionals seeking to ameliorate health effects consequent to the food system.

This first chapter of the thesis introduces the research and positions it as a social ecology investigation that examines consumer perceptions of the food system and the extent to which food safety and security affects food choice. The chapter firstly outlines the purpose and objectives of the research and discusses its value to the public health sector. The rationale for the research follows, noting the absence of studies that investigate environmental health risks from a viewpoint other than that of food safety and individual health. In particular little information exists on consumer perceptions of the degree to

which food choices contribute to environmental impact, which in turn affects population health, and their beliefs about the capacity to respond to these impacts. The importance of clarifying the link between the environment and health is highlighted. An explanation of the methodology is included to explain its value as a health strategy. Included also is acknowledgement of the researcher's background of commitment to social ecology, which encompasses justice, equity, sustainability and citizenship.

The final section of this chapter provides definitions of key terms used by the researcher and the outline of subsequent chapters with an explanation of both the purpose and content for each chapter.

1.1.1 Purpose

The purpose of this research is to assess the degree to which consumers consider environmental health risks when making food choices and to position this information within a social ecology framework. This requires exploring consumer understandings of the connections between food safety, health and environmental risk. Integral to this is identifying the level of control that consumers perceive themselves to have over the range of risk factors, how they would prefer to exercise this control, as well as noting the changes deemed necessary to assist consumers in making sustainable food choices. That environmental health is essential to human health is an accepted public health concept (Coveney, Carter et al. 1999; Lang and Rayner 2001). Agriculture, while providing an accessible, cheap and bountiful supply of food for Western populations, has adopted practices that are impacting on individual and public health as well as environmental health.

The extent of consumer understanding of the importance of ecological balance in maintaining a safe and secure food supply, however, is a subject for exploration.

1.1.2 Objectives

The specific objectives of the research were to explore and describe the knowledge of consumers in the following areas:

- The food system and the stages in food production;
- Consumer understandings of environmental health risks in relation to food;
- The extent to which consumers believe they can act to minimise environmental health risks.

1.1.3 Value

The research is of value for three key reasons; firstly the insights afforded by this research illustrate the benefits of facilitating greater awareness by members of the public of the integrated nature of health and the environment. This can lead to behaviour change that aligns with health promotion goals. Secondly the iterative critical reflection process employed in this research is a strategy that focuses on working collaboratively with consumers to achieve identified health outcomes, in this instance sustainable food production. The research process facilitates participant consideration of the influences that determine food choice, including the role of stakeholders, and is an educative and transformative process that is owned by participants. In the field of education, critical reflection has been accepted as a significant process that may enhance practice (Freire

1972; Mezirow 1991). Thirdly this research contributes to the development of a model that aims to situate food choices as part of the continuum of consumer/citizen behaviour.

1.2 *Rationale for the Research*

Clarifying consumer concerns about the food system is essential if the public health sector is to design relevant policies and programs and play a consumer advocacy role in the escalating debate about the nature and quality of food. There is, however, a paucity of information on consumer understanding of how food is produced and the impact of food choices on the broader environment. The environmental impacts of food production as well as the food safety risks associated with these impacts have been extensively reported in the literature (detailed in Chapter 2). The area that has not been explored to the same extent is the degree to which consumers connect environmental impacts and food safety when making food choices.

The importance of linking the environment, food production and health is borne out by the increase in food-borne illness (World Health Organisation 2001). Reference to the professional literature reveals numerous articles in recent years that focus on food safety risk, for example pesticides and pathogens, reflecting a similar rise in consumer concerns about the food system as represented in the popular media. The emphasis in these reports is on threats to personal health as perceived by scientists and governments. Consumer understanding of the role of food choice as a contributing factor to environmental impact and subsequent risk to health has not been explored. This need to clarify the connection between environmental issues, a sustainable food supply and nutrition has been identified

within the health sectors both in Australia and overseas (Lang and Rayner 2001; Coveney 2003).

The critical social science methodology used involves participants in reflecting on a situation and gaining information and insight that consequently may result in changes to behaviour. This approach is little used in public health research but has the potential to serve as a powerful tool to work with communities in determining appropriate and effective interventions to enhance population health. As a consultative approach, it offers opportunities for public health advocates to represent community views in forums that decide the nature of an issue, for example food production processes. The credibility of decision makers would be enhanced if there were opportunities for public input prior to the adoption of policies and processes that may be regarded as potential safety issues. This could avoid the anger and frustration that arises when people find out about decisions about which they were not aware. The responsibilities of the health sector extend beyond championing a particular approach to risk management. It includes a duty of care for population health that is guided by collaboration with consumers, and which contributes to education about the food system.

1.2.1 Researcher's Position

Over the years I have been concerned by the accelerating loss of species, the inequities experienced by disadvantaged people, and the disenfranchisement of people as economic powers influence policies that impact on health and welfare. Studying in the areas of education, environmental science and health has facilitated a greater understanding of the importance of ecosystems and the need for the individual to act both independently and collectively to protect and conserve the integrity of these. In food all these areas come

together and yet food is often taken for granted. The sustainability of all life requires a paradigm shift that facilitates a holistic view of natural and human created environments that allows us to perceive the connection of all systems and the flows between these. This research is an opportunity to expand my own knowledge of the food system and to work proactively with people in the critical reflection process that is the vital first step to envisioning the preferred food system, and taking action to achieve this.

1.3 Definitions and Thesis Structure

The following outlines the rationale and content for each chapter. Before proceeding to these, definitions of key concepts are provided. The research will canvass participants' perspectives of these, allowing for the diversity and scope of interpretations that can be applied:

1.3.1 Definitions

1. *Environmental health risk* – the possibility of damage to the environment and all species, including humans, as a consequence of particular actions/events (Beck 1992; Adams 1995).
2. *The food system* – this incorporates the production and processing of food, as well as the economics, politics and practicalities of distribution, marketing, and any associated infrastructure. Food production can be described as the sequence of actions taken to obtain, prepare and present food for consumption. At one end of the continuum there is natural, unprocessed food available direct to the customer. This then moves to processed and packaged natural foods and on to the technologically developed and

synthesised foods. At this end of the scale are genetically modified and ‘designer’ foods created for specific purposes (McMichael 1994; Tansey and Worsley 1995).

3. *Consumers* - within this thesis the broad and encompassing definition of consumers is used, that is anyone who uses a product or service - which in this instance is food and thus is everyone regardless of expertise or speciality. This definition is different to that used in marketing theory in which consumers are defined as a specific target audience for a particular good or service.
4. *Sustainability* - ensuring current behaviours and practices do not irreversibly damage the environment or create social inequities (Fien 1993; Pimentel, Westra et al. 2000).
5. *Social Ecology* – a philosophy that promotes participatory action to achieve balance between the social and ecological needs of species and systems (Milbrath 1989). In health, social ecology is used to explore differences in health status as a function of access to resources (Bartley 2004)

These definitions have been formulated after extensive research and professional experience in developing sustainability and biodiversity resources, thus the references given are representative of the diverse literature available on these topics.

1.3.2 Thesis Structure

Chapter 1 sets out the purpose, significance and rationale for the research as a lead in to the body of the thesis. Reference is also made to the position of the researcher by way of explaining private and professional commitment to collaborative research that has the potential to contribute to a sustainable food system. Key definitions are provided, followed

by an outline of the intent and content of each chapter, beginning in Chapter 2 with a rationale for the social ecology framework that informed the methodology as well as the subsequent data analysis.

Chapter 2 defines social ecology as a critical social science approach that provides an important framework that would assist public health practitioners to facilitate broader community understanding of the food system as an influence on health. The advantages of this holistic approach over the more common reductionist approach to health are discussed. The chapter then reviews literature describing the environmental and health risks associated with the food system. This provides the context for the research in linking food production to incidences of food crises, and tracing these back to changes in food technologies and intensive farming. It encompasses a historical perspective to explain the social shifts that have been identified as the impetus for changes to food production methods. The purpose is to clarify this as an interactive process because removal of the need for self sufficiency in food provision has encouraged urbanisation, which in turn has been depicted as the justification for agribusiness intensification. Consumer reaction to risks associated with changes to the food system, particularly controversial technologies, leads to a consideration of the imperative for a public health approach to environmental health risk.

Chapter 3 moves from the holistic perspective to draw on risk and the individualisation theories as the framework for explaining how individuals have come to be positioned as responsible for personal and environmental health through choice. This chapter defines these concepts and provides a brief history of how the individualisation of risk has come to dominate modern societies. The extent to which the individual can be held to be responsible for health impacts is discussed within the modern context of decision making

and the influences that affect food choices. A continuum is used to explain how responses to the food system can vary from acceptance of the status quo to the adoption of a citizenship approach that aims to minimise the impact of food choices. This approach may stem from consciously deciding to act as a result of critical reflection. Therefore this reflective process underpins the methodology used within this research. This chapter is the reference point for the analysis of the findings discussed in Chapter 5, 6 and 7.

Chapter 4 provides detail on the methodology used for data gathering and analysis.

Critical social science, as used within the research, is defined to explain its value in investigating social phenomena because it is grounded in life experiences. The rationale for recruitment and the staged interview process, as well as the role of the researcher are explained. The intent is to provide a clear account of the process, enabling this to be reproduced and verified.

Chapter 5 is structured around the interview stages to present the findings in a sequence that tracks participants' reflections on and responses to the food system. The findings highlight the concerns and priorities identified by participants. These were analysed with reference to the literature and the theory to develop an understanding of the significance of participants' perceptions and how these can inform the public health sector in addressing environmental health issues associated with food.

A number of the environmental health issues overviewed in this chapter are reflected in the findings discussed in Chapter 6 and 7.

Chapter 6 builds on the findings of Chapter 5, where it became apparent that the individualisation of risk was resented by participants. This chapter discusses the nature of

risk and how participants perceived this to change over time as a consequence of an emphasis on economic growth. Erosion of trust in the food system was indicated and this was linked to the imposition of risk and a sense that consumer objections were not being heard by those in control.

Chapter 7 goes on to describe how participants are dealing with the risks they perceived to be associated with the food system. The actions taken reflected the depth of concern of each participant and the priority accorded to environmental health risk. Citizenship theories are referred to as a means of clarifying whether the actions taken were for individual health benefit or were intended to reduce environmental impact through food choices. This information is important in verifying the difference between expressed concern and willingness, and capacity, to act. To illustrate participant positioning on food system risk a continuum is used to depict the interaction between the influences and their responses.

Chapter 8 draws the findings together and positions these as contributing an insight into consumer food choice preferences and concerns about the food system. These can form the basis for a larger investigation into consumer food choices to determine the extent to which the identified issues are held to be of wider concern. The benefits and limitations of the research methodology as a process that could significantly benefit public health programs, is discussed. In conclusion, ways forward for health professionals based on the findings of this study are suggested.

2 The Food System and Environmental Health; Literature Review and Background

2.1 Introduction

It is evident from the literature that numerous risks are generated at the production end of the food system and that the individual cannot be held responsible for these, and yet within modern society this is what is happening (Beck 1992). Critical social theories explain the interaction between the individual and social structures, for example how economic influences determine the way we live (Huckle 1993). Traditional views overlook, however, the significance of the biophysical world as both a context and consequence of human activity. It is argued that a social ecology framework redresses this omission to clarify how interactions between humans and other ecosystem elements are interdependent and can affect population health. In this investigation the consumer perspective of the role of the public health sector in ensuring food safety and security is considered. Current health practices situate the consumer as being responsible for healthy food choices. It is important to understand from the public's perspective how they perceive this responsibility and respond to it. The participant focus of this research requires a framework that facilitates understanding that consumer behaviour is "embedded in sociology, history and geography" (Williams 2003, p.149).

Population health depends on food security and safety and hence food production is crucial to survival. Science and technology have significantly changed food production, including processing (Goodman and Redclift 1991). From a general perspective these changes would

appear to be gains for the consumer, with modern food production practices said to have increased food safety and abundance (Ruthven 2000; Anklam and Battaglia 2001). It is emerging, however, that these have also introduced some risks to food safety and longer term food security, with consequences for population health. Food system activities are disrupting ecosystem balance and are threatening the maintenance of a sustainable, safe food system (Lang and Rayner 2001; World Health Organisation 2001). In order to redress food system risks there needs to be action to move the food system towards sustainability. The current emphasis, however, on immediate risks to health may be to the detriment of developing the necessary holistic perspective on food safety and security. An ecological approach to health issues is more appropriate. Though the literature that exhorts this approach is still minimal, there is an increasing advocacy within public health that calls for action in relation to food production, health and the environment (Lang and Rayner 2001; Coveney 2003; Nestle 2003).

An important task for this chapter is to position social ecology as the most appropriate framework in addressing those population health issues that are consequent to modern food production methods. This need has long been acknowledged by governments and the health sector (World Health Organisation 1986) at a rhetorical level but is not reflected by government action or in the literature. It will be argued that the resolution of risk to food safety and security requires a holistic perspective, a fundamental that has been lost in 'modern abstract systems' that emphasise specialist knowledge (Giddens 1991, p.30). To do this social ecology is defined and contrasted with the theories from which it derives, classical social theory and environmental sociology. A historical perspective is referred to

in explaining why the latter two theories are limited to an anthropocentric focus that is not adequate for resolving complex health issues.

Analysis of the food production system exemplifies the appropriateness of suggesting social ecology can provide a new model for public health. The next section briefly describes the changes to the food production system and concurrent social changes which have influenced dietary preferences and increased reliance on the industrial food system. This has facilitated the urbanisation of populations and in many countries people often have no contact with the food system other than as consumers. This sets up a cycle of dependence on the food system and contributes to the intensification of production which has both environmental and social impacts. Diverse literature is referred to in describing and linking technical advances in the food system to social change, health inequities and environmental health impacts.

To date the literature has focussed on consumer perceptions of direct risks to personal health and the erosion of trust in the food supply but it needs to also explore the discrepancy between consumer expectations of the food system and increasing awareness of risks associated with food production. Consumer actions taken in response to adverse impacts are of interest because these potentially indicate that once consumers become aware of negative consequences or believe that traditional values are being compromised, they become less accepting of current food system practices. To support this proposition the imposition of technology, specifically genetic modification and irradiation, is discussed. Research on consumer influences on the food system as a consequence of concerns about food production practices is noted as being limited.

The chapter concludes by reiterating the need for collaborative action to address food system risks but acknowledges the difficulty of adopting a social ecology paradigm within the current economic climate. The major impediments relate to agency and structure in a social context where information has commercial value. The complexity of what is known is compounded by awareness that there are significant gaps in our understanding of the interaction between natural and constructed systems.

2.2 The Imperative for a Social Ecology Framework

Social ecology provides public health practitioners with a framework to facilitate broader community understanding of how complex modern systems can influence health. The advantage of social ecology over the cause and effect approach often used in public health, for example in health campaigns, is that it acknowledges the extent to which human life is interdependent with nature. For example there is evidence that current food production methods are not sustainable and that incremental environmental damage is as much a risk to population health as that posed by pathogens and contamination (McMichael 2001). This section establishes the need for a new perspective as provided by social ecology through reference to the limitations of classical critical social science in resolving current population health issues, especially in relation to the food system.

Public health practice, as described by Powell and Wessen (1999), is a sphere that strongly subscribes to the concept of specialist expertise. That this is a reductionist approach to addressing issues is evidenced by their account of the compartmentalisation of medicine and public health into areas such as child health, occupational health, drug and alcohol services, and environmental health. Such an approach is proving ineffective in dealing with

contemporary and emerging challenges to public health (Lang, Barling et al. 2001; Coveney 2003). This may be the result of a limited capacity to address significant contextual influences. For example, health issues have been addressed by using single focussed interventions such as immunisation programs and issue-driven health education campaigns. The more recent shift from government health and welfare provision to market based commodification of these essential goods and services (Powell and Wessen 1999) continues the focus on singular issues. This approach situates individuals as responsible for the causes of illness and poor health through their personal choices (Dean 1999). It fails, however, to acknowledge the need to support consumers in dealing with the complexity of modern systems that can impact on health.

The challenge for the public health sector is to adopt a new perspective that facilitates an integrated approach to health issues. The complexity of food system issues, including food safety and security, presents a public health priority that exemplifies the need for such an approach. Social ecology provides such a framework for analysing the food system. It combines ecology and critical social science in a critique of the influences that can affect the safety and security of the food supply, including geography, species interaction, biophysical dynamics, economics, science and politics. This encompassing approach is important because the food system comprises both constructed and natural systems. Constructed systems can be considered as those systems designed to meet human needs while natural systems are the interrelationships that govern the dynamics of the biophysical world. Often natural systems are taken for granted, and yet these support life on the planet.

The holistic perspective of social ecology considers the importance of interdependent relationships in the resolution of those environmental health risks and values conflicts that have emerged in relation to the modern food system. Ecology has been defined as

'the study of the structure and function of nature. Structure includes the distribution and abundance of organisms as influenced by the biotic and abiotic elements of the environment; and function includes how populations grow and interact, including competition, predation, parasitism, mutualism and transfers of nutrients and energy' (Smith 1990, p.3).

This definition describes the interdependency of all life and is more complex than simply defining the environment as our external surroundings (Collins 1997). The key elements of structure and function explain the interactive nature of the biophysical world and all species, and accepting our position as part of this web makes it apparent that there are ecosystem reactions to human activities (Murphy 2002). Efforts have been made to control ecosystems for human needs but ecosystems are dynamic and connected in ways we do not yet fully comprehend. Social ecology allows that we do not have the omniscience required to predict nature in our technological attempts at dominance (Dickens 2002). This is in contrast to other critical theories that either do not acknowledge, or inadequately allow, that human behaviour is mediated not only by social structure but also ecological dynamics (Buttel 2002).

The contribution of critical social theory is a framework for critiquing human behaviour as a function of interaction with social structures. It encompasses the work of classical theorists such Marx, Durkheim and Weber (Buttel, 2002). Marx, in his critique of capitalism and its commodification agenda, suggested that this contributed to a false

consciousness that material gains would resolve the inequities experienced by the masses. Marx was concerned with elaborations of class, structure and labour, while Durkheim explored the relationships between men and society, and the effects of these on the state of the mind (Jureidini 2003; Ganguly-Scrase 2003). Both were attempts to explain power and structure in society but the significance of the environment was not explored in this classical social theory. The focus of such theories is anthropocentric, with the environment constructed as a resource to be exploited for economic gain. The theories, however, did provide a foundation for explaining behaviour that has continued to be built on by successive generations of theorists. Knowledge is dynamic and critical social theory has been refined and revised in an effort to account for patterns of behaviour or social change, and to move beyond theoretical expositions to propose strategies to resolve identified issues. The growing acknowledgement of humankind's dependence on natural systems and the evolving nature of this knowledge, is facilitating recognition of the imperative for a social ecology framework (Buttel 2002) that enhances understanding of our dependency on the biophysical world.

The historical context for critical theory was of a smaller, more dispersed population that did not impact on the environment with the global intensity that has become evident in modern society. The agrarian nature of society until the mid twentieth century was central to the theorists' focus on the social distribution of limited resources rather than the state of the physical environment as a risk to food security (Dickens 2002; Catton 2002). A basic need has always been to ensure access to a secure food supply and food crises have precipitated massive social disruption, as evidenced by the food riots of the French Revolution or the mass emigration consequent to the Irish potato famine (McMichael

2001). Theorists such as Marx, Durkheim, and Weber critiqued the social and political structures that brought about such upheavals that significantly impacted on health and welfare. They did not have access, however, to a holistic view of the environmental impact of human activities, and thus the state of the environment was of secondary concern to social justice issues. As indicated by Murphy (2002, p.80) "There is much in Weber's work that requires either improvement or modification to take into account developments since his time".

There are indications that the classical social theorists did have some understanding of the environmental limitations that restrict behaviour. In writing about the need for a society that serves as a conscience to regulate the behaviour of men, Durkheim referred to the interconnectedness of life - a hint at the ecological perspective that has since evolved;

"It is not true, then, that human activity can be released from all restraint. Nothing in the world can enjoy such a privilege. All existence being part of the universe is relative to the remainder; its nature and method of manifestation accordingly depend not only on itself but on other beings, who consequently restrain and regulate it. Here there are only differences of degree and form between the mineral realm and the thinking person. Man's characteristic privilege is that the bond he accepts is not physical but moral; that is social." (Durkheim in Spaulding and Simpson 1952, p.252).

The acknowledgement that there are natural constraints, however, is secondary to the rejoinder that there is an ethical obligation to conform as expected by society. In modern society the question is whether conforming to the dominant production and consumption

ethos is in the interest of public health if it means accepting a commodification agenda that cannot be sustained.

The concept of a sustainable food system requires a theoretical shift that encompasses an analysis of the commodification agenda and the impact of this on natural systems, together with suggested strategies to achieve sustainability (McMichael 2001). Later theorists, such as Dunlap, O'Riordan and Huckle, built on the foundational social theories, critiquing and remodelling these to develop a social ecology that progressed 'society's self reflexive recognition that it does not exist in complete opposition to nature and that reason and culture are nature.' (Wehling 2002, p.157). Inherent in this ecocentric view is the position that no sector of the population has more rights than another. For example animal welfare activists contend there should be regard for the integrity of other species beyond these simply being food sources and the minimum required is the humane treatment of domestic livestock (Singer 1993). The concept of equity is embedded in one of the guiding documents for public health, the Ottawa Charter, which stated that the principles of equity and social justice, including intergenerational equity, were essential for health and well being (World Health Organisation 1986). This document identifies the need for a secure food supply and a healthy environment as the basis of the food supply. When food resources are degraded or exploited this reduces the availability of these. In turn this increases the cost of essentials and contributes to social instability and negative impacts on population health (O'Riordan 1989). Since the inception of tools and agriculture, ecosystems have been impacted upon and modified by human activity and the impacts are evident in the extent of widespread species extinction, as well as geographic and climate change (Ponting 1991; Flannery 1995; Diamond 1998). Change is an evolutionary process

that is to a degree inevitable, but the rapid pace and global scale of environmental degradation now experienced is consequent to food production for profit, rather than survival (Pimentel, Westra et al. 2000).

A social ecology perspective questions the ethics of viewing food as a commodity and critiques food system technologies that contribute to the destabilising of the natural systems that life depends upon (Lang, Barling et al. 2001). Within the next section the holistic approach of social ecology is applied to describe how the food system has evolved over the last century and to elucidate what these changes have meant for public health. This involves exploring historical, geographical and economic connections within the food system.

2.3 The Food System, Social Change and Public Health

From a public health perspective it would appear that social conditions have changed for the better and that food system developments are an integral part of this gain. The benefits are perceived to include improvements in food safety (Anklam and Battaglia 2001) and access to cheap food for many western consumers (Lang, Barling et al. 2001). It has become clear, however, that there are significant impacts consequent to the resource use that underpins modern food production. The impacts include environmental damage, social inequity, food safety and security, and waste in both food production and consumption. The brief history that follows explains the connections between these impacts.

Farming changed significantly during the first half of the twentieth century with science and technology providing the means to commodify food, making available quantities of

cheap food, at least in western societies (Lang, Barling et al. 2001; Early 2002). The mechanisation of equipment facilitated large scale cropping and harvesting, and production line technologies were applied to domestic livestock to maximise meat gain while reducing costs. The industrial approach to farming was supported by innovations in refrigeration and transport to deliver the final product to local and global markets (Tansey and Worsley 1995). The result is today's food production systems which differ significantly from traditional mixed farming systems. There is now a dominance of '...large scale intensive livestock units... on small areas of land in which animal production is virtually a factory process for converting grass or grain into meat and eggs' (Lowe, Clark et al. 1997, p.51). In fact 'more grain nutrients are consumed by American livestock than by Americans' (Hawken, Lovins et al. 2000, p.207) From a global perspective this means that the grains needed to feed the lesser nourished but larger proportion of the world's population, are diverted to cattle on intensive feedlots for meat for more affluent consumers (Pimentel, Westra et al. 2000). The food system can thus be seen to be an influence that impacts on social stability by differentiating access to food on the basis of wealth. The consequences for affluent and poor people are different but these can still translate into adverse health impacts as detailed below.

The intensification of food production has become a self perpetuating cycle that is stimulated by urbanisation, consumptive lifestyles, population growth and rapid technological change (Atkins and Bowler 2001). Urbanisation occurred because the mass production of food freed many people from agrarian lifestyles. In moving to towns and cities, people became distanced from the environmental basis of food production and increasingly dependent on the industrialised food system. Whereas previously over 90% of

the population was involved in agriculture there is now a reliance on a small number of farmers who are contracted to provide for a market dictated by food processing firms (Tansey and Worsley 1995). The scope of this physical relocation is evidenced by the prediction that fifty nine percent of people will be living in cities by 2025 (World Health Organisation 2001). As a result farmers are under pressure to maximise food production for urban communities, while complying with trade and other commercial imperatives (Echols 2001). To supply food all year round agriculture has adopted practices that result in pesticide and fertiliser residues in food and, in some instances, introduced pathogens into food (Solomons 2000). For example, the commercial imperative to reduce production costs, including that associated with waste, has resulted in the practice of using reconstituted animal by-products in animal feeds. "In the American south contracted growers feed their raw materials (live chickens) into industrial processing and manufacturing units that use every body part of the chicken - from meat for human consumption to head, feet and offal wastes ground up and reincorporated as protein into feed for following generations of chickens" (Atkins and Bowler 2001, p.81). Such practices have been implicated as introducing pathogens into food and Bovine Spongiform Encephalopathy (BSE) is the result of industry efforts to reduce costs by recycling animal protein in stock feed (Fiddes 1995; Echols 2001; Lang and Rayner 2001; McMichael 2001). Food safety, environmental integrity and animal welfare may all be adversely affected in the cycle of intensive food production.

Consumer priorities may over-ride consideration of food production impacts that are regarded as remote or indirect, either in time or spatially. Meat provides an example of how mass production reduces the cost of food, leading to an increased demand that has

environmental health effects. The increased consumption of "... of animal protein has changed diets radically in the advanced industrial countries, and increasingly, in the Third World" (Goodman and Redclift 1991, p.112) and meat production has come to be a major contributor to environmental degradation. Media reports may contribute to the growing public recognition of such degradation but consumers may prioritise food value and cost as more important than the less obvious issue of environmental impact (Holm 2003).

Similarly, other changes to the food system that impact on health appear to be minimised by both consumers and the public health system until a crisis emerges. For example food safety incidents, dietary change, and the shift from being physically involved in daily food production to a sedentary lifestyle have become issues arising from modern food production (Millstone and Lang 2003). The situation, however, has been constructed as one in which it is the individual who is blamed for careless food preparation, or for eating excessively and not exercising enough, culminating in obesity (Nestle, 2003; Ruppel Shell, 2002). The ready availability of energy dense and nutritionally empty processed food has both health and environmental impacts. These examples illustrate how a social ecology framework can clarify seemingly disparate public health impacts as not single issues for which the individual is to blame, but as the outcomes of complex social interactions.

The social changes that have occurred in parallel with increased urbanisation and affluence have contributed to and deepened consumer dependence on the modern food system.

Access to a convenient supply of food has become the priority for the increased number of women entering the paid workforce (Atkins and Bowler 2001, p.312). Familiarity over time was the traditional measure of food acceptance but now industrial food processors exploit the perceived limited time of home managers, as well as the area of food value, to

gain and increase market share (Goodman and Redclift 1991; Tansey and Worsley 1995; Bell and Valentine 1997; Atkins and Bowler 2001). Convenience foods are marketed as meeting the needs of identified groups such as people who are busy, or weight or health conscious. There is an increase in the consumption of fast food that is precooked, packaged and sold ready to heat (Lang and Rayner 2001), and one in five meals are now eaten outside the home (Ruthven 2000). This emphasis on convenience, combined with access to higher disposable incomes, has also resulted in what may be interpreted as a reluctance to cook from scratch, given time and motivational constraints. One American company quoted the decline in 'scratch baking and the preference for frozen, microwavable food' as the reason for their loss of market share for a milk product that was the basis of desserts (Blackwell, Talarzyk et al. 1990, p. 98). This role modelling of family food preferences, combined with the influences of media messages about food, is a socialisation process that can create lifetime patterns (Bell and Valentine 1997). A pattern of increasing reliance on processed foods is emerging and this may lead to a generational loss of skills. When people are not able to turn basic food into meals the cycle becomes one of dependence on pre-prepared foods, which requires access to a level of income.

More disposable income may be implicated as a stimulus for intensifying food production but the commercialisation of food production is also of concern. Commercialisation has contributed to the inequitable distribution of food system risk with the impacts inclusive of malnutrition, eating disorders, and transmission of disease (McMichael 2001). All of these are public health issues. In parallel with the development of strategies to address the environmental health consequences of overproduction affluent nations have had to resolve the inequity and poverty that result from 'constraints on self-sufficiency' (Powell and

Wessen 1999, p.7). The determinant of adequate nutrition is a reasonable and steady income - and for many people in both developing and developed countries this is not available. The growing division between the 'haves and have nots' is evident in that '...the largest food aid program in the world, almost \$29 billion...' is provided by the US for its own citizens as a public health intervention (Tansey and Worsley 1995, p.222).

The effects of inequity are manifest. The majority of the world's population suffer nutritional deficiencies, and people in developing countries consume less calories per caput (Food and Agricultural Organisation 1996) and have restricted access to clean water and air. Agricultural activity in these countries is directed toward the export market and poverty restricts the capacity to buy food. The population drift to the cities in an attempt to find work to buy food results in the social issues of overcrowding, poor hygiene, and the contamination of food and water through waste mismanagement (Schlosser 2001). Food related diseases develop in these conditions, including dysentery, cholera, hepatitis, typhoid, Giardia and tuberculosis and these continue to be of concern to health officials. Further, food processing plants and abattoirs keep costs low by paying minimal wages (Schlosser 2001) and it is often the urban poor who are employed in such areas. Fear of job loss and the cost of medical treatment may result in a disease infected individual concealing the condition. The risk is of pathogens spreading to any food being handled and then distributed, and global trade agreements mean that food can now come from anywhere in the world and its manner of production is often unknown to the consumer (Echols 2001). This snapshot of social history links geography, economics and the food system in a combination that has the potential to have an adverse and broad impact on public health.

Increasingly it is recognised that the economic gains of increased food productivity have come at significant cost to environmental health and there is growing concern about the sustainability of the food system (Lang and Rayner 2001; World Health Organisation 2001). A healthy physical environment supplies the range of basic needs including water, air, sunlight, and a soil and plant combination that is the basis for food. The absence or poor quality of one or more of these essentials can have an effect ranging from discomfort through illness to death. Johns and Eyzaguirre (2000, p.25) state that "Disruption in environmental integrity affects patterns of human health, disease and nutritional status". Public health leaders have identified that the threat to health and natural systems has increased since the 1930's, with the scale of the environmental impacts traditionally accepted as part of food production intensifying at the global level (McMichael 2001). For example, topsoil is lost in dust storms that are attributed to the over-ploughing of land, and extensive pumping of water from aquifers is rapidly depleting these. Such impacts adversely affect food production. Erosion, drought, salinisation, infertile soils and biodiversity loss often result from intense farming practices. Developing countries provide another example, in that it is estimated that soil erosion and irrigation damage result in the loss of upwards of six million hectares of productive land per year (Roetten and Krawinkel 2000). Another consequence of land clearing is climate change and this has affected weather patterns and resulted in increasingly frequent storm events (Brown 2001) that damage and destroy life and infrastructure.

When the environmental impacts of food production were first brought into public focus in the 1960's (Carson 1962) a need to broaden the scope of social theorising beyond power and structure was also identified. Popular movements formed to respond to the

environmental issues of the times. In taking an interest in the motivations and behaviours of these groups, sociologists linked environmental degradation to capitalist productivity and in this way environmental sociology came into being (Buttel 2002). The focus however, was predominantly anthropocentric, because the issue became one of how to manage environmental issues without challenging whether the resource exploitation and class domination that characterise capitalism's pursuit of accumulated wealth could be maintained (O'Riordan 1989). This approach enlisted technology to manage the effects of damaging practices within an economic environment that supported the continued growth of material living standards. Table 2.1 refers to some of the technologies used in food production and clarifies these as both a cause and an effect for environmental and social impacts.

Food Production Related Activity	Sample of Environmental Impacts	Sample of Health Effects (human and other species)
Land clearing – deforestation	Erosion, siltation of water courses, loss of habitat	Alienation of indigenous residents (stress), pollution of drinking water, loss of species used as a food source for locals
Ploughing/tillage	Damage to soil structure & loss of soil nutrients, compacting of earth, land becomes infertile & unsuitable for cropping	Loss of agricultural productivity leading to malnourishment
Irrigation	Dryland & wetland salinity, contamination of water sources, depletion of water sources	Loss of quality drinking water
Application of pesticides and fertilisers	Potential poisoning of other species & biodiversity loss, water contamination*, bioaccumulation of toxins	Accidental poisoning of workers and possibly consumers, inhalation of toxins during application, birth defects
* 'Agriculture is the most damaging activity in relation to water quality' (Lowe, Clark et al. 1997, p.5)		
Intensive Feedlots	Contamination of water by effluent, over stocking of an area +	Health imbalances caused by bioaccumulation of chemicals & hormones fed to livestock, animal welfare concerns
+ The effluent from '40,000 head of cattle is equivalent to 500,000 people, yet no waste water treatment of equivalent technical level is implemented, just ponding' (McMichael 1994, p.90)		
Genetic engineering	'Escapes' of engineered species leading to corruption of wild stocks, unknown side effects, loss of biodiversity	Unknown
Processing of food	Wastes released to land, water, and air – polluting these	Potential for respiratory illness, water borne illness, & disease from unhygienic disposal of waste, salmonella etc caused by poor handling & storage ~
~ '30% of frozen chook have high levels of salmonella' (Atkins and Bowler 2001, p.210)		
Packaging of food	Resources used unnecessarily for packaging & discarded, contaminating land & water	Potential for disease resulting from accumulated garbage & associated vermin

Table 2.1 Food Production Impacts

These examples highlight the ineffectiveness of a scientific approach that looks at food production issues in isolation, based on the notion "that every problem has a correct solution if we could only find the right expert' (Mezirow 1991, p.15). Each of these environmental impacts is related to resource use, and the developed world currently

accesses the greater share of the available global resources (Beck 1992; Hutton and Giddens 2000).

Aside from the equity and social justice considerations, another public health issue that arises from this exploitation is the resulting waste as a proportion of the world population accesses more resources than can be fully utilised. For example, the Australian State of the Environment Report (1996c) indicated that food consumption per head (measured by energy content) increased by more than seventy percent between 1967 and 1992, not because more was eaten, but due to more energy intensive production and more wastage in processing. Food related waste is the largest component of the Sydney region's household garbage (Inner Sydney Waste Board 2000).

In contrast to a purely scientific approach, social ecology provides a holistic framework within which the concept of waste is understood as the inappropriate and unsustainable use of resources. Waste is more than what goes into the garbage bin at the end of the day. It is indicative of an excessive or inefficient use of finite resources in the first instance and is also the disposal of residues that can contaminate natural systems, often defined as pollution. Thus the related health risks extend beyond the hygiene issues that are precursory for diseases such cholera, Giardia, and typhoid, which have preoccupied the public health sector over the years (Szreter 2003). Awareness is growing of the impact of wasteful practices such as the unnecessary use of water, the loss of soil quality if organic matter is not recycled as nutrients, and the loss of resources through unnecessary packaging (Department of Environment and Conservation [NSW] 2003). Where the connection is not being made as strongly is the threat to food security if land and water become degraded to the point of reduced productivity.

A focus on individual waste management strategies does not address the issue of the need for more appropriate resource use in the first instance, particularly packaging. Reference to the Figure 2.1 highlights that residential waste only comprises about one third of overall waste (Environment Protection Authority NSW 2000). Of the remainder, restaurant and fast food waste from commercial and industrial sectors comprise a large component, and case studies indicate that some of these businesses are able to reduce waste by 90% with changes to practices (Environment Protection Authority NSW 2000). Packaging waste from the consumption of fast food is a significant component of solid waste in modern societies, with excess resources used in over-packaging for marketing and convenience reasons.

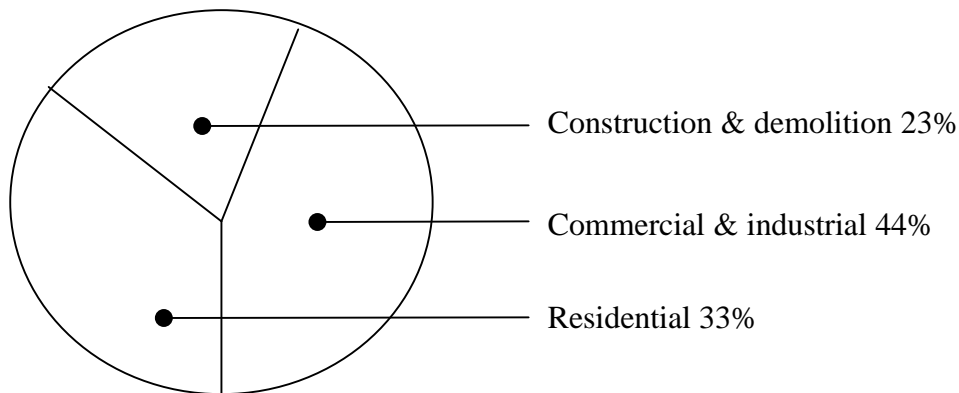


Figure 2.1 Waste Composition

Adding to waste is the fact that this type of food is nutritionally empty but heavily marketed and extensively consumed. A diet reliant on snack food is high in fats and less satisfying than energy from protein, leading to the consumption of more of the same and contributing to the health issue of obesity (Leathwood 1993). A pattern of fast food consumption and careless disposal has emerged over the last ten years, with most discarded

packaging being recyclable (Clean Up Australia 2000). Clearly the connection between this waste, health impacts and environmental degradation appears not to be made.

The actual disposal of waste via the traditional practice of burying this at landfill presents further health risks including the potential for leachate to contaminate water, offensive odours and transport issues. Urbanisation, combined with increased public awareness of pollution from inadequately managed landfills, has reduced the opportunity for waste to be disposed of this way (Smith 1990). During the last decades of the 1900s landfills in the Sydney region reached capacity, often more quickly than planned - a result of increased consumption and a greater tendency to 'throw things away'. Governments have encountered resistance to the development of new landfill sites in populated areas - people do not want to live next to waste disposal facilities. Additionally, governments do not have the resources to transport waste extensive distances and any such proposals for disposal have also been opposed by possible recipient communities. The question is the extent to which consumers link the range of waste impacts with personal choices, and make attempts to minimise these effects.

What has been missing in classical and environmental sociology theories is acknowledgment of the interdependency of natural systems and human health and that, ethically, these have a value separate to market assessments (Huckle 1993). These theories reflect the human exemptionalist approach taken by much scientific theorising in positioning humans as not bound by ecological principles (Dunlap 2002). This is not appropriate because humans are cause and effect for the current state of the environment. For example the Marxist notion of division of labour is mirrored in global spatial divisions of nature, including monocultures (Dickens 2002). This means that certain locations

concentrate on producing a given food because the context provides a greater return for capital investment, regardless of the ecological consequences. Theories of economic power and the needs of groups and individuals now require positioning within a context of modern environmental upheaval so that the 'relationship between social action and the processes of nature' (Dickens 2002, p.75) are considered. An example is that cited by Fullerton (2001) of rice grown in climates too dry to support this crop, requiring the unsustainable and inequitable diversion of water, depriving populations of this health essential. There is also a direct connection between exploitative labour practices based on low wages, countries with less regulated environments, and environmental degradation (Jackson 1990).

2.4 Consumers, Trust and the Food System; Existing Research

Research on the extent to which consumers recognise the interdependency of health and the environment and perceive themselves to be able to influence the sustainability of the food system is limited. The literature indicates the emphasis is on personal safety, with the indifference to food impoverishment described by Labonte et al (2004) a contrast to the consumer outrage expressed when the developed world experiences a food related crisis such as variant Creutzfeldt - Jakob disease (vCJD) and finds pesticides in food (Smith and Reithmuller 2000). Public outrage has occurred as a reaction to authorities approving agriculture practices that pose risk, direct and indirect, and which conflict with personal values, without consulting consumers (Echols 2001; Frewer and Salter 2002). For consumers there is difficulty of identifying and obtaining accurate information about food production methods and this undermines public trust in the food industry and government

regulatory agencies (Echols 2001). The expectation is that governments would ensure the security and safety of the food system on behalf of consumers.

Consumers are alerted via media reports to food scares that are a potential health risk.

Food production risks can be direct and obvious, for example out of date food, or indirect as in environmental risks including contamination and degradation. Direct risk in the form of pathogens such as *salmonella* and *Escherichia coli* can enter anywhere along the food production process, from contaminated animal feed, to poor sanitation on the farm, through to careless slaughter practices (Gregory 2000; Schlosser 2001) or poor personal hygiene.

The harder to trace diseases such as vCJD, the human variant of BSE which has resulted in at least 85 deaths in Europe (Waltner-Toews 2000), highlight the links between production practices and human health. Similarly the emergence of strains of antibiotic resistant human diseases have been linked back to antibiotic use in animals (Anderson 2000; Gregory 2000), and *Listeria monocytogenes*, a bacteria that has adapted to thrive in chill storage conditions, has been the subject of many food recalls (Food Safety Australia and New Zealand 2003). The mass distribution of food as part of international trade increases the potential for the rapid dissemination of pathogens (Woteki, Facinoli et al. 2001), and challenges regulatory systems assigned with responsibility for public health.

In Australia consumers depend on Food Standards Australia and New Zealand (FSANZ) to protect public health and safety, a major component of which is risk assessment. Despite this, in 2000 there were an estimated 11,500 cases of food poisoning a day in Australia, costing approximately 2.6 billion per year (Gregory 2000). In 2003, however, 5.4 million cases of gastroenteritis or 13,700 cases per day were reported (Worth 2003), a marked increase over three years. A comparison with other countries finds parallel stories; in 2000

it was estimated that 76 million Americans per annum suffered food poisoning and 5,000 died (Waltner-Toews 2000); in England and Wales the number of food poisoning cases climbed from 14,000 in 1985 to over 93,000 in 1998 (Yeung and Morris 2001). Reference to the escalating number of food incidents would not reassure consumers that the measures taken to protect public health are adequate for addressing the complex risks inherent in the food system.

Consumer confidence is further undermined by disparity in how they would assess food related risk and the approach of government, scientific and industry bodies (Macfarlane, 2002). Core to this are judgements about the period of time required for a food or process to be assessed as safe. In contrast to the public preference for extended assessments for new foods or processes, industry groups use the argument of the necessity to gain a competitive market edge to influence the swift approval for innovations in food (Nestle 2003). A glance at the food safety assessment process would suggest that this is structured to meet the needs of food producers. FSANZ works with other agencies to meet its responsibilities, and the Food Standards Code is the key tool for determining food safety standards. In setting the maximum permissible concentrations (MPCs) of contaminants to protect public health, it was also admitted that "environmental contaminants cannot necessarily be controlled to provide the same margin of safety..." (National Food Authority 1995, p.16). Standards are usually based on data received from the manufacturers of the product. The public can comment on changes to the Food Standards Code but there are impediments to public participation in decisions affecting food. Primarily many people have not been aware of the existence of FSANZ or its role (Donovan Research 2001). Further the information provided as a basis for its request for comment is couched in

scientific and legal jargon and the time frame for assessment of the changes is often very limited. Reference to FSANZ food code changes exemplifies these difficulties, and yet information is crucial if consumers are to make informed decisions related to food choices.

Information about food safety risks influences consumers, and the increased demand for organic foods reflects concerns about adulterated or contaminated food (Harper and Makatouni 2002) and a preference for chemical free fruit and vegetables (Lang and Rayner 2001). There is evidence of differentiation in diets with 'privileged consumers eating free range chickens hand prepared in restaurants, while mass consumers eat reconstituted chicken foods from supermarket freezers or fast food shops' (McMichael 1994, p.93).

Halkier's (2001) study of how consumers handled environmentally based food safety risks also highlighted the importance of trust and the priority of personal health. Consumers in Halkier's study indicated mixed reactions to organic produce that related to beliefs about risk and the level of control that can be implemented in the absence of being fully informed about the production of the food. Organic farming is generally not subsidised like other foods and the increased cost of organic foods is an obstacle for many consumers (Yeung and Morris 2001; O'Donovan and McCarthy 2002). The current study aims to contrast environmental health risk against other consumer priorities.

The desire to be both health conscious and environmentally responsible may be represented in the contrasting research findings of how consumers respond to information about food production impacts. For example, individual health was identified as the priority in a study that sought to determine whether food choices were influenced by awareness of farming practices that impact on animal welfare (O'Donovan and McCarthy 2002). This self interested focus may also be represented in the conclusion of another survey that consumers

accepted, without question, the claims that the food had had minimal environmental impact, for example brands of tuna that were marketed as being caught without harming dolphins (Atkins and Bowler 2001). This finding was in contrast with other research that indicated producer credibility was a significant issue for consumers (Frewer and Miles 2003). A similar analysis considered whether eco-labelling might provide the consumer with a means to influence the quality and sustainability of the food supply (Ibanez and Stenger 2000). Both this paper and a quantitative study into consumer preferences for eco-labelling (Johnston, Wessels et al. 2001) noted that there was potential to minimise environmental impact through labelling strategies. The identified constraints however, were the deterrent of increased food prices, the capacity of global food suppliers to find alternative markets, and, again, the possibility of false label claims. Further research into consumer preferences and behaviours was recommended by the latter study.

Research indicates a growing consumer disquiet and resistance to the imposition of processed and industrial foods, with public interest groups asking questions about farming practices, food safety, and nutrition (Knox 2000; Atkins and Bowler 2001; Lang and Rayner 2001). There is extensive information available on the negative environmental impacts of agribusiness, and signs are that 'goodwill towards farmers is being weakened by the public's growing awareness of negative effects of agribusiness on the environment and rural communities' (McMichael 1994, p.54). An environmental morality is developing with 'pollution and industrial risks now being elevated to the status of a crime' (Lowe, Clark et al. 1997, p.4). There is also consumer resentment at the imposition of new technologies and the hostility evoked by these is directed at government authorities, including the public

health sector (Frewer and Salter 2002). This is because these agencies are perceived to collude with the food system by approving the technologies.

2.5 Controversial Technology and the Food System

The environmental health risks referred to above have not generated the same level of public opposition and controversy as biotechnology. The reasons for this are explored as these illustrate how public perceptions of risk differ to those of agribusiness scientists. It is claimed that biotechnologies will improve the quality of food and contribute to feeding the world's growing population (Early 2002). Echols (2001, p.151) states that food safety has also become an area where "scientists have replaced personal experience" in assessments of health impact. Consumers, however, are resisting the imposition of the genetic modification of food and food irradiation for reasons that include but extend beyond perceived risk to health (Yeung and Morris 2001). The adoption of biotechnologies requires more than a scientific evaluation of risks and benefits, with recognition accorded to individual values that are as important as physiological health.

Scientific review of the risks associated with genetically modified food does not reflect the full range of concern that people may have about the use of this technology (Yeung and Morris 2001; Echols 2001). Yeung et al (2001) refer to consumer concerns about the profit motive of technologically modified food and Echols (2001) raises concerns about the cultural and moral issues involved in the genetic modification of food. The latter encompasses cross-species genetic combinations that may violate the beliefs and practices of people from diverse religions and citizenship positions. Many, including scientists, consider that the long term health and environment effects are inadequately dealt with by

the scientists who assess these foods (Kidd 2000; Knox 2000). Fear of these effects remains a major obstacle to acceptance of genetically modified foods. The first application of genetic engineering was by scientists in America who developed a gene for the production of human insulin, enabling this to be used instead of the pig insulin that was then the only option for people with diabetes (Nestle 2003). The minimal risk of this procedure was restricted to people with diabetes who also had the most to benefit, and there was little public objection. The subsequent opportunities for this science though, in the form of 'perfect foods' with inbuilt pest resistance, and foods modified to meet specific diets are the focus of public criticism.

Consumer distrust of this technology is significant, and there are also ethical objections to cloning and patenting species and the potential loss of biodiversity. When the Monsanto chemical company developed the "Round-up Ready range of crops (soy bean, corn and cotton) that was supposed to give it a market edge, public antipathy to these products was so strong in Europe that US commodity exports fell from \$400 million in 1996 to just \$10 million in 2000" (Hunter 2001, p.31). The concerns are that modified organisms will contaminate wild plant and animal stocks, as well as the unknown long term effects of eating GM foods. This fear of longer term health impacts also underpins consumer resistance to irradiated foods. Despite assurances that irradiation is safe, the dread of unknown consequences has meant that consumers are reluctant to take the risk (Yeung and Morris 2001). Ostensibly the technology prolongs food shelf life by exposing this to low levels of gamma rays. This is said to prevent micro-organisms that may be in the food from reproducing, putting the decay process on hold. Consumer concern, however, reflects a wariness about radiation, including excess X-rays or proximity to nuclear installations

(Sjoberg 2001). The Chernobyl nuclear incident contributed to the generation of these fears because of its dramatic effects on health and the environment. Compounding resistance to these technologies are the consumer beliefs that industry will profit from longer lasting food while options to purchase alternative produce will be limited (Nestle 2003). The secrecy surrounding biotechnology, often a commercial motivation, further adds to outrage as consumers are not even sure which foods have been modified (Nestle 2003).

Through connecting and clarifying the complexity of systems that affect health, social ecology provides a framework to explore the broader impact of food system technologies. These impacts may otherwise go unidentified in a reductionist approach that does not consider context. For example approval of the above technologies raises questions about the ethics of introducing novel food without consumer consent or an assessment process that gives credence to lay perspectives of the significance of time in risk assessment (Wynne 1996). Food regulation was instigated to protect public health but this is being subsumed to short term economic interests. One way to refocus agricultural activity towards the primary goal of sustaining health is to align preventative health with the precautionary principle (Raffensperger and Tickner 1999; Goldstein 2001). The aim is to ensure that if risk to health or the environment were identified or anticipated then the government and scientific community would take precautions to avoid harm.

2.6 Public Health; The Need for a Holistic Approach to Food System Risks

Consumer confidence in government ability to respond to and control risk to health and the environment will continue to dissipate in the face of recurring food system failures. Lack of genuine consultation with the community on controversial food technologies prior to the

implementation of these further undermines public faith and raises questions about government agendas for the food system (Yeung and Morris 2001; Frewer and Salter 2002).

In the decades since that first public alert to the impact of modern agriculture on the environment and health (Carson 1962) awareness of the scale of incremental environmental damage has grown (Lowe, Clark et al. 1997; Brown 2001). The 1978 Declaration of Alma Alta drew on growing concern about this situation and made explicit the connection between health and environment. It stated that addressing environmental health issues required 'education concerning prevailing health problems and the methods of preventing and controlling them; promotion of food supply and proper nutrition; an adequate supply of safe water and basic sanitation...' (World Health Organisation 1986). This is a social ecology view of the world but, despite this rhetoric, government policies continue to support the status quo and are deemed to favour the economic interests of the food industry (Echols 2001). For many impoverished people the risks continue to be the lack of nutrients and clean water and there are renewed efforts to stimulate government action through the establishment of an Earth Charter (Miller 2002).

2.6.1 Challenges to Adopting this Holistic Approach

In arguing that social ecology provides the essential framework for considering the interdependency of the natural and constructed elements of the food system, consideration needs to be given to the difficulties of achieving this. As a paradigm shift social ecology challenges the competitive economic foundation of consumer societies. Entities with significant economic influence will resist social change that diminishes their power, and the

dominance of the capitalist paradigm is evident in the embedding of words like resources and natural capital in the language. A starting point may be the reconsideration of terminology so that ecosystems are not regarded as exploitable commodities but as finite life systems that require care-taking.

It may be that one of the daunting characteristics of social ecology is the breadth of interdependencies that need to be considered, as outlined in Table 2.1 (p.40). This has probably been an impediment to its uptake in public health sectors where the focus has been on reductionist intervention strategies, with the individual positioned as the agent responsible for health status. The task of making the appropriate health choice requires access to information. In the area of ecosystem dynamics there is still much to be learnt, and then prioritised, and the situation is further complicated when information is withheld to gain commercial advantage. In all, dealing with the complexity of ecosystem interdependencies coupled with the difficulty of accessing the requisite information can prove to be overwhelming and lead to a form of paralysis (Beck 1992) or unquestioning acceptance of the status quo.

2.7 Summary

This chapter has established food safety and security as population health issues that need to be addressed from a holistic perspective. Social ecology, as a critical social theory, provides a framework for critiquing the influences on the food system. Reductionist or single issue attempts to resolve health and environmental issues overlook the contributing and connecting influences that provide the context of how these issues actually originate or develop. Further, the reductionist approach tends to focus on the individual as the source of

the issue and attributes blame while ignoring these contextual or structural influences that are outside the control of the individual (Beck 1992). This is particularly evident when referring to the food system as a significant impact on the health of the individual.

The history of the food system over the last century highlights the priority of moving beyond an anthropocentric focus to consider how natural systems are essential to a sustainable food supply as well as the ecosystem balance that determines the overall quality of life. Integral to this shift is recognition of the diverse values that consumers ascribe to their food preferences, in contrast to the economic values that have come to dominate the food system. For public health to advocate a social ecology view that encompasses these other values, it is important to understand how consumers respond to the complexity of the food system. It is such individual responses that are the focus of the next chapter.

Consumer responses to the food system are clarified through reference to the theories individualisation and risk, with specific attention given to how these position the individual in relation to environmental health risk. Within neo-liberal societies commodification has prevailed, and this includes shifting the responsibility to the individual to purchase the right options - and in such decisions a level of risk is inherent. Most aspects of life have come to be valued as economic products, including food, health and the environment. Regardless of capacity to deal with the complexity of modern systems, the individual is held accountable for personal and environmental health through his/her actions as a socially responsible consumer. This suggests that the adoption of a precautionary approach is a priority because our incomplete understanding ecosystem dynamics requires that we 'provide ecological space and margins for error' (Jordan and O'Riordan 1999, p.24).

3 Theoretical Framework

3.1 *Risk and the Individual in Modern Societies*

This chapter moves from the social ecology view of food system impacts on public health, as explored in the previous chapter, to focus on theories that help to understand how individuals perceive the relationship between food, health and the environment. As previously discussed, the individual has been positioned within dominant scientific and economic theories as being responsible for personal and broader environmental health through consumer choices. It is argued that a culture of blaming the individual for lifestyle choices, including food decisions, is limited as it represents an epidemiological approach that ignores the structural imposition of many public health risks (Szreter 2003). This chapter refers to the theories of individualization and risk and citizenship to provide a framework within which to position consumers' understanding of the relationship between food, health and the environment.

First the concept of individualisation is defined as essentially a transfer of responsibility for risk. In neo-liberal societies, commercial considerations of risk have come to dominate lay perspectives of risk, even with regard to public health (Beck 1992; Hutton and Giddens 2000). Local traditions, knowledge and cultural values have historically guided individual responses to risk. However, in modern societies the emphasis is on economic issues and this has permeated the role and function of both social institutions and individuals (Beck 1992). At the institutional level public health initiatives have been designed to reduce risk to population health. But it has been suggested that, rather than being focussed on

humanistic purposes, these were a means of ensuring a viable workforce to facilitate economic growth (Szreter 2003). Also, the financial responsibility for managing personal risk by making appropriate choices about health, education, family and employment has increasingly been allocated to the individual. This economic agenda has created a context in which both risks and wealth are inequitably distributed.

The influences of both government and science are discussed in relation to the trust placed in these bodies to manage environmental health risk. For government the role is a compromise between providing risk protection for citizens while balancing economic imperatives. This extends to the regulatory role it has over an increasingly privatised scientific sector. This is relevant because the individual cannot be an expert in all the fields necessary to reduce personal risk and is often reliant on science as an external source of information (Giddens 1991). The dilemma is that knowledge is not static and in market based societies it can provide a commercial advantage, with much of everyday life standardised through commodification (Giddens 1991). Thus consumers are urged to support economic growth but are also confronted with conflicting messages about the impact of their choices on health and the environment. Illustrating these contradictions are references to government campaigns urging individuals to be conservative in their use of resources while governments support exploitative practices and avoid commitment to a precautionary approach to environmental health risk.

The credibility of official information is an important factor in consumer food choices (Frewer and Salter 2002). The notion of reflexivity is used to describe the process of prioritising the risks associated with choice. Critical reflection can provoke a reconsideration of previously accepted 'truths' and expose the existence of false

consciousness by clarifying that the way the world and events are understood by the individual, or group, does not correspond with the perceived situation (Fay 1987).

This thesis proposes that a continuum of citizenship values may be useful to describe the various positions that are assumed by consumers in responding to environmental health risk. Beck (1992) has stated that consumer decisions are a function of both critical reflection and education, and this can be extended to food choice. Thus the discussion links social ecology and the behaviour of socially responsible individuals (Christoff 2000) to highlight how critical reflection may contribute to a holistic perspective on the interdependency of natural and constructed systems. Citizenship theories provide insight into why individuals may question the status quo and choose to act for community rather than personal benefit. The discussion goes on to explore the concept of consumer sovereignty as a means of influencing the food system, and again, the importance of credible information is stressed. Frustration with risks imposed by existing structures can lead to formation of activist groups intent on politically challenging the status quo, in this case the structure of the food system.

The chapter concludes by reiterating that the current emphasis on individual agency is inadequate given the complexity of modern systems. The previous chapter documented the extent to which individuals are recognising the profit motive, and questioning the impact that this is having on the food system. The extent to which this questioning leads to alternative behaviours in relation to food choice will be explored through analysis of consumer perceptions of food system risk.

3.2 Transferring the Responsibility for Risk to the Individual

Traditionally cultural standards guided individuals in the avoidance of choices that may have carried repercussions or risk, such as the ostracism of eating taboo foods (Douglas 1992). However, in neo-liberal societies rapid change has been a corollary to the emergence of a dominant scientific approach. New technology makes choices available to the individual prior to there being a social consensus on the cultural acceptability of a given innovation, such as new food technologies. The individual is now required to make decisions about much of life that was previously proscribed by cultural rules. Parallel with the increasing dominance of science was the retraction of the role of government as a protector and provider of health and welfare systems. Responsibility to act in their own best interests shifted to the individual and the term individualisation has been used to describe this process (Beck 1992; Shove and Ward 2002).

The retraction of welfare support is part of the overall trend to neo-liberal governance which positions the individual as responsible for making prudential judgements about the options available. Rose (2000, p. 324) is explicit in stating that in neo-liberal economies individuals must provide “for their own security and that of their families...including health insurance...”, with the capacity to achieve such autonomy deciding the level of social inclusion or exclusion for the individual. Thus while acknowledging that Marxist views of equity and social structure still constrain social behaviour, Rose’s views very much align with authors such as Benton (2002), Beck (1992) and Giddens (1991) who stress that the emphasis is now on the agency of the individual. These theorists question the notion of the individual as an active agent who has an independent ability to assess risk so as to inform the range of decisions that affect daily life, including health options. The questioning

relates to the ability of the individual to influence a range of external factors. Thus the flaws in the individualisation concept, as identified by Dean (1999), are the presumption of access to information, an ability to fully comprehend the outcomes of complex interactions, as well as access to the resources to make provision for alternative behaviours should these be indicated. The absence of these factors combines to increase the individual's exposure to the risk of negative consequences (hazards). Individuals interpret risk according to the resources they have at their disposal and deficiencies in these affect judgements of risk.

The concept of risk clearly has more than one interpretation, even though public health professionals use the term as if it has a uniform meaning. Douglas' (1992) explanation of how risk has shifted from its neutral meaning of chance or probability to the current economic concept of risk as a danger is useful in understanding how risk is imposed in modern societies. This explanation links the theories used in risk assessment by science and manufacturing to the political process because governments base regulations and policy on these theories. Thus risk assessment is an economic based activity that directly influences government decisions, including those that have the potential to impact upon population health. For the consumer there may be a certain security in accepting official assurances that risks are calculable and manageable, but, as highlighted by Douglas (1992), personal and cultural beliefs influence decisions about how to respond to everyday risks. Food choice is one of the more difficult areas of personal decision making with many food-related risks beyond the control of the consumer, and yet as Nestle (2003) and Lupton (1995) point out, the responsibility for poor decisions rests with the individual.

Individualisation can also be regarded as the privatisation of risk, so that the cost of making poor choices is borne by the individual. The caretaker role previously assumed by

governments for citizens had provided a form of risk management through ensuring public health and paying social security benefits. Szreter (2003) provides a historical perspective on the management of epidemiological risk and links this to the dependence of workforce productivity upon the eradication of diseases that could severely impact on population health. Governments provided improved sanitation measures to reduce the incidence of vector borne diseases and immunisation programs controlled the spread of contagious viral diseases such as polio and measles. While there is little public opposition to advancements in hygiene, immunisation programs frequently conflicted with the personal values of individuals. The threat of sanctions was, and is, a primary means of ensuring compliance with imposed health initiatives. It has been suggested, however, that the delivery of public services has become too expensive for many governments (Garland 1996; Crook 1999). Governments have now facilitated the privatisation of health, education, employment, and much public infrastructure.

Under privatisation the consumer pays for services rather than accessing these on a free or subsidised basis, and also insures against the loss of intangibles such as health as well as material goods. The commodification of previously intangible services, including health care and environmental amenity, enables these to be constructed as products that have a dollar value. Consumer willingness to pay or insure is influenced by factors including the perceived quality of the product, personal value decisions about the need for this, and the risks associated with accessing or not accessing the product. Thus risk is a cultural construction to assess the impact and acceptability of the options available to an individual (Douglas 1992; Adams 1995), as well as a means of calculating the monetary value of a risk to insure against economic loss.

Public health risk reduction has focussed on prevention but this strategy was premised on ascribing economic value to the health of individuals. The outcomes of this approach are the individualisation of risk and the subversion of the interests and values of individuals to commercial imperatives. Consumer capacity to respond to risk is not equal and there is a need for governments and health agencies to mediate to ensure that consumer views of risk are considered within decisions that impact on the food supply.

3.2.1 Views of Risk

There are diverse views on the nature of risk and its impact but in modern society all have an economic theme and a social effect. Dean (1999) suggests that the socialisation of risk operates, resulting in a shared risk burden with the costs and benefits of risk fairly dispersed. Capitalist societies, however, are not premised on equity. In identifying modern society as a risk society Beck (1992), contends that the inequitable distribution of risk, a consequence of the inequitable distribution of wealth, has created incalculable risks. Douglas (1992) does not concur with Beck's estimation of risk but suggests that greater public awareness of imposed technological risk, concurrent with a propensity to see merit in risk taking, has contributed to a trend away from a collective responsibility for risk. The disparate positions evident in these views are reflected in public debates about risks regarded as imposed, such as novel food technologies. It becomes apparent that the politics of market based competitiveness impedes consumer capacity to control risk and ignores the social construction of risk, particularly risks distanced by space or time.

Dean (1999) states that the socialisation of risk is premised on the view that technology has rendered risks as calculable, with the individual expected to shoulder a proportionate share

of the moral responsibility in the event of loss. Such a concept of risk can be linked to the increasing role of insurance in our society. For insurance to work each individual requires access to the funds to contribute as well as the altruism necessary to ensure the equitable disbursement of the funds on a needs basis. The cost of premiums for a range of risk options, including health care, has functioned to exclude many consumers from insurance options. The Australian insurance system experienced a crisis in the early part of the twenty first century because of excessive claims and failed insurance companies (Australian Competition & Consumer Commission 2002). These risks to the public good can be traced back to a preoccupation with acquiring wealth and power... "People are the risk. Human greed, malice and error are the primary threats." (Bryden in Fox 1999, p.17). The health and environmental risks that are generated by food production activities, discussed previously, also derive from the economic agenda of industry (Echols 2001; Nestle 2003). Thus market based competitiveness may discourage public willingness to accept risk burden for food system activities beyond public influence. The food system exemplifies a context in which estimates of calculable risk are rendered futile because of unknown and compounding factors, as suggested by Beck (1992). Individuals are confronted with daily reports of local and global risks that affect many facets of life, translating into some level of personal impact, and they have to decide how to respond.

Daily life comprises a range of risks and risk perception and response reflects individual familiarity with the hazard. The level of risk that the individual accepts is a combination of personal comfort zones, assessments of affordability, and the degree of trust in external agencies. When an activity is routine and there is regular voluntary engagement with the risk, for example crossing the road or sunbathing, the individual takes responsibility for the

risk. Engagement with risk also varies according to cultural context, and the standards that comprise the moral structure of a given society, for example acceptable foods, dress codes, road rules, and public behaviours. The extent to which an individual conforms is determined by conscience and 'some-risk taking behaviour appears to be a confirmation of moral autonomy' (Adams 1995, p.18), or a measure of individuality. That there is a resistance to imposed or unknown risks, such as those associated with new food technologies, has been documented (Macfarlane 2002). These are regarded as risks that are beyond the control of the individual and there is a dread of possible outcomes (Sandman 1991). This explains the public outcry when technologies perceived as risky to health are proposed for implementation, especially when these are associated with potentially negative impacts on the food system.

The way the scientific community views risk is often at variance with lay perceptions of risk. A complexity of risk identification is that many health risks in modern society are imperceptible. Invisibility may mean that the risks are either discounted or magnified, for example air pollution, or microbe contamination of water or food. While outrage at learning of such a risk may not always equate with the actual hazard presented, the perception of the risk will produce strong opposition. Core to the outrage are the differing perceptions of risk. Science and technology predicts and quantifies risk in terms of probability and severity. In the short term it also plans for the control of risk. This approach is dismissive of the cultural perspective, including the traditional values and knowledge (Wynne 1996; Echols 2001) that are considered by individuals in their assessments of what can go wrong as well as judgements about the actual ethics underpinning the technology. The public debate about biotechnology illustrates this

disparity between the lay perspective and scientific view. That risks can eventuate into hazardous events because of inadequate scientific assessment, and that the short term control plans are ineffective, is evidenced by nuclear accidents and food system risk. Beck (1992) describes these events as evidence of risk developing as an effect of modernisation and a consequence of production activity that is beyond the influence of the individual.

Many of the food-related risks generated by modern society are beyond the control of the individual, and in fact may not be detectable in instances of contamination of food, air or water. Clarifying consumer perceptions of the environmental health risk associated with food is a starting point for public health workers in identifying consumer concerns and for the development of strategies to respond to these. Government and those agencies charged with responsibility for safeguarding against environmental health risk should consider consumer views in such efforts.

3.2.2 Trust and Risk

The increased focus on the individual to make decisions regarding risk-related behaviours necessitates an examination of the role of science and government in relation to the identification and amelioration of public health risk. For consumers to exercise their increased responsibility to safeguard their own health, they are reliant on the provision of information to answer the range of questions that they may pose. It can be assumed that there is also an expectation that governments would act in the public's interest. Several factors, however, mitigate against this occurring, including an economic agenda that obstructs the adoption of a precautionary approach to risk assessment.

Trust as defined by Giddens (1991, p.3) requires individuals to have faith in the agencies who act on their behalf to “screen off potential threats and dangers”, especially in the modern context of abstract systems. Like Beck however, Giddens agrees that the very nature of modernity has introduced new risks that permeate the public consciousness and detract from the ontological security of unconditional trust. Public reaction to risk is both a response to the hazard itself as well as a reaction against those trusted to protect the public from the risk. In democratic societies the public vote for governments in the belief that these will act in their interest. Researchers such as Ruibal-Mendieta et al (1998) and Knox (2000) have identified that open scientific disagreement about the risks associated with emergent technologies, such as the genetic modification of food, contributes to the public perception of risks being imposed by government rather than government acting to protect public health interests. In this context public criticism of, and scepticism about, the role of science and government in risk assessment and appropriate response can be understood as negative reaction to incidents that threaten public health and safety, and damage trust.

In addition Benton (2002) has intimated that public faith in the credibility and impartiality of science has been undermined by the transfer of research and development funds from the public sector to the private sector, where the emphasis is on commercial value. In this sector the ability of scientists and researchers to speak independently is curtailed by commercial confidentiality requirements, as well as the realisation that their own livelihoods and research interests are dependent on the continued support of their employer. The economic agenda dominates not only the research and technology sector, it also influences and directs political decision making on risks to health (Nestle 2003). Durkheim commented over a century ago that 'government, instead of regulating economic life, has

become its tool and servant' (in Spaulding and Simpson 1952, p.255). Since then the influence of capital has been further consolidated with the wealth of some of the global corporations now exceeding that of several smaller nation states (Dean 1999). Starr, Langley et al (2000) have also noted that governments have become subservient to powerful industry groups and are therefore not as responsive to risk situations as identified by the public.

A loss of public trust occurs when incidents affect public health. This is particularly so in relation to risks that were resisted by the public in the first place but which were implemented with government sanction, such as the siting of nuclear facilities. The complexity of systems that influence modern life, including food choices, requires the consumer to have faith in the experts who develop such systems and advise on the impacts of these (Giddens 1991). It is not possible for any one individual to have full understanding of all such systems and thus the government has the responsibility for legitimising innovations after considering scientific advice. Government approval for a technology that then adversely affects health would decrease faith in the regulatory process. The food system provides some clear examples of this loss of trust. The BSE outbreak in Britain was an environmentally based incident that had health ramifications, but the power existed for industry and stakeholders to shift the focus from health to the importance of saving the industry (Benton 2002). Appealing to the social justice values of the public may distract attention from an agenda that is more directly linked to the need to secure profit, and in which 'safety itself is treated as a trade barrier' (Shiva 2000, p.124). Individuals who discern this commercial agenda and object to perceived hazards may have reduced

confidence in government and food industry commitment to the control of food system risks.

The public would expect that if risk to health or the environment is identified or anticipated then the government and scientific community would implement precautions to avoid harm. Such an action would be a public indication that these agencies were acting on their behalf. This is the basis of the precautionary principle, which evolved as a risk assessment approach that recognised a moral obligation to protect the health and safety of all species. 'The concept assumes that science does not always provide the insights needed...' (Echols 2001, p.109), that precautionary approaches should be adopted, as information is likely to be incomplete.

This approach is not uniformly agreed upon. Opponents of the principle are concerned that it is being used to stifle scientific and technological advances just in case something goes wrong (Wildavsky 1995), or that unnecessary and costly safeguards are imposed, diverting money from essential social programs (Jordan and O'Riordan 1999). Advocates for precaution see it as a means of minimising the risk of damage from scientific processes where outcomes are uncertain, and this aligns with public concerns about potential adverse effects on health (Frewer and Salter 2002). From a public health perspective both escalating environmental degradation (Brown 2001; Miller 2002) and food safety incidents highlight the damage and risk that result from technological miscalculations. The principle posits that preventing damage is preferable to resolving, remediating or bemoaning the consequences of any given technology. The principle moves beyond managing known risks to anticipating possible consequences and taking preventative action. The burden of proof is shifted to the proponent(s) of innovations or new processes to identify risks and

then, regardless of scientific proof regarding the certainty of harm, to respond appropriately. When this does not occur public trust is eroded.

The key issue is the allocation of blame for consequences. The preventative approach to managing health that is advocated by governments has a focus on modifying behaviour to minimise harm. This closely aligns with the core attributes of the precautionary principle (Raffensperger and Tickner 1999; Goldstein 2001), but a significant difference is who is responsible for risk management. The preventative approach has a focus on individual responsibility while the precautionary principle advocates that the proponents should take responsibility for any risk generated. Allocating blame to individuals for health impacts while not adequately implementing a precautionary approach may be regarded as compromising public safety for economic gain. Public dissent occurs when risks are imposed, especially in relation to the food system where the risk may be invisible.

The protection of public health should be considered to be a principal function for governments, and it is valid for the community to expect a level of responsiveness to identified health needs. Without the application of the precautionary principle there is the potential for a company that benefits from a technology to claim that its particular product was not responsible for adverse health impacts, until there is overwhelming evidence to the contrary. Even with evidence, however, there are governments who still resist a precautionary approach because of economic considerations. For example the push by agribusiness and government for the genetic modification of food illustrates how the longer term risks associated with the technology are unknown but are imposed on consumers. Similarly food productivity is threatened as a result of exploitative practices (WHO 2001a) but, despite awareness of rural land degradation, the environmental impacts consequent to

Australian government's recent signing of the Free Trade Agreement (FTA) were ignored in the focus on wealth. One of the government's own scientific bodies, the CSIRO identified that producing the additional agricultural products for export as stated in the FTA would require an increase of "up to 1.3 trillion litres [of water] per year, almost as much again as the total national domestic water use." (Porteous 2004, p.4). This would occur in a dry country in which individuals were already restricted in daily water use and much of the country's agricultural land was officially in drought. The benefits from such an agreement would go to investors while individuals are castigated for overt resource use. Huckle (1993) has described the government position as evidence of a conviction that technology can raise productivity and overcome the limits imposed by nature.

Within the commercial food system the primary role for the individual is as the consumer who trusts technology to minimise and resolve potential health and environmental issues. Food related incidents have occurred, however, and the consumer has difficulty in knowing who to trust and whether the government really is considering the long term health interests of the public. A constructive role for public health within this situation is to support consumers by advocating a precautionary approach to food related decisions that balances incomplete scientific information with a sustainable health and economic agenda.

3.3 Consumption and Reflexivity; the Risks of Choice

Increasing the engagement of people in decision-making about risk involves understanding how decisions are made in the modern context of abundant, but often conflicting information, and for which there may be subsequent negative consequences of such decisions. Consumption, especially that related to the food system, contributes to waste,

inequity and environmental degradation. It is important to identify the level of control that consumers perceive themselves to have over food choices, given that some of these choices can be linked with resource depletion, the degradation of natural systems and adverse impacts on the health of economically disadvantaged peoples.

People make choices even when there is a known undesirable consequence, because the individual determines that there is more to be gained than lost in the immediate evaluation of that choice. This process is described as reflexivity and has also been referred to as 'self endangerment' (Beck 1992, p.48), because the longer term impact is either not the priority at the moment of choice or it is not known. Risk perception and response are core to reflexive living (Beck 1992; Adams 1995) and decisions are often made in a reactive situation. These choices include decisions about health, education, work, political alliances, and physical location. The dilemma for the individual is balancing socially responsible consumption with the information available, in an environment that apportions blame if there is a negative outcome for the choices made (Beck 1992; Dean 1999; Lupton 1999). Placing the onus on the individual to actively compete for achievement and status, and to accept responsibility in the event of failure, for example poor health or unemployment, masks the structural context that limits the choices that can be made. For example the deregulation of industry and accountability to shareholders rather than social outcomes, is a trend across western governments. This leads to job losses because reducing the number of employees increases profit as a return to shareholders. Schlosser (2001) has described how the loss of employment reduces options for people, as it affects income and ability to purchase the preferred options including geographical location and diet choices,

thus affecting health. Another negative impact may be reduced educational opportunity which would otherwise inform choice about risk.

A holistic approach, incorporating immediate, long-term and spatially distant risks to environmental and public health, requires people to have access to information that enables the conscious connection of consumer decisions with such risk (Huckle 1993). The hegemony of commodification creates a barrier to the capacity of individuals to make choices that minimally impact on health and the environment. Members of the public are expected to purchase products such as foods, on the belief that this will be rewarding not only to them, but also to society. Dickens (2002) suggests that the ethos of consumption and the belief that technology can manage nature for capital benefit is held by consumers and government alike. Increasingly, however, it has become apparent that the risks that are controlled are narrowly defined and that broader, less immediate but still important risks, are not addressed due to the focus on the immediacy of profit.

That this situation will only change when people start to question how existing economic, political and social structures contribute to the inequitable distribution of risk and wealth is discussed by authors such as Giddens (1992) and Hamilton (2003). Giddens (1992) suggests that fateful moments can provide the stimulus for critical reflection on issues. These moments may be a reaction to a food safety incident, the loss of valued open space, nostalgia for the way things were, or growing awareness of inequities - including the inability of other species to counter habitat degradation and loss (McKechnie and Welsh 2002). Ultimately there needs to be recognition that the earth is a closed system and that while, as Beck (1992) suggests, wealth may provide a sense of control over risk, there is no

such place as the commonly referred to 'away' when disposing of goods. The 'away' referred to is always the abode of another person or species.

The diffusive nature of the global commons (air, water and soil), means that there is no escape from effects of air or water borne contaminants. The foot and mouth outbreak in Europe in 2000 exemplified the difficulties of containing soil borne contamination. In such instances the public health risk could be said to be equitably distributed but in cases of more apparent risk, a powerful citizenry will resist imposed risks. Thus an outcry in a developed country about a health and safety risk may lead to the relocation of the facility or practice out of sight with the risk imposed on the less visible and disenfranchised poor (Jackson 1990; Beck 1992; Hutton and Giddens 2000), as in the use of some agricultural chemicals. The capacity to take action to reduce risk requires access to information that facilitates understanding of power relationships and the impact of these on interconnected natural and constructed systems. A number of theorists, including Beck (1992), Goldstein (2001) and Wehling (2002) have suggested that information is politically controlled. This means that scientific knowledge may be constructed and disseminated to the public so as to serve the economic interests and limit public debate, as exemplified by the decades of tobacco industry denial of the health impacts of smoking.

Awareness of risks creates dilemmas and tensions for individuals as competing personal values come into conflict. Knowing that a desired food is produced at significant social or environmental costs may create tension for the consumer. Giddens (1991) positions commodification as a pervasive influence that promotes individual consumption as a socially acceptable norm that contributes to society. As cited by Huckle (1993, p.53) 'A consumer society facilitates the reproduction of workers and citizens while sustaining

capital's profits and involves the social control of consumption through marketing and advertising.' The ability and willingness to pay for commodities, including health services and access to environmental amenity, is considered to dictate the quality of life. Durkheim (in Spaulding and Simpson, 1952) suggested that society has a role in moderating consumptive desires, but the ideology of capitalism is based on production and consumption. The 'ethic of self-fulfilment and achievement' (Beck and Beck-Gersheim 2002, p.221) is risky, however, because it is premised on infinite resources. The question arises as whether it is easier to focus on consumer diversions, rather than question the material comforts and convenience of living standards in western societies? As Beck (1992, p.37) stated 'Where there is no escape, people ultimately no longer want to think about it' .

Choosing not to think about it highlights that acting as a social agent may prove to be too difficult in certain circumstances. The difficulty of choosing the 'right' option is fraught as individuals struggle with their own needs and capabilities, and conflicting messages about roles and responsibilities. For professionals to assist individuals and communities in these more difficult decisions it is necessary to explore the possible ways that individuals may respond to risk.

3.3.1 A Continuum of Consumer/Citizen Behaviours

“...we are citizens as well as consumers.” (Huckle 1993, p.57). Response to risk may include actions aimed at influencing the political and social context of risk production. The citizenship literature discusses many motivations for adopting what could be regarded as socially responsive behaviour. This section refers to this literature to identify the range of

positions that may be reached by consumers after reflecting and acting on food choice behaviours that impact on the environment. Public health agencies need to take note of individual motivations if these agencies are to have relevance when engaging with consumers in addressing food system issues. Within this discussion of citizenship behaviours is consideration of the extent to which consumer sovereignty (Korthals 2001b) is an influence in the market place. Consumer sovereignty is reliant on access to information that is reliable and independent. This is a central theme in response to risk.

As discussed by Douglas (1992) individual reaction to risk varies according to values and beliefs. Figure 3.1 presents consumers along a continuum of citizenship in an attempt to map the influence of these values and beliefs upon judgements about environmental health risk related to the food system. At one end are consumers who, through either lack of awareness or choice, accept the commodification of food as unproblematic. Further along the continuum is the environmental citizen who will voice concerns about the 'preservation of landscapes and species' (Christoff 2000, p.206) but the focus remains anthropocentric because these elements are valued only in human terms. At the extreme are consumers who, as a consequence of concerns about social justice and sustainability have adopted an ecological citizen approach, in an attempt to minimise the environmental impact of their food choice.

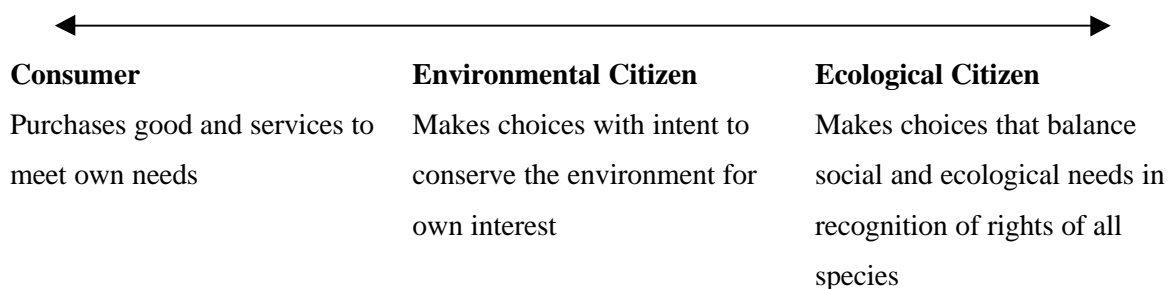


Figure 3.1 Citizenship Continuum

The diversity of positions on the continuum indicates different individual values and it is active reflection that underpins the ability to make conscious determinations about the preferred way of living. The ecological position aligns with active citizenship (Kane 2000). This has been defined as the fulfilment of responsibilities to the community, including questioning existing structures, and resisting identification as a resource to be manipulated by power groups (Higgins and Ramia 2000). Active citizenship is premised on the belief that each citizen has the same participatory rights with the 'values of equality and inclusiveness' (Higgins and Ramia 2000, p.137) core to the notion of modern democratic citizenship. People that fit this description are engaged in critical reflection on their own thinking as well as on the 'cultural assumptions governing the rules, conventions and social expectations which dictate the way we see think, feel and act' (Mezirow 1991). An ecological citizen views all the elements of the global system as having intrinsic and equal rights, and deplores the exploitative role of humans in destroying the integrity of the global ecosystems (Christoff 2000). From a food system perspective this would mean that active citizens would seek to contribute a balanced view of all potential impacts in decisions relating to risk. This contrasts with the predominating instrumental rationality, described by Higgins and Ramia (2000) as decisions being made by more powerful groups, government or economic, on behalf of other people in the so called common interest, but which generally serve to maintain the existing power structures.

Citizenship parallels individualism in recognising that a diversity of roles can be assumed, and, at times tension will arise for an individual when balancing conflicting interests. It is recognised that the 'The ability of a person to live lives of their own choosing depends, in part, on their ability to live according to principles and values that they have freely and

reflectively chosen' (Hogan 2000, p.160). Part of this reflective process is identifying obstacles to taking the preferred action but time and energy can be limitations to individual enthusiasm for the 'live simply' doctrine that underpins ecological citizenship (Hamilton 2003; Christoff 2000). Time and energy also set the parameters that dictate the level of interest in obtaining further information on environmental issues. It is possible that the hardest areas may be the lifestyle choices that contribute to the less visually immediate degradation of air, water and soil. With food, the literature suggests that the information that connects personal choice to these impacts has to be painstakingly traced back through the production process (Lupton 1996).

In addition, developing a resistance to the ongoing barrage of media imperatives to consume involves making a conscious decision not to participate and, as noted by Stern (2000) this is not always feasible. Apart from time and convenience the obstacles may include structural ones, for example there may be desire to reduce packaging waste but many foods are pre-wrapped. High standards of living may also make it easier for people to financially contribute to an identified environmental cause without consciously reflecting on the ways that their own lifestyle may be unsustainable, especially with regard to consumption. Kaplan (2000) describes this duality in his discussion of people's capacity to be simultaneously reasonable and unreasonable about environmental issues. Personal values conflicts also occur when citizens hold simultaneous roles within diverse communities, again creating individual tension (Kane 2000). For example, employment in the business community may require actions that conflict with the ideals of an individual who otherwise identifies as a member of the 'greens'. Such situations may require the individual to prioritise the conflicting values.

The complexity of modern life requires individuals to make reflexive judgements about many choices, including food. The adoption of a position that seeks to minimise social and environmental impact may require the individual to balance competing personal values and the expectations of significant others. Even those dedicated to ecological citizenship may be challenged by both the social context and the difficulty of accessing the necessary resources. Theorising consumer behaviour with consideration to the overlap of risk, the effects of individualisation and citizenship responses can provide public health agencies with a framework that maps consumer food system needs. Further, identifying consumer positions would enable resources to be allocated to meet the diversity of information and support required by those who want to reduce environmental health risk within the food system.

3.3.2 Consumer Sovereignty

Beck (1992, p.35) indicates that self identification on the consumer/citizen continuum is a combination of a consideration of personal values, and a pre-requisite is access to 'education and attentiveness to information'. This education process can lead to adoption of consumer practices that are identified as green consumerism, which aims to reduce energy use and demands on natural resources, as well as promote social justice, through purchasing goods and services that are less resource intensive (Shove and Ward 2002).

Green consumerism is about considering the ecological impact of purchases and has been identified as one of the forces that has emerged as an effort to 'engage individuals in reflection on their own contribution to the overall problem' (Benton 2002, p.253). This facet of consumer sovereignty (Korthals 2001) suggests that consumers can enforce their

rights through purchasing decisions and thus dictate both the development of new products and the degree to which these are accepted in the market. Green consumerism has thus been positioned as a form of political action. Consumers are considered to make conscious choices to lessen environmental impact, even though this may mean more effort for the individual. This is considered to be an attempt to influence the supply and demand basis of market based economies. The concept unravels, however, when conflicting positions of rights and responsibilities within marketplace justice are considered. Some believe that corporations may not consider it in their economic interests to divulge either the nature of the food that they supply or the production processes, thus impacting on consumer capacity to make informed decisions (Schlosser 2001). That risks increase in market environments is evident in Dean's (1999, p.148) admission that there is a need for company audits, and this is despite his assertion that liberal and social forms of government have provided successful regulating mechanisms. Consumers not only experience restricted access to information about environmental health effects of food choices but also the effects of deliberate attempts to avoid compliance with standards set to protect consumers. A growing awareness of this situation may provide an impetus for citizen orientated action to challenge the existing social structure. This has been evidenced in the opposition that has been demonstrated in the anti-globalisation rallies that have occurred (Holloway 2001; Bleiker 2002).

Restricted access to information has led to an increased questioning of information presented by experts and authorities. This questioning has arisen when interested parties compete for environmental amenity and quality of life resources including food safety and security. Finding answers is, however, difficult. In addition to limited access to product

information from corporations, media monopolies have been found to restrict access to other sources of information about risk (Giddens 1991; Ten Eyck 1999). Consumers thus become more dependent on information from experts and external agencies who are entrusted with a responsibility to safeguard the interests of the individual. This is important in modern society where many aspects of life, including access to self-sufficient food production, have been removed from the control of the individual. This source of information is also compromised, however, by institutionalised reflexivity. Expert opinions only change in response to the dynamic nature of knowledge or the confirmation of a previously unacknowledged risk (Giddens 1991). This is evidenced in public health by professional disagreement that takes the form of competing views on the value of red meat, or the taking of complementary medicine. Often it is the vested interests that have promulgated the health value of such products, based on industry funded research. Thus the basic requirement for trust, mutual disclosure, is not met (Giddens 1991). In the absence of information sources that are perceived to be independent and reliable, grounds are provided for the individual to challenge those who are regarded as aligned with the competing party. In such a situation alternative sources of information are sought.

It is recognised (Christoff 2000) that community leaders who have access to local knowledge and experiences, and environmental groups with a research and advocacy role, may provide alternative sources of information. Sharing information can lead individuals with a common interest, such as preserving and protecting the environment, to form coalitions of like-minded people. Benton (2002) suggests that this provides a context for activists and groups to advocate for independent voices and research that challenges the existing technological regime's creation and management of food system risk.

3.4 Summary

In this chapter theories relating to risk and the individual, as well as citizenship have been discussed to further understanding of consumer responses to food system risk. If the diverse positions adopted by consumers in relation to food system risk is the sum of a relationship between these theories, as suggested by Figure 3.1 then it may be possible to determine the influences that contribute to individual shift on the continuum. These influences may include information access, purchasing options or time to reflect.

A significant deficit in the theories discussed is the focus on human activity and the exclusion of the influence of natural systems upon human behaviour. Huckle (1993) suggests that environmental management has been co-opted by industry and governments to manage environmental risks without questioning the production and consumption that drive modern society. This represents the belief that science and technology will provide the means for ensuring that current rates of consumption can continue. Wealth has been constructed as a safety net (Beck 1992) that will give individuals the opportunity to selectively minimise their exposure to risk. Within neo-liberal societies however, wealth, and therefore risk, are inequitably distributed. In addition the acquisition of wealth is competitive and the attempt to increase capital can lead to activities that pose further threats to environmental health. This is evident in the food system, where food crises can often be traced back to production processes.

The individual is placed in the insidious position of responding to demands to consume while at the same time being responsible for the impacts of that consumption. The inequity of this situation is the limited access the individual has to information about these impacts,

especially within the food system. In summary the individualisation approach would appear to conflict with the citizenship approach required if equity and sustainability in ecosystems is to be achieved. A food system incident however, can be the start of questioning the status quo. From there consumer concern can result in agitation for recognition of their preferences and lead to the adoption of citizenship actions that aim for healthy and sustainable food production. The next chapter describes the methodology for exploring participant understanding of the links between food production, health and the environment to gain insight into perceptions of environmental health risk.

A qualitative approach was chosen to gauge consumer views of the food system as a public health priority as well as any changes to these views after the opportunity to reflect on these. This method was chosen as it was believed it would provide greater insight into the consumer perspective (McKechnie and Welsh 2002; Patton 1990) and would enable such views to be explored within the theoretical framework outlined here. This approach gives recognition to the value of critical reflection as a self educative tool. To provide background and to enable verification of this methodology, details of the setting, recruitment process, interview sequence and data analysis are given. The data analysis process provides the conceptual link between the critical theories discussed in this chapter and the research findings.

4 Methodology

4.1 *Introduction*

This chapter details the qualitative research techniques that underpinned this investigation of participants' food choices and describes the methodology used to investigate their understanding of food choices environment impacts. It also explored the extent to which this understanding influenced their food choices.

The interview methods are described to explain the contribution of these to the data collection process. Two types of semi-structured interview situations were used to obtain and verify the data, individual interviews and focus group interviews. The researcher's role is described because this clarifies the parameters that the researcher worked within. The research process, including location, recruitment, interview process and questions, and data analysis, is detailed. This explains the sequential process used to obtain the data. An explanation of how the data were managed and analysed concludes this chapter.

4.1.1 Approaches to Qualitative Data

A qualitative approach was chosen for this research project because it facilitates a greater depth of understanding of behaviour as described by the participants. A brief overview of the interview methods and the data analysis methodology is provided before describing the research process.

Critical reflection within interview situations is a technique used to obtain participants' perspective (Mezirow 1991) and this has value in assisting individuals to interpret the

influences in their lives. The process gives recognition to the significance of local knowledge (Beck 1992; McKechnie and Welsh 2002) with the collated data presenting participants' perspective on the food system as an impact on environment and health.

Clarifying the priorities that dictate food choices may assist in identifying the extent to which individuals control dietary intake to protect health and the environment. The individual interview is an opportunity to discuss personal views and strategies adopted in regard to decisions. Critical reflection in the interviews may result in recognition of 'the explicit possibility of acting differently as a result of progressively learning from experience' (McTaggart 1993, p.22). The pace of modern living dictates that many decisions are reflexive, with time, convenience and cost the variables that affect the ability to adopt a citizen consumer approach. This includes routine decisions about which foods best align with other personal lifestyle values, such as green consumerism or animal welfare. Critical reflection also facilitates the exploration of the impact of economic, political and social influences on food choice.

The value of the interview situation is that 'through dialogue between individuals and groups in the setting, people are able to explore other ways of seeing their world and interpreting their situation' (Stringer 1993, p.158). Thus it is a form of action research in that participants actively engage in reflecting on choices and make decisions about the adequacy of these. It can also become an educative process when an individual uses this as the catalyst to seek to actively address both personal and community development needs. It can also be an empowering technique to further demands for a fair say in decisions that impact on participants' lives.

Focus groups are another form of interview situation in which a group of people are involved in a semi-structured discussions. Patton describes focus groups as having developed 'in recognition that many of the consumer decisions that people make are made in a social context, often growing out of discussions with other people' (1990, p.335). The optimum size for a focus group is six to eight people (Patton 1990) as this increases the potential for a diversity of opinion as well as providing scope for equity in the time available for each participant to speak. The interview is structured around a set of questions. The group situation is an opportunity for people to listen to and reflect on all contributions to the discussion, and to modify their own position on the topic as desired. This requires the creation of a supportive and respectful atmosphere where all group members feel their contribution is of equal value. To be avoided is a situation whereby some members of the group become intimidated by outspoken participants. It is essential for the facilitator to have the skills to encourage interaction, to be able to explore in depth the responses without being diverted by tangential issues, and to ensure that there is equity in speaking time for each participant.

Patton (1990, p.169) states that qualitative research 'focuses in depth on relatively small samples'. This requires purposeful sampling to obtain richness of data and the choice of participant group is an important consideration in optimising the information sought. Having a range of ages was important to the study because this would provide the historical perspective that contributes to an understanding of how food system changes are perceived. Thus this research focussed predominantly on recruiting women, at various life stages, as it is they who have the majority responsibility of food choices, purchases and preparation (Goodman and Redclift 1991; Bell and Valentine 1997; Worsley and Scott 2000).

Part of the rationale for the longitudinal approach to this study was to counter for the small sample size by gauging over time the extent to which participants brought new information to the interviews. Participants in this study were to be provided with summaries of the interviews as it was anticipated that time to reflect and consider the process may produce further comment on the issues under discussion. This combination of reflection time, input and pursuit of participants' questions was designed to elicit as much information as possible, to the point where data saturation was achieved when no new information was forthcoming (Strauss 1987).

This methodology aimed to stimulate thinking (and provide time to reflect) on food choice and the environment. For this reason the interviews were planned as a sequence of events over an 18 month period, with an individual interview to prompt initial reflection on the issues and then the focus groups to provide for interaction on the topic. The questions provide a guiding framework only, as critical research is a collaborative learning process, and validity depends on genuine participation not the imposition of structure.

4.1.1.1 The Role of the Researcher

The researcher provides a context for the research and responds to participant requests for further information without leading in a way that skews the interaction. It is the 'value positions and beliefs of the group' (Melrose 1996, p.52) that is of interest to the researcher. In exploring these with the group, however, the researcher also needs to anticipate that he/she would be questioned and be able to redirect discussion back to the group. While attempting not to influence or direct the responses, acknowledgement is required of the fact that the questions set an agenda and the group will interpret these as an indication of the researcher's priorities. Basing the research in participant concerns requires the researcher to

be open to perspectives which may challenge his/her position. Collaborative research provides for all participants to reflectively inquire into the rationality and justice of their own social practices, as well as their understandings of these practices and situations (McTaggart 1993). Critical reflection may lead the researcher to revise and possibly modify his/her original position following involvement in the process. My experience during the interviews was that the participant interest was intense and dialogue was consistent in flow, and my only input was as facilitator.

4.2 *The Research Process*

4.2.1 Location

The location for the research was a coastal district of New South Wales, Australia, that includes a large city, urban and industrial areas as well as primary production in the hinterland. The population of this area is inclusive of diverse demographic and cultural groups, a consequence of significant immigrant settlement. Purposive sampling in such an environment enabled the interviews to encompass a greater diversity of cultural views on food choices.

4.2.2 The Recruitment Process

It was planned to recruit 30 participants as it was anticipated that this number was likely to result in a broad enough base to reach data saturation (Strauss 1987). A mixed sample of participants with a primary role in household food decisions were sought to encompass a broad range of positions on food choice. Men were not as actively recruited given the primary role of women in food choices.

On receipt of ethics approval for the interview process, advertisements for participants (Appendix A) were placed in a range of public places and professional offices, including a government workplace, gym, doctor's surgery, neighbourhood centre, massage therapy clinic, community library and local shops. The other consideration for recruiting a larger group at the outset was the likelihood of attrition over the longitudinal study, with data collection expected to span eighteen months. The initial response to advertisements resulted in the recruitment of most participants.

A variation of the snowball approach (Crookes and Davies 1998; Rice and Ezzy 1999) was used to contact colleagues and acquaintances of the participants to reach other individuals who varied demographically from the self-nominated recruits. This approach was a variation as it did not rely on friendship networks but rather nomination of acquaintances (women) whom participants believed had the time to participate. The nominees were then contacted independently by the researcher to ascertain willingness to participate. The goal was to ensure the sample was as broad as possible while avoiding the 'homogenous sample, (Rice and Ezzy 1999) that can be produced by true 'snowballing'.

The selection process resulted in one set of twenty six self-selected participants participating in an iterative interview process over eighteen months. It was not necessary to exclude any nominees from the research and, though the final number of participants was short of the thirty subjects initially sought, the sample did provide a demographic mix of people involved in household food decisions. Female participants included young women, single and in partnerships (N=4), mothers (N=9) whose children ranged from babies through to post school, and post family/mature women (N=7). All the males (N=6) were in relationships and most of these had families. The range of income levels was spanned, with

unemployed and aged pension participants involved. Education levels ranged from completion of secondary education to tertiary qualifications. At least four participants had a non-English speaking heritage. Demographic information was collected at the start of each interview (Appendix D) and participant details are provided in Appendix G.

4.2.3 The Interview Process and Questions

This section covers both the interview stages and questions, as the data compiled from the first interviews were used as the basis for further questions and to provide feedback to participants in the subsequent focus groups.

4.2.3.1 Interview Methods

Prior to embarking on the recruitment process, an informal focus group of colleagues and acquaintances participated in a trial of the questions proposed for the initial individual interviews. This trial resulted in minor modifications to the questions as a result of feedback and the final form of the individual interview questions is provided below.

The data collection proceeded in three stages, elaborated below in 4.2.3.2.

1. Individual interviews were conducted to gauge the participants' perceptions of the links between the environment, health and the food system.
2. Round One of the focus groups was convened to explore the findings of the individual interviews through a process of interacting with others on the topic.

The Round Two focus groups discussed the findings of the Round One focus groups.

The second and third stages were informed by the findings of the previous interviews. This approach was used to identify, stimulate and track critical reflection and identify instances

of reflexivity. Attendance in the focus groups was based on participant availability and this allowed for a variation in the groupings at each stage, providing for new input and further stimulus for discussion.

Individual interviews and focus groups were conducted at venues convenient to the participants and took between 60-80 minutes. The settings for these were either private or public rooms that ensured privacy and no external interruptions, for example small meeting rooms. All interviews were audio-recorded with the consent of the participants, and notes were taken by the researcher as far as practical.

The initial questions provided a context but then the research proceeded from participant concerns. Participants were encouraged to raise questions that could be explored further. Transcripts of the interviews were analysed at the completion of each round of interviews. This analysis is described under Data Analysis and Management 4.3 below.

With regard to confounding bias and integrity, a conscious effort was made not to bring to the interviews any environmental information that may influence participants' current knowledge and understanding. In each stage of the interviews participants were asked the same set of questions for that round to maintain consistency, with minimal rephrasing used where necessary if the question was unclear to the respondent.

4.2.3.2 Stage 1: Individual Interview

Semi-structured interviews were conducted to determine interest in, perceptions about and individual positioning on the topic. Participants came to the interview knowing what the focus was as they had responded to the recruitment advertisement (Appendix A) which outlined the research. In addition, after initial contact with the researcher, they had been

provided a Participant Information Sheet (Appendix B) detailing the aim of the research.

This also contained an assurance of confidentiality for the participants.

At the commencement of the interview the participants were asked to sign an interview consent form (Appendix C) and provided with the questions below (Appendix E).

Semi Structured Interview Questions

Stage 1 – please answer question 1, and then the box which best describes what you think.

1. What sort of foods do you buy regularly, and why?

2. When you are buying food, food safety is a consideration in your choice?

Strongly agree	Agree	Disagree	Strongly disagree
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3. Do you have more questions about the way food is produced, say in comparison to 10-15 years ago?

Often	Sometimes	Infrequently	Not at all
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4. Is the food production system controlled enough to protect health and the environment?

Strongly agree	Agree	Disagree	Strongly disagree
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What risks do you think there are?

5. You are happy with the amount of information provided about your food?

Strongly agree	Agree	Disagree	Strongly disagree
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6. Do you consider food related waste to be an issue?

Strongly agree	Agree	Disagree	Strongly disagree
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Stage 2 – we will now work through each of the questions for you to tell me more about your responses.

Do you have any other general comments to make about food choices?

Participants were asked to indicate on the scale, strongly agree to strongly disagree, their response to the questions. The ranking was structured without providing a middle position so that the participant committed toward one end of the scale or the other. This strategy

created a visual positioning as a reference point but is also one that the participant could modify during the course of the discussion. This achieved three important steps:

- it provided an overview so as to reduce nervousness about the questions;
- it required the participant to consider the question and make a commitment to a response, and though this could be modified it provided a discussion starting point;
- it started the critical reflection process.

The number of questions were restricted, N= 6, so as not to appear too daunting for participants. These were structured to allow for prompting without leading, to minimise the potential for the researcher to influence the responses. The questions were, to a degree, repetitive, to enable the cross referencing of responses and explored the following areas:

- food choice behaviours;
- knowledge and understanding of the food system and production processes;
- identification of key stakeholders with responsibilities in the food domain; and
- an estimation of the risks that may be associated with food.

The exploratory nature of the questions also required flexibility on the part of the researcher, as the participants' answers may provide an opportunity to probe for further information about food choices. The researcher facilitated the process but also contributed by answering, if possible, questions asked about the study.

Participants' references to the actions they currently take to minimise the environmental impact of food choices were collated, coded and then analysed within the framework of the research. These were summarised into a handout for participants (Appendix F) as preparation for Round One of the focus groups. This was sent to participants prior to the meetings to provide time for reflection on the findings. It was stressed to participants that

the findings were a compilation of views, and not all issues were raised by all participants. The questions for Stage 2 were developed through a process of combining the findings of the individual interviews with the original research questions. The questions reflect the dynamic nature of critical social research as these build on participant information and their questions.

4.2.3.3 Stage 2: Round One of the Focus Groups

The second stage provided an opportunity for interaction with others on the topic. The participants were contacted and invited to attend a focus group meeting and to bring a shopping docket if they wished. This was intended to provide a stimulus for considering how one food item was produced.

The focus groups were organised around participant availability to attend a scheduled time. The goal was to have six participants at each meeting to allow for interaction on the questions. As anticipated, there was some attrition from the initial recruitment. One participant moved interstate and three others could not attend. Twenty two participants participated in the focus groups. Comments were sought on the summary of the interviews (Appendix F) at the start of the group interview, prior to addressing the focus group questions.

Focus Group 1 Questions

Introductory Activity: participants to bring a shopping docket and the group to select an item on one of these, imagine themselves to be 20 years in the future, and briefly run through the steps in producing the food item. The group to discuss this for any new information that may emerge.

1. What will food be like in 20 years and how will it compare with foods today? (this is incorporated into the shopping docket activity above)
2. What level of processing is acceptable for fresh produce, and what traits should the food retain?
3. What food safety risks may emerge from the long term environmental impacts of food production?
4. What areas of the food production system require the most control and who should be responsible for this?
5. Ideally what information should be provided about fresh food?
6. What other aspects of the food production and supply system would you like to comment on?

As in Step 1, the process of collating, coding and analysing the data from these interviews then led a further summary sheet (Appendix J) and the questions for the Round Two of the focus groups.

4.2.3.4 Stage 3: Round Two of the focus groups

The participants were contacted and invited to attend a focus group meeting. The participant summary sheet was posted to participants prior to their attendance at the meeting. As in Stage 2, the focus groups were organised around participant availability to attend a scheduled time and the goal was to have six participants at each meeting to allow for interaction on the questions.

A final set of questions was developed (below and Appendix J), based on the findings and the stated intent of the research. The questions for Round Two of the focus groups included the addition of a probing question to determine if any new issues had arisen for

participants. Participants were also provided with the opportunity to comment on the research process.

Focus Group 2 Questions

1. For some participants the environmental impacts related to food choice result from having too much food and too much choice. Other participants could not imagine living without the increased choice we have had over the last 20 years. What are your thoughts?
2. With the environmental impacts that have been mentioned, what can be done to minimise these? Who has responsibility for these actions?
3. How, if at all, have you changed your food choices over the last 6 months and why?
4. What for you has been the most interesting aspect of participating in this research? What would you like to see come out of this research?

The aim was to determine what effect, if any, participation in the group had made on individual food choices in relation to environmental impact and health. The evidence would be participants clearly identifying their own position in relation to food choices and the environment, including the elaboration of any tensions that emerged. It was apparent by the conclusion of the third interview that no new data were emerging and that concept saturation was reached (Strauss 1987).

By the time of Stage 3 of the study, two participants had moved interstate and four others could not attend. Twenty participants were interviewed within Round Two of the focus groups.

4.3 Data Management and Analysis

All participant names were changed to ensure confidentiality. The interview data from each participant were kept in individual folders and coded to identify the participant, to enable cross referencing.

Following the transcription of the interviews at the end of each of the three stages, the data were analysed and coded using the NVivo (QSR 2001) software program, a qualitative program that facilitates the coding of information to identify categories and patterns. This involved examining the factors influencing the food choices of participants and then grouping these into categories based on the description of these as concerns and/or priorities. The text of the transcripts was closely analysed to identify words that were common across the interviews and which could be used to form categories that reflected participants' concerns, for example food safety and agricultural practices were mentioned by most participants.

Other academics and specialists in the use of the NVivo software were consulted as to the best means of ensuring the rigour of the data analysis. These confirmed that using those participants' terms that were common and frequent as names for the categories was appropriate and would facilitate the best analysis of the data being collected. A second way of ensuring the validity of the interpretation was cross referencing between participants' comments and the context of the text unit to ensure that integrity was retained.

The categories developed from the first round of interviews were reviewed, modified and further developed over time as the staged interviews provided additional rich information which either confirmed or did not confirm the initial categories (Patton 1990). Appendix I

provides an overview of common participant terms derived from Round 1 of the focus groups to exemplify the close and comparative consideration of these responses. These responses informed the development of the categories. The coding structure evolved into two main themes, one organised the food choice comments into content areas describing the food system and the other grouped participants' comments according to their reaction to elements of the food system.

This approach was a blend of manifest and latent analysis strategies (Berg 2001) in that while the words used by participants determined the content within the coding structure, the response also required a close consideration of words, tone and an interpretation of the context for accurate coding. This enabled the researcher to not only clearly document what was said but to conduct a semiotic review of the data, and thus identify instances of reflexivity. Semiotic analysis assists with discerning the agenda behind participants' narratives (Rice and Ezzy 1999), and this is important in determining awareness of the influence of political, economic and social structures on individual decisions. The researcher's interpretations of the data were subjected to close scrutiny by the academic supervisor for the research.

The outline of the coding structure that was developed as the main framework is provided in Table 4.1.

Environmental Impact	Agriculture (degradation, intensity, pesticides etc)	Food Processing (waste)	Supply Context (regulations, labelling, marketing, economics)	Food Traits - (shelf life, freshness, flavour)	Responses (concern, anger, questioning)
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Table 4.1 Coding Structure

The rationale for using a longitudinal process was to enable close review of the transcripts and compare the content of these to corroborate participants' responses over time and record changes in views as well. When minimal new information emerged from Round 2 of the focus groups, the researcher determined that data saturation had occurred. The Findings chapters present excerpts of participants' dialogue to substantiate the researcher's interpretations and to provide links to the theoretical framework (Strauss 1987).

4.4 Conclusion

In this chapter the rationale for the use of a qualitative methodology was explained, with details provided on the techniques that supported the staged interview process. The methodology aimed to provide the opportunity for participants to critically examine personal values and priorities and to assess how these align with their food choices. Critical reflection over time and in interactive situations was the principal strategy employed to assist participants to clarify their perceptions of the connections between the food systems and environmental health. The approach emphasised the value of local knowledge and aligned with the intent of critical social theories in exploring participants' views of the influences that determine food safety and security.

This process has value for the public health sector as it assists in the identification of when consumers make choices to minimise environmental health risk. To explore the food choice motivations of participants the findings are discussed with reference to the concepts of individualism, risk and citizenship. These concepts assist in understanding behaviour and thus are quite relevant in exploring those considerations which emerge as significant in participant responses to the food system.

The findings of the data collection and the analysis of these are the focus of Chapters 5, 6, and 7. Chapter 5 presents a general summary of the Findings to encapsulate participants concerns, and the priority of individual health is apparent. The reflective process was, for most participants, an opportunity to take time to think about food system issues that are usually not considered in detail. Through conscious deliberation a number of issues not previously identified as connected were perceived to be overlapping. Thus participants drew together a more holistic perspective of modern food system practices as a potential impact on health and the environment, and changing the nature of food. For participants a significant concern was the limited options open to the individual. It was acknowledged that consumer food choices do contribute to environmental impact. However, there were objections to being blamed for risks associated with the food system when information about production processes was often difficult to access.

5 Findings - 'Give Me Something to Expand My Mind About'

5.1 *Preamble*

The longitudinal nature of the study allowed for the identification of food related issues that remained constant over time as well as noting where priorities had shifted for a participant or a new issue had emerged. This approach identified, stimulated and tracked critical reflection, and behaviours towards the food system over the eighteen month study period. At the conclusion of the final round of interviews it was evident that no new data were emerging and most participants indicated that further reflection required input from external food system stakeholders. Reaching this point aligns with Strauss' concept of data saturation (1987).

The data gathered during the process reflected participants' lives and routines and contributes significantly to 'providing useful and understandable information based on stakeholders concerns' (Patton 1990, p.492).

In summary those concerns were:

1. The level of control that be can exercised by consumers via food choices to minimise environment related health risks;
2. Perceptions of blocks/barriers that impact on sustainable food choices
and
3. Who was responsible for dealing with environmental health risks associated with food
(government, industry, public or private domains).



The next three chapters focus on the findings of the research. For clarity the findings are structured to first present a descriptive view of the depth and complexity of the food system issues identified by participants, with the subsequent two chapters analysing these issues within a theoretical framework of risk and the individualisation of risk. This approach allows for the development of the emergent themes across the three chapters. Further, considering the methodology of critical reflection as an impact on participants' food choices enables a consideration of the value of this approach as a public health strategy.

Chapter 5 provides a descriptive overview of the diverse food system concerns raised by participants, over the three sets of interviews. Both the interconnections and complexities of the food system as perceived by participants are presented. Extensive use of quotes is made to ensure that the participants' voices are represented (Strauss 1987). To compare and contrast participants' comments with the research that has been undertaken in this area, selective reference is made to other research as relevant. Participants' views of food production and processing issues are also considered in relation to the literature, to interpret participant views of the influences on the food system.

Chapter 6 considers how participant concerns relate to theories of risk and individualisation as a way of explaining consumer responses to the food system. An understanding of the consumer perspective is necessary for the development of strategies that assist consumers to make healthy and sustainable food choices. This analysis considers comparative research approaches and findings to identify consumer patterns and differences.

Consistency across research studies can provide a focus for future action by public health authorities who have responsibility for representing consumers in food system issues.

Variance in the findings may indicate either the need for more research or the need for a

decision making approach that is more cognisant of the consumer perspective. Chapter 7 follows with an analysis of the actions taken by participants in response to perceived food system risks. Such an analysis is important for identifying both the motivation for action and the level of commitment that the individual has to taking the action. Citizenship literature is referred to guide the analysis. Clarification of the reasons for behaviour can enable health interventions to be aligned with the consumer values that govern behaviour and thus be more effective.

5.2 Introduction

The findings presented in this chapter are organised sequentially to reflect the flow of the interviews and focus groups. The first section presents an overview of the issues discussed in the individual interviews, leading to the structuring of the questions for Round 1 of the focus groups. The findings of these are then outlined as the basis of the second set of questions and the final round of focus group interviews. This structure assists in discerning the participants' responses to the interview process over the duration of the study, as discussed in the final section of the chapter.

In Section 1 the issues raised by participants within the initial stage of the individual interviews are detailed. The issues are organised under three headings: Agricultural Intensity, Food Quality and the Environment; Food Safety and the Environment; and Waste. For participants this included their understanding of food production, concern about the health and environment impacts of the food system, knowledge of the regulatory controls, identification of the consumer information required, food associated waste, and the personal tensions that arose when responding to such issues. Evident throughout these

interviews was significant personal reflection. Overall, a holistic assessment of the food system was made by most participants. These participants perceived food system risk to be linked to the mass production practices that also delimited food choices. The section concludes with a summary of the key discussion points, and an explanation of how these were reformulated to become the questions for Round One of the focus groups.

Section 2 presents the findings for the two rounds of focus groups. Participants affirmed the concerns they raised during the individual interviews about the consequences for food and nutrition. In addition, the way food was changing to meet the demands of an increasing world population emerged as a focus. In these discussions participants debated the effects of social change and the influence of stakeholders in the food system. Resentment was expressed about changes made to the food supply without consulting consumers.

Participants considered that their ability to control the risks associated with new foods and technologies, through non-purchase, was limited by a lack of information.

In Round Two of the focus groups little new information was elicited, indicating data saturation (Strauss 1987). Participants mostly elaborated on the key findings, especially economic influence as a key determinant of environmental health. The degree to which this influence impacted on other personal values was a focus for participants' discussion, and issues around physical space, visual amenity and convenience were covered. Their discussion also considered the roles of government and individuals in resolving health and environment issues.

The final section of the chapter critiques the reflective process. The disparity between participants' experience of the food system and preferred food choices evidenced

reflexivity. Health was the main priority but there was also conflict in prioritising other personal values. Such conflicts were mediated at the moment of choice by the concern that was paramount at the time.

The emergent themes from the findings were individualisation and risk, with participants reflecting on issues of accountability within the food system, and the extent of their control over these perceived issues. These themes form the basis of the following chapter.

5.3 *The Individual Interviews*

The individual interview questions were constructed to explore the influences on participants' food choices, including awareness of food production processes, risks and controls, and the role of stakeholders. For many participants the initial reaction to the questions was that they had not given much thought to food production. Upon reflection, however, participants voiced a range of concerns about food quality and safety related to mass production and environmental impacts. Waste was identified as an issue at all stages of food production.

Participants indicated that the readily available supply of food in Australia combined with the pace of daily living meant that food may be taken for granted, with minimal questioning of the structures that govern production. Time and budget were described by participants as limiting the scope to deliberate more closely on the information that participants had, or would like to have, about the food system. Sharon states that opportunities to find out more about where food came from and how it was produced may not be sought:

"...it comes from living in the city too, everything is so convenient...when you want it you just drop down to the shop and get it ..." Sharon (nurse, 2 children)

For some participants thinking about the origins of food was the first time they had consciously connected food with environmental impact. Making this connection for the first time challenged the perception of these participants that the environment was 'out there' and of secondary concern. Others, however, were already engaged in reflecting on food choices. Most participants indicated the process of critical reflection led to an aroused interest in the topic and a desire to pursue this further, as evidenced by this comment:

"...give me something to expand my mind about, now that we have started". Travis (pensioner, 2 children)

5.3.1 Agricultural Intensity, Food Quality and the Environment

Participants linked intensive farming practices to environmental impacts and the food quality issues of flavour and nutrition. In addition to concern about the immediate impact of these on health, there was a direct connecting of the longer term consequences of such impacts.

The more obvious consequences of farming and factory practices were commented on by most participants, though not generally in detail. These participants linked intensive farming to irrigation induced salinity, soil erosion, fertiliser and pesticide contamination of water ways, and loss of biodiversity (plant and animal) under mono-culture regimes or when the land was cleared of vegetation. Other issues were the depletion of soil nutrients as an impact on food quality, the urbanisation of farmlands, the ability of the water supply to meet irrigation demands, and transport emissions. A common view expressed by

participants was that the shrinking area of arable farm land would have consequences that eventually would be felt back in the supermarket. Many also expressed concern for environmental sustainability, with industry or the government seen as responsible for the control of environmental impacts.

"It would be interesting to see if in agribusiness they give the land that time to regenerate... the risks are for the environment... you want something sustainable... or else we'll be dead." Lila (young engineer, single)

Components of the food supply system were noted as finite and the overexploitation of fisheries and water resources was raised. Water quantity and quality were identified by most participants as areas where impact has been detrimental, and the logic of farming thirsty crops in an arid environment was questioned. Participants differed in opinions, however, as to where the blame lies for these declining natural resources and the measures necessary to slow this trend.

The environmental context of food production was considered by participants to be a crucial factor for nutrient and flavour development. It was identified, however, that the production of fruit and vegetables to meet all year round demand required accelerated growth based on intensive fertiliser and water use. The premature harvesting of produce to avoid blemishes and pest damage, with cold storage and artificial ripening techniques completing this process, was regarded by participants as adversely affecting nutrient value and flavour development. Participant concerns about the adverse impact on food quality is supported through reference to the information that flavour is the culmination of the natural ripening process, with flavonoids contributing to the nutrient value of the produce (Wildman 2002). These impacts were in conflict with the majority preference of

participants for fresh food, which was based on their belief that this should be nutritious and have true flavour. Participants who had grown up with access to backyard orchards, home grown vegetables or organic produce made comments such as the following:

"They make tomatoes now that they can package and send off to markets that don't bruise and last for a long time - terrific... just don't taste like tomatoes... nothing tastes like it used to. Things had flavour... pork had a certain flavour...now it is hard to tell what is what anymore." Amalie (unemployed, post-family)

Considerable passion was evidenced by those who spoke of flavour as being compromised by an industrial approach to the food system. In contrast, however, fewer flavour references were made by younger participants, who were aged 30 or less. This is exemplified in a comment that was made in the context of rejecting genetically modified foods:

"I don't think that we should be modifying things to produce bigger and different tasting, all the rest of it." Sharon (nurse, 2 children)

This group did not refer to 'backyard' or naturally grown produce as did the older participants. Younger participants indicated less experience in distinguishing between the flavour of tree ripened fruit and intensively grown produce.

Other participants described seasonal food as meeting the nutrient requirements of the body, thus contributing to health. They regarded nutritious food as containing minerals and trace elements that are derived from the soil and the ripening process. This discourse linked lower nutrient levels to early harvesting and agribusiness practices that damaged the soil structure. In addition, it was stated that practices designed to enhance the appearance of fruit, did not add to food value, with storage further diminishing value.

"... my fear is ... how long has the orange been sitting in the shop between being the time it was picked... how much Vitamin C is actually in it?" Amalie (unemployed, post-family)

Participants observed that this information is not disseminated as part of health campaigns that promote fresh produce.

In summary, large scale food production and storage processes were regarded by participants as having a range of impacts on food, health and the environment. The loss of nutrients and flavour were common personal considerations, but also encompassed were broader issues of environmental degradation in the event of continued intense food production. The more direct health risks associated with food production, and the cumulative effect of these, are the focus of the next section.

5.3.2 Food Safety and the Environment

For participants food safety required a holistic approach to food production and retailing. Food safety concerns included the extent to which substances accumulated in the food system, questions about the effect of these if they interacted, as well as the quality of imported and processed foods. Some participants explicitly referred to the food chain concept to explain how food sources, plant, animal or water, could be negatively affected and, in turn, become a food safety issue for humans. Their concerns about the intensive use of chemicals, sprays, fertilisers and interventions that alter the character of the food, underpinned their choices in fresh and processed food. They identified a need for food label advice that declared the occurrence for residues, such as given for allergy to nuts, as well as methods of processing and country of origin.

Another common concern for participants was that health would be affected if the meat consumed contained substances that may be harmful, for example antibiotics and hormones. The treatment of 'food' animals, for example cattle and chicken, featured as a priority issue for most participants.

"... two main concerns are the level of contaminants in the food production chain, antibiotics... and... the concentration of production." Ambrose (estimator, 2 children)

In referring to Bovine Spongiform Encephalopathy (BSE), participants expressed abhorrence and disgust that food producers could implement practices that resulted in grazing animals eating those of their own kind. They also noted that the intensive rearing of livestock in confined conditions could stress the animals, and a health impact may be the potential for such animals to produce toxins in their meat. A minority of participants talked about animal welfare as an issue.

The majority of participants indicated a preference for fresh food but this was also an area of tension because of fears about agricultural contaminants. The basis of this concern was that pesticide and fertiliser residues cannot be detected easily by the consumer and there is no requirement that produce be labelled to indicate the presence of residues. Further, the credibility of government assurances of stringent controls on these substances was diminished for participants by media reporting of unacceptable levels in food. This resulted in a compromised position for participants. However, despite their concern about residues participants still expressed a belief in greater control over health by choosing fresh food. They explained this as an expectation that fresh food would have more nutritional value than processed food, as well as a distrust of the latter, especially with regard to the control of additives.

"... I buy fresh foods, the ingredients to construct meals not all ready prepared meals,
... I'd like to be in control of what goes the meal..." Megan (p/time librarian, 3 children)

Many participants referred to health promotion campaigns that have reinforced the message that fresh is better and thus processed food was not regarded as an adequate source of nutrition. A parallel reservation expressed by a few participants was about reconstituted foods. For example, Livia mused on the fact that ground animal meal is marketed as fish sticks, chicken nuggets, and similar products.

"... what about all those seafood sticks ... and things that are made out of animal by-products... they mince them down really fine..." Livia (administrator, 2 children)

Livia went on to link this practice to those that resulted in BSE. There was awareness that such foods comprised remnant carcass matter that was previously deemed to be waste and this may have conflicted with cultural values about the nature of food. The absence of recognisable ingredient foods and a lack of labelling on take away food meant that consumers did not know what was in these foods and most participants were concerned that the novel character of these foods may pose a latent threat similar to BSE. For them the possibility that such a threat could arise through the use of otherwise unmarketable waste, again a profit motive, made the possibility of risk even more unacceptable.

Participants indicated that food labelling was essential to assist consumers in food choices and for safety reasons. It was also stated that labelling currently did not enable consumers to easily identify the presence of unexpected substances or the methods of production, or to make decisions about food from locations considered risky. There were particular concerns about imported food and hygiene standards. Less developed countries were cited by

participants as sources of contaminated food that may be exported. In advocating for labels, the participants admitted that the routine nature of buying food and often having to do this quickly, constrained the reading of labels. Despite this, there was still a preference for labelling that indicated the processes used, especially genetically modified or irradiated foods, as highlighted by the following comment.

"... as much labelling as possible... if anything says genetically modified or anything has an additive it has to be on there so you can make informed decision when you buy. ...I want to know, so I can... buy the scrappy old one that has not been irradiated..." Dannielle (clerical, single)

The difficulty of obtaining accurate information about food production methods and impacts was described by participants as a major impediment to their capacity to influence environmental impact through food choice. An example of the information sought by some participants was advice on the potential for contamination of seafood through industrial effluent, including heavy metals. They identified this as an area not addressed within current advice to consumers on the safety of fresh produce.

It was important for participants to be able to make choices not just on the food available but also on the extent to which food production aligned with personal values. Suspicions about the nature of food and its method of production were compounded for them by media reports of contamination. The majority of participants were concerned that they may be making decisions that compromised personal values, as they were not able to clearly identify the ingredients, the origin of these, or the production technologies. Exacerbating their sense of dis-empowerment was their perception that food contamination occurred as result of deliberate negligence. The next sub-section on waste outlines concerns about a

particular type of negligence, ineffective waste management controls, and the risks for the food chain.

5.3.3 Waste

Participants noted there was a discrepancy between what they perceived as inadequate efforts by industry to reduce waste and their own attempts to minimise this. Waste was linked to food production, processing and packaging but participants recognised that consumers support this situation through food preferences. On one hand they noted the preference for fresh food and the desire to reduce waste, and on the other they discussed the convenience and hygiene provided by food packaging.

The difficulty for most participants was reconciling the enjoyment of an accessible and plentiful choice of food with the knowledge that this was accompanied by excessive waste. For these participants the waste started at the farm gate, with reference made to the destruction of crops that could not be sold for a profit in preference to reducing the market price of these. The artificial maintenance of prices through such practices was condemned.

"... often crops will be just ploughed back into the ground because there is too much... why grow them in the first place, why clear so much land?" Julie (retired, post family)

This concern was exacerbated by the awareness of all participants that a significant percentage of the population do not have access to adequate nutrition. For participants there was convergence around the issues of hunger, quantities of leftover food in cafes and restaurants, and the importance of composting. The hospitality industry was perceived to waste food and to dump leftovers in waste bins.

"When you see restaurants and cafes and clubs ... just throwing their food into garbage and when you question them - why can't you take it to the poor people's home ... 'oh no by law we are not allowed to'... not even composting it... it is nice to have choice but we have such an overproduction." Tom (gym manager, two children)

Composting was described by many participants as necessary to return nutrients to the soil, reduce land fill and also as an activity promoted by government agencies. In enthusing about their own efforts in composting and the importance of these, participants commented on the discrepancy between the expectations of individuals and those of commercial enterprises. A number of participants perceived that catering and food processing industries seemed to be allowed to throw food out, promote excess packaging and allow by-products to pollute natural resources. The visibility of these practices provided a platform for participants to raise the issue of double standards, and the role and motivation of those responsible for controlling waste.

Participants also linked waste and mass produced food with the rapid deterioration of produce once it was removed from cold storage. This was a cost at both purchase and disposal points for the individual. Retail outlets were perceived to reduce the economic loss of deteriorating produce by pre-packing segments of the food that could be salvaged, as elaborated by a participant who had observed the following practice;

"... salads and vegetables in packs - I can't buy it that way, for me it's not fresh - it's they've used all their scraps to make it up..." Terri (food retail assistant, 2 children)

The concealing of inferior produce within packaging was regarded by participants as both dishonest and wasteful. If all the pre-packed food were not used at once the remainder often spoiled quickly. Another ramification of such packaging for participants was the risk

of not detecting the early stages of the bacterial presence that causes food breakdown, a food safety issue in the event of consumption.

The disposal of spoiled produce led to the participant question of whether produce sprayed with pesticides and chemicals should be used for compost on gardens and grounds. The risk identified by several participants was the potential for substances to leach into, and contaminate waterways. They were concerned that wild and domestic animals, including food sources, may ingest these substances, but also on death and decomposition may re-release the chemicals into ecosystems. Participants queried the accumulation of such substances and their relationship to uncontaminated organic matter that decomposes without release of toxins.

A further tension for participants was between desiring the protection provided by packaging and use by dates, and knowing that this contributed to significant amounts of waste. Packaging was deemed by participants as hard to avoid as most foods were pre-packed, even butchers and green grocers adopt a portion approach to food retail. They stated that while this purportedly made food choice quicker and easier, it resulted in greater waste than being able to select the preferred quantity. In contrast, other participants identified individual servings for children's snacks and lunch boxes as an advantage for parents. Most of this packaging was designed to be easily opened by children, which they perceived to be a bonus. Convenience, combined with marketing aimed at children, however, provided a dilemma for those parents who sought to minimise waste.

"... over packaging is a convenience thing... designed for busy parents like me that just go there's one for your lunch... we've just become lazy ..." Hilary (middle manager, 3 children)

Sharon, one of the younger participants illustrated the duality of choosing between convenience packaging and nutritional food. Healthy snacks were preferred and fruit was placed in disposable zip lock bags. Another comment, however, reflected a desire to reduce packaging.

"... I know what healthy choices are and I do consider that a priority and I would like to know better ways... to... provide snack foods for my children that don't involve preservatives and packaging..." Sharon (nurse, 2 children)

The connection between waste reduction and the disposable zip lock bag seemed to be overlooked. This contrasted with another participant, in her late forties, who used and reused a more durable lunch wrapping for home prepared food until the wrapping disintegrated, thus avoiding waste. The difference between the two participants was the younger one had grown up in a society where the use of plastic wraps and bags were an expected convenience. While Sharon avoided the packaging associated with processed food, the tension of providing healthy and hygienic food resulted in accepting the zip lock bags as the lesser issue. Thus while packaging in general was viewed by participants as a wasteful use of resources, accepted forms of this provided security that food was not exposed to bacteria.

On the issue of food safety, the media were regarded by participants as instrumental in highlighting other risks associated with food packaging. The lack of a protective covering, as in buffet style food, was one such risk. Thus individual packaging provided a safety measure that limited the risks of communal handling.

"... individual sachets of sugar for instance... someone could say well that is over packaging but the reality is that it's there for a safety... as opposed to the ones... that transfer the bacteria." Hilary (middle manager, 3 children)

The same participant, however, discussed the concealment of food tampering within packaging. She considered the safety risks of packaged products, given that food in the retail sector has been sabotaged resulting in recalls of products. Tampering concerns reflected participant awareness of the global situation in which governments are calling on citizen vigilance to counter possible terrorist activities.

Waste was a focus for participants but reflection on the issues highlighted a dilemma in deciding individual priorities. The consensus was that industry should be regulated to reflect the level of compliance expected of individuals in managing waste and this was partly based on participant recognition of the need for equity and social justice in access to food.

5.3.4 Summary of Individual Interviews

The issues identified by participants during the interviews included concerns about nutrition, food safety, the sustainability of the food system and consumer friendly information on production processes. Of note for health promotion campaigns was the participants' perceptions of the discrepancy between messages promoting fresh food as healthy and their perceptions of the negative effects of mass production, harvesting and storage practices on such food. These adverse impacts extended to degradation of the environment, including waste, and the flow on effects for health. All of these issues fit

within the realm of public health and challenge the restricted view of food and disease that generally sets the parameters for health promotion activities.

The individual interviews indicated that, for most participants, there was a personal discrepancy between what is known about the food production system and the level of information desired. Participants were aware of a range of environmental impacts associated with food production and several discussed the connections between natural and constructed systems, indicating a holistic perspective of such flows. Despite this however, participants qualified their comments by stating a self perceived lack of knowledge about food production. It was also remarked that the opportunity to consider the integrated nature of the food system was a new experience but one that was valuable in clarifying the diversity of factors that influence the food chain. For a number of participants the critical reflection process resulted in the identification of food as a commodity that is structured to profit industry, aligning with Lupton's concept of the 'interests served' (1995, p.13). To be consulted on significant changes to food production was regarded by participants as essential to the making of informed choices, especially when individual values conflicted with the characteristics of mass produced food. Core to this conflict were participant perceptions of risk, and these featured consistently within participants' discourse.

5.4 *Round One of the Focus Groups*

Health remained the primary focus in the discussions in Round One of the focus groups but the environmental context of food choices as a determinant of health was also a constant. The focus groups explored the issues of environmental degradation, food production and social change, technology and food quality, and the values dilemmas involved in food

choice. There was increased participant talk about the macro level factors of economy, power and world trade, and less discussion of waste issues. Participants considered the preferences of children and significant family members to be one of the major influences on food choice. During the group discussions the critical reflection process was broadened as ideas were shared, explored and debated, and a number of the concerns raised in the individual interviews were reiterated and expanded. This also provided the opportunity to compare and contrast the responses given in the individual interviews with the views expressed in the groups to determine the extent to which opinions on issues were changed.

To stimulate reflection on personal food choices during the focus groups, including the food production process in its entirety, participants were asked to bring a shopping docket with them. At the commencement of the focus group, participants chose one item from the dockets to provide a tangible food choice that could be traced through the production process. This activity served as a focus that participants came back to during the interview, illustrated below in tracing the origin of chocolate wheaten biscuits.

“... what sort of seed... whether it is a hybrid... what sort of chemicals they put on there, like fungicides... what about the storage of that and whether or not they use pesticides... and then the preparation of the soil... whether it has had superphosphates... added to it... the sowing of the seed... and then pesticides... while it grows and the fertilisers... a lot of the [seed]... is developed so that it is resistant to diseases but at the same time a lot of the companies... develop them in such a way that they are dependent on particular chemicals... most of the seed companies are owned by chemical companies...” Livia (administrator, 2 children)

Through such discourse, which was common in the focus groups, participants engaged in discussions of the cause and effect of environmental health risks. This brought into focus the issue of responsibilities, analysed later in Chapter 6 but described here to ensure that participants' views are represented in context.

"... the money that they are ripping off out of all that production, there is very little or nothing going back into the environment...we are slowly raping the environment... how much we can put of that money...back into the environment is going to dictate just what our food is going to be like in the future." Tom (gym manager, 2 children)

Some participants saw too much choice as both the cause and effect for both environmental degradation and food production waste. Producing food excess to need was an unnecessary impost on scarce resources such as water, and was regarded as a risk, ultimately, to food security. This position was evidenced in questioning water diversion for irrigation with the damage that this causes, as well as the damage of other large scale farming activities.

"... they are producing as much beef and suddenly we're not eating as much... those beef cattle are still churning up our land, and causing erosion ... whether we want... or need the food." Julie (retired, post family)

The vulnerability of the food system to environmental risk had been reinforced by the Australian drought, devastating bushfires and dust storms. The concern was for the combined effect of natural disasters with increasing pressure on the food system.

Participants identified the links between the evolving food system, social changes and how these combined to influence consumer demands on the food system. In turn these changes were perceived to become part of a cycle of cause and effect that further influenced food

production. For example it was stated that working families needed to access quickly prepared food, and that the diverse convenience foods that had been made available had come to be expected. This meant that while acknowledging the real cost of food security and variety, the younger, self described environmental citizens still expressed frustration when unable to buy a product when they wanted it. One participant described her expectation of food variety and abundance as part of a quality of life but also suggested that the demands of a growing population may curtail such access.

"Like the baby boomers had everything... they had jobs, they had food... and we were brought up to expect the same... but things have changed because there are so many people now..." Lila (young engineer, single)

Incorporated in such discussions was participant acknowledgement that the growing population impacted on how food was produced but talk also focused on overproduction for commercial advantage and the environmental impact of agribusiness.

For participants there was vacillation between the benefit of modern technologies in the form of quantities of affordable and varied foods, and the realisation that the nature of food was affected. It was stated that the initial stimulus for commercial approaches to farming was reducing seasonal waste and achieving consistent prices for producers by avoiding the glut and scarcity cycle. In turn this created the consumer expectation that produce would be available throughout the year, unrestricted by seasons. The historical perspective of this situation is captured in Bob's recounting of his experience of limited food availability prior to the advent of cold storage and fast transport.

"I always used to wait for Xmas for watermelon because that was the season for watermelon... Now you can buy watermelon but it doesn't taste the same..." Bob
(retired bricklayer, post family)

A younger participant in the same group admitted having no idea when fruit was in season.

Another change that many participants perceived to have occurred in tandem with this loss of seasonal knowledge related to the fact that mass produced food had increased food availability and lowered prices. Older participants observed that within a generation foods like chicken had shifted from a special occasion food to a regular component of the menu, and that this was attributable to intense farming and growth enhancement. The food itself had changed as a consequence of altered production and processing methods but most participants noted that often the changes occurred in subtle, incremental ways. It was stated that these may accrue to a point where an individual who remembers the taste of the original food will question, and possibly reject, intensively grown produce. In contrast, Terri, a young working mum, disliked the taste of the vegetables that her retired father grew. These were too different to the pre-packaged foods which were a significant part of her childhood diet.

"When my dad brings a cabbage or cauliflower... out of his garden, I am used to the other taste in the supermarket and the other tastes better than the fresh stuff ..." Terri
(food retail assistant, 2 children)

Thus changed food production methods were described as having impacted on the choices and expectations of successive generations. In support of this suggestion, the younger participants indicated they did not see the point in time consuming food preparation and kept a store of easily prepared foods with ready made sauces providing flavour. Similarly a

number of other parent participants also remarked that much of the food designed to appeal to young consumers is already 'synthetic', for example fruit bars. These foods claim a relationship to the natural version but are artificially coloured and flavoured in an "exaggerated way" (Rochelle, (p/time librarian, 2 children)). Participants expressed concern that children often preferred such sugar based foods over fruit or vegetables and that the nutrient claims on labels may enable the rationalisation that the less-fuss choice was healthy. It was also commented, however, that it was understandable for children to prefer these foods to readily available but tasteless fruit that was produced en masse.

It was identified by participants that the mass production of food had increased availability but by changing the nature and flavour of food, consumers may choose less healthy options and may reject certain foods because these do not conform to flavour and quality values. For this reason many stated that the overproduction of food, that is more than what can be consumed or in forms that participants do not want, was described as unacceptable because of waste and ethical issues. A broad perspective was taken on this and extended to linking the overproduction of genetically modified grains and the imposition of these on less developed countries in the form of aid for hungry populations.

"...in the States... there is a great deal of genetically engineered grain stored which they can't sell... yet we have got people starving but the governments in those countries ... won't ... take that produce because the vast majority ... use that seed to plant next year's crop whereas they can't do it... it just seems to be a dominance of a particular country ... dictating to the rest of the world..." Travis (pensioner, 2 children)

This issue aroused passion and while strong objections were voiced to the wasting of food in the face of hunger, many of the participants acknowledged the right to reject unproven

food technologies. Their discussion was tempered with awareness that starvation severely constrained rejection as an option for people in poverty. They blamed the food industry and scientists for the imposition of processes regarded as risky, including genetic modification. It was also commented, however, that we may need to rely on the scientists for further innovations to keep us alive as nature becomes too altered and depleted to provide food.

In talking about food in the future, many participants held a general view that this will probably be more processed and the reaction to this prospect was mixed. Despite saying that synthetic food will have to be accepted, discussion uncovered a strong preference for natural food. In clarifying what natural meant, participants nominated organic food as the ideal to avoid chemicals and sprays, but the cost of organic food was identified as a deterrent. It was remarked by a number of participants that organic food had become the option for higher incomes, and that, ultimately, lower income families were better off at least eating mass produced vegetables in preference to eating only ready prepared foods. Processed foods were perceived to lose nutrients during food processing. Participants referred to the use of vitamin supplements as a means of rectifying nutrient deficiencies.

Whether food was wholesome was further discussed in relation to the credibility of labels and marketing claims, including organic foods. Most participants desired to be able to make choices knowing that food was healthy and produced with minimal environmental impact. For some participants, however, discovering, and having to deal with, the full reality of how food is processed and handled was overwhelming and unwelcome if it further complicated the decision process. Others noted that, despite personal discomfort arising from awareness of the potential negative impacts of intensive food production on

health and the environment, certain foods were still eaten. For instance, it was stated that meat and egg production impacted on animal welfare but were consumed anyway.

"We know that chickens are fed battery style... but we still eat the eggs...and the same thing happens with pig farms... with calves... and we will eat them..." Hilary (middle manager, 3 children)

This was identified by participants as stemming from an underlying Christian ethic of being grateful for what is available. In discussing changing attitudes to the quality and security of food, reference was made to other generational experiences, including food rationing and deprivation during depressions and war. The impact of such experiences was recognised and presented by several participants as a personal conflict in questioning the health and environmental effects of current food production while acknowledging the variety and quantity of food available.

"...my grandma... would just say...'don't be so fussy just eat it whereas in my day'... you don't want to start questioning too much... it is this Catch 22 situation where you have got to appreciate what's here because we are really lucky..." Geri (university student)

Competing environment and health values were evident. This was particularly exemplified by participants extensively debating whether home grown produce was a viable option to mass produced food. There was consensus on chemical residues as a potential hazard but the source of contamination was debated, as were ways of resolving the issues. The following lists the diverse perspectives debated by participants:

- growing your own produce enables control on the sprays and fertilisers used;

- gardening in industrial areas was unsafe due to contaminated soils and emissions;
- excess pest control and fertiliser use by home gardeners (no time to pick off bugs);
- bugs in produce were disliked but indicated that the produce was chemical free;
- growing your own produce contributes to sustainability;
- density housing limits the capacity for home grown produce;
- governments limit the sale of home grown produce - for food safety, or to protect commercial markets?

It was acknowledged that both societal structures and individual positioning have created the existing set of circumstances, and these need to be looked at closely to see who was advantaged. For example, some participants suggested that the individual could be blamed for wanting bigger houses, but questioned the role of industry in creating that demand?

People want to live in cities but how to source fresh, healthy food?

5.4.1.1 Summary and Questions

Several key discussion points emerged from Round One of the focus groups. The way food had changed as a consequence of modern production methods as well as the impact of these on both health and the environment were a concern for most participants. To a degree most participants indicated acceptance of the need for innovation in food production to meet population demands but at the same time they resisted changes that were perceived to affect both food quality and the environment. These impacts were particularly decried when related to overproduction because participants perceived the impetus to be the securing of

profits by corporate stakeholders. Such companies were deemed to have little regard for compliance with regulations and this was related to both contamination within food production and unethical waste. Participants stated that consumers could indicate their acceptance, or otherwise, of foods and production practices through purchasing behaviour, but also acknowledged that credible information about these was a prerequisite. Even with this information participants would still be confronted with the task of reconciling food choices against the minimisation of the environmental health risks of such choices.

From these findings it became apparent that identifying participants' perceptions of responsibilities for environmental impact might assist in further clarifying the individual's position on the relationship between the environment and food choices. The questions for Round Two of the focus groups were constructed to explore this and participants' reactions to the research process.

5.5 Round Two of the Focus Groups

Little new information emerged in the last round of the focus groups, many participants indicated that without the stimulus of input from other sources they had fully explored the issues. The findings reflected the issues raised in the individual interviews and in Round One of the focus groups. New perspectives on issues, or elaboration of such, are presented below. Participants focussed on values, and the discussion tended to polarise around the issue of responsibility for impact on both health and environment. Government, and its agencies, were not perceived by the majority of participants as willing or able to assume the expected protective role. In exploring the perceived government abrogation of responsibility from the individual perspective, participants discussed the range of

motivations and positions adopted by other people in regard to food production. From this it was clear that a strong distinction was being made between participants' own behaviour and that of other people.

Most participants regarded events such as droughts, dust storms and fires as reminders of our dependency on the environment for sustenance. An expansion on the previous cause and effect discourse for environmental impacts was the suggestion that natural disasters were cyclic and inevitable. For some participants this served to situate such events as isolated from human activity, and therefore from individual responsibility.

"... some of it comes down to evolution too... the plagues that they had... we have got droughts now... we've got no control over it whatsoever." Annelise (p/time clerical, post family)

In contrast, global events like the war in Iraq were described by participants as politically motivated disruptions that deliberately impacted on the food supply of those targeted. In referring to the media coverage of food relief operations in disaster affected areas, participants questioned the motivations behind these efforts and the cultural and environmental impact of the imported food.

Cultural taboos and values were described as significant factors in food choices, which in turn impacted on the environment. Food production changes that have benefited the environment were associated with demographic shifts by some participants. Immigration was linked to the farming of Mediterranean style foods more suited to the Australian environment and climate. It was deemed, however, that further value changes were necessary to take advantage of abundant native species that have less environmental impact and to eliminate the waste associated with culling. For example, kangaroos were identified

as a potential meat source but it was stated that many people objected to eating these. The waste from kangaroo culling was regarded by some participants in this debate as unjustified when compared with the decimation of ocean fisheries to meet the demand for meat. This discussion covered the different values ascribed to the natural environment. It was remarked that many cultures held little regard for trees and green space, and that the success indicator of having a large house in a city setting, was a further impost on the environment.

Urbanisation results in a totally constructed landscape, and participants deplored the loss of green space as a reduction of agricultural productivity, the loss visual amenity and the loss of perceived psychological benefits. Participants described the loss of farmland to urban sprawl as a lost opportunity for children to have the visual experience of domestic animals such as cows and sheep, as well as wildlife. As well as reaffirming the need for an understanding of the environmental basis of food production, several participants identified green space as essential for the balance of the human psyche.

The physical distance of people from the food system was one of several reasons offered by participants to explain the different attitudes that people display with regard to food production. Additional reasons that participants offered included the lack of interest in food that some consumers may have, and that people knowingly accept technologies that negatively affected food quality as the trade-off for convenience and economy, and this latter opinion is consistent with other research (Holm 2003). Included in the convenience factor for participants was diversity in food choice. This was described as a benefit of technology and as progress that is evolutionary, inevitable and largely for the consumers' benefit, even if food quality and the environment are compromised. Those participants

who had actively sought information on the impact of food choices, indicated frustration when they found themselves making choices based on convenience rather than their health and values. For example, Rochelle expressed guilt at giving in to time pressures and providing food that was normally avoided.

"Oh it's horrible, I spend my time putting in half the sachets so they don't get too much of a taste of it..." Rochelle (p/time librarian, 2 children)

The availability of food that participants regarded as an environmental health risk was identified as an issue that required more regulation. In reflecting on accountabilities in the food system, many participants stated that governments were not genuinely interested in food quality, and that public concerns were ignored when a government felt it was in a secure position. This was elaborated as a frustration at the minimal influence that parents have in comparison to intensive marketing campaigns for snack foods which have detrimental health and environmental consequences. Concern was indicated at the combined effect of an economic structure that enabled the food industry to avoid paying the true cost of producing fast food and the dependence of school canteens on these foods to raise funds. Governments were perceived to have failed in not adequately funding education, as well as not actively promoting education about the food system. It was stated that governments focus on the outrage factor, as opposed to hazard, and that it was only when a disaster occurred that action was taken to protect the public and environmental health.

"...somebody has got to die... has got to get violently ill..." Angela (clerical, 3 children)

It was in this context that several participants linked food quality to long term health care expenditure, though this was discussed at the individual level rather than from a population

health perspective. Paying more for good food was regarded as a preventative measure that would reduce risk, though this capacity was limited by the availability of food produced in the desired way. Participants acknowledged, however, that individuals can achieve change and influence the food system when their action was collective. This was exemplified in their discussion of a change of packaging practices by Macdonalds when faced with increasing opposition to polystyrene packaging. The Macdonald's action was explained by participants as a response to the threat of economic repercussions if it did not appease its market by addressing the waste issue.

Environmental health issues, including waste, were characterised by debate about individual responsibility and the role of producers, but Julie presented a holistic perspective on food production. This encompassed all the inputs including water use, application of chemicals, processing, packaging, and retailing, and yet if the product was not used but disposed of, it was a waste:

"Yeah... it's all been for nothing..." Julie (retired, post family)

5.5.1.1 Summary

The final round of interviews confirmed the previous findings in highlighting the priority of individual health but, by Round Two of the focus groups, participants strongly connected health to the environmental context of food production. This was an outcome of the discourse between the participants and quite probably a heightened awareness of food issues as a result of involvement in the focus groups. There was an appreciation by participants of the range of food choices that technology had facilitated but they also weighed this against potential impacts on food quality. There was consensus that it was

important for stakeholders in the food system to be actively regulated by government.

Social and cultural changes were also identified by participants as major influences on the food system but the influence of the individual was regarded as minimal. It was suggested that this could be strengthened by taking collective actions, so that when consumers objected to certain food production practices, they avoided these foods. This would cause a market collapse in that area. The other perspective countered that individuals are ignored until there is a crisis.

5.6 *Reflections on the Process*

Talking about food choices, food safety, levels of control and the nature and accessibility of consumer information provided a starting point for participants and the researcher to observe stated changes in food choices over an eighteen month period. The nature of the process could be a catalyst for individuals to consider alternatives to their current food choices. This constituted a derivation of critical social action research because engagement with the topic and with other participants could potentially influence attitude and practice.

5.6.1 The Participant Perspective

Participant responses confirmed that personal and family health was more of a motivator than environment when it came to food choices (Department of Environment Sport and Territories 1996b). The other stated preference of participants, however, was for natural foods grown with a minimum of disruption to natural systems. They considered this to be at odds with current agribusiness and industrial food processing practices that have the effect of disrupting ecosystems. A core concern expressed by many participants was the

long term capacity of the environment to produce food and to absorb the associated waste.

The emphasis on these issues varied according to the participant's age, reflecting experience related differences in the acceptance of food production practices.

Food choices were complicated by conflicting priorities for participants, including convenience, budget constraints, health and dietary needs, access to information, beliefs about controls in the food production system, waste issues, and equity in the global food supply. Participants made compromises in food choices, for example eating chicken but worrying about the possible presence of hormones. Individuals were also aware of contradictions in food choices, for example a food is described as fresh but has been in cold storage, or is over packaged. Several participants during the focus groups evidenced a preference not to confront food production issues that challenged their existing food choices. Among the younger participants, even those who expressed a desire to complete all interviews, there was a greater rate of non-attendance at both focus group meetings. This was explained by the participants as the difficulty of juggling time, work and family commitments, and it is these same constraints that were identified as impeding the capacity to critically reflect on food choices in general. The greatest obstacle identified by all participants was the difficulty of obtaining accurate and credible information about food production methods and potential risks associated with these.

Participants described how food production methods had changed considerably during the lives of many of the participants. Access to food has at various times been restricted, and participants who had experienced deprivation provided a historical dimension that contributed to understanding differences in attitudes and expectations. Aligned with this perspective was the view that food choice was a privilege in a world where poverty, food

scarcity, and waste were visually evident. For participants the tension to be resolved was balancing personal insistence on food variety with the knowledge that the right to food was still to be attained by many people.

5.6.2 Participant Views on The Process

Participants brought a range of knowledge and experiences to the research. The depth of the issues in common was explored while ascertaining the degree to which expressed views remained constant across the interviews. For some participants reflecting on food choices was a totally new experience and the questions invited closer consideration of food choices that had been previously taken for granted. Other participants were already engaged in a process of critical reflection that impacted on food choices. The difference between the personal ideal of how food should be produced and dissatisfaction with how it is actually produced was viewed as a tension by some participants.

Most participants indicated that involvement in critical reflection assisted them to identify the difference between the participant's ideal of food choice and what had been previously accepted without question. After considering how food choices relate to the environment, a number of participants indicated a change in their views of the food system and environmental health risk. This was evident at the conclusion of the individual interview when participants were given the opportunity to modify the initial written response they had made to the questions. Several participants moved from a position of being satisfied with the regulatory controls in food production to being dissatisfied with these. There was also an increase in the number of participants who wanted more information about food choices and who regarded waste as an issue. Despite structuring the questions to avoid a

middle position of indecision, quite a few participants identified areas within a question where there was agreement and also concern. This could be construed as evidence of tension for the participant.

The challenges of the reflective process continued during the focus groups. Most participants stated that the process had been valuable and several indicated that they were actively changing food choices consequent to the research and their own investigations. The reasons given for changes were discomfort with certain food production methods and the desire to assume more control for personal health, including consideration of environmental impacts.

The perception for participants was that the food system emphasised economic gains without consideration of longer term health and environmental risks. For this reason self-regulation by industry was deemed to be an inadequate control, with too much to be gained by vested interests for controls to be properly implemented. Economics were also seen to determine the choices available to the consumer. For the majority of participants the government's failure to support environmental initiatives raised questions about campaigns aimed at promoting individual action while the government, and industry, did not comply with community expectations.

5.7 Conclusion

This chapter has presented the participants' considerations of the various aspects of food production. Their discussions around the issues resulted in an increased questioning of the food system. There was a growing awareness by a number of participants of a previous

state of false consciousness. The period over which the interviews were conducted saw significant shifts in knowledge and attitude for a number of the participants. For example, some participants described themselves as naïve at the commencement of the interviews but subsequently indicated a strong interest in learning more about food production. A number of tensions also became evident throughout the discourse. It was noted by participants that mass produced food interfered with natural growth cycles, impacting on the quality and safety of food, as well as disrupting ecological balances. It was deemed, however, that the needs of a growing population may make this approach inevitable. Despite participant consensus on the need for technology in food production, they strongly resisted the imposition of biotechnologies that had not been tested over significant time. Their perception was that these posed significant risk to both health and the environment and that government, as the regulating authority, should take a precautionary approach rather than conceding to the commercial agenda.

Chapter 6 discusses in greater depth the concerns that participants had about food related risk and who should be responsible for the control of this, with reference to the literature. The participant consensus that the economic agenda of government and industry was apparently of higher priority is discussed within a context that also considers the individualisation of risk. The ability of the consumer to comply with the expectation that personal responsibility be assumed for health is exposed as limited by restrictions to essential information and the imposition of technology, as described by participants. The generational differences referred to in this chapter are again evident but converge with all participants agreeing that the government should be doing more to safeguard the sustainability of food production processes. Participants indicated that consumers require

support in both accessing information about food and in ensuring that their objections to resisted technologies are heard. The adoption of a social ecology perspective by public health would provide an essential bridge between consumers and those that influence the food system. This would contribute to restoring confidence that a government agency was acting on behalf of consumer interests.

6 Risk, Trust and Control in the Food System

This chapter focuses on the risk, trust and control concerns that permeated the participants' discourse consequent to the identification of the environmentally based health risks discussed in Chapter 5. The data gathered within this research provided a grounded consumer view that is now compared with the individualisation and risk theories that have informed public health approaches. The diverse concerns expressed by participants illustrated the value of critical reflection in enabling participants to identify and clarify the connections between health and environment and to attribute responsibility for food associated risks. To facilitate the flow of the discussion, these issues are teased out as separate points as far as practicable while not losing the connections that distinguish this research as an embedded social ecology perspective. The sections are presented with the theoretical underpinnings providing context in the first instance, followed by analysis of the findings, and reference to other literature and research.

There were significant differences between participant views of food system risk and accountability for this and the perspective deemed to be held by food system proponents and regulators (Echols 2001; Nestle 2003). Central to such differences are the values associated with the food system, including the key question of the purpose of food production - is it sustenance or profit? Participants took a broad view on such issues, reflective of the ecological health approach advocated by researchers such as Coveney (2003) and Lang (2001). Understanding participants' positions on food issues can contribute to professional understanding of the consumer perspective of the food system.

Participants objected to the blaming of individuals for food related health impacts. For them there were external factors beyond consumer control that contributed to risk. These included food system governance, the apparent ignoring of public opinion of risk, economic agendas, the unknown and imposed nature of much food risk, the inadequacy of scientific risk assessment, and the role of the media. The modern food system exemplifies the risk society described by Beck (1992), in which incalculable risks arise from complex, overlapping modern systems, and this has happened within the memory of older participants. The commodified, technology dominated food system that is associated with risks such as BSE, pesticides and additives, differed to the simpler food supply of their past, one in which they felt they had more control. As noted in the literature, the presence of unsafe chemicals in agricultural produce justifies consumer concern, and speaking out on these cannot be dismissed as "scare-mongering" (Lang and Rayner 2001). The occurrence of food system incidents was linked to modern practices and participants' assessment of food risk reflected their experiences. They identified that there were different views of risk between consumers and food system stakeholders, including governments.

Other constraints identified by participants as obstructing their ability to influence the generation of perceived risks were limited consumer access to both adequate and accurate information and the alternatives they viewed as less risky. The situation was viewed by most participants as exacerbated by the way the media constructed and disseminated information on risk, impacting significantly on the public's capacity to respond to food system issues. Thus a flaw of the individualisation thesis could be seen to be the restriction of consumer capacity to take precautions and to act to minimise impacts.

The broad perspective taken by most participants is in strong contrast to issue focussed health promotion initiatives aimed at individual behavioural change and highlights a need to adopt a more sophisticated approach to health messages. The extent to which the health sector subscribes to the individualisation thesis reinforces the culture of blame rather than engaging in a more holistic and empowering approach to population health issues.

Participants indicated behaviour change after involvement in the process, and a summary of this is provided in Figure 7.1, in Chapter 7. This is important because it was self initiated and a consequence of their own assessment of the food system impacts. In such changes was recognition that, even if the overall influence of individual behaviour is minimal, there was benefit gained in being able to act according to clarified values.

The conclusion highlights the extent to which there is a sense of disenfranchisement and frustration with a food supply system that appears to be minimally responsive to public challenges about food safety, both long and short term. The measures taken by participants to address this situation - one that is characterised by a sense of not being able to rely on governments to protect health and the environment, are discussed in Chapter 7 Risk, Action and Environmental Citizenship.

6.1 *The Food System, Governance, Risk and Trust*

Participant consideration of governance and regulation revealed distrust of both the food industry and the government. For many people food choice is part of the hegemony of unquestioning acceptance of what is made available by the industrial food production system. Food is commodified and presented as a smorgasbord of choice. Participants demonstrated, however, that identifying food associated risks and the protagonists

responsible for creating these risks may result in consumers challenging current practices. They viewed food standard setting as an arbitrary process that was minimally influenced by consumers. This is important given the social context of attributing blame for food associated risk to the individual.

The individualisation of risk is a modern concept (Giddens 1991; Beck 1992) and has contributed to the development of a blame mentality that focuses on consumer choice as the major factor in health status. Implicit in this is both the individual capacity for total self direction, as well as blame-worthiness in the event of poor decisions. In this context the individual could be regarded as the protagonist whose choices dictate food production, processing, and convenience packaging, allowing the government and corporate sector to abrogate responsibility. This positioning of the consumer is an outcome of the liberalisation of government and the diminishment of regulatory and welfare support systems, to governance "through the responsible and prudential choices and actions of individuals on behalf of themselves" (Dean 1999, p.133). This effectively sidesteps the influence of marketing, and the government's role in subsidising certain crops and supporting biotechnologies that result in the imposition of new products on consumers.

These are external elements that are beyond the control of the individual, and, as noted in Chapter 2, it is the political influence of agribusiness that dominates the food system and determines the options available to consumers. This situation evolved over the twentieth century and contributes to explaining generational differences in views of food system risk. Some consumers have experienced a continuum of food supply strategies ranging from traditional farming to modern day production technologies. It is familiarity with such processes that underpin consumer estimates of risks and their causes. These estimates

govern the extent to which consumers believe they can control food associated risks and are central to their acceptance or not for such risk and the associated blame (Wynne 1996).

In considering how participants reacted to environmental health risks, it became evident that participants rejected the premise that full responsibility for food production practices and associated risk rested with the consumer. All participants expected that governments should act to protect public health and welfare but, at the same time, they indicated awareness of the reduction, over time, of the provision of such services. This created a quandary for most participants in ascribing responsibility for food related risk, with different perspectives on the role of producers, governments and consumers in managing risks to protect health and the environment. The consensus was that producers should act in the general interest and that the government needed to regulate and control the food system to ensure this.

Participants debated government responsiveness, with their perceptions of government commitment to consumer concerns ranging from disinterest to occasional reaction to such concerns. These opinions reflected generational differences of trust in regulation; younger participants supported existing controls but acknowledged that these might not be effective:

"... it might be naïve of me, thinking that but I do... if it wasn't good for you the government wouldn't have it out there... there's rules and regulations but I guess I trust a bit too much on that." Carla (*Individual Interview*, 23, p/time retail assistant)

In contrast older participants drew on their experience with the food system, including the simpler food supply that existed prior to the development of agribusiness. They were cynical about the role of government, indicated less faith in food system controls, recalled more negative food related incidents, and traced these to government failure to control risks

by regulatory measures and monitoring. Participant concern about the adequacy of monitoring was common, with assessment over an extensive period of time regarded as essential to detect longer term effects, especially with regard to newer technologies that altered the nature of food. Most participants reacted negatively to food technologies that were identified as focussing on aesthetics without enhancing food value, especially if the technologies adversely affected the environment. Comparisons were drawn by participants between genetic modification and irradiation and discredited scientific advances, initially marketed as beneficial and safe. For example, reference was made to thalidomide, acrylamide, hormone replacement therapy, and the feeding regimes that resulted in BSE.

"... this is nothing to with food, but the thalidomide case with people taking the drug and years... before anyone put together what was actually happening, and it wouldn't surprise me if we do run into some major scandals in food ... mad cow disease is a fine example... there are a few time bombs ticking..." Ivor (*Focus GroupRd1*, teacher, no family)

Thus, despite scientific testing regimes, participants regarded time to be the appropriate measure by which to judge new or novel foods. The consumer preference for time as an assessment of food technology safety stems from tradition and culture, and has been described within the literature (Wynne 1996; Echols 2001). For governments who view food primarily as a commodity, however, this approach is not expedient.

The commercial view of food was regarded by all participants to contribute to double standards when it came to protecting health and the environment. Governments promote self regulating behaviour and expect individuals to conform, but the compliance of industry with such expectations was considered to be low. This culminated in participants

questioning the motivation of food producers and revealed they held doubts across the whole food production process. At the paddock end of food production their concerns were about the impact of farming methods and inadvertent chemical contamination. Industry was viewed by most participants as a significant producer of waste by-products and self-regulatory mechanisms were identified as providing insufficient control over such outputs.

"With the production of... quantities of food there has got to be some sort of detrimental effect on the environment... I try to buy foods actually that have no packaging... it's sort of a double standard though... if individuals are supposed to be looking after our health... but then the government and other industries aren't implementing their responsibilities to the highest level..." Geri (*Individual Interview*, university student)

For participants the introduction of industry self monitoring practices and the absence of a regulatory regime to ensure that chemicals were applied correctly, were evidence of government relinquishing control in areas that impacted on health. Their retelling of reports about fertiliser contaminants in food and antibiotics in chicken exemplified these doubts about regulatory controls. It was viewed by participants as contradictory to hold consumers responsible for negative impacts that should have been constrained during the production process. For most participants the inability to detect substances visually and the lack of public scrutiny of food production practices contributed to their lack of confidence.

Tied into this was criticism by many participants of governments that facilitate industry access and use of resources at the public's expense, both in real dollars as well as eventual impact on health and environment. This was clearly evidenced in Rochelle's narrative about the interdependency of economics, governance, health and the environment. Other

participants shared her view of government complicity in the form of a lack of political willpower to curb industry excesses by insisting on a cradle to grave approach in dealing with food production. This included pricing food to reflect its true cost and the appropriate disposal of waste.

"... but companies are subsidised by government... in terms of the access they have to infra structure... and they use facilities that they never have to pay for and so they are assisted in so many ways in setting up food... " Rochelle (*Focus Group Rd2*, p/time librarian, 2 children)

"... a lot of that take away food is cheap... it is absolutely appalling food... so if companies were forced to put the true environmental costs into the item then people might think twice about it..." Rochelle (*Focus Group Rd2*, p/time librarian, 2 children)

In this last statement was acknowledgement that the emphasis was on the individual to choose consciously to minimise the risks that may be encountered in daily life. To a degree most participants accepted the individualisation of risk (Giddens 1991; Beck 1992), but at the same time they identified structural constraints on the extent to which the individual could respond to food system risk.

Concerns, such as those expressed by participants about the control of externally imposed risks, may result in an increase in the self-reliant sourcing of information about food related risks. The shift to self-reliant behaviour in response to an incident that undermines trust has been described in the literature as re-educating the self to increase control and reduce risk (Giddens 1991). An explanation for the greater trust indicated by younger participants could be a more limited exposure to food related incidents as well as restricted time to reflect and act on these. Their reconsideration of such trust, however, may relate to

recalling recent food scares. This differing level of generational trust evinced by participants was the reverse to that found by Kirk, Greenwood et al. (2002) in a quantitative study of the public perception of food risks in the UK, in which the younger subjects were less trusting. The difference between the two studies was the research reported here provided participants with greater time (and thus depth) to consider the questions, and, following the initial interview, these questions were structured around participants' concerns. The methodology enabled consumer concerns to be captured and avoided directing responses according to a predetermined agenda. That some participants reflexively moved from ambivalent acceptance to the questioning of production practices and standards indicated that they perceived a gap in the existing regulations, and this could be the catalyst for becoming more self-reliant.

Participant concerns that regulatory control and risk monitoring were inadequate for reducing adverse or potentially adverse impacts on health are consistent with other literature (Lang and Rayner 2001; World Health Organisation 2001; Nestle 2003). Participants' views of food system risk were the culmination of their own reflective thinking coupled with the sharing of lay knowledge within the focus groups. The depth of participants' insight and connection of food system issues over the course of the interviews reflected the holistic perspective with which these consumers viewed such issues when given the opportunity to explore these. This contrasts with other research that suggests consumers lack the technical expertise to assess food safety, specifically the direct risks of contamination and residues (Smith and Reithmuller 2000). The latter research, like much other literature in the field, explored consumer perceptions of personal risk rather than

investigating the extent to which consumers considered other food choice risks, including the environmental impact featured in this study.

That both latent environmental health impacts and responsibility for risk were identified by participants is indicative of the much more active role that consumers could play in sustainable food decisions if supported by an influential sector such as public health. It may be necessary for this involvement to occur at the governance level, not just the supermarket, to increase trust and reduce the conflict that erupts when risks are perceived to be imposed and the individual blamed for these. In the current study all participants indicated scepticism about government motivation and the perceived reduction of official accountability for public health.

6.1.1 Governance and Standards

For participants a tension existed between risk governance that was seen to be determined by an economic framework, purportedly for the benefit of population health, and the positioning of individuals as the agents responsible for decisions that affect health. Consideration of the process of setting food standards, discussed in Chapter 2, provides a study of risk governance and the extent to which the consumer can influence such processes. Participants regarded the food standards process to be dominated by the food production sector, with limited input from other important sectors such as health. In addition, it was deemed that the food standards process should strongly reflect the consumers' perspective as a priority.

Core to this issue is a significant change in the purpose of food standard setting. This change needs to be considered from a risk perspective, because it influences the extent to

which individuals will accept responsibility for food risk. The original intent of regulation and policy governing the food system was to ensure food safety by preventing contamination or the concealing of spoiled food. This role still exists (Australia New Zealand Food Authority 2002) but has now been expanded to include the protection of health within a context of food modified for commercial advantage. Thompson (2001) describes this as an ethical shift. Thompson argues that public consent would have been a given in the instance of controlling for contaminated or poor food, but this consent cannot be assumed in the light of technologically manipulated food that may contain longer term, as yet unknown risks. This would indicate a situation that could be considered to be socially unjust, that is expecting consumers to be responsible for environmental health impacts over which they have minimal say. As indicated by the participants and also reflected in the literature (Adams 1995; Anderson, Lean et al. 1995) there is willingness to accept blame when one has consciously made a choice that may have a negative impact, for example not wearing a seat belt, or consuming excess sugary food. Responsibility for potential risk arising from food production over which consumers have no control, however, was regarded by participants to lie with governments. Their view is consistent with those reported elsewhere (Frewer and Salter 2002).

The participants' expectation that governments maintain a protective role was accompanied by their doubt about government capacity to regulate food associated risk. This included the process of food standard setting and monitoring. While some participants viewed the Australian standards as adequate for protecting health, others questioned their adequacy. Concern about the perceived discrepancies between Australian standards and those of other

countries were expressed along with the desire to know specific standards and the level at which substances were present in food.

"... the limits here... would be highly illegal in some parts of the world..." Tom
(*Focus Group Rd1*, gym manager, 2 children)

Most participants were concerned about standards and residues and this may indicate a need to explore consumer understanding of these and to provide education that assists in the interpretation of the standards. For participants this concern about discrepancies in food standards extended to the global nature of food markets and the possibility that their efforts to minimise food safety issues at home were compromised by the risk of imported foods being contaminated. The Australian Quarantine Inspection Service (AQIS) was identified by participants as responsible for detecting food safety breaches but they had concerns that monitoring was inadequate. Comments by many participants highlighted that the invisible risks associated with the food trade, such as pathogens and contaminants, were an issue that government regulation and monitoring should address with more consistency.

A consumer view expressed by most participants in this study was that environmental health risk is often considered to be the result of food system decisions being made without consideration of other connected influences. This view is supported by much of the literature referred to in Chapter 2, and one such instance was the health risk that emerged when animals were fed antibiotics (Gregory 2000), with other examples indicated in Table 2.1, p. 39. The failure of regulatory measures to predict and control such risks underscored participants' objections to invisible pathogens and contaminants, and the cumulative impact of these. For participants one of the complexities in regulating the broad factors that affect the food supply is the division of responsibilities for administrative and political purposes.

A sustainable food supply requires an integrated approach but government departments are sectorised into key areas such as agriculture, fisheries, water, health and education. This is a potential problem because it could limit government capacity to address complex issues in a holistic way. There is some recognition of this by governments with the establishment of the NSW Food Authority which aims to integrate the food system responsibilities of stakeholders whose activities may directly impact on health. However, the viability of the longer term food supply remains uncoordinated as indicated by the approval of bluefin tuna for eating despite its endangered status (Darby 2004).

Participants were concerned that decisions affecting the food supply are made without consideration of overlapping or synergistic effects that impact on food production and the nature of food. Participants quoted the BSE incident as an example of how a focus on agricultural efficiency can be detrimental to population health. Reports indicate that this was caused by attempts to minimise waste and increase productivity by recycling animal protein in cattle feed, without allowing for potential effect on consumer health (Lang and Rayner 2001; McMichael 2001). Walls and Pidgeon (2004) suggest that consumers regard the occurrence of incidents that compromise the food supply as a failure by the regulators to act in the public interest. This view was shared by participants in this study and aligns with broader concerns about the negative impacts of modern food production on health (World Health Organisation 2001). The incidents referred to highlight the need for an integrated approach to regulation that addresses consumer food risk concerns. Government approval of processes that consequently impact on health undermined participant confidence in government and the food industry, an outcome that has been identified in other studies about food choice (Knox 2000; Harper and Makatouni 2002).

It was perceived by participants that lobbying and economic justification by the food industry often resulted in a less than thorough analysis of the potential impacts of industry actions, such as in the development of new products. Aside from the direct control of unanticipated risks the community expects governments to assume responsibility for ensuring that industry operates within an ethical framework to safeguard health (Beck 1992). Industry was thought by participants to be regulated to a lesser extent than individuals, even when it produced impacts that posed direct and indirect risk to public health and the environment. An example from the literature that supports participants' views is the Common Agricultural Policy that resulted in the destruction of fruit trees (Lang, Barling et al. 2001; Early 2002), resulting in the need to import such food.

Another common example given by participants as evidence of the lesser priority accorded by governments to industry generated risk was Australian government failure to support environmental initiatives, for example the Kyoto Protocol (Davidson 2002). Thus questions were raised by many participants about campaigns aimed at promoting individual action while the government, and industry, did not comply with community expectations. Evidence supporting their view of a strong industry influence in setting standards and policy can be found in research evaluating the historical influence of the dairy industry on nutrition policy in Canada (Ostry, Shannon et al. 2003), through to commercialisation of genetically engineered produce (Martineau 2001).

For participants the combined impact of changes to food standards, the segmentation of responsibilities in the food sector, and industry influence all served to constrain the governmental ability to fully consider the effects of food system decisions on health and the environment. Their recognition of the economic imperative plus minimal opportunity to

comment on food standards contributed to their rejection of being held responsible for population health as a result of food choices. The next section explores the construction of the economic agenda as the key influence on the food system.

6.2 *Economics or Health*

In challenging the construction of food as a commodity, participants indicated dissatisfaction with the physical and social risks posed by agribusiness. They perceived that much food system activity was about attaining profit, including the avoidance of regulations to increase profit and thus demonstrated an 'extensive realism about risks' (Wynne 1996, p.53) related to the food system. This contrasted to the blindness to risk that Beck (1992) attributes to the techno-scientific community who generate such risk to increase productivity. Blindness to risk situates the perpetrators as negating or minimising resultant hazards because the focus is on profit. The World Health Organisation (2002) has acknowledged that organisations construct the evidence to conceal health risks to protect profit, citing the example of the tobacco industry. With food system risks, governments were viewed by participants as complicit in supporting the commodification of food. This view reflects a global context of businesses avoiding government controls, with the food industry and its associated lobby groups often being more powerful than elected governments (World Health Organisation 2002). For participants, government policies that prioritised the agribusiness agenda evidenced the lesser priority of health and social justice considerations.

Participants indicated increasing resentment that the cultural and nutritional values that they associated with food were being compromised by a capitalist structure that focussed on

economic gains for industry. For example, for participants flavour was important. The significance of flavour in food choice has also been noted in the literature (Rozin 2000; Atkins and Bowler 2001). Participants comments indicated the potential for consumers to come to accept a description of food as fresh as an adequate measure of quality independent of an appreciation of the characteristics of ripeness. Negating the value of fully ripened flavour, traditionally significant in buying produce, was viewed by participants as contributing to consumer acceptance of agribusiness practices that provide less nutritious food and compromise future food security. The emphasis on economics is historical, as remarked in Chapter 3 (Durkheim in Spaulding and Simpson 1952), and the belief that economics determine the level of regulation and the consumer choices available is reflected in the literature (Krimksy and Wrubel 1996; Echols 2001; Nestle 2003).

More recent are the values conflicts that stem from the way that food has become commodified and there are grounds for the opinion that consumer values are of secondary importance. This is illustrated by referring to the emphasis and response of the food industry to public concerns. As already cited, the food industry shifted the focus to individuals in its promotion of the continued consumption of meat during the BSE crisis (Benton 2002), despite the potential health risk. Within this context it is easy to understand participants' anger about food system issues that are beyond their control. Krimsky and Wrubel (1996) have suggested that new products bring profits to producers rather than benefits to consumers, and Marshal (1995) supports this view with the observation that industry motivation is often about capturing a greater market through novel products and price competitiveness. Most participants recognised that consumers do expect a plentiful supply of cheap food, and this is supported in the literature (Holm 2003).

However, many also viewed that this situation has been constructed as a consequence of an industry competitiveness that is supported by government policies and infrastructure.

Governments were positioned by the majority of participants as subservient to powerful industry groups and unresponsive to issues raised by the public. The consequences of this situation were described with frustration that stemmed from participant awareness of the unsustainable nature and social impact of many industry practices, as indicated below.

"... we don't have the water resources... governments know that but they allow it [the growing of rice and cotton] to happen because it is a money spinner for them. ...the transportation of goods, it is far more environmentally friendly to transport by train ... [but] road transport has taken over because the transport lobby is too powerful. So governments aren't going to do anything for us..." Bob (*Focus Group Rd2*, retired bricklayer, post family)

The same frustration on the part of participants was evident when risks were linked to social justice issues and sustainability at the local and global levels. The recurrent example given was genetically engineered foods and the potential risk these posed for natural and constructed systems. Genetic engineering was strongly opposed by all participants on the grounds of unknown impacts on individual health, the environment and on populations in less developed nations.

"... the whole issue of gene foods... it is completely driven by industry... there is no question that we are short of food. Why do we have to introduce a new technology... when you know other sort of practices might compensate but ... that's to do

with...who owns the genetic material..." Rochelle (*Focus Group Rd2, p/time librarian, 2 children*)

This discourse questioned the motivation and integrity of food producers in promoting this technology when existing practices were regarded as capable of meeting world food needs.

In describing the priority accorded to protecting commercial interests, another example given by several participants was that of contaminated food receiving less public health attention than child drownings, despite food's greater potential as a morbidity factor. It was identified that commercial interests would suffer if eating a particular food was associated with risk. Similarly, liability concerns were regarded as the rationale for food labelling and the disposal of food that could relieve food scarcity for underprivileged people.

"... it's a health risk for companies that...donate them..." Angela (*Individual Interview, clerical, 3 children*)

In objecting to having to balance competing demands, including their own desire to consume ethically, participants resented industry and stakeholder responses that appeared to be only about minimising the risk of liability. This was perceived to be risk management not for public health but for commercial interests.

The potential for consumer outrage to be fuelled by apparent disregard for health in the interest of maintaining profits was identified by participants. That this may result in consumer anger being directed at regulatory bodies has been confirmed by overseas studies examining the BSE incident (Frewer and Salter 2002). For participants the threat from contaminated food was viewed as involuntary and resulted from a commercial agenda. Worse from a consumer perspective, was not being warned by public health authorities

because the over-riding concern was limiting the damage to a commercial operation. The direct risk of contaminated food was perceived by participants as potentially affecting more people than an individual drowning and thus presented a larger scale threat.

The angst expressed by some participants on this was intensified by their discussion of the expenditure of public money on campaigns targeting individual preventative actions, such as drownings, while other avoidable risk was commercially sanctioned. Yet participants acknowledged that people do not speak out against such public health campaigns because to do so would be to appear to be insensitive to the individual tragedy of avoidable death. This type of reaction has been referred to as cultural filtering (Adams 1995), a process that could be described as governments directing public attention to individual responsibility while allowing the imposition of supposedly calculable risk within the food system.

Health was viewed by participants as compromised by a commercial imperative that has resulted in the imposition of resisted products and practices. Risk to health and environment were deemed to be associated with government approval of these technologies. This, in combination with the increasing number of food scares (Gregory 2000; Lang, Barling et al. 2001), provided grounds for participants to object to food being modified without public consent. Social equity was also considered by participants to be compromised within competitive markets and their regard for this equity is now considered.

6.2.1 Economics and Equity in the Food System

Justice, both economic and social, was clearly valued by all participants as indicated by concern expressed about farmers and lower socio-economic groups. Their perception was that food system stakeholders benefited while the risks stemming from food production

were borne by those with the least resilience to such risks. This view provides substance to the inequity of the social distribution of risk (Giddens 1991; Beck 1992). Participants regarded such a situation as grossly inequitable, with economic injustice perceived to compound the impact of natural disasters and social disadvantage.

It has been recognised that the combination of lower socio-economic status and limited formal education can result in a cycle that negatively impacts on knowledge about nutrition as well as the capacity to obtain such information (Glanz, Rimer et al. 2002). A consumer on a low income who does not understand nutrition may choose food on solely on the basis of budgetary constraints (Australian Institute of Health and Welfare 2004). Participants identified the situation as one in which governments aim to appease the majority of consumers by facilitating the provision of cheap food rather than quality food. Other research supports participants' view that processed food may be regarded by lower socio-economic consumers as more economical (Holm 2003), especially in the absence of culinary skills (Blackwell, Talarzyk et al. 1990).

Participants were concerned that processed food may be of less nutritional value and even conflict with government health campaigns. However, as Goodman and Redclift (1991, p.250) have noted "As the food we consume has become more processed, it has been presented as more 'natural' by the food industry". Fiddes (1995, p.138) also noted that what he calls the "standardised fabrication" of food to ensure that it is reminiscent of known and familiar flavours, even if these are not naturally derived. Participants observed, however, that there were more voters in the lower socio-economic strata. They stated that governments would not be interested in making changes that would alienate both popular

support and the industry stakeholders who benefit from the market while not being held responsible for the impacts.

Government reluctance to take the political risk of true pricing for food was perceived to be a significant obstacle to achieving the necessary level of protection for health and the environment.

"... when a government feels it is entrenched and it has commercial interests then it becomes really hard through agitation and public opinion to change government course and government opinion ... the public opinion has got to rise to certain level of threshold every-time..." Ambrose (*Focus Group Rd2*, estimator, 2 children)

Consumer demand for cheap food may be detrimental to a sustainable food supply and contribute to broad social inequity. It has been noted that Western diets are endangering non-renewable resources across the globe while at the same time the content of these diets contributes to the public health issue of obesity for economically disadvantaged groups in Western societies (Early 2002; Ruppel Shell 2002). The situation can be traced to a reflexive consumer focus on immediate needs, such as convenient food, rather than planning to avoid longer term health risks (Beck 1992). The irony in this situation is the reinforcement of individual responsibility for food choice (Waltner-Toews 2000) but the context is one in which information about less visible food risks is difficult for consumers to access. Participant concern about the social injustice of this self-perpetuating situation however, tended to reflect the view of 'others as more at risk' (Knox 2000, p.99). They attributed responsibility for the situation to the economic policies that govern the food system. These policies were regarded by participants to negatively affect both the

nutritional status of lower socio-economic groups and the support available to other hardship victims.

The participant tendency to sympathise with the victims of social injustice was evident in references to the Australian drought and dust storms, and the impact of these on farmers and the food system. Sympathy for the hardships endured by farmers reflected participant concern about immediate impacts, but was also in stark contrast to the annoyance they directed at retailers that were perceived to take commercial advantage of natural crises by increasing the price of fresh produce. The impact of budget returned participants to an individual position of reflexivity (Giddens 1991; Beck 1992) because, even if there is awareness of a negative consequence for the food choice as in risk to health or the environment, a choice will still have to be made. This highlighted how social equity issues became complicated for participants when there is also a direct cost to the individual.

For participants, even clearly defined social justice issues, including those related to the food supply, were not resolved within the representative model of government. Beck and Beck-Gersheim (2002) identified that democracy is based on representation, which is in effect the disenfranchisement of the public. Outside election periods participants stated there was little scope for the public to voice its opinions. When individuals perceive their trust in political systems to be misplaced this may lead to the development of self-politics (Giddens 1991; Beck and Beck-Gersheim 2002). Self-politics provides a means for individuals to cope with conflicting information and awareness of inequities over which they have little control, and is an outlet for dissent.

This study found that participants were resentful of the lobbying by retailers and corporate stakeholders that influenced government responses to food system inequity. Food safety incidents and environmental degradation indicated for participants the dominance of economic priorities over social concerns. In another example, participants linked the war in Iraq with food scarcity, refugees, and war casualties, all of which are public health issues. Participants referred to media reports that indicated seventy percent of the population actively opposed Australian involvement in the war as evidence that the government did not listen. It was deemed that the catalyst for action on food risk would have to be a crisis affecting a vulnerable sector of the population. A dismissive approach by governments to public concern was viewed as typical and other prominent organisations share this concern about the ongoing perpetration of inequity in who bears the costs of food system risks (World Health Organisation 2002).

Participants recognised the integrated connections between economics, government, and environmental health risk. While it was acknowledged that food system stakeholders are in business, there was a perceived need to balance profit against negative impacts. The returns to government of its alliance with industry were considered of minimal benefit for consumers, apart from cheaper food that is perhaps more dubious in quality. Food quality was recognised by participants as an issue that required coordinated action to address the economic inequities that affect health. For them this included education strategies to facilitate the making of sustainable food choices. Reducing consumer cynicism requires that genuine efforts be made to listen to their concerns, and to act on these. Integral to this is consumer access to accurate information and this issue is discussed next.

6.3 *Imposed Risks and Information*

Access to information that was concise and accurate was raised as a recurring issue.

Participants considered that consumers had restricted access to all the information needed to make sound choices. On the one hand they described the direct health risks associated with a variety of foods. These included the consumption of fats, sugars, additives and so forth, and participants made choices according to the level of risk that they wished to accept. Some life choices can be considered to be "life enhancing even if not health enhancing" (Anderson, Lean et al. 1995, p.124), for example when individuals choose to eat foods or drink beyond recommended intakes. On the other hand participant concern about invisible and involuntary food associated risk was viewed differently in that it was imposed. Such concern aligns with the identified consumer trend to fresh food reported in other research, a sign of consumer suspicions about processed foods (Starr, Langley et al. 2000; EQUAL 2002). The food choices described by participants reflected their acceptance of responsibility for their own health, those areas where information was available, and the level of trust or distrust they had in food suppliers and government.

Constructing health as a consumer responsibility (Lupton 1995) overlooks the external risks for the individual. These may include limited awareness, minimal control, and personal value conflicts. Evident in participant opposition to new products and practices was their concern that there is a full consideration of costs and benefits for health and ecosystems before wide scale implementation of these. Participants wanted a duty of care to be taken by the government, as the approving body, so that potential risks are allowed for even if there is a lack of scientific evidence. The belief by participants that pre-emptive action should be taken to reduce harm found in this study was consistent with the broader adverse

public reaction to genetic modification. That consumers want to know when food is genetically modified remains consistent across the research (Donovan Research 2001; Yeung and Morris 2001; Luntz 2002). The consumer's "right to know if their food has been bio-engineered", however, is still subject to debate - even though research indicates that this is the public preference (McCullum 2000, p.1312).

This consumer concern about genetically modified food is shared by a number of scientists (Anderson 2000; Knox 2000). The technology is, however, commercially valuable and food stakeholders have attempted to circumvent the controversy, by lobbying governments to weaken or nullify label requirements that indicate the genetically modified content of food (Krimsky and Wrubel 1996; Tait and Bruce 2001; Nestle 2003). Tait and Bruce (2001, p.107) identify the Australian government as being part of the Miami group that was 'forceful' in the watering down of such labelling requirements. Industry and its advocates have argued that what consumers need is more education on genetically modified foods (Knox 2000; Martineau 2001), whereas participants stated that consumers expect governments to exercise stricter controls and provide more information.

Core to participants' comments are fundamental differences between consumers and food system stakeholders on the nature of information. Research confirms that consumer considerations of the costs and benefits of food technologies includes the extent to which processes align with or conflict with personal values, for example values related to animal welfare or organic production (Echols 2001; Yeung and Morris 2001). In contrast, food stakeholders, including the researchers whose advice underpins the setting of government food standards, adopt a utilitarian approach that discounts personal values as significant in information provision (Echols 2001; Thompson 2001). Thus it could be predicted that the

issue of what information is provided will become even more contested with the combining of animal and plant genes that are unacceptable to groups on religious or ethical grounds. The consensus by participants that consumers require access to comprehensive information reflected the significance of personal values in food choice and contributes to explaining consumer frustration with the information that is currently available.

Embedded in participants' need for reliable information were concerns about overlapping health and environmental risk beyond the sphere of individual influence. As noted in the literature (Douglas and Wildavsky 1982; Adams 1995) there is a degree of tolerance in accepting a minimal level of food related risk, such as eating oysters or raw foods. The dilemma occurs when consumers heed dietary advice from trusted authorities, or eat items that have been culturally regarded as a valuable source of nutrients, such as fish - only to find that the food source is contaminated to dangerous levels (Cole, Sheeska et al. 2002). The need for this type of advice, and as sought by participants, has been recognised in other research advocating that consumers be alerted to potential environmental contaminants in food sources (Cole, Sheeska et al. 2002).

Given that industry does not supply such information, the alternative conduit for advice that enables participants to make choices that accord with their values would be via the health sector. It has been identified that health alerts do impact on consumer behaviour (Yeung and Morris 2001; Frewer and Salter 2002). This then contributes to reductions in environmental risk by placing pressure on industry to modify production processes to avoid loss of market share. Failure to alert consumers results in anger and resentment. This was evidenced in participants' frustration when trying to assume a level of responsibility for

their health and the environment, as advocated by the preventative approach (Goldstein 2001), only to find later that the original information was inaccurate or incomplete.

"... you think you are doing the right thing but you keep finding... you don't have the information..." Julie (*Focus Group Rd2*, retired, post family)

Participants did want to know how, where and when their food was produced but questioned whether the food industry really wanted consumers to have that information. It was apparent to them that individuals could not be held responsible for subsequent health impacts in the event of consuming food that contained substances of which they had no awareness. Consumer frustration is understandable when the expenditure of public dollars on promoting balanced eating based on the food pyramid is considered. Many of the foods, however, have been produced within a regime that includes applications of pesticides and fertilisers - residues of which are consumed within food (Lupton 1996). Processing of food adds to the burden of extraneous matter in food, and it has been suggested by Gregory (2000) that up to 5kg of additives are consumed annually per person. There have been questions about these food risks for well over a decade (Australian Consumers Association 1991) and the finding that participants regarded pesticides and residues as ongoing issue for consumers parallels the conclusions in other literature (Lang and Rayner 2001).

Control of food related risk raised questions for participants about how consumers were supported in dealing with food risk, such as food label information. For example the finding that fresh food was deemed by participants to require as much labelling as processed food contrasted with the 1995 findings of an Australian survey of food labelling - "There is little evidence of a call for labelling unpackaged food; people use an outlet which they trust..." (Australia New Zealand Food Authority 1996, p.15). This may reflect more

recent consumer awareness of the globalisation of the food supply, including fresh produce. However, participants also regarded the imposition of the less obvious risk of unknown substances and the long term environmental impacts of production as a source of conflict for consumers who become aware of these. Giddens notes that "the differentiation between risks that are voluntarily undertaken and risks which affect the individual in a less sought-after way is often blurred." (1991, p.124). The difficulty for participants was in determining how to respond to information that complicates other aspects of life.

In addition to debating the value of the information provided participants discussed the motivation of industry in doing so, such as the liability issues associated with food safety. Some viewed food labels as a consumer victory that had occurred in response to health concerns. The majority, however, indicated that the value was limited because of the technical language used, a lack of clarity with regard to 'use by dates', for example the longevity and safety of the food upon opening, and the absence of information about production methods. Use by dates were perceived by some participants to be an additional pressure because they did not want to waste money through buying food only to throw it out, thus contributing to environmental waste. Added to these issues was the knowledge that the provision of label information had incurred extra costs for consumers, and the value of the information was weighed against this cost burden. These perspectives exemplify that reflexive decision making occurred when priorities conflicted and illustrate that trust was related to the perceived honesty of information providers; whether information assisted in risk identification or the degree to which the individual viewed the risk as imposed.

For many participants coping with food associated risk was complicated by difficulty in accessing research, short term assessments of food risk, and conflicting perspectives on the

potential risks. They perceived that environmental risks may be difficult for consumers to identify because information that describes and links the environment to the food system is not provided within a context of food choices. Participant tolerance of inadequate levels of information dissipated and they became resentful when a higher level of risk was associated with food that had been advocated as healthy or of minimal environmental impact. The effect is a reduction of consumer confidence in public health agents (Giddens 1991). Public health needs to not only provide dietary advice but to situate this within a context of the associated environmental risks, if it is to retain credibility. In addition, public health agencies need to be careful in citing scientific research to justify the validity of public health messages. Increasingly, the scientific community is at variance in opinions of risk to health and the environment, and too often it is discovered that vested interests underpin research. These issues are the focus of the next section.

6.4 *Research, Science and Food Risk*

The public views risk differently to the scientific community and this, coupled with concerns about scientific independence, is a contributing factor in questioning scientific risk assessment. Openly aired disagreements between scientists have led public scrutiny of the role of science and research in risk assessment and the development of appropriate responses (Sjoberg 2001; Frewer and Salter 2002). In this research the impact of scientific dissent was evident in that some participants chose to do their own evaluation of food associated risk, and expressed confidence in their research abilities. For others, however, this daunting task was complicated by the conflicting scientific reports. Thus the need for

research and technology was acknowledged, but public acceptance was conditional on perceived risk to health and the environment.

Participants identified several factors that were held to undermine consumer confidence in scientific risk assessment. These were dissension between experts, the emergence of evidence indicating greater risk than first estimated, and the curtailing of independent scientific and research activity by creating dependence on research funding. These were all viewed as detracting from the credibility of scientific opinion.

Consumer doubts about the integrity of the food system stakeholders, as represented by participants, arise from a different view of food safety to that held by the experts. Scientists refer to risk in terms of probability and magnitude and the advice they provide to governments is the basis for the determination of food policies and standards. Reliance on science occurs because of the complexity of diverse and abstract systems that govern modern life, including food production. This means that any given person, expert or not, must rely on the competence and integrity of those who contribute to these systems (Giddens 1991), and consumers have to choose who to believe. The limitations of current scientific knowledge is a recognised issue (Lash, Szerszynski et al. 1996; Brom 2000; Macfarlane 2002). In contrast, the public are often termed lay people when it comes to debates about technical issues because there is an assumption that there is a lack of knowledge (Knox 2000).

The public assess food safety on the basis of severity of personal risk (Yeung and Morris 2001; Frewer and Salter 2002), including of considerations of the cultural context of food and its role in the quality of life. Hence scientific risk assessments often do not align with

public perceptions of what can go wrong (Krimksy and Golding 1992; Marshall 1995) and what is ethically acceptable to the consumer. Consumer rejection of the imposition of unknown and dreaded technologies can be linked to the numerous food safety incidents over recent decades (Lang and Barling et al., 2001; Gregory, 2000). Most participants referred to such incidents, indicating that these have detracted from the scientific credibility and contributed to a distrust of scientific assurances.

For participants the lack of independent scientific research on food risk was another factor that compromised the credibility of research findings. Given the complexity of modern life the expectation is that the scientific community would act to ensure the safety and quality of food on behalf of the public (Giddens 1991). However, participants perceived that a great deal of research was undertaken by vested interests, and conducted under the auspices of a partnership with an academic institution to enhance credibility.

"The more government steps out of its funding of independent research...

universities, huge amounts of their funding comes from the private sector...

The emphasis on commercial ventures coupled with the loss of independent government funding, were also regarded by participants as constraining the conduct of essential longitudinal research. It was suggested, and many participants agreed, that research that indicated adverse health or environmental impacts may be suppressed if this had negative financial implications for the food industry. The alignment of science with the food industry contributed to their distrust of pronouncements from such partnerships and places science in an ambiguous position on food issues. This situation has been acknowledged by some scientists, such as Martineau (2001), as well as confirmed by research (Ruibal-

Mendieta and Lints 1998). Thus the participants' observation that there is increasing dependence on industry funding is a reality that is reinforced by regular media reports.

The trend for governments to withdraw from providing many public services, including health and research responsibilities, has resulted in the transfer of funds from the public sector to the private sector where the emphasis is on commercial value (Ruibal-Mendieta and Lints 1998; Benton 2002). The role of government in this process is to legitimise new technologies and standards after the consideration of scientific advice. Klein (2001, online) is blunt in summarising this role as changing "the laws to fit the contamination". The concern behind such an assertion is the potential to not adopt a precautionary approach, with the law providing a shield for stakeholders who are reluctant to be accountable for adverse consequences if and when these eventuate. In these instances, participants viewed that science and technology may provide immediate commercial benefits without consideration of long term impacts.

For some participants this contributed to resignation to a self perpetuating reliance on technology, with consumers becoming habituated to certain products. The depletion of natural resources and environmental degradation was considered by these participants to contribute to a paradoxical cycle of dependence upon scientists to find alternative food production methods. Linked into this was a tension between participants' preference for natural foods and their realisation that feeding a growing population may require some level of technological assistance. The participant fear of public acceptance of previously resisted technologies, would appear to be confirmed in Wynne's description of the loss of genotypes because of product standardisation (in Lash, Szerszynski et al. 1996). For instance it has been noted that of 2,000 varieties of apples available, only nine are the focus

of British commercial orchards (Gabriel and Lang 1995). Similarly, participant reference to consumer acquiescence to previously contested production methods is an issue that has been documented in the literature. Accommodating technologies that conflict with personal values may well involve consumers distancing themselves from the food source as part of a filtering process that 'naturalises' or sanitises the end product (Lupton 1996; Eden 2001; Korthals 2001). Acquiescence, however, may be more a reflection of the contextual constraints (budget, diet, convenience), choices available, and the absence of immediately observable negative impacts. The emergence of a threat, especially from technology that has been previously questioned produces outrage at the imposed risk, evidenced by the StarLink Corn affair (Nestle 2003). As stated by Wynne (in Lash, Szerszynski et al. 1996) apparent public acceptance of, or resignation to, technology cannot be construed as unqualified trust.

As evidenced by participants' discourse the concern was more often about 'the severity of the consequences, than the probability of the occurrence', (Yeung and Morris 2001, p.172). The sequence could be construed as the introduction of new technology/product, public resistance to this, imposition regardless, a familiarisation period, but then a serious incident occurs, for example BSE or Chernobyl, and earlier concerns are ignited. Such incidents become benchmarks in public memory and most participants referred to these. The incidents referred to generally presented an unanticipated level of risk, even for science, reinforcing for the public the importance of a precautionary approach because of the limits of scientific knowledge (Wynne 1996; Raffensperger and Tickner 1999). For example, the risk associated with ionising radiation has been identified by some researchers as greater than that identified by experts 50 years ago (Sjoberg 2001). The combination of such

information with media reports that authorities were aware of technical faults, as they were with the Chernobyl nuclear reactor, and the subsequent disaster that resulted in 5,000 deaths (Krushelnycky 2003), results in a loss of public confidence. Participant references to the realised, latent health effects of new technologies indicated that this loss of confidence was exacerbated when governments regulated to allow the implementation of technologies such as the ionising irradiation of food, despite public resistance. The result for participants was reinforcement of the conviction that health and the environment were secondary to profit. Ironically, once a product was accepted or a practice implemented by government, the onus shifted to objectors to prove that it was detrimental to health and/or the environment and this required reliance on scientific approaches again. The need for technological innovation was regarded to be self-perpetuating because the resolution of one issue often created another problem that needed addressing.

From a public health perspective these findings reinforce the importance of adopting an ecological perspective to food issues so that the public can be assured that a holistic assessment of risk has been conducted. Integral to this is greater transparency in and independence of research funding, as well as the publication of all possible impacts on systems, not just the immediate gains. Consumers as represented by participants are seeking such assurances to guide their decision making, encouraging trust in the system, but they require support in achieving such an outcome. As a political influence, health professionals need to reassert an independent role, a public voice not compromised by industry ties (Dixon and Banwell 2004), and support the recognition of consumer rights within the food system.

6.5 Power, Influence and the Media

The results of this study provide more insight into the consumers' view of the media's role in the reporting of food related issues. Beder (2002) claims that the food industry's focus on market advantage extends beyond the co-opting of scientific opinion to the use of its greater resources to block consumer attempts to increase accountability within the food system. This industry approach may stifle some opposition. It can, however, also engender public support for resisters, who are perceived to be victims and thus create more antipathy to imposed food technologies. In these situations the media can influence public opinion but there was also awareness that the media may provide a distorted version of events and information.

A core issue for consumers, as identified by participants, is distinguishing real environmental health risks from sensationalised reports. Beck (1992) positioned the media as a forum for the venting of the 'antagonism' that erupts between those who produced and profited from the risk and those who were affected by its imposition. Such debate may contribute to the sensationalism that obscures the facts for consumers. The media also has been ascribed by Lupton (1996) a significant role in consumer risk perception, with its construction of 'food as pathogen'. This view was substantiated by participant references to the proliferation of media reports covering food related risks that fuelled public concerns. Such a proliferation of media reports has also been identified as a trend overseas (Anderson 2000). This is not surprising as consumer interest in food related articles guarantees the sale of newspapers and magazines. The difficulty noted by participants was determining the actual level of risk or impact of the reported incident or issue.

Many media articles are written with the intent to influence or educate the public about a particular 'scientific view' (Anderson 2000), or to suggest a behaviour deemed to be health promoting. This perspective was supported by participants who commented on advice that advocated the use of nutritional supplements to eliminate the risk of dietary deficiencies. Deficiencies occur when whole foods are processed. Media advertising suggests that deficiencies can be remedied by fortifying the product or taking vitamin or mineral supplements. Sales of the latter are a billion dollar business (Wilkinson, Wahlqvist et al. 2002) and the distrust expressed by some participants about the need for supplements was related to dietary needs as well as possible health effects. During May 2003, an interview period for the study, there was widespread public reaction when the Australian media focussed on the PAN pharmaceuticals controversy because certain health supplements posed a health risk (Needham, 2003). Over 1600 complementary medicines were recalled because of safety concerns. This was followed by a British report highlighting the health risks of overdosing on vitamin and mineral supplements, with side-effects including cancer and bone damage (Robotham 2003). These two reports highlighted the role of the media in identifying the anomalies often present in risk situations, supporting the participant view that it is difficult for consumers to identify risk when sources of advice conflict.

The extent to which the popular media was a credible source of information proved to be an area of tension for participants. The media provided convenient access to information but there was recognition that the diversity of news sources presents competing and conflicting reports. On a global level, media entities significantly monopolise information about world events (Hutton and Giddens 2000). Participant mistrust of such corporations was a function of power inequity whereby such corporations use their economic power to both

influence and collaborate with media. A specific issue they objected to was the intimidation of consumers who object to technologies or products. The unequal nature of such disputes was seen to contribute to the atmosphere of public cynicism. For participants this was exemplified in their references to reports of the farmer who was sued for theft by Monsanto after its genetically modified grain blew into and co-mingled with his crop, and the libel action taken by Macdonalds' against two activists. While participants were wary of the media's portrayal of such incidences, the occurrence of such incidents reinforced their perception of a power inequity between consumers and corporations. This perception is supported by research that indicates that the corporate trend is to use the legal system to stifle public opposition to technologies or developments by threatening individuals who do not have the capacity to counter such intimidatory practices (Beder 2002). The under-resourcing of legal aid by governments means that the lay public is disenfranchised in decisions that determine the nature of food and its impacts. Media reporting of such incidents is recognised as crucial to how consumers interpret and respond to both the actual risk and those involved in food related incidents (Ten Eyck 1999).

That media reports galvanise public action was recognised by participants, but their preference was a more considered approach to risk. In identifying with consumer actions taken in response to reported food system incidents, several participants referred to their own actions to draw political attention to food production risks. Efforts included protesting, writing letters and seeking more information. That these attempts aimed more for political gains rather than knowledge was evident in references to the importance of advocacy. Such action aligns with the strategy, described by Wynne (in Lash, Szerszynski et al. 1996) of requesting information from industry stakeholders to determine positions on

issues and draw attention to public accountability, and thus is not a demonstration of faith in the integrity of the stakeholders. It is most likely that such information will be passed to other lay experts or consumer representatives to assess credibility and impact. This is where public health professionals could be advocating on behalf of consumers as independent and reliable sources of information, rather compromising their position by providing the 'symbolic capital' that the corporate sector seeks as validation of its position (Dixon and Banwell 2004).

The media was also regarded by participants as manipulating information for its own purposes. The perception of this as a constraint for the citizens attempting to obtain accurate information aligns with the findings by Ten Eyck (1999) that reporters control information. Compounding the situation are the nuances of communication between scientists, reporters, government agencies and the public. Trust is a key issue with scientists concerned about being misreported (Anderson 2000) as well as not believing the public is 'rational' enough to deal with complex scientific processes (Frewer and Salter 2002). Thus a self-perpetuating cycle of distrust can be created. In response to media reports of a high profile food risk, the public becomes agitated and the scientists may view this as irrational. To determine the influences in a given situation the question needs to be constructed as who does what to whom, and for what gain, and what are the flow on effects. This is an analysis of risk related to economics, industry, politics, labour and social structures. The imposition of situations that present either avoidable or unknown risks will result in public alarm and outrage that the risk was even contemplated, and participant opinions confirmed this. "The public responds more to outrage than to hazard and that activists and media amplify the outrage, but they don't create it." (Sandman 1991). While

the media may profile an issue, its real value is probably as the catalyst that provokes discussions of issues among consumers, as evidenced by the participants in this and other research (Kirk, Greenwood et al. 2002).

Though the media was viewed as an ally in stimulating debate on food controversies, this was regarded by participants as a two edged sword that could be equally manipulated to advantage the food industry. Participants resented the power inequities that result in corporate stakeholders having such great influence over the food they eat. This resentment was exacerbated by the perception that food producers employ socially unjust methods of quelling opposition to resisted food technologies. Conflicting media reports of health and environmental issues added to confusion and participants stated that consumers have difficulty in identifying whom to trust for information. The public health sector, which has been identified as being relatively trusted by the public (Frewer and Miles 2003), could be more proactive in positioning itself to act on behalf of consumers with regard to food system issues.

6.6 Conclusion

This chapter presented participants' concerns about the food related risks. Individual health remained a consistent priority but concern about environmental impacts was also a focus, and in particular an economic agenda that resulted in imposed risks was questioned. Concern about technological innovation remained consistent, with participant acceptance of technology related to individual values and experience of exposure to risk and social changes. The increase in food related scares over recent decades was a reference point for participants in challenging the continued imposition of production methods not tested over

time. Korthals (2001) describes the context as one in which governments are not in control and with industry being more powerful - and this is the view enunciated by the participants.

The disparity that participants identified between their beliefs and their experience of risk regulation and control was reflective of false consciousness (Fay 1987; Beck and Beck-Gersheim 2002). The outcome of realising such a gap was, for many participants, expressed as anger and frustration, as encapsulated by the following quote:

"... the government sort of expects... a corporate... responsibility but it's not regulated and it's not punished... it's on the guidance that our buying will influence the market so if it's not good for the environment and then the buyers will tell you... but I don't think it works... all those other pressures..." Geri (*Focus Group Rd2*, university student)

This comment repudiates the suggestion that we are changing from a supplier food economy to a demand food economy (Korthals 2001). However, it is possible that the marketplace pressures referred to could be countered by public health advocacy that represented consumer interests within the food system. Such action is required to alleviate the tension created for individuals when they are expected to assume responsibility for their own health and act as industry watch dogs through purchasing behaviour, and yet have restricted access to information.

This chapter highlighted that participants hold specific expectations of those working in public health agencies. Identified areas of challenge for this sector include resolving perceptions that consumers are not listened to and have a minimal influence on the food system (evidenced by approvals being granted for publicly resisted foods). Further there is

a need to reassure consumers that information is adequately and independently researched with consideration given to environmental health risk.

The focus of the next chapter, Acting to Reduce Risk, is the action taken with regard to food associated risk. Some of the actions taken by participants to minimise exposure to perceived risk align with the adoption of a citizenship approach that seeks to redress inequities and issues at the personal level. In the absence of governance that provides the desired protection - and the evolution of a context that blames the individual for negative consequences, actions described included consumer boycotts, protests, and demands for structural change.

7 Acting to Reduce Risk

7.1 Introduction

This chapter describes and discusses the actions taken by participants in response to the concerns about perceived food related threats to health and environment, identified in Chapter 5. The discussion considers participants' experiences of food related risk in combination with their values and confidence in opposing imposed risks. Participant variance in willingness to act is analysed within the context of environmental and ecological citizenship, and a continuum is used to describe the range of positions held. The catalyst for action for the majority of participants was the priority of individual health, but those who believed that this was dependent on a healthy environment also described efforts to minimise individual impact on the environment.

From the outset some participants self-identified as environmentally concerned and proactive, while others indicated that the environment was of secondary interest. It was evident from the comments and self-reported behaviours that a small number of participants had adopted practices that align with the philosophy of social ecology. These participants took action to minimise their ecological impact and to safeguard natural systems to conserve these for personal and social justice reasons. Other participants revealed an understanding of the need to adopt an ecological approach to food system issues. However, reflex decision making combined with structural obstacles, such as information access, impeded their capacity to take the participatory citizenship actions that they may otherwise have taken.

The opening paragraphs explore the links between food system risk, trust and consent to explain the actions taken by consumers to minimise risk. The motivation for action ranged from the minimisation of personal risk to citizenship attempts that aimed to influence the food system, especially with regard to protecting cultural and traditional values. Integral to this discussion are participant perceptions of rights and responsibilities associated with the food system. The concept of consumer sovereignty is critiqued against the influence of traditional values, such as obedience, self-discipline and family, to determine the validity of this concept. This is followed by a consideration of the motivators for environmentally responsible behaviour, for example the desire to minimise waste, conserve energy and resources, or animal welfare concerns. It is also identified that self-interest, when linked to health, can be a powerful catalyst for change. The importance of confidence is noted as a pre-requisite for taking action. Equally important for action to occur is being at a stage in life where other demands do not compete for the time and energy necessary to take citizenship actions.

Consideration of the range of influences on consumer actions to minimise risk and how these impacted on participants' behaviour over the eighteen month period of the study culminated in the development of a model of these influences and impacts. This is presented as a visual guide to describe the critical reflection process. The model depicts the consumer/citizen continuum of possible responses to the food system. To illustrate how some participants shifted in their perceptions of the food system and modified their behaviour, quotes from several participants are mapped along the continuum. Different positions on the continuum are exemplified through a number of participant vignettes that summarise the views of five participants using data from across the interviews.

The conclusion draws together the common threads from across the series of interviews. The disjunction for participants was between the emphasis on individual responsibility for environmental health risk and the support needed to act as an environmental citizen. While action may originate from self interest, when this is considerate of the needs of other people and the environment more broadly, then the overall gain is a contribution to sustainability. The educational value of the research process in this study and its contribution to the taking of positive actions to minimise food associated risk, indicated potential importance as a public health tool.

7.2 Food Citizenship

7.2.1 The Politics of Food System Risk

The level of action taken by participants was a function of considering the effectiveness of personal risk minimisation strategies as well as belief in their own ability to influence governmental decision making. A minority of the participants indicated they had significantly modified food choice behaviours prior to the interviews. These people could be described as having assumed an active citizenship role, a conscious and political stance derived from concerns about social issues. Taking such a stance was an attempt to protect those personal values and rights that have been perceived as compromised by food system developments, including the denial of the consumers' right to withhold consent to food being processed in a manner they regarded as risky and unnecessary. For other participants food issues were perceived as too complex to deal with, and this aligns with Beck's paralysis (Beck 1992). After being involved in the reflective process, however, a number of participants stated they had shifted towards a more action oriented approach to food decisions. The reasons for such

behaviour changes are discussed below, providing insight into how public health can assist consumers to broaden their focus from individual to environmental health.

Participant responses to food associated risk were governed by a clearly articulated view of personal rights, and government and stakeholder responsibilities. There was vacillation around the amount of trust they were willing to place in government and the extent to which they believed that democratic processes would facilitate the representation of their interests. The voting process was regarded as producing an entrenched government that would be reluctant to respond to issues outside the initial mandate, as captured in the comment;

"... I don't think you're going to get big governing bodies making any major changes because the people are the ones that vote them in..." Annelise (*Focus Group Rd2*, p/time clerical, post family)

This was particularly a concern with reference to policy changes that would incur more regulation or cost for business.

The participants' view was that they were disenfranchised of their individual right to the information necessary to safeguard personal and environmental health. As acknowledged by others (Beck 1992; Hindness 2000), the inherent contradiction of democratic societies is that while governments are voted in on majority vote, and thus are purportedly representative, once a government is in place it functions more as a monarchy. This is exemplified in a hierarchical structure that generally operates independent of consultation with the citizenry when imposing decisions. "The idea that the government is accountable to the people primarily through public debate and the electoral process requires that people are able to evaluate what the government is doing in their name" (Hindness 2000, p.72). However, much of food system operations are not apparently transparent to the public despite, in Australia,

having a mandatory consultative process through FSANZ. Clearly the mandating of public consultation about food regulations does not equate with what consumers may perceive as effective consultation.

The desire to be consulted on food production issues reflected participants' belief in individual rights. For the majority of participants the issue of risk associated with the food system was construed as an ethical dilemma that stemmed from the commodification of food. This was reflected in the questioning of why food was produced or processed using technologies that participants objected to, such as genetic engineering or irradiation, and why food contained residues or included additives; "Well were we asked? Who made the choices..." (Heather, *Focus Group Rd2*, self employed, 4 children). Thompson (2001, p.835) articulated this as an expected courtesy, 'One respects other persons when one obtains their consent before exposing them to risk'. The situation has arisen, however, whereby the food industry and government agencies are not only making decisions on behalf of the public without seeking consent for food system risks, but are also ignoring public opposition to the imposition of these (Nestle 2003). This included changes to the nature of food as well as those environmental impacts that are consequent to food production and which impact on population health. What is needed are alternatives that allow consumers the option to not participate with certain food because of value conflicts, described by Thompson (2001) as the right to 'exit'. The denial of the individual's right to choose food according to personal values is exacerbated by a corporate approach that seeks to protect commercial competitiveness by controlling access to information. Food production processes that ignore cultural or religious values may produce anger and resistance, as expressed by some participants, and lead to the adoption of strategies to counter the imposition of risk.

It may be expected that participants would respond to imposed risks by increasing self-reliance when it is perceived that their concerns are disregarded. After-all, such situations manifest the individualisation of risk. An impediment to consumer action, however, could be the tension that arises when personal values conflict. It has been suggested that the traditional values of 'obedience, self-discipline and family...' do not align with the assumption of a proactive environmental position (Stern 2000, p.414). For example, several participants discussed examples of people who, though sceptical about food issues, chose not to actively seek information because knowing about, and responding to the overwhelming diversity of risks, made decisions difficult. An example of this was provided in one family's reaction to media reports of antibiotics in chicken;

"... the chicken scare - ... I don't eat chicken ... but my family do and they were for one week talking about it and the next thing they are buying chicken..." Geri (*Individual Interview*, university student)

Acquiescence to governmental guidelines may be construed as another facet of appropriate or politically benign behaviour, with resigned acceptance providing the most comfortable position for an individual who holds traditional values. This avoids the confrontation involved in challenging authority and the task of sourcing alternative foods that may not fit convenience and cost requirements. The difficulty arises when such values result in food choices that impact on individual or environmental health. For participants this was a difficult situation in that, on the one hand, the consumer could be seen to be trying to be a responsible citizen by conforming but on the other, this behaviour may contribute to the perpetuation of food system risk. Resolving this tension requires the facilitation of consumer access to information that integrates health and environmental issues in conjunction with the

means for consumers to express, and have heard, their views on food system risk. Public health sector personnel are best positioned to assume this role, thus modelling the collaborative approach that is essential to addressing population health issues.

7.2.2 Consumer Sovereignty and Citizenship Behaviour

Another view of seeming consumer disregard for potential risk, as perceived by participants, could be construed as individuals asserting their preferences in the market place, and this is reflective of the concept of consumer sovereignty. The latter suggests that buyers determine the choices available within the marketplace but there are several flaws evident in this concept. Significant among these is the level of accountability of those that influence and control the food system. Other limitations of consumer sovereignty are the constraints of traditional values and key variables such as budget, convenience and family influences. In combination these factors serve to limit reflection on food choices, raising questions about the effectiveness of consumer sovereignty.

Participants who identified with the citizenship and ecological values of equality and responsibility wanted there to be clear accountability for the generation of food system risk. They regarded the consumer as a minimal influence in the food production process, with the food industry expected to assume responsibility for its products, including the flow on of health and environmental impacts. Their perception of a different reality resulted in frustration. The lack of responsiveness by food system stakeholders was exemplified as the imposition of genetic and irradiated food technologies despite consumer concerns. Such technologies were viewed as focussing on food for commerce and at odds with valuing food as sustenance.

Represented here are quite disparate views of the purpose of the food system and Clayton (2000) distinguishes between these two world views as micro-justice when the focus is on property rights and macro-justice when the concern is about larger issues that affect society. Clayton suggests that a narrow focus on property rights does not account for a broader consideration of responsibilities or impacts on the rights of others, and is often anti-environmental in nature. Underpinning these views is a values schism that can set consumers and the food industry in opposition on rights and responsibilities. This is apparent in the food industry's neo-liberal position that it has the right to conduct business with minimal obstruction by regulations that reduce competitiveness. The approach is tacitly endorsed by government (Worth 2003), as evidenced by the modifying of label requirements for genetically modified organisms so as to not impede trade (Tait and Bruce 2001). Most participants, however, identified the commercial approach to be irresponsible and detrimental to consumers and environment health.

The industry focus on markets is at significant variance with the views of consumers as identified by participants. The dominance of the commercial approach over consumer interests, including health, is evident in the release of over 2000 new snack foods in 2001 (Early 2002) despite the fact that most new food products do not gain public acceptance (Overington 2003). These different world views were perceived to result in the denial of legitimate consumer concerns and the adoption by industry of subterfuge practices to counter public resistance. Klein (2001) has commented on these industry practices claiming that the blending of food produced via consumer resisted technologies into existing products aimed to build acceptance by default. The food industry retains a monopoly on product information and the experience of participants more accurately reflected this, a finding that aligns with research on eco-labelling (Ibanez and Stenger 2000; Johnston, Wessels et al. 2001). This

would be considered unethical and is a rebuttal of the notion that consumers can enforce their values through purchasing decisions (Korthals 2001).

Participants also determined that there was duplicity in food industry marketing that targeted consumer values of loyalty. It was identified that such strategies aimed to influence consumers by appealing to traditional values, exemplified for participants by the Buy Australia or support Australian farmers media campaigns. These marketing approaches are designed to appeal to traditional values, a component of which are the notions of obedience and self-discipline, or the 'passive consumer' (Korthals 2001). That the majority of participants accepted and supported these initiatives without qualification indicated that the sentiment underlying the campaigns aligned with personal values. In contrast several self-identified environmentally aware participants critiqued the appropriateness of importing food that could be grown locally, and questioned the sustainability of certain agricultural practices;

"... the buy Australian stuff and how that ties into products... but I would try not to buy Australian rice because it is not suited to the environment and why should we be sucking water out of rivers producing a crop that ... should not be...." Rochelle
(*Focus Group Rd2*, p/time librarian, 2 children)

The impact of such statements within the focus groups was to stimulate reflection and debate on the responsibilities of individuals, industry and the government. The tension can be identified as recognition that the food industry exploits citizen concerns about farmers and the environment while at the same time both abrogating responsibility for its own impacts, and promoting products that result in further negative health and environmental effects. The untenable position for consumers is the commercial play on their values so that they act in a socially responsible way by supporting loyalty campaigns while these same values constrain

questioning of the impact of food production processes. The duplicity of food marketing is further served by constraining access to credible and comprehensive information about the interconnected nature of the food system.

Perpetuation of the existing regime relies on consumer inertia. Participants acknowledged that it is the capacity of the individual to translate awareness into action that brings about change. Critical reflection does align with the concept of consumer sovereignty but the commodification of food, influence of values and information access may combine to minimise the effectiveness of consumer sovereignty as a market influence. Given the importance of a safe and sustainable food system as a social issue, a role for public agencies should be to mediate food value conflicts to ensure that consumer concerns are treated with respect and with holistic consideration of broad and long term impact.

7.3 Motivations for environmentally responsible behaviour

Individualisation of responsibility may result in a self-interested focus on immediate risk and detract from the longer term citizen oriented behaviour that is important to a sustainable food supply. An initial individualised focus shifted, however, for a number of the participants during the process of critically considering the elements of the food chain, resulting in a heightened awareness of the importance of environmental integrity.

In the early stages of this research minimising risk to health was cited as the motivation for many food choice decisions for participants. The preoccupation with direct risk to health can be considered a position of self-interest that reflects the emphasis on individual responsibility. Health promotion campaigns and media reports of food incidents reinforce this perspective. For a number of participants, however, there was a noticeable transition from immediate self-

interest to a more encompassing view of self-interest. This appeared to relate to their discussions of broader food production impacts, during which they linked individual and population health to nutrient flows, pollutants, animal welfare, waste, and cumulative effects. The following quote typifies participants' views of ecological interdependence and synergism;

"...overfishing... that's one of the risks... things are happening now for profit but people aren't thinking about the future and their kids..." Livia (*Individual Interview*, administrator, 2 children)

Livia's comment goes beyond the immediate impacts to consider the longer term consequences of species loss. Shultz (2000) describes the individual's extent of connection with nature as a measure of environmental citizenship, but it could be considered that Livia's contemplation of the broader interactions more reflects ecological citizenship.

Over the eighteen month duration of this study participants evinced diverse motivations for behaviours that could be described as environmentally responsible, such as waste minimisation, composting, water conservation, animal welfare, or purchase of organic foods. The degree to which an individual was engaged by an issue appeared to determine how actively he/she responded to these. For example, in this research Verity explained her vegan diet as a consequence of animal welfare concerns, an issue she was passionate about. This could be interpreted as altruistic because it is about adopting a moral stance for the benefit of another. As Kaplan (2000) explains, however, even this seemingly altruistic action can be linked to self interest because there is the reward of personal satisfaction in taking an ethical stance, as well as the hope of enjoyment of other species in a non-exploitative relationship.

The overall health of the individual may also benefit because the capacity to act according to values, even those based in self-interest, influences psychological health (Lang and Rayner

2001). For example most participants' valued access to rural areas, and the importance of this for health is confirmed in a recent report on farming and food (Lang and Rayner 2001).

Another perspective has suggested that spatial separation from the plants and animals that contribute to the food chain can lead to the acceptance of food technologies that would previously have been questioned (Eden 2001). Thus definitions of individual benefit and broader or environmental benefits may not be discrete.

Self-interest may serve as a powerful motivator for the adoption of environmentally responsible behaviours (De Young 2000). This was confirmed in the participant comment, "... we have got so much more choice and but then more responsibility..." (Geri, *Focus Group Rd2*, university student), reflecting an awareness of the expectation that consumers assume responsibility for food associated risks. In terms of food choice, however, the growing awareness of potential health risks has eroded consumer faith in regulatory controls, providing the stimulus for consumer advocacy and action. Often this action has been constructed as individuals and consumers adopting a Not In My Backyard (NIMBY) approach to imposed risks such as contamination and pollution. The NIMBY stance has been criticised as self-interested individuals engaging in protectionism. The stance, however, has repercussions that benefit the wider community (Kaplan 2000), demonstrating how selfishness can be positive if accompanied by active empathy and tangible resistance to all similar proposals. The labelling of community opposition as an over-reaction by industry and government proponents can be viewed as an attempt to polarise health and environment debates via appeal to the traditional values of obedience and passivity. The aim of constructing community opposition in this manner is to position activists as radicals trying to usurp due process. Assumption of responsibility in the manner described by Geri depended on a level of self interest and confidence in the ability to take alternative action if desired.

The desire to take action to reduce environmental impact was a frequent outcome of the consideration of the links between the food system and personal food choices. Regardless of the initial motivator for such action, the need is structural support and genuine alternatives to facilitate citizenship behaviour. As an influential sector public health would be well positioned to advocate the addressing of such needs on behalf of consumers, so that focus becomes more holistic rather than the current reactive one.

7.3.1 Change, Confidence and Other Priorities

The motivation for participants to take citizenship action ranged from a reaction to an incident in the food system, to a personal response arising from other value conflicts. Identifying the diverse values that underpinned the willingness to take action provided insight into how such concerns can become the catalyst for the taking of citizenship actions.

Participants reported taking action as a consequence of a significant food incident, such as the BSE scare, or when a fateful moment happened. Such occasions aroused interest and involve the consumer in a closer consideration of food choices. Even then, as evidenced in several initial interviews and reported in an earlier article (Kriflik and Yeatman 2003), prior to the opportunity to reflect on the food system the response was more often a consideration of a given issue than a critical assessment of the food system. The general lack of considered action by participants could be a consequence of the incremental nature of many of the changes to food production and processing since the 1930's, described as '*stealth*' by one participant (Dannielle, clerical, single). Often such modifications have been accompanied by marketing spiels touting the changes or the novel food as better. In addition, memories of simpler food production methods were the prerogative of the older generation, and thus may

be unavailable as a measure of comparison for many consumers. It would appear that low visibility changes to the nature of food, combined with the increase in working women and a steady rise in ready prepared meals (Anderson 2000), have contributed to a perception, noted by participants, that such changes are progress and for consumer benefit. The participants, however, who self-identified as environmentally aware and active, indicated that they had researched elements of the food system and questioned the value of many changes in food production methods. While confident in their ability to take individual action, they indicated they felt constrained at times by food system stakeholders who provided limited information.

The ability to confidently take action has been identified as a significant factor in environmentally responsible behaviour (De Young 2000). Holm (2003) noted that participants in her study also identified skill as important to food choice. If the situation is regarded as difficult, including pressure from within the family to purchase certain foods, then the taking of action may be either avoided or a conscious stance taken and defended. The latter was indicated by Livia's response to a family food choice issue.

"Just the energy that goes into making it and the wastage that comes with it ... my daughter used to have Macdonalds once a fortnight ... and now I have cut it down and she hasn't had it for about two and a half months... it is because of the way they produce their food and they strip resources from places, they take advantage of undeveloped countries... that is an ethical reason, plus I think it is not that good for you." Livia (*Focus Group Rd2*, administrator, 2 children).

This discourse served to highlight the juxtaposition of environmentally responsible behaviour and the self-interested rationale of health, with the decision probably prompted by information that conflicted with personal ethics.

Environmentally responsible behaviour was also an inadvertent consequence of actions that were motivated by other citizenship concerns, including economic and social justice imperatives. For example, Terri was pragmatic about food choice from an environmental and health perspective, and indicated that the government should oversee food related issues. Her position altered when restaurant food waste was considered, and in particular she questioned public health restrictions on donating leftover food to hungry people. That Terri was actively involved in redistributing food from a catering business, despite her concerns about legality with regard to health regulations, indicated her passion about the injustice of food waste. De Young (2000) identifies frugality as a motivator for environmentally responsible behaviour. The key variable of cost also was cited by these participants as both a constraint in purchase of food, and as a motivator to ensure that neither the money spent nor food bought was wasted. Consideration of the diverse motivations for environmentally responsible behaviour and the constraints on this, illustrates the importance of social ecology in exploring how these interrelate and determine behaviour.

For most of the younger participants the capacity to take action beyond the individual level was constrained by the key variables of time and budget and in meeting the demands of a young family as well as working. In addition, and as previously suggested, by virtue of being younger they possibly had less exposure to home grown food and to a history of food crisis. These factors may explain the expressed inclination to rely on government regulation and not assume an active citizenship role. Further support for the suggestion that this group were juggling several priorities was the higher rate of attrition from the study and, for those that were able to continue throughout the research, the necessity to reschedule interviews and meetings to accommodate last minute family pressures. This is not to imply that there was not interest and concern about food choice, health and the environment, and the findings refer

to the contribution of these young women. Sharon's comment "you don't worry about things unless they affect you" (*Individual Interview*, nurse 2 children) illustrates how personal distance can act as buffer from issues while the individual attends to more immediate demands. From a citizenship perspective this could be interpreted as reflective of life stage rather than generational difference because individual actions, for example composting and waste minimisation, were taken if these could be accomplished without impact on daily schedules.

The ability to act to minimise environmental health risk was a function of the complex relationship between personal values and priorities plus individual energy and structural support. Acknowledging the dynamics of this situation is the first step for health professionals who are interested in assisting consumers to make healthy and sustainable food decisions. While the key to change is identifying the values which the individual sees as threatened by current practices, there is also a clear need for structural support that facilitates preferred food choices. Figure 7.1 below is based on participant responses to the food system, and provides a map that could be used to identify those points where health professionals could intervene to assist consumers to make healthy and sustainable food choices.

7.4 Mapping Responses to the Food System

For participants individual action was mediated by personal values, situational constraints, and awareness and experience of negative food incidents. All of these variables are susceptible to context and therein lies the difficulty of categorically labelling an individual as to his/her positioning on issues described as environmental, as acknowledged by other researchers attempting to do so (Schultz 2000; Stern 2000). It is for this reason that a continuum has been used to describe the degree to which participants expressed both

willingness and capacity to act in response to food related environmental issues. These responses ranged from indifference to the risks through to the expressed belief that such risks can be controlled, to assertions that a specified environmental risk has reached a crisis point and precipitated a willingness to take action.

A continuum enables the visualisation of the positions taken by participants with regard to food associated environmental health risks. The reflective process presented in Figure 7.1 provides a model that expands on the continuum concept presented in Chapter 3, to graph the process of participants responding to food system issues. The advantage of the continuum approach is that it enables the mapping of discrete risks (though interrelated), such as waste or water issues, to capture the identified priorities for an individual. Change may occur when people consciously consider food choices and the degree to which these align with personal and environmental health goals. Behaviour change consequent to externalities, such as media reports, or in consequence to focus group participation, can thus be monitored and noted as an impact of a 'fateful moment' (Giddens 1991) that significantly shifts the priorities. Taking action is indicative of moving along the continuum to active citizenship and a social ecology position. Figure 7.1 illustrates how participants may move from trusting the food system, based on believing this to be safe and secure, through to a critical awareness and distrust.

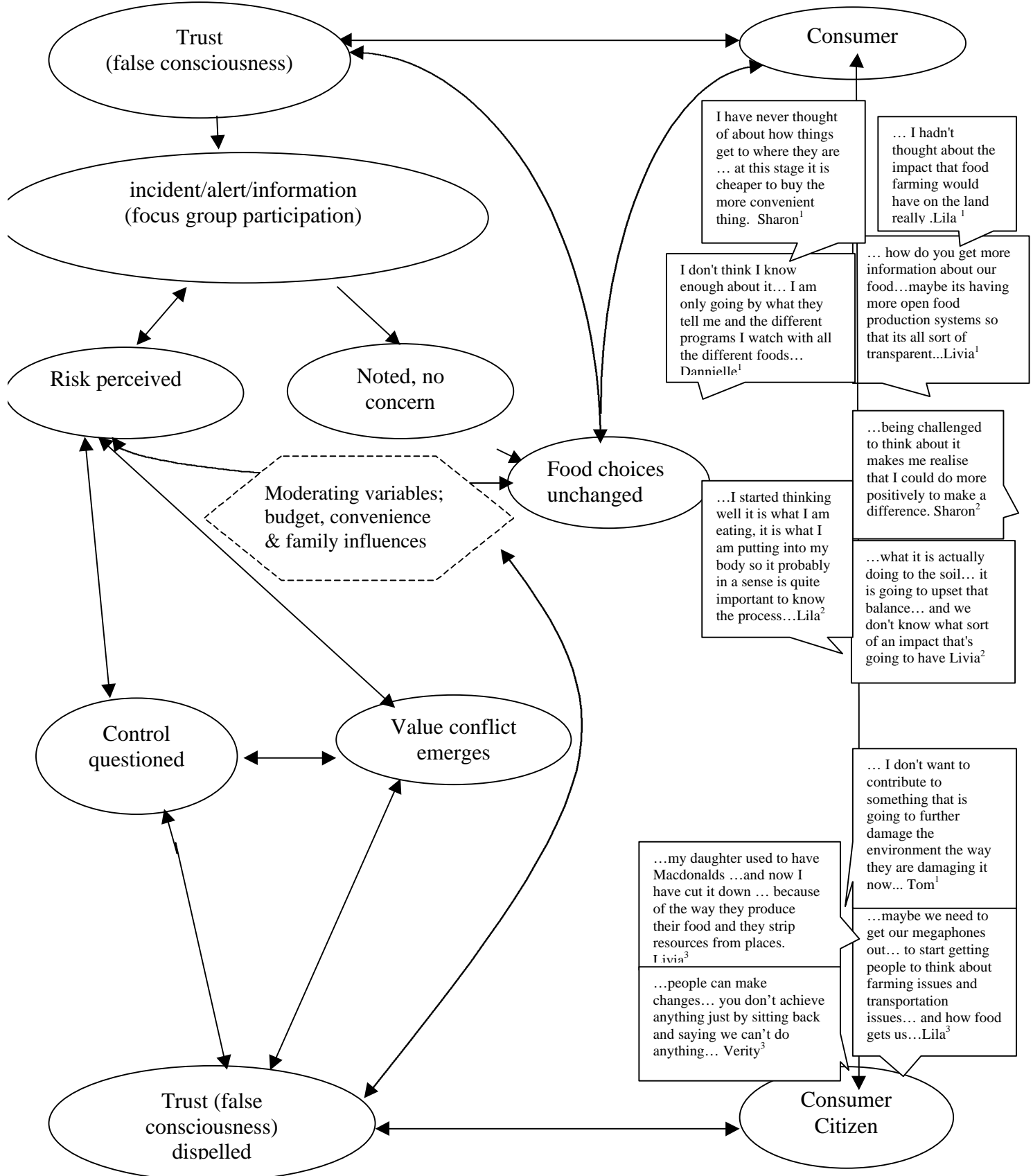
The move from trust to distrust is essentially the shift from false consciousness in relation to the food supply, or holding false beliefs about this, to a sense of unease and even a perception of crisis, depending on how food safety/security incidents are viewed. Fay (1987) has described the critical reflection involved in this process as core to social change. Figure 7.1 is useful in identifying both triggers for change as well as the obstacles to this. Individual capacity to respond to perceived risks is moderated by the key variables. This is related to the

continuum of possible actions ranging from consumer, or someone who purchases food, through to consumer citizen, who can be defined as someone who consciously chooses to buy products that align with personal values of social/environmental equity and justice (Hogan 2000). An individual may perceive there to be issues associated with the food system but still choose not to adopt a citizen approach to food choice. This was evidenced in the positioning on the model of those participants who indicated tension because their enunciated values and preferences were obstructed by structural limitations such as access to information or the time to reflect on choices, thus curtailing their capacity to act according to conscience. These participants exemplify how more structural support could assist consumers to move along the continuum towards the consumer citizen (Shove and Ward 2002).

Participants in this study demonstrated that involvement in a process that was essentially educational because it involved interaction with other participants, can lead to behaviour change. The value of the educational process has been identified by other researchers (Beck 1992; Shove and Ward 2002) and described in Chapter 3. Consumer involvement that is supported by the provision of appropriate and adequate information and resources is crucial to the adoption of a range of behaviours that would benefit personal and environmental health. This may involve consumers questioning regulations and control, as participants did and as depicted in the model, but if this results in a safer and more sustainable food supply then the benefit is for the whole of society. As participants indicated, and described in other research (Worsley and Scott 2000), often consumer action to minimise risk was taken reactively in response to a specific incident reported in the media. The ideal for participants was a precautionary context that enabled a considered and balanced approach to risk management at both the production and consumption levels of the food system. The adoption of such an approach moves beyond the individualisation of risk, as well as the notion of consumer

sovereignty, because it requires action at structural levels that, as noted by participants, consumers have little influence over. Thus while participants were willing to make changes, it could be suggested that the educational process also needed to involve decision makers in assessing their accountability for food system risk.

Figure 7.1 Food System Influences and Responses Model



Participants in this research brought to the process a diversity of backgrounds and experiences, and from the outset some individuals were positioned at the consumer citizen end of the continuum, with others situated at various other positions. Positioning on the continuum refers only to participants' indication of level of awareness of food production methods and it is acknowledged that response may well vary according to individual stance and response to a given issue, for example waste and recycling or animal welfare. To illustrate how some participants changed position in regard to food choices as a consequence of actively reflecting on these, speech boxes capturing key comments are placed along the continuum in Figure 7.1. Other participants also indicated shifts in position after reflection and could have been accorded the same scrutiny but the clarity of the comments of the selected participants suffice to support the model.

To elaborate on some of the movements depicted in Figure 7.1 and to provide the opportunity to consider the positioning of other participants via more detailed comments, several participant vignettes follow. In these the comments are focussed on as discrete units of analysis, chosen to exemplify different positions and, where applicable, the moderation of this after reflection. The self-reported changes are a result of both personal reflection and the influence of focus group discussions, and illustrate the value of critical reflection in contributing to sustainable food choices.

7.4.1.1 Tom

Tom self-nominated to participate but also indicated that he was not fond of interviews or discussion groups, stating that he wanted to contribute because he believed the topic to be important. In the first interview Tom described himself as environmentally aware and discussed the actions he took to minimise the impact of food choice on both his own health

and the environment. In Figure 7.1 he is positioned at the consumer citizen end of the continuum to reflect his comments. Tom said he did not want to contribute to environmental damage through his food choices and indicated that this was one of the reasons he was a vegetarian. In talking about animal welfare and cruelty to intensively farmed chickens, Tom also linked sanitation issues at these premises to water quality and catchment health. Waste was a big issue and Tom believed too much choice and overproduction were the cause, with food markets and restaurants culpable in not composting the leftover food.

To an extent Tom accepted the responsibility ascribed within the individualisation process, "...we put up with it we're not out there saying we don't want so much" but he also blamed government agencies "...because they are the ones who represent us and make decisions...". The cynicism expressed in his statement that he did not believe "ethical changes" would be taken "until it is too late" was indicative of a sense of potential crisis, and Tom's discourse evidenced significant distrust of food system stakeholders. A major concern for Tom was that an economic emphasis in food production system was impacting on sustainability and would affect future food supplies. Tom stated that the achievement of change required "people (to) become more educated and take more responsibility for themselves... and doing what we can in what we consume... to get a better outcome, not only as an individual but as society..." (*Focus Group Rd2*). In the latter statement and his call for more lobbyists to speak out on issues with the food system, Tom was subscribing to a theory of education and calling for the transformative action that has been described elsewhere by Fay (1987).

Tom participated actively in the focus group discussions but was not a dominant group member. There was clarity in the way he described the food system, and economic pressures within it. Comments from other participants indicated that they valued what Tom had said,

and his contribution informed the discussions. This would indicate Tom provided the informant role that Beck (1992) identified as essential to the adoption of socially responsible behaviour .

7.4.1.2 Livia

Livia was invited to participate when the target number of participants was not reached. While amenable to being involved, she was not sure of the extent to which she could she discuss the topic. In the first interview Livia stated that her food choices were based on health considerations, and this was the reason for her preference for less processed food. Reference was made to chemicals in food and the standard of hygiene applied to imported food. Talking about pesticides led Livia to consider residues and the impact of these on the environment and the food chain. As the interview progressed Livia would often pause and, in exploring the impact of food choices, would reflect on where her own comments had taken her and state that she hadn't thought of that before. Another comment was "I never expected to be talking about this stuff... the consequences are enormous really...", highlighting the power of reflecting on one's own information in a way that facilitates the linking of diverse issues and as described in the literature (Hogan 2000). Livia was a participant who changed her initial written responses to the questions after reflecting on these. In stating that she did not believe that the controls in the food production system were adequate Livia said "I am saying that because of a gut feeling rather than real knowledge", and this was tied into her expressed distrust of politics and the control exerted by multi-national companies. Sources of information for Livia included the media. Animal welfare concerned her and she purchased free range eggs, and worried about the impact of urbanisation on fisheries.

In the focus groups Livia talked about the need for food producers to be accountable and transparent in their actions because consumers want to be more informed (1st round of focus groups). The perspective for Livia at this time was one that considered interaction within the food chain, with intense agriculture described as disrupting natural balances and having unknown longer term impacts. The indication that Livia had continued to reflect on the impact of food production and the role of consumers was substantiated in the 2nd round of focus groups. Livia had changed buying habits because of perceived environmental impacts and described this as an "ethical reason". Livia commented on the research process as being good because it made her think about food and that she had never focussed on the food system as a whole previously. It is possible to map Livia's comments as moving towards the consumer citizen end of the continuum because she consciously changed her food choices to minimise the environmental and social impact of these. Questioning the food production system resulted in her identifying unease with the current system, and Livia had taken action to resolve areas of personal tension for her.

7.4.1.3 Lila

Lila was invited to participate in the research and expressed enthusiasm for being involved in the focus groups. For Lila, food safety was about eating things that did not impact on her personal health and fats and sugar were her principal concerns. At the outset Lila stated she had not thought about pesticides or the environment, though she had observed that her recent trend to buy fresh food had resulted in less packaging waste. Lila described it as someone else's responsibility to protect the environment but demonstrated an understanding of sustainability without connecting this to specific agricultural practices. "...the risks are for the environment that they could do things that aren't sustainable... and ultimately you want

something sustainable, I think or else we'll be dead....". Talking about water quality set off a train of thoughts for Lila that she wanted to consider further, "We can come back...OK because there is something big I have missed, I will have to think about that one". Lila later returned to water runoff as an issue linked to food production because of potential chemical contamination. Lila's pauses and questions indicated reflective behaviour and a growing interest in the food system, clearly demonstrating the value of dialogue in exploring a situation not previously considered, as discussed by Stringer (1993).

In the 1st round of focus groups Lila talked about trusting the farmers because it was not possible to know everything but indicated that being involved in the research had started her thinking about the food production process. During the focus groups Lila asked questions of other participants and explored the issues raised to obtain further information. By the time of the 2nd round of focus groups, some 16 months after the initial interview, Lila talked of having a megaphone to alert other consumers to aspects of food production. Lila described the process as educative and to an extent accepted responsibility for a role in food production but did indicate that the prospect of individually questioning the system was daunting. For change to happen Lila stated the support of like minded people was necessary, but she also referred to the "lethargy" of the public, given the ready availability of food and an uncaring attitude. Lila's comments provided a contrast between her self-reported shifts in attitude to the food system and her perception of a general indifference to the impacts of food production.

7.4.1.4 Sharon

Another invited participant was Sharon, a young mother with two small children. Sharon valued convenience in her food choices and said that she had not thought of how food gets

into stores, she just bought what was necessary when she needed it. After reflecting on animal welfare and environmental issues in the individual interview about food production Sharon stated that while she would like to act to care for the environment as well as health, often it was "cheaper to buy the more convenient thing". Time also limited her ability to research how food was produced and Sharon indicated that she relied on the government to look after food production issues but also stated that this trust may be misplaced. In the 1st round of focus groups Sharon described the interviews as having challenged her to think about food issues and that this had led her to the "realisation that (she) could do more positively to make a difference." After talking with other participants Sharon questioned her trust that her food "was going to be alright". Animal welfare was an issue for Sharon but she also valued meat as a regular part of the family diet.

Sharon moved out of the area and was unable to attend the 2nd round of focus groups. Her contribution across the first two stages, though, illustrated conflicting priorities and a weighing up of what was more important. Talking about the food system brought into focus several areas of tension for Sharon, moving her away from a position of acceptance that 'food production was a benign activity. Sharon's discourse indicated that in most areas of health she had accommodated the individualisation of risk, but with food safety and security she perceived that the government should be acting on her behalf. After talking about risk, and to counter what she regarded as government inaction, Sharon was moving toward a consumer citizenship position in taking some action but she affirmed that this was mediated by her values and priorities.

7.4.1.5 Ambrose

Ambrose nominated to be involved in the study and in the individual interview raised a number of issues connecting environmental and personal health. He opposed a number of newer food technologies and indicated a preference for less processed food. When deliberating on these choices Ambrose questioned his own assumptions "...fresh stuff you take for granted in its preparation and presentation, which is interesting". For Ambrose the lack of information about food processing was a stated concern, including the disposal of wastes and the effect of this on environmental amenity. This combined with a lack of alternatives restricted consumer ability to "generate a difference" through "buying behaviour". He suggested that there was a need for public education on how food was produced and the impacts of this so that consumers could make informed decisions, rather than relying on media articles and television programs. Ambrose identified the "hidden" nature of environmental benefits as part of the reason that the public overlooked the significance of these, coupled with a preoccupation with consumption rather than public amenity. In talking about environmental degradation Ambrose stated that producers did not consider the environment "...because it is perceived as not being profitable".

In the 1st round of focus groups Ambrose reiterated his concern at the dominance of economics in food production. Within the 2nd round of focus groups Ambrose expanded on this political perspective of food system risk. He identified farming communities as not only consumers and members of the public, but as a significant electoral influence that acted to maintain the current situation of overproduction. In this way Ambrose linked 'unhealthy production techniques' to the 'dumping of overproduction on third world markets' as well as to a general acceptance of such practices because the people that contributed were regarded as

ordinary citizens making a living. Acceptance of the responsibility of the individual was also reflected in Ambrose's comment, "... if we want something changed it is a public responsibility through agitation and representation". In ascribing responsibilities for food system risk, however, Ambrose vacillated in his focus on the individual, as evidenced by his criticism of larger commercial interests making gains without responsibility. That the government did not react to public concerns, or that it focussed on agitation that reflected outrage rather than real risk, made Ambrose cynical about government priorities. The citizenship actions that he took to counter perceived food associated risk, with its "cause and effect lag times... of 20 years", were to "...steer them (his family) away from chicken and pork...". With regard to positioning on the consumer/citizen continuum, from the outset Ambrose indicated food choices based on critical reflection. Over the course of the interviews Ambrose's discussion of the food system was increasingly political, and he acted to reduce risk to personal health.

Vignette Summary

The common thread throughout these vignettes was participant awareness of the responsibilities that are ascribed to consumers as part of the individualisation of risk. Regardless of this acknowledgement there was consensus that both food system stakeholders and the government should reprioritise the focus from economics to ensuring that consumer and environmental health are sustained. For individuals who had commenced at the consumer end of the continuum this often represented a change that stemmed from their own critical reflection of the food system as well as participation in the focus groups. While the comments along the continuum are selective, these also illustrate the move by these participants along the continuum to practices that could be defined aligning with social

ecology. Other participants not represented on the continuum indicated a similar shift. The process was perceived to be educational and provided the incentive for a number of participants to make positive changes to their food choices.

7.5 Conclusion

Mapping participants' responses provided a clear indication of the power of critical reflection and involvement in participatory processes. While participants within this research were limited to the actions that they could take as an individual to reduce the environmental impacts, there was commitment to make such changes. This observation is based on the self-reporting of participants, which has been identified as a limitation of this style of research (Pelletier, Green-Demers et al. 1997; Baranowski, Weber Cullen et al. 1999). Over the time span of the interviews, however, the discourse of participants indicated a depth of knowledge about food associated risk and, in the focus groups, the connections between environment and health were debated and elaborated.

The tensions evinced by participants in attributing responsibility for food system risk highlighted the incompatibility of the individualisation thesis with the notion of active citizenship. While participants agreed that consumers should exercise a degree of responsibility via their food choices, the capacity to do so was constrained by the imposed nature of food processing, limited access to food system information and often a lack of alternative food products. These constraints affect individual ability to act to avoid risk to either personal or environmental health, and expose consumer sovereignty as a fallacious concept. Regardless, the actions of participants demonstrated the resilient capacity of consumers who do not want to see their values compromised and who take citizenship action

to benefit both self and others. While some actions may originate from self interest these have flow on effects that contribute to the general good. The actions taken by participants were viewed not as sacrifices but as alternative ways of being, and this reinforces the importance of presenting sustainability as a gain for overall well being (Kaplan 2000).

The importance of depicting sustainability as enhancing health is discussed further in the next and final summary chapter. The experiences of the participants in this research suggest that consumers would welcome the opportunity to reconsider their food choices and contribute to a more sustainable food system. This requires support, however, both through the representation of their views at an influential level and in advocacy for essential reforms to the food system that would increase the alternatives available to consumers. The public health sector is responsible for population health and as such should be acting on behalf of consumers in the area of food system risk. The capacity of the sector to do so, however, may be limited by professional lack of understanding of the ecology of the food system.

8 Summary and Final Considerations

8.1 *Introduction*

This research aimed to assess the degree to which consumers considered environmental health risks when making food choices, and to position the findings within a social ecology framework. The specific objectives of the research were to explore and describe the knowledge of consumers in the following areas:

- The food system and the stages in food production;
- Consumer understandings of environmental health risks in relation to food;
- The extent to which consumers believe they can act to minimise environmental health risks.

The results of this pioneering study indicated that consumers held sophisticated views of the relationship between food, health and the environment, though time to reflect on these may be necessary to elicit comment on the social factors that affect health. The collaborative process reflected participants' concerns, with changes to food choices being a result of their contemplation of values and preferences associated with the food system. The main focus for participants was the impact of the food system on personal health but participants also indicated a previously untapped depth of understanding of food safety, quality and security issues. Participants regarded it as an imperative that the health sector adopt a holistic and community oriented view. The findings challenge people working in public health to contrast their current practices and strategies with the collaborative reflection identified by participants as influential in reconsidering food choice behaviours.

Environmental health risks pose as much a threat to consumer health as food safety issues and, as detailed in the literature (Lang and Rayner 2001; World Health Organisation 2001), can also be considered a food safety issue. There is a dearth of research, however, exploring consumer perspectives on the relationship between food choice, health and the environment; an area of significance because food choice is integral to the long term viability of the food system.

To date the public health sector has tended to focus on immediate food risk and consumer behaviour, as evidenced by research referred to in Chapter 2. As a consequence the emphasis for health professionals can be a focus on health behaviour models as an intervention for encouraging consumers to assume more responsibility for their own health (Lupton 1995; Glanz, Rimer et al. 2002). This approach reinforces the notion of consumer responsibility for food associated risk (Korthals 2001), ignoring the hegemony of a social and political structure that prioritises economic concerns. This study was based on an unusual amalgamation of theoretical concepts, including individualisation, risk, critical reflection and citizenship, and thus contributes to the reframing of the debate about health, as advocated by Williams (2003). It also provided a broader analysis of food choice than cross-sectional quantitative surveys (Worsley and Scott 2000).

It was anticipated that the audience for this research, public health sector professionals, would find value in an approach that explored public awareness of the interdependence of health and the environment. This approach of this study demonstrated the empowering nature of the interactive process, discussed by writers including Mezirow (1991) and Webb (1996), and also highlighted where consumers needed assistance to make sustainable choices. The model developed as a result of this investigation provides health professionals

with a map that clarifies the influences and constraints on consumer food choice. This could be used to determine at which juncture the resources of the health sector could be best applied to address consumer food system concerns.

The result is a concise, cohesive picture of how participants viewed health, environment and the food system to be connected. This critique is of importance to the health sector as it helps to explain who consumers identify as responsible for the risks linked to food and what should be done about these. That these are the views of a small cross section of people is acknowledged prior to suggesting recommendations based on this investigative process.

Participants indicated resentment of a food system that ignored personal values, denied consumers a role in decision making processes and blamed individuals for any negative consequences of such decisions. These views are reflective of the individualisation of risk as described by Beck (1992) and Giddens (1991). In addition, such views are relevant to the health sector, as these may lead to the assumption of citizen actions. Participants identified a need for independent voices in health promotion and research that consumers could trust, a point also made by Dixon and Banwell (2004, p.129) in the comment that 'health professionals are acting as legitimising agents for corporate interests...'. Also of benefit would be the use of interactive processes to engage consumers in formulating strategies that enhance personal ability to minimise health and environmental risk, as sought by participants. A collaborative approach has been advocated by WHO (1986) for some decades, and is reiterated by the Food and Agricultural Organisation (Bhardwaj, Maekawa et al. 2003).

In acclaiming the usefulness of the process, it is also necessary to acknowledge the limitations of this qualitative approach. For this reason the size of the sample, the extent to which this could be regarded as representative, and the reliance on self reporting are discussed, as well as the measures taken to minimise these as constraints.

The final section of the chapter suggests ways forward for health professionals and reiterates the need for the health sector to adopt social ecology as a framework for resolving food safety and security issues. Inherent in this is the clarification of the purpose of food, is it primarily a commercial venture or should it be considered more as the basis of life? Accepting the latter, the most effective health strategy would be a precautionary approach to food decisions, thus avoiding risk rather than minimising the potential consequences. This study suggests that consumers are a powerful ally for the health sector in changing direction to take up the issue of food sustainability, thus enhancing population health.

8.2 Participants' Perspectives on The Food System and Associated Risks

Participant views of environmental health risk within the food system were comprehensive and inclusive of a holistic understanding of the dynamic nature of food system elements. Some participants came to the study with these perspectives already guiding their food decisions while for others the process provided the opportunity to formulate and clarify a position on food system issues. While individual health was a priority, other values were a source of personal conflict. The commodification of food was held to be a reason for many of the issues arising out of food production and processing.

Personal health was the dominant focus in considering food quality and safety, but environmental integrity was regarded as an important underpinning determinant of the food supply. The discourse revealed a strong regard for food that was minimally processed, and this aligns with findings of other research on food safety (Yeung and Morris 2001; Harper and Makatouni 2002). The notion of scientifically modified foods as an alternative to fresh food was generally rejected. While budget and convenience factors strongly influenced food choice, this view reflected participant preferences in an ideal situation.

For participants the commodification of food was both understandable and unethical. This resulted in a context of difficult food choices for consumers and has been described in the literature (Thompson 2001; Early 2002). Participants acknowledged that agriculture was a business, but food was also seen as an essential that should be safeguarded from monopolisation by industry, especially with regard to processing that conflicted with participant values. This view is shared by WHO (2001, p.21), which has stated that 'food safety needs to be driven primarily by health issues, rather than specific trade issues'. In objecting to food choices that are determined by production economics, participants also recognised that consumers support this regime through food purchase. The alternatives, however, are limited by dominance of the transnational companies (Gabriel and Lang 1995), both in accessibility and price. The conflicts inherent in this situation can be summarised as recognition that mass produced food is widely available and cheaper, while seasonal food may be more nutritious, less available and more expensive. The immediacy of these considerations may eclipse the spatially distant but equally risky environmental impacts of food production.

A further difficulty for participants was reconciling their personal objections to mass produced food with the recognition that processing may be necessary to feed the increasing global population. This social justice perspective reflected a discrepancy between the individual and industry worldview. While participants may contemplate a level of personal sacrifice in food quality to meet the needs of the less advantaged, the willingness of industry to shift the burden of negative impacts to such populations has been described elsewhere (Beck 1992; Hutton and Giddens 2000). Awareness of this situation contributes to explaining consumer disquiet at industry stakeholders that perpetuate such inequity.

Economic priorities may drive the imposition of risk but it was perceived that science had been co-opted to the agenda of increasing productivity and justifying the technologies adopted. This singular and reductionist focus on resolving technical issues has worked to the detriment of adopting the holistic view advocated by social ecology, and identified by participants as essential. Social ecology is premised on taking a precautionary approach to minimise the risk of harm. This parallels with the participants' preference for time to be the basis of assessing the potential impacts of new food technologies. Raffensperger (1999, p.29) describes a precautionary approach as essential to protecting public health and the environment, with time being the crucial element that challenges '... institutional performance and a sense of citizenship that primarily concentrates on the well-being of society today rather than the state of the world tomorrow'. Participants indicated an element of fatalism, however, in acknowledging society's destructive preoccupation with immediate gain. This was evident in the suggestion that ultimately science may have to be relied upon to resolve the self-perpetuating problems it created, particularly if the environment was degraded beyond its capacity to produce food.

This study illustrated that participants identified a breadth of food system issues and adopted a sophisticated approach to the discussion of these. This would appear to refute the notion suggested in some literature that consumers have difficulty in dealing with technical information about food risk (Smith and Reithmuller 2000; Anklam and Battaglia 2001). While acknowledging that there may be some grounds for believing that technology can provide answers, participants also cited evidence of scientific failure to address health and sustainability issues. The negative impact of this on trust was observed by participants and is a finding that aligns with the conclusions of several studies, described within Chapters 2 and 3, especially the research conducted by Wynne (1996). In conclusion, participant scepticism contributed to a considered assessment of risk and the ascribing of limits to which consumers could be held responsible for environmental health risk.

8.3 Participant Response to the Individualisation of Risk

Issues of lack of trust in the government, its agencies, and food system stakeholders underscored participant resistance to the individualisation of risk. In accepting a level of responsibility for food decisions that may have negative impacts, it was also apparent that many food risks were beyond the control of the individual.

To an extent participants accepted responsibility for food choices, acknowledging that individuals may deliberately choose unhealthy options, but they objected to imposed or invisible risks. Unhealthy food choice behaviour may appear illogical but participants viewed the rewards or benefits of 'bad eating habits', as detailed in the literature by Lupton (1995), as quite different to imposed environmental health risks. Such risks were associated with external factors beyond consumer influence, exemplified for participants in

the lack of a consensual role in food system decisions and lack of access to production and processing information. These factors curtailed individual ability to choose to reduce food related health and environmental risks. The situation was exacerbated by conflicting health messages, a perceived lack of independence in food and health research, and evidence of double standards with government and industry not regarded as safeguarding health and the environment while admonishing consumers to do so.

Aside from these barriers, the individual capacity to make sustainable food choices was further complicated by individual reflexivity. Beck (1992) has detailed the conflict involved in prioritising the values that guide consumer decisions. For participants confronting food issues that did not align with personal values was regarded as frustrating and complicated by the difficulty of sourcing alternative foods. Their response to the tension of conflicting values and priorities ranged from paralysis (inability to act), to acquiescence, through to citizen oriented actions. Figure 7.1 drew on diverse citizenship literature (Christoff 2000; De Young 2000; Hogan 2000; Kaplan 2000) to depict a model that aids our understanding of the food system influences that were identified by participants as affecting their food choice.

Tolerance of different positions on food system issues was indicated by participants and was attributed to the valid demands that certain life stages placed upon the individual. A finding suggested by this study is that the concept of life stages, reflecting significant time constraints such as parenthood, may be more useful in explaining consumer responses to the food system rather than the more simplistic notion of generational differences. This may well contribute to the consumer inertia that was deemed to assist in the maintenance of the status quo. Such a situation did not sit easily with more ecologically oriented

participants who saw change as essential to minimise both short and long term risks to food quality and sustainability. This provides a useful device for explaining why participants with the interest and time for reflection, regardless of age, tended to hold a more encompassing view of the food system. The value of the interview process was a close assessment of the food system even for those whose busy lifestyles had previously precluded a consideration of the interdependency of natural and human systems. A number of participants indicated the process had positively influenced the extent to which they consider sustainability when making food decisions. This finding aligns with other findings on the value of participatory research processes (Mezirow 1991; McTaggart 1993).

Taking action aligns with the notion of citizenship and when the individual acts to protect broader environmental health, the act also aligns with social ecology practices. It would appear that there is an inherent contradiction between the notions of individualisation and citizenship behaviour. A willingness to change behaviour can be regarded as a demonstration of the desire to reduce impact (Singer 1993; Christoff 2000). The individualisation of risk as it currently operates, however, functions to keep consumers ignorant of risk elements while blaming them for the consequences (Beck 1992; Lupton 1995). Thus it is important for governments to work out their priorities with regard to the long term sustainability of the food system and enlist the social theory(ies) that best assist in the design of policy and strategies that support this goal. The theories and methodology used within this study may have broader application for addressing community based health issues that require a collaborative approach.

The public health sector has had primary carriage for encouraging individuals to minimise health risk through behaviour, including responses to environmental contaminants. Food system incidents highlight the need to reconsider the focus on the individual and move towards a more holistic view of influences upon food in order to safeguard population health. The value of supporting consumers is evidenced by the participants who claimed a citizenship position as well as those who, during the course of study, adopted or moved toward adopting such practices

8.4 *Significance to the Health Sector*

Public health professionals need to be aware of consumer concerns about the food system as well as the role that the health sector is perceived to play in the generation of food related risk. The health sector needs to understand and respond to the belief that it has contributed to exposing the public to perceived risk, if confidence in this sector is to be restored. The priority ascribed to individual health by participants in this study, as well as in other research previously referred to, provides the common ground necessary for health workers and consumers to collaborate and minimise conflict on food system issues.

For participants the ideal was an independent health voice that had the ability to challenge industry on food related issues that were regarded as a priority by consumers. The health sector was regarded as not adequately addressing consumer concerns about mass produced food, nutritional needs, food residues, and the approval of technologies that conflicted with cultural values. The transition by food authorities from a regulatory role to one of approving new forms of food and processing, as described by Thompson (2001), was regarded to be a wrongful assumption of authority. It was viewed that food safety

assessments were conducted expediently to meet industry needs, a practice in conflict with the precautionary approach sought by participants and advocated by various health theorists (Raffensperger and Tickner 1999; Goldstein 2001). It was observed that the health sector supported current practices by emphasising a preventative approach that situates the individual as responsible for negative health impacts. As noted by participants, when consumers perceive there to be an absence of independent and credible official information, other sources may be identified and these may challenge the credibility of public health messages and risk management strategies.

A consequence of participants' critical reflection and increased alertness to information about the food system was a heightened awareness of related risks and the importance of the environment to health. Participants referred to public lobbying on food issues, such as reported in the media, as confirming their private views of what constituted a food risk. This verification of concerns was viewed as reducing the individual's sense of isolation in opposing certain food technologies and fuelled the determination to take action. Participants identified collective action as the most influential means of achieving recognition of consumer concerns and this aligns with the social change process described by Fay (1987).

To address the belief that controls were ineffective and that minimal action was taken until a significant incident occurred, the health sector needs to collaborate actively with consumers in addressing their needs. A shared critical reflection process is recognised as empowering for all who are involved (Higgins and Ramia 2000; Hogan 2000). It can facilitate the reconsideration of current behaviours and practices as the first step in contributing to the resolution of food related environmental health risk.

Some participants were already engaged in actions aimed at reducing the health and environmental consequences of food risk, illustrating the value of health as a powerful motivator. There is a need to profile the gains of sustainable food choices as positives across the board for individual and population health, and not depict these as sacrifices. Participants observed that people will resist making changes that are perceived to reduce quality of life, but the discourse also reflected a growing realisation of false consciousness, as described by Beck (1992) and Fay (1987). This was embodied by their increased focus on the risks inherent in the current methods of providing abundant and diverse food.

Despite self identified tensions arising from conflicting personal values and priorities, the resolve was that the public would want more say about food rather than more of the same, as currently offered. Participants who had moved to citizenship action highlighted that the changes involved were not about doing without but with enhancing life, both short and long term. Traditional values underpin the change to simpler, less consumer oriented lifestyles and a tendency for such shifts has been observed in several countries, including Australia (Hamilton 2003). Hamilton also noted however, that political support is required for this to happen on a larger scale. This underlines the importance of health sector advocacy on behalf of consumers, including the dedication to champion a food system based on health rather than economics.

The achievement of a sustainable food system moves beyond the focus on individual behaviour to the provision of structures and alternatives that assist the consumer to choose to reduce personal impact on health and the environment. This is the holistic view expressed by participants who demonstrated their commitment through the interview process. The desire to further engage with food system issues was evident at the conclusion

of the interviews, with participants identifying that further progress required interaction with experts who could further the groups' knowledge as well as consider their concerns. This is a clear invitation to the health sector to provide avenues to allow for the interchange of expertise, a process that has been identified as integral to optimising the outcomes of participatory processes (Kaplan 2000).

8.5 Limitations and Areas for Further Exploration

This research provided a clear indication of participant views and preferences with regard to health and environmental risk but it is important to acknowledge that the research design may influence such outcomes. The qualitative process reported on here relied, to a large extent, on self-selection, a relatively small sample size, and self reporting. The extent to which these are issues, and suggestions for confirming the approach, follow.

It is acknowledged that the self-selecting process used to recruit participants may have resulted in a sample that were perhaps more articulate and passionate around food system issues than might be expected. The fact that a number of participants self professed an ignorance of food issues at the outset, however, and significantly shifted positions in relation to these, would appear to indicate the real value of involvement in critical reflection. The focus on food may have facilitated awareness of its essential nature, and the possibility of risk associated with its production, thus generated vocal and intense debate. The recruitment of the additional participants via the snow ball process was a deliberate effort to draw on a candidature beyond those who were keenly interested in the topic.

The relatively small size of the sample provides an area for further investigation. Given the importance of the findings to a reconsideration of how health interacts with consumers, such findings need to be assessed to further determine the degree to which these reflect the opinions of the broader community. In noting the limitation of sample size, it is also important that larger scale follow-up studies use a similar methodology as it is contended that the process provided a much more in depth and comprehensive view of participant concerns. The limitations of surveys and questionnaires that reflect the researcher's agenda rather than allowing the participant to explore his/her perspective on a topic have been noted within this research and in the literature (Rowe and Frewer 2000).

In identifying the importance of larger scale follow-up studies it needs to be noted that a significant constraint of this methodology is that it is resource intensive. Consideration would need to be given how the approach could be integrated within existing investigation processes without losing the integrity of in-depth interviews. A parallel issue related to the depth of the interviews is the possibility of raising investigator expectations of behaviour change as a consequence of participant involvement. The variables of a larger group may be such that expectations that participants will choose to act differently consequent to the interviews may not be fulfilled.

The constraints of self reporting, as used within this interview process, is also an issue that has been discussed extensively in the literature (Pelletier, Green-Demers et al. 1997; Baranowski, Weber Cullen et al. 1999). This was one of the considerations in developing a longitudinal methodology that captured those views and opinions that remained consistent over time and tracked the changes that evidenced a transition in the way a participant

discussed the topic. Again, this is an area that could be explored with a larger group to compare and contrast research outcomes.

All attempts were made to minimise the influence of the constraints on the research outcomes. It is suggested that the value of the methodology used is evidenced by the elucidation by participants of a clear, comprehensive view of the food system, including the interdependency of natural and constructed systems. This is a much more holistic assessment than is generally attributed to consumers by those health professionals who tend to focus on single issue health messages. It is important to capitalise on such lay knowledge by working more collaboratively to redress food system issues, as outlined in the following recommendations.

8.6 *The Way Forward*

In suggesting ways forward for health professionals to work with consumers on food system issues, based on this research, it is acknowledged that there a range of complex issues to be considered. This is the essence of social ecology, which emphasises that issues can not be resolved in isolation but require a coordinated effort by all stakeholders. The adoption of a social ecology approach to health requires taking a broader perspective when clarifying the role of health in food regulation with the imperative being for a precautionary view of risks. Most important is facilitating the active involvement of consumers in food system decisions that affect their health.

This study has highlighted a need for professional development for health workers that facilitates their own understanding of the complexity of ecological systems. This would

produce gains in a more comprehensive understanding of the impact of food choices and would flow onto many other areas of health decisions as these are interdependent, as indicated in Table 2.1.

Health professionals need to instigate a debate that clarifies the role of food regulation. The perception reported here is that regulation has shifted from protecting health to minimising economic risk, and this view is supported by others (Tait and Bruce 2001; Thompson 2001). Public confidence needs to be restored and this can be achieved by collaborating with consumers in the development and delivery of strategies that minimise food related risk to health and environment. Working with consumers on such issues would provide the opportunity to ensure that the cultural values ascribed to food were recognised and respected.

Within such a debate, health professionals need to give credit to lay perspectives, with the interviews demonstrating a depth of consumer knowledge and understanding. This acknowledgement is essential for achieving collaboration and tangible outcomes, a point also emphasised in the research of Wynne (1996). The adoption of the precautionary approach to environmental health risk would reassure consumers that their concerns are being acknowledged. In the area of food regulation and standard setting this requires a significant shift on the part of the authorities. Precaution requires a full and holistic assessment of risk. This would move beyond current measures to allow for the evaluation of any cumulative and synergistic effects arising from the interaction of the diverse substances that are part of the modern diet. It would need to be inclusive of a time element to ascertain any latent impacts. Transparent conduct of such processes would enable there to be public scrutiny of the depth of investigation that has occurred.

Health researchers could assist consumers by honestly appraising new technologies or novel foods, and communicating their findings, including any limitations. One of the hurdles to be overcome is the explicit acknowledgement by the health sector that what is known about ecological interactions is incomplete, very complex and daunting in scope. Health professionals may be overwhelmed by this context and are as disadvantaged as consumers by the individualisation of risk, with its reliance on experts to fill gaps. The adoption of open communication that is honest in its disclosure of gaps or questions about food research is required to restore public faith in the integrity of the health sector.

The restoration of funds that are not tied to industry influences is essential to facilitate the independence that the public expects of people working in the health research. Further this may provide the opportunity to develop more innovative approaches to involving all food system stakeholders in food system decision making. The goal would be to ensure that health considerations are not secondary to economic priorities which would in turn contribute to addressing other health inequities.

The findings indicate that there is an opportunity for health professionals to work with consumers on food safety and sustainability issues, using the identified priority of health as the stimulus. The adoption of the above suggestions would progress the health sector beyond the delivery of health messages that research has shown to have little impact (Glanz, Rimer et al. 2002). The attention paid to such messages is selective and a function of the consumer's priorities and values at a given time. The discounting of risk may also occur with 'others' regarded as more vulnerable, depending on experience and context at the time. In contrast, the interactive interview process, while time consuming, provides the

opportunity to reflect on and exchange knowledge, clarify values and identify preferred choices. It is evident that behaviour change can result from this process.

The actions of individuals and food system stakeholders need to be viewed as part of the larger network of relationships, with recognition given to the elements of species dynamics, geography and space, including time. Situating health within a social ecology framework would further enhance broader consumer understanding of how the food system is influenced by the interdependency of natural and constructed systems. This would contribute to the achievement of a sustainable food system as well as the protection and conservation of many other social values.

This study indicates that consumers are resentful of being disenfranchised in food decisions. The health sector needs to recognise consumer knowledge and enable consumer collaboration on food system decisions to add value to this process. The input of credible experts and the capacity to access alternative choices enhances the likelihood of consumers adopting healthy and sustainable food choices. Consumer health priorities provide an excellent opportunity for the public health sector to work with the public to achieve food system changes that facilitate population health and reduce the burden of negative food system impacts.

Please see print copy for Appendix A

Please see print copy for Appendix B

Please see print copy for Appendix C

9.4 Appendix D - Participant Contact Details and Background

Could you please complete the following details. These will assist in providing important background information for the research. This information is confidential and will only be used for the stated purpose, and aliases will be used if your comments are quoted within the research. Please fill in the details or circle the correct response.

First name:		Phone Contact:			
Suburb:		Age:			
Sex:		Single Partnered			
No. of Children:		Country of Birth:			
Length of Australian Residency (in years):					
Occupation:					
Education Level Completed: Secondary Business/TAFE University					
Nearest Income for the Household:	<\$15,000	\$15, -<25,000	\$25, -<\$35000	\$35, -<\$45,000	
	\$45, -<\$55,000	\$55, -<\$65,000	\$65, -<\$75,000	\$75, -<\$85,000	
	\$85,000>				

Are you able to get to the places that you prefer to buy food from?

Often Sometimes Infrequently Not at all

Do you have a significant role in food choices in your household?

Strongly agree Agree Disagree Strongly disagree

9.5 Appendix E - Semi Structured Individual Interview Questions

A quiet, comfortable room will be required, away from possible disturbances. Participants will be asked to switch mobiles off and will be given an estimate of how long the interview will take (this information will have been communicated previously but will be repeated to ensure that this is satisfactory to the participant).

1. Introduction of self, the topic and thank participants for their involvement.
2. Outline the research approach ie interviews, discussions, surveys, and some practical activities. This explanation will require sensitivity (as indicated under "Type of Data") on the part of the researcher. Participants will need to feel confident that the various components of the research are not calling into question their own integrity. The research process relies on the establishment of trust between the researcher and participants, and the validity of longitudinal research depends on mutual confidence and respect.
3. Ensure participants are comfortable with the setting, including the taping of the interview, the taking of notes, and the research approach in general.
4. Ask the participants to complete Appendix B, this will provide essential background details. Assure participants that such information is kept strictly confidential.
5. Introductory statement:

"We all eat and there is a diversity of food now available now. This research aims to explore what people eat and why, as well as looking at what is understood about the food system and the food production process."
6. Commence interview.

The tape should be stopped if there are any disruptions and started again once full attention is back to the interview.

Appendix E cnt

Semi Structured Interview Questions

Stage 1 – please answer question 1, and then the box which best describes what you think.

2. What sort of foods do you buy regularly, and why?

2. When you are buying food, food safety is a consideration in your choice?

Strongly agree	Agree	Disagree	Strongly disagree
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3. Do you have more questions about the way food is produced, say in comparison to 10-15 years ago?

Often	Sometimes	Infrequently	Not at all
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4. Is the food production system controlled enough to protect health and the environment?
What risks do you think there are?

Strongly agree	Agree	Disagree	Strongly disagree
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6. You are happy with the amount of information provided about your food?

Strongly agree	Agree	Disagree	Strongly disagree
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6. Do you consider food related waste to be an issue?

Strongly agree	Agree	Disagree	Strongly disagree
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Stage 2 – we will now work through each of the questions for you to tell me more about your responses.

Do you have any other general comments to make about food choices?

9.6 Appendix F - Summary of Round 1 Interviews

An overview of comments on the food system, environmental impacts and related concerns.

Reasons for Food Choice:

Personal health - this is the basis for food choices and fresh food is valued as essential to human health.

Processed food - is not highly regarded as a source of nutrition and the inclusion of additives, colourings and chemicals during processing is of concern. There is doubt about the effects of current food production processes in the long term. Natural or organic food, grown without sprays or chemicals, is desirable but the cost of this is an issue.

Flavour - the growing environment is crucial - growing fruit and vegetables all year round to meet demand requires early picking, cold storage and artificial ripening that do not allow flavours to develop naturally. Coming generations might not have the opportunity to taste naturally ripened produce, resulting in a loss of flavour experience. This loss would be a gain for food producers as there would be no memory of 'natural flavour' that they would need to try to copy. Children and grandchildren in future urban areas may never get to eat a naturally ripened peach or pear, and may not realise there is a difference between these and fruit forced to ripen outside its natural season or stored for lengthy times. Several times it was asked "What are they doing to our fresh vegetables" and "What does 'fresh food' really contain".

People's concerns

- contamination, pesticides and additives, and things like antibiotic residue and hormones as these alter the 'natural' character of the food and may affect the human immune system;
- farming of animals eg cattle and chicken, under intense conditions causes concern for the animals and flow-on effects to food;
- other issues, but not as immediately related to the dinner table, were about the agricultural supply and demand eg clearing bush for farms, the loss of farms around growth areas, irrigation demands, contamination, water supply, and transport emissions. Mad cow disease (BSE) was referred to but this was more as disgust that food producers could have practices that resulted in grazing animals eating their own kind.
- what happens to the byproducts of food production and whether farming practices are sustainable.

Responsibility and Information:

Profit - there is a strong belief that profit is the main consideration for both corporate and government sectors. The emphasis is seen to be on mass produced food that will make quick profits for the producer, and the long term environmental and health costs are not considered. **Standards** - Australia is seen to have high standards to protect consumers - but the recent fertiliser scare and antibiotics in chicken raise questions about the level of protection.

Personal control of food choices is linked to the information available to consumers - most know that more information can be obtained but the problem is time and knowing where to start.

The media is a main source of information and influence on food choices. Food scares raise awareness of faults or malpractices but then the public outrage seems to die away.

People want to know more about the way their food is produced, eg spraying, additives, genetic modification and where food is from, to assist in food choices.

Waste reduction - it is an agreed priority but it raises questions about how to balance waste minimisation with family convenience and individual packaging. Additionally there is the protection provided by packaging and use by dates but on the other hand people know this creates more waste and the throwing away of food that could be used by needy people. Food waste from bakeries and restaurants, whilst people go hungry, and the disposal of excess crops to maintain prices was strongly opposed.

9.7 Appendix G – Participant Details

Participant Record (- = data not given)

	Pseudonym	Birth	Age	Fam/ Single	Income	Occupation	Education	Ind Int Date	Round 1 F/G No.	Round 2 F/G No.
1.	Bob	Aust	66	F	Pension	Retired	Secondary	12/4/02	1	1
2.	Heather	Aust	46	F	\$25-35	S'employ	Tertiary	18/3/02	2	2
3.	Lila	Aust	28	S	\$55-65	Engineer		18/3/02	1	3
4.	Leticia	Aust	42	F	<\$15	H/Duties	Secondary	3/5/02	2	2
5.	Tom	Aust	54	F	\$35-45	Gym Manager	Tertiary	11/4/02	3	3
6.	Livia	Italy	48	F	\$85>	Admin	Tertiary	20/5/02	4	4
7.	Ambrose	Aust	49	F	\$85>	Estimator	Tertiary	8/5/02	3	3
8.	Charmaine	Aust	48	F	\$85>	Teacher	Tertiary	3/04/02	-	-
9.	Dannielle	Aust	53	S	\$45-55	Admin	Secondary	3/5/02	3	1
10	Annelise	Aust	48	F	-	Admin	Secondary	26/5/02		1
11	Verity	Libya	49	S	Pension	Unemployed	Secondary	18/4/02	3	1
12	Angela	Scot'l'd	45	F	-	Admin	Secondary	3/6/02	5	3
13	Megan	Aust	47	F	\$45-55	Teacher Ass	Secondary	7/6/02	5	1
14	Rochelle	Aust	42	F	\$55-65	Librarian	Tertiary	27/5/02	4	4
15	John	Italy	37	F	\$45-55	Restaurateur	Tertiary	12/6/02	-	2
16	Amalie	Aust	50	S	<\$15	Unemployed	-	19/6/02	-	-
17	Travis	Aust	51	F	Pension	Retired (Med)	Tertiary	19/6/02	2	2
18	Gerri	Aust	25	S	<\$15	Student	Tertiary	3/07/02	4	4
19	Julie	Aust	55	F	<\$15	Librarian	Secondary	21/6/02	2	4
20	Valmae	Eng	51	F	-	Shop Assist	Secondary	23/6/02	5	4
21	Hilary	NZ	41	F	\$85>	Admin	Tertiary	23/6/02	1	1
22	Vicky	Aust	30	F	\$25-35	H/Duties	Secondary	03/07/02	6	-
23	Ivor	Aust	48	F	\$85>	Teacher	Tertiary	3/04/02	6	3
24	Carla	Aust	23	F	\$35-45	Shop Assist	Secondary	7/8/02	-	-
25	Terri	Aust	31	F	\$55-65	Shop Assist	Secondary	9/8/02	5	-
26	Sharon	Aust	28	F	\$85>	Nurse	Tertiary	21/08/02	6	-

Please see print copy for Appendix H

9.9 Appendix I – Focus Group Responses

Round 1 Focus Group Responses

	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
Desired Food Traits	-freshness -flavour -naturally ripened -convenience -nutrition	-freshness -appearance -naturalness	-freshness -appearance -flavour	-flavour -appearance -convenience -variety	-freshness -aesthetics -flavour -naturalness -variety; cultural needs -convenience	-freshness -flavour -appearance -naturalness -nutrition -convenience
Undesired Food Traits	-nutrient loss in cold stored/processed food -GM food -loss of species variety -cumulative effect of agricultural residues	- allergies to additives - processing - nutrient loss in stored food - agricultural residues	-cumulative effect of additives & chemicals -GM food -long term health effect	-cumulative effect of additives, & residues -exaggerated flavours -GM food -short shelf life of cold stored food	-additives -chemical residues -prior land use residues -processing technology	-additives/preservatives/hormones -technology & GM food -flavour/nutrient loss -cold store pesticides -long term health effects
Environment/Health Impact	-farms lost to suburbs -depletion of soils -land clearing -fertilisers & food chain -soil & water pollution -unsuitable crops & introduced pests -sustainability -animal welfare	- soil & water pollution - food miles - overproduction - salination - water scarcity	-GM contamination -chemicals/antibiotics - unsustainable farming -salination -water issues -effluent in food chain; industrial & farming - fish stock depletion -unsuitable crops	-emissions & home grown produce -home gardening, chemicals & runoff -chemicals in soil -changes to ecosystems -land clearing -unsuitable stock & crops	-soil erosion -floods ruining crops -water scarcity leads to food shortages -chemical residues	-chemicals/fertilisers -salinity/irrigation -limit population -climate change -waste disposal & breakdown -fish stock depletion -animal welfare
Control, trust, stakeholders	-research biased -changing & contrary nutrition advice -producers not truthful -self regulation issues -little trust in industry -restrict env. damaging farming -gov't has duty of care -profit priority -monopolies & exploitation	-experts disagree -changing & contrary nutrition advice -imported food safety -profit priority -overproduction -unscrupulous -monopolies -wasteful	-producers not truthful -misplaced faith in experts -profit priority -more power than gov't -monopolies & exploitation -wasteful -quantity not quality -health industry complicit in drug solutions	-research biased -deregulation & demise of small business' -misleading on content -producers need to be accountable -profit priority -more power than gov't -monopolies & exploitation -producing chemicals -individual blamed, not companies who profit	-research biased -Buy Australian push & inferior food -hygiene in factories & shops	-research biased -gov't has duty of care -experts lack credibility -distrust of label info. -misleading on content -unexpected ingredients & allergies -profit over quality -technology aids competitiveness -GM food as answer to growing population -imposing GM food

Information Needs	<ul style="list-style-type: none"> -many people oblivious -process food accepted; culinary skills loss -conflicting info. -how food is grown -trustworthy source -value of rural amenity 	<ul style="list-style-type: none"> -food containing risk -education a priority -conflicting info. -trustworthy source 	<ul style="list-style-type: none"> -many people oblivious -credible information -nutrient advice -processing history -education a priority -school env. education 	<ul style="list-style-type: none"> -food containing risk -many people oblivious -avoid processing that damages environment -educate market gardeners -how food is grown 	<ul style="list-style-type: none"> -decipherable labels -how food is grown -food processing education -culinary skills loss 	<ul style="list-style-type: none"> -decipherable labels -many people uncaring -GM food labeled -young unaware of potential health effects -crisis' prompt thinking -residue level in produce
Tensions	<ul style="list-style-type: none"> -mass production; profit or consumer demand -more home gardeners needed -seasonal production results in glut & waste -evolutionary change in tastes -hygiene ineffective against absorbed contaminants -organic farms should be subsidised -hesitancy to question accepted food production methods -aware of animal welfare issues but consume such products -instant gratification the priority 	<ul style="list-style-type: none"> -cost of healthy food -population growth drives mass production -profit run school canteens -overpackaging 	<ul style="list-style-type: none"> -cost of organic food -chemical free more important than looks -efficient transport should eliminate chemicals & storage -disparity between what is regulated & what consumers want -prefer seasonal produce to variety -hygiene ineffective against absorbed contaminants -choice results in waste -standard of living an artificial quality -discrepancy between Australian standards and other countries -imposed preventative medications -sponsorship of health programs by fast food companies hypocritical 	<ul style="list-style-type: none"> -cost of healthy food -verifying organic food -imported food not as regulated -increasing distrust of processed food -exploitation of developing countries -processed food desensitising -inferior produce better than processed food -appreciate choice but know the costs -balancing healthy env. with social needs -loss of home gardener skills -shelf life enhanced with processing -junk food in chemists 	<ul style="list-style-type: none"> -cost of organic food -food stored too long -conflicting priorities -too much information causes confusion -quality sacrificed in mass production -will pay for quality but not a lot more -env. degradation leads to increased food costs -family desire for junk food, good food wasted -hygiene ineffective against absorbed contaminants -organic food affected by hygiene issues -food as quality of life 	<ul style="list-style-type: none"> -cost of quality food -food stored too long/ bacterial contamination -technology resistance -increasing reliance on convenience foods -freshness traded for variety & choice -modern transport should eliminate chemicals & storage -impact of population increase -mass food production, freshness & waste -env. damage increases dependence on science -the need to supplement processed food -the inevitability of future env/health crisis' - level of residues in domestic produce -imported food a risk

Explanatory Note: some comments could fit in other parts of matrix but for brevity this was not done, extrapolation enables the location of those which can be cross referenced to other concerns

9.10 Appendix J- Summary of Round 1 Focus Groups

Areas of common concern were environmental degradation, mass produced food and the nutrient value of this, the impact of food technologies on health, the regulation of the food system, and concern about the nature of food as the global population increases.

Environmental Degradation

Some participants see industrial processes/factories as a source of chemical contamination of soil, while others view backyard gardening as an area where the misuse of chemicals might occur. Also mentioned was soil loss through dust storms and land clearing, and the subsequent impact on farming. Water quantity and water quality were frequently mentioned and the lack of water has been highlighted by the drought and the accompanying bushfires. Irrigation that contributes to land degradation in the form of salinity and runoff that contains chemicals, pesticides and fertilisers were other problems.

The suitability of sheep and cows, and the crops we grow ie rice and cotton, were questioned because of the environmental impacts of these. It was suggested that these things may be better grown in more suitable environments.

Food Technology and Choice

Some said there was too much choice and this creates waste and environmental degradation, while others could not imagine not having the range of food that we do now and found it frustrating when they couldn't buy the food they wanted. It is recognised that the growing population has meant that food has to be mass produced but that this also causes overproduction and waste. Producing more food than we can consume, or in forms that are not wanted, for example gm food, was regarded as not acceptable because of the waste and the ethical issue of dumping gm food on less developed countries.

The range of choice is a result of technology, especially cold storage, food export and import, and the growing of food outside the traditional seasons. It was suggested that this type of production started with refrigeration in the 1950's to achieve more consistent prices for business. It avoided the glut and scarcity of seasonal fruit and vegetables. As a result it is now expected that these foods would be available all year. Aside from concerns about the nutritional value of mass produced foods, participants questioned the hygiene standards of imported food, and the use of chemicals and fertilisers.

Views on the Nature of Food

There was a general view that food in the future will probably be more processed and the reaction to this was mixed. It was remarked that often food designed to appeal to children is already synthetic in the form of fruit bars and the like. There was concern about the introduction of processes that may be risky, including genetic modification. It was commented that there may be an increased reliance on scientists for new ways to supplement foods as more synthesised food is introduced. The loss of nutrients during food

processing was mentioned, but the use of supplements is accepted as a way of rectifying this situation.

Flavour, appearance, smell and texture were important. In looking at what is meant by natural, organic food was said to be the best way to avoid chemicals and sprays but there was concern that the cost of organic food is a deterrent. It was remarked that organic food had become the option for higher incomes, and that lower income families were better off at least eating mass produced vegetables rather than missing out, or eating only ready prepared foods.

The preference is for healthy foods which are produced with minimal environmental impact, that is the soil, water, animals and plants are farmed sustainably. Shopping for food, however, is often rushed, and there is not time to read labels and packaging. There were also questions about the truth of labels and marketing claims, and this applied to organic foods as well. Knowing the details of how food is processed and handled can be overwhelming and unwelcome if it makes decisions harder. There is also the suggestion that we should be grateful for range of foods we have. There is difficulty in questioning how food is produced when there is also a desire for variety and quantity in food choices.

The Focus Group Process

This was an opportunity to share views and to ask question about other people's choices. A number of participants commented on learning from what was being said in the group.

Some participants spoke of taking food for granted and, after discussing the health and environmental factors related to food production, suggested that education may be a way of increasing general understanding of this process.

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