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Exploring individual values and attitudes for a more sustainable Canberra: the example of food

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Report for the ACT Commissioner for Sustainability and the Environment

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DISCLAIMER

The information in this report has been collated from publically available sources which are identified as references. However, very little information is specific to the situation in Canberra and hence generalisations have been made and the author takes no responsibility for any actions that readers may take on the basis of the information provided in this report.

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EXPLORING INDIVIDUAL VALUES AND ATTITUDES FOR A MORE SUSTAINABLE CANBERRA: THE EXAMPLE OF FOOD

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1. Introduction

The fact that 'Our community is treading very heavily on the earth'¹ is now well recognised across diverse sectors of society. However, there is no well developed consensus on how to reduce this footprint.

After extensive consultation the ACT Office for the Commissioner for Sustainability and Environment released a framework for its 2011 State of the Environment Report². This identified four 'driving forces' that cause fundamental pressure on the environment. These being population, land use and transport systems, climate, and finally, consumption.

Consumption determines the level of resource use and associated waste generation. The 2011 State of the Environment Report will consider three consumption driving force indicators; ecological footprint, economy and income, and consumption values. This paper considers the attitudes and values of individuals and their influence on consumption decisions as well as other approaches to achieving desired changes in behaviour. Consumers make numerous decisions that impact on the environment, such as dwelling size and design, transport, energy and source of products. However, this report focuses on food as it has been identified as being one of the largest components of the ACT's ecological footprint³.

2. Consumption and sustainability

Decisions made by individuals in relation to what products and services they consumer can have a significant environmental impact, especially in countries like Australia, where per capita consumption levels are relatively high. The environmental impact of consumption is due to the combined effects of the production, transport, sale, use and disposal of the products consumed. These impacts can be captured in a lifecycle analysis of individual products. Recent research has used life cycle analysis to determine the ecological impact of some purchases in the ACT⁴. For example the environmental impacts of a 29" LCD TV are estimated to be 62 000 litres of water and 1241 kg of CO₂ in the production stage. Additional energy would be used to operate the TV during its working life. And finally, under current Australian practices the TV would mostly likely be disposed of in landfill which has additional impacts in terms of contamination from toxic materials such as lead and mercury⁵.

An understanding of how consumption affects the environment is especially relevant to the ACT where choices that individuals make on a daily basis account for over half of the Territory's ecological footprint (Figure 1). Moreover, as shown in Figure 1, the overall ecological footprint of the ACT has increased over the last 10 years primarily due to increased consumption. This trend is associated with increasing household income, and is commonly observed in affluent societies. It is occurring even though there are some areas in which environmental impact has been steady or even falling, such as direct energy use⁶.

¹ Dr Maxine Cooper, ACT Commissioner for Sustainability and Environment, press release dated 14 December 2010.

² ACT-OCSE (2011). *Framework, themes, and indicator groups, ACT SoE 2011 Report*. Canberra: Australian Capital Territory Office of the Commissioner for Sustainability and Environment.

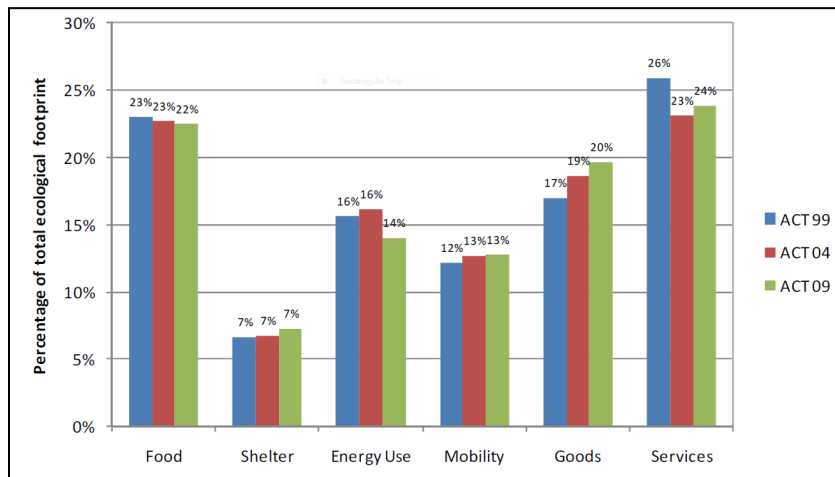
³ ISARG (2010). *The 2008-09 Ecological Footprint of the population of ACT*. Sydney: Integrated Sustainability Analysis Research Group, University of Sydney.

⁴ Ryan, S. (2011). *Buying Choices for a more sustainable Canberra*. Canberra: Office of the Commissioner for Sustainability and Environment..

⁵ However the ACT currently has a mandatory TV recycling scheme, *ibid.* p. 33.

⁶ *ibid.* p. 4.

Figure 1: Comparison of ecological footprint consumption categories in the ACT in 1999, 2004 and 2009⁷



Source: ISARG, 2010

Ecologically sustainable consumption is a phrase used to describe the aim of reducing the ecological impact of consumption. It is generally seen as being the use of ‘services and related products which respond to basic needs and bring a better quality of life while minimising the use of natural resources and toxic materials as well as emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardise the needs of future generations.’⁸ An emerging awareness of its importance has led the United Nations to set up a framework of programs in sustainable production and consumption within their environment program⁹. These range from making tourism more sustainable through to reducing greenhouse gasses from buildings.

In relation to the decisions made by individuals there are many approaches that promote sustainable consumption that incorporate elements of the 4R’s (Figure 2); Refuse to purchase, Reduce purchases, Reuse purchased items, and Recycle purchases that are no longer being used. One approach is that of ‘anti-consumption’ where individuals are encouraged not to consume¹⁰. Another is that of ‘green consumption’ where consumers are encouraged to choose the more environmentally friendly option. This may include choosing electricity that is generated from a more environmentally friendly source such as a wind farm. In some cases these green consumption programs can have unintended outcomes. Such as promoting unnecessary consumption, when, for example, a light globe or appliance is replaced with a more energy efficient model before the original product has reached the end of its life.

⁷ ISARG (2010). *The 2008-09 Ecological Footprint of the population of ACT*. Sydney: Integrated Sustainability Analysis Research Group, University of Sydney, p. 17.

⁸ NME (1994). *Oslo Roundtable on Sustainable Production and Consumption*: Norwegian Ministry of the Environment.

⁹ UNEP (2011) *Sustainable production and consumption* Rome: United Nations Environment Program.

<http://www.unep.org/themes/consumption/index.asp> [accessed 27 July].

¹⁰ Black, I. (2010). Sustainability through anti-consumption. *Journal of Consumer Behaviour*, 9, 403-411.

Figure 2: Waste Management Hierarchy

Most favoured option



Least favoured option

3. Consumption behaviour

3.1 Linking personal values and attitudes

The understanding of consumer values and attitudes is based on theories developed in psychology. These assume that motives for individual choices emerge from a small number of relatively stable values, which in turn form attitudes. The linkage between values, attitudes and choices is constructed through the Theory of Planned Behaviour, and its derivatives, along the sequence of values→attitudes→behaviour.

An extensive academic literature in this area¹¹ incorporates two practical outcomes in relation to consumption that are pertinent to this report. The first of these is the use of values in marketing communications¹². In this situation the values held by individuals in a particular target audience are identified. Then a communication is crafted where the message is associated with these values. This approach improves the likelihood of message acceptance (this is discussed in more detail in Section 3.3).

The second relevant area of research explores values→attitudes→behaviour in terms of identifying people's values and then determining their causal link to actual behaviour. Its major contribution is in confirming that there is often a gap or disconnect where actual behaviour is inconsistent with the values identified¹³. The major reasons for this are that choices result from a personal assessment of many factors, values are important but do not dominate over other influences such as financial cost, availability of time, wanting to be included in particular social groups as well as the availability of alternatives that

¹¹ See, for example, Chapters 11 and 16 in Quester, P., Pettigrew, S. and Hawkins D. (2011) *Consumer behaviour*. Sydney, McGrawHill.

¹² See, for example, Belch, G., Belch, M., Kerr, G. & Powell, I. (2009). *Advertising and Promotion: An Integrated Marketing Communication Perspective*. Australia: McGraw-Hill, pp. 138-40.

¹³ See for example Eckhardt, G., Belk, R., & Devinne, T. (2010). Why don't consumers consume ethically? *Journal of Consumer Behaviour*, 9, 426-436.

result from political and industrial leadership¹⁴. In addition, many consumer choices result from established routines and there are many sources of inertia for individuals in relation to changing their habits. An example in relation to food choices would be an individual who has developed expectations from within their family about what is normal, such as the convenience benefits from highly processed food products, and hence is insensitive to additional information that highlights the high ecological impact of these products.

However it is possible to target interventions to encourage behavioral change before choices become habitual (such as eco driving where new drivers are taught to drive economically) and where habits are broken or unstable (for example ‘teachable moments’ with new residents in a community, new employees, or parents having a first child). In addition, not all behaviours are habitual, as many are ‘one off’ or occasional purchases (buying a washing machine for example)¹⁵.

3.2 Alternative approaches to understanding consumption

Although the theoretical constructs of values and attitudes are still used as an approach for understanding what influences consumption there are many other approaches that provide alternative perspectives by incorporating additional relevant variables.

At the broadest level consumers are influenced by the political, economic, societal, technological and legal aspects of the country within which they live. Their social connections also influence their consumption. These include social groups or individuals that they aspire to be like, those that they associate with as well as those to which they do not want to be linked. Finally aspects of the individual and their specific situation influence their consumption; including motivation, personality, experience as well as values and attitudes as previously discussed. In addition dynamics within the living arrangement of the individual will influence their consumption. Hence, household or family structure provides an additional perspective that incorporates factors including who initiates, influences, authorises, makes, and finally, who uses or consumes the products purchased¹⁶.

One of the most popular approaches for influencing consumers that integrates different factors is that of lifestyle. This approach is based on the assumption that many choices are motivated by lifestyle goals as well as values and attitudes. The lifestyle of health and sustainability, often referred to by its acronym of LOHAS, is one such example. Recent research has shown that LOHAS consumers are dedicated purchasers of organic food¹⁷. Other approaches for understanding consumption include individual self interest being achieved through rational choice and social factors such as individual identity being created through how others perceive the individual¹⁸. These can also be used in programs to influence consumer behaviour.

¹⁴ Isenhour, C. (2010). On conflicted Swedish consumers, the effort to stop shopping and neoliberal environmental governance. *Journal of Consumer Behaviour*(9), 454-469.

¹⁵ See Chapter 1 ‘Old habits and new routes to sustainable behaviour’ by Verplanken, B. in Whitmarsh, L., Oneill, S., & Lorenzoni, I. (Eds) (2011). *Engaging the Public with Climate Change* London: Earthscan, p.24.

¹⁶ See for example, Evans, M., Jamal, A., & Foxall, G. (2009) *Consumer behaviour*, London: John Wiley and Sons Ltd.

¹⁷ BFA (2010). *Australian Organic Market Report 2010*. Brisbane, Australia: Biological Farmers of Australia.

¹⁸ Jackson, T. (2005). *Motivating Sustainable Consumption: a review of evidence on consumer behaviour and behavioural change*. England: Sustainable Development Research Network, Centre for Environmental Strategy, University of Surrey. As well as the more recent book that includes novelty seeking and conspicuous consumption Jackson, T. (2009). *Prosperity without growth*. London: Sustainable Development Commission.

Thus there is not a single unified approach for influencing consumption. Hence in terms of attempting to change behaviour it is common to consider the details of the specific message and target audience, and then select an approach, or combination of approaches, that is most likely to be effective. Community Based Social Marketing¹⁹ is one popular framework used to influence changes in consumption that support environmental sustainability. It has been widely used by governments and non-government organisations throughout the developed world and is supported by a network of practitioners and case studies.

3.3 Green consumption²⁰ in Australia

As previously mentioned it is common for a gap to exist between what consumers say they would like to do, and what they actually do. This is illustrated by the results of a survey of 1,000 Australian shoppers exiting supermarkets in major cities²¹.

Figure 2: Supermarket consumer desires and actions²²



¹⁹ McKenzie-Mohr, D., & Smith, W. (1999). *Fostering sustainable behavior: an introduction to community-based social marketing*. Gabriola Island, BC, Canada: New Society Publishers.

²⁰ In this report the term 'green consumption' is used to refer to choices made by consumers where they select the more environmentally sustainable option.

²¹ Australian Food and Grocery Council & Netbalance Pty Ltd, 2010. *Green Shopper Summary Report*, www.afgc.org.au/sustainability.html#GreenShopper [accessed 9/8/11].

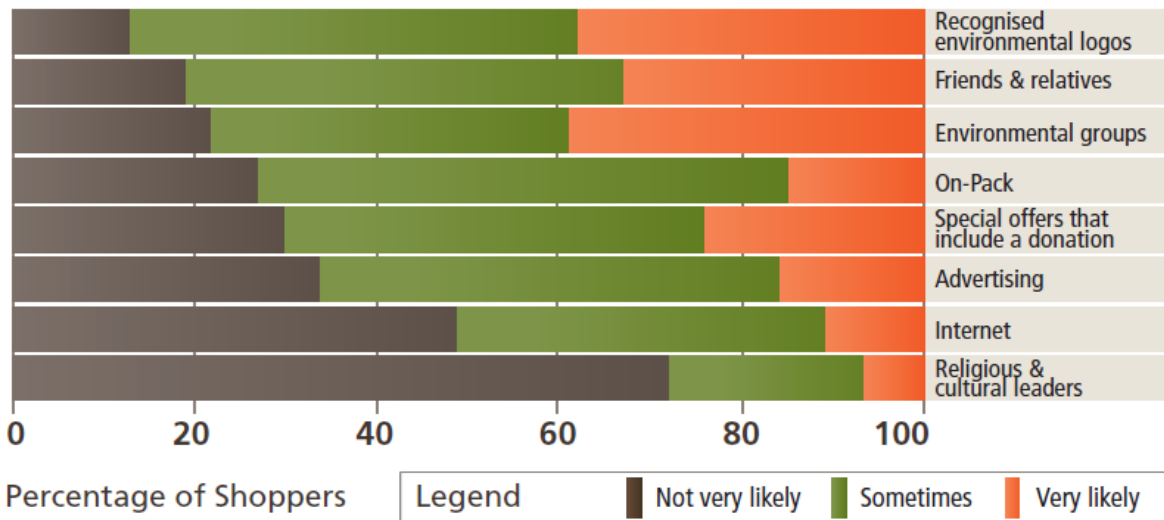
²² *ibid*, p. 3.

As shown in Figure 2, although the majority of consumers (84%) express concern about the impact that their purchases have on the world, only a small number (13%) actually bought an identifiably ‘green’ product.

Consumers’ purchasing decisions are a result of many factors; environmental impact is just one of these. Hence activities that aim to influence behaviour should be informed by data on which factors about a purchase are most important to consumers and which they are willing to compromise on. Results from the previously mentioned survey found that shoppers are most willing to compromise on packaging (27%), but least willing to compromise on convenience (6%). It is important to note that this survey included a range of household goods purchased from a supermarket and hence did not specifically focus on food choices which are also heavily influenced by taste, nutrition as well as considerations of cultural habits.

Figure 3: Consumer’s level of trust in different information sources²³

How likely are you to believe environmental or green claims from the following sources



Studies have shown that consumers were most likely to believe environmental claims from a recognised environmental logo or from friends and relatives. In contrast they are least likely to believe claims from religious/cultural leaders or the internet (Figure 3).

Further, subtle differences may have a major impact on the effectiveness of the activity. For example two UK supermarkets introduced milk sold in plastic bags. This was promoted as a way to reduce packaging as the bags are estimated to contain 75% less plastic than an equivalent sized milk bottle²⁴. One supermarket chain has discontinued the bagged milk trial due to low sales whilst in the other supermarket chain sales have exceeded expectations. The key to success would appear to be the decision by the second store to

²³ *ibid*, p. 5

²⁴ However the milk bags are assumed to be non-recyclable, unlike many other milk containers.

give their staff free re-usable milk jugs. These staff were able to explain the use of jugs to consumers based on their own experience²⁵.

4. Encouraging sustainable consumption: the example of food

4.1 Impacts of the food system

As previously mentioned food is a significant component of the ecological footprint in the ACT. A 2010 study by the University of Sydney found that food accounts for 22% of the footprint, second only to services at 24%. Each of which is significantly larger than each of the other four categories of shelter, energy use, mobility and goods. This report also identifies that the economic cost of food consumed in the ACT does not fully incorporate its environmental cost. Its contribution to the ecological footprint, at 22%, is significantly larger than its economic cost at only 10% of ACT residents' expenditure²⁶.

The amount of food consumed per capita has changed little in recent times²⁷. However, the composition of food in the diet is changing as individuals are eating more foods that are prepared outside the home. These include meals away from home that are supplied by the food service sector in restaurants and cafes and ready-to-eat meals from supermarkets as well as confectionery and snack foods. In addition there is a general trend to increasing consumption of foods that are transported from other states and countries. These dietary choices have environmental implications in terms of greater inputs of energy, water and materials for packaging used in production, manufacturing and transport.

Many governments have taken a leadership role in attempting to influence the dietary choices of individuals. Historically these have focused on ensuring that there is enough food and that it is safe to eat. In recent decades additional information has been added that enables consumers to create their own healthy diet. Attempting to encourage environmentally friendly dietary choices, that are also healthy, is a very recent challenge for these governments²⁸ (a number of programs are discussed in the subsequent section 5.2, Current behavioural changes initiatives).

To understand the impacts of food consumption on the environment a lifecycle analysis can be done for individual food products. This is useful in identifying 'hotspots' in the lifecycle where impacts are particularly high, as well as revealing to what extent the impacts are within the control of the consumer. The following table provides a summary of 'hotspots' identified by Ryan (2011)²⁹ for selected food products. It includes realistic recommendations for Canberra consumers wishing to reduce the environmental impact of their food consumption.

²⁵ Smithers, 2010, 'Waitrose shelves eco friendly milk containers', article in the *Guardian*, 15 April 2010, www.guardian.co.uk/environment/2010/apr/15/waitrose-milk-containers [accessed 9/8/11].

²⁶ ISARG (2010). *The 2008-09 Ecological Footprint of the population of ACT*. Sydney: Integrated Sustainability Analysis Research Group, University of Sydney, pp. 17-18.

²⁷ SoE-WA (2007). *Fundamental Pressures: State of the Environment Report*, Western Australian Government.

²⁸ See for example, HCN (2011). *Guidelines for a healthy diet: the ecological perspective*: Health Council of the Netherlands. Further, the Australian Government is anticipated to include sustainability criteria in its revised Dietary Guidelines which are anticipated to be released by the National Health and Medical Research Council in late 2011.

²⁹ Ryan, S. (2011). *Buying Choices for a more sustainable Canberra*. Canberra: Office of the Commissioner for Sustainability and Environment..

Table 1: Lifecycle analysis for specific food products consumed in the ACT³⁰

Product	Hotspots			Recommendation
	Land impacts	Greenhouse gasses	Water impacts	
Beef	Land area required for raising cattle.	Methane produced by cattle.		Consider reducing the amount of beef eaten. Avoid waste: ensure all beef bought is eaten.
Bread	Land area required for growing wheat.	Energy use in consumer shopping trips. Energy use in baking phase.		Avoid waste: ensure all bread bought is eaten.
Fresh tomatoes		On the farm (energy used to manufacture fertiliser). Energy use in consumer shopping trips.		Reduce customer transport impacts.
Processed tomatoes		Energy use in consumer shopping trips. Energy use in processing phase.	Water use on the farm for irrigation.	Reduce customer transport impacts.
Coffee		On the farm (fertiliser). Drying the beans. Final use phase (energy for coffee machine etc). Disposable cups.	Water use on the farm for irrigation.	Avoid electronic coffee machines for home use. Avoid disposable cups for takeaway coffee.

4.2 Priority areas for change

Through a similar process of lifecycle analysis, the UK Sustainable Development Commission has developed a list of household level priority actions for improving the sustainability of the food system. This study used a very broad definition of sustainability, which included more than just ecological outcomes. It is based around the UK Government's principles of sustainable development which are 'ensuring a strong, healthy and just society and living within environmental limits' and it explicitly aimed at integration (rather than trade-offs) between environmental, social and economic outcomes³¹. Thus, the study's recommendations are generally consistent with health guidelines. However, the hierarchy of recommendations does not take into account the relative ease or difficulty of implementation. The Sustainable Development Commission assessed a range of possible changes to the current average UK diet. It placed highest priority on actions they considered were 'likely to have the most significant

³⁰ Ryan, S. (2011). *Buying Choices for a more sustainable Canberra*. Canberra: Office of the Commissioner for Sustainability and Environment.

³¹ SDC (2009) *Setting the table: Advice to Government on priority elements of sustainable diets*. London: Sustainable Development Commission, p. 8.

and immediate impact on making our diets more sustainable, in which health, environmental, economic and social impacts are more likely to complement each other.³²

The high priority actions identified are:

- lowering consumption of meat;
- lowering consumption of dairy products;
- consuming less low nutritional value products; and
- reducing food waste.

Actions which were likely to result in tradeoffs between different aspects of sustainability were given a lower priority. These were:

- increasing consumption of seasonal and field grown fresh fruits and vegetables (and reducing consumption of foods grown in heated greenhouses);
- only eating fish from sustainable sources; and
- increasing consumption of organic food.

Some examples of the tradeoffs identified are show in Table 2.

Table 2: Tradeoffs in food sustainability³³.

Action	Positive sustainability impacts	Negative sustainability impacts
Seasonal food	Reduced carbon emissions from heating greenhouses.	Lack of available seasonal fresh fruits and vegetables may lead to lower consumption, with associated negative health outcomes. Increase in the seasonality of horticultural labour which would have negative employment impacts.
Sustainable fish	Slow the global depletion of fish stocks.	May lead to increases in fish farming and associated increases in ecologically harmful nutrient releases from fish farms.
Organic food	Reduction in greenhouse gas emissions, mainly due to reduced use of industrial fertilizer.	Increase in the cost of food, which could impact most on the poorest in society. It was estimated that a diet consisting wherever possible of organic food is around 30% more expensive than the current average diet.

Actions expected to make a smaller contribution towards sustainability were given the lowest priority. These were: reducing energy use in food purchases and cooking; and finally, and drinking tap water rather than from bottles³⁴.

Although these recommendations are for the UK, they are seen as being relevant to Australia due to a large number of similarities between both average diets and food systems in the two countries. The following discussion identifies the main implications associated with each of these recommendations.

³² *ibid*, p. 38.

³³ *ibid*, pp. 17-30

³⁴ *ibid*, p. 38.

4.2.1 High Priority actions

Reduced meat and dairy consumption

The production of livestock for human food has a large negative impact on the natural environment as well as having both positive and negative impacts on human nutrition. It accounts for a very significant portion of global greenhouse gas emissions with estimates that meat and dairy consumption in affluent developed countries accounts for around 50% of the climate change impact of a typical diet³⁵. In relation to meat, dairy and egg products consumed in the ACT they are estimated to contribute almost half (42%) of total ACT food impacts³⁶.

In Australia methane emissions from livestock make up 11% of Australia's total greenhouse gas emissions³⁷. The main components of this are methane from enteric fermentation, nitrous oxide from manure and fertiliser, carbon dioxide from land-use change, and use of energy in agricultural activities³⁸. Although it is possible to reduce greenhouse gas emissions per unit of meat or milk produced, reducing consumption will have a bigger and more immediate benefit. This is particularly important in countries, such as Australia, where consumption is above the recommended dietary requirements³⁹.

While it is important to note that the impact of different climates and farming systems may have a major impact on the ecological footprint associated with the consumption of red meat⁴⁰, the impact of beef and dairy cattle in terms of greenhouse gas emissions is significant in both the UK and Australia, despite differences in production systems⁴¹.

Production of meat is a significant part of the Australian economy, and Australia is the world's second largest exporter of beef⁴². Thus it could be argued that the effect of reduced domestic meat consumption will simply be to increase Australia's meat exports rather than actually reducing production levels. A similar phenomenon was addressed by a UK study which concluded that a reduction in domestic meat consumption drives down domestic prices and decreases domestic production but also fosters exports, and thus meat production (and its related environmental impacts) is not reduced to the same extent as demand⁴³. Another approach would be move away from farming

³⁵ FSA (2010). *Food and Climate change: A review of the effects of climate change on food* London: Food Standards Agency.

³⁶ ISARG (2010). *The 2008-09 Ecological Footprint of the population of ACT*. Sydney: Integrated Sustainability Analysis Research Group, University of Sydney.

³⁷ Wilson, G., & Edwards, M. (2008). Native wildlife on rangelands to minimize methane and produce lower-emission meat: kangaroos versus livestock. *Conservation Letters*, 1, 119-128.

³⁸ FAO (2006). *Livestock's long shadow*. Rome: Food and Agriculture Organisation of the United Nations.

³⁹ See for example, Friel, S., Dangour, A., Garnett, T., Lock, K., Chalabi, Z., Roberts, I., et al. (2009). Public health benefits of strategies to reduce greenhouse-gas emissions: food and agriculture. *Lancet*, November, 46-55. In addition research on the actual amount of meat purchased, eaten and wasted for families in the ACT is being carried out by University of Canberra PhD student Michelle Minehan.

⁴⁰ See for example a comparison between the New Zealand and the UK in Saunders, C., & Barber, A. (2007). *Comparative Energy and Greenhouse Gas Emissions of New Zealand's and the UK's Dairy Industry*: Lincoln University, New Zealand.

⁴¹ Peters, G., Rowley, H., Wiedemann, S., Tucker, R., Short, M., & Schulz, M. (2010). Red Meat Production in Australia: Life Cycle Assessment and Comparison with Overseas Studies. *Environmental Science & Technology*, 44(4), 1327-1332.

⁴² Meat and Livestock Australia, www.mla.com.au/About-the-red-meat-industry/Industry-overview/Cattle, [accessed 9 August 2011].

⁴³ Wolf et al, 2010, 'Do healthy diets in Europe matter to the environment? A quantitative analysis' *Journal of policy modelling*, 33 (2011) , 8-28.

beef towards kangaroos (which do not produce methane) for Australia's domestic and overseas markets. It has been argued that this would provide many environmental and human health benefits⁴⁴.

Reduced consumption of 'junk food'

Although there is widespread concern about consuming large amounts of food of low nutritional value (some take away food products as well as sweets, soft drinks and the like) from a health perspective, less attention has been paid to the full environmental impact of these products. In part this is because very few full life cycle assessments have been undertaken for these products. However, their impact is significant as demonstrated in a comprehensive life cycle assessment in Sweden where these products were found to account for one third of total climate change impact in the food sector⁴⁵.

Reduced food waste

Reducing the amount of food wasted in the household also presents an opportunity for increasing the environmental sustainability of the food system. It has been reported that perishable products, such as fresh fruits and vegetables, and meat, are most vulnerable to waste. It has been estimated that there is \$5 billion per year of food waste in Australia⁴⁶. Whilst some waste is unavoidable, it been suggested that better management within the household could reduce food waste from 30% to around 6%⁴⁷. The environmental benefits of reducing food waste include reducing the total amount of food purchased, thus lowering total production and associated environmental impacts. Redirecting food waste out of landfills to composting and other recycling facilities also has benefits such as reducing greenhouse gas emissions from landfills⁴⁸ and producing a beneficial end product (compost).

4.2.2 Lower priority actions

Seasonal and field grown fresh fruits and vegetables

Whilst there are many health led initiatives aiming to increase consumption of fresh fruits and vegetables⁴⁹ consideration of the environmental as well as health impacts leads to the emphasis on seasonal outdoor production, as opposed to indoor glass-house methods. This is because production greenhouses in cold climates such as the ACT region are typically artificially heated, leading to a higher energy footprint than for outdoor ('field-grown') produce. Avoiding out of season fresh fruits and vegetables will generally result in a more localised diet. For example some products are often imported from overseas (such as oranges, grapes and cherries from the USA) when out of season in Australia.

While reducing the distance that food has travelled from 'farm to plate' will reduce the transport component of the product's ecological footprint this does not provide a true reflection of the much more complex task of choosing low-environmental impact production and supply chains. This is because a focus on food miles reduces opportunities for benefiting from comparative advantages of production methods in different locations and climates as well as economies of scale and scope. Moreover, for many food products freight transport represents a relatively small percentage of the product's total

⁴⁴ Wilson, G., & Edwards, M. (2008). Native wildlife on rangelands to minimize methane and produce lower-emission meat: kangaroos versus livestock. *Conservation Letters*, 1, 119-128.

⁴⁵ Carlsson-Kanyama, A., Ekstrom, M., & Shanahan, H. (2003). Food and life cycle energy inputs: consequences of diet and ways to increase efficiency. *Ecological Economics*, 44(2-3), 293-307.

⁴⁶ Baker, D., Fear, J., & Denniss, R. (2009). *What a waste: An analysis of household expenditure on food*. Canberra: Australian Institute.

⁴⁷ FSA (2010). *Exploring food attitudes and behaviours in the UK: Findings from the Food and You Survey 2010*. London: Food Standards Agency.

⁴⁸ SDC (2009) *Setting the table: Advice to Government on priority elements of sustainable diets*. London: Sustainable Development Commission, p. 22.

⁴⁹ AG (2011). *Go for 2&5*. Australian Government <http://www.gofor2and5.com.au/> [accessed 27 July].

ecological footprint⁵⁰. However there may be other benefits which are important to consumers in choosing local food, such as higher quality, fresher products and supporting the long-term viability of local industries.

Eat sustainable fish

The consumption of fish is supported by a number of health initiatives, such as the National Health and Medical Research Council Dietary Guidelines⁵¹. However, with many natural fish stocks now under stress due to over-fishing this is being reviewed in the revised Australian dietary guidelines⁵². With this in mind the Australian Marine Conservation Society has produced a Sustainable Seafood Guide for consumers that provides a 'traffic light' system for 60 commonly purchased seafood species⁵³.

Organic food

The superior environmental credentials of the organic food industry are supported by many influential organizations, including the United Nations who use it as an exemplar of a more environmentally sustainable food production method⁵⁴. Further, with annual sales over \$1 billion organic food is now a viable choice for consumers in Australia⁵⁵. However, distribution is not comprehensive and higher prices make it difficult for some consumers to purchase these products.

4.2.3 Lowest priority actions

Reducing energy use and consumption of bottled water

And finally, reducing the amount of energy used in purchasing and cooking foods as well as drinking tap water, which has an environmental impact of less than 1% of bottled water⁵⁶, offer additional areas in which the sustainability of the food system could be improved.

4.3 Consumer choices

In relation to consumer's choice of different types of individual food products, there are some areas where lack of alternatives, or lack of information, make it difficult to reduce environmental impacts. For example impact 'hotspots' for a loaf of bread are: growing the wheat (land impacts) and energy use in retail and consumption (carbon emissions). While some consumers may choose to buy organic bread to reduce land impacts there is relatively little organic bread produced (though this might change in response to consumer demand). While consumers can choose to reduce energy use in the consumption phase by not freezing or toasting bread, there is little opportunity to avoid impacts of energy use in retailing in the ACT, where almost every retail outlet is air-conditioned⁵⁷. Lack of information is also an issue for some purchases: for example, retailers are not obliged to label fresh fruits and vegetables as

⁵⁰ Ryan, S. (2011). *Buying Choices for a more sustainable Canberra*. Canberra: Office of the Commissioner for Sustainability and Environment, p. 45.

⁵¹ NHMRC (2003). *Dietary guidelines for Australian adults*. Canberra: National Health and Medical Research Council.

⁵² NHMRC (2011). *Review of the Dietary Guidelines*. National Health and Medical Research Council. http://www.nhmrc.gov.au/your_health/healthy/nutrition/review.htm#mil [accessed 27 July].

⁵³ AMCS (2010). Australia's Sustainable Seafood Guide. http://www.amcs.org.au/WhatWeDo.asp?active_page_id=238 [accessed 27 July].

⁵⁴ UNEP (2008). *Planning for change: Guidelines for National Programmes on Sustainable Consumption and Production*. Rome: United Nations Environment Program.

⁵⁵ BFA (2010). *Australian Organic Market Report 2010*. Brisbane, Australia: Biological Farmers of Australia.

⁵⁶ Jungbluth, N. (2006). *Comparison of the Environmental Impact of Drinking Water versus Bottled Mineral Water* Zurich: ESU Services.

⁵⁷ Ryan, S. (2011). *Buying Choices for a more sustainable Canberra*. Canberra: Office of the Commissioner for Sustainability and Environment, p. 9.

'field grown' or 'glasshouse grown', or to state which area of Australia they are sourced from, making it difficult for consumers to take these differences into account in their choices.

However overall Ryan (2011)⁵⁸ estimates that around half of the ecological footprint of the consumer products she examined in the ACT is under the control of the consumer. This is in areas such as the shopping trip, how the product is used, and the amount that is wasted. Impacts of consumer transport are particularly significant. For example, in relation greenhouse gasses for 1kg of tomatoes, the amount emitted it is roughly the same for the car travelling 10km to and from a supermarket (assuming that nothing else is purchased at the same time) as an articulated truck travelling 5,000km (even if it is only 'averagely laden'). This report concludes that general strategies to counter the impacts of the home consumption phase include: plan ahead and shop less frequently, buying more at a time, and finally that of combining shopping with other purposes of using a car⁵⁹. This highlights the importance of the final purchasing phase in the total lifecycle impact of food purchases.

All the high priority recommendations of the UK Sustainable Development Commission report (Section 4.2) relate to areas directly under the control of the consumer, and provide a useful guide to actions that consumers can realistically take now, based on current levels of information. However the willingness of consumers to make these choices will depend on a complex range of motivational factors, and recent research investigating this is discussed in the following section.

5. Achieving change

5.1 Consumers willingness to change: an ACT perspective

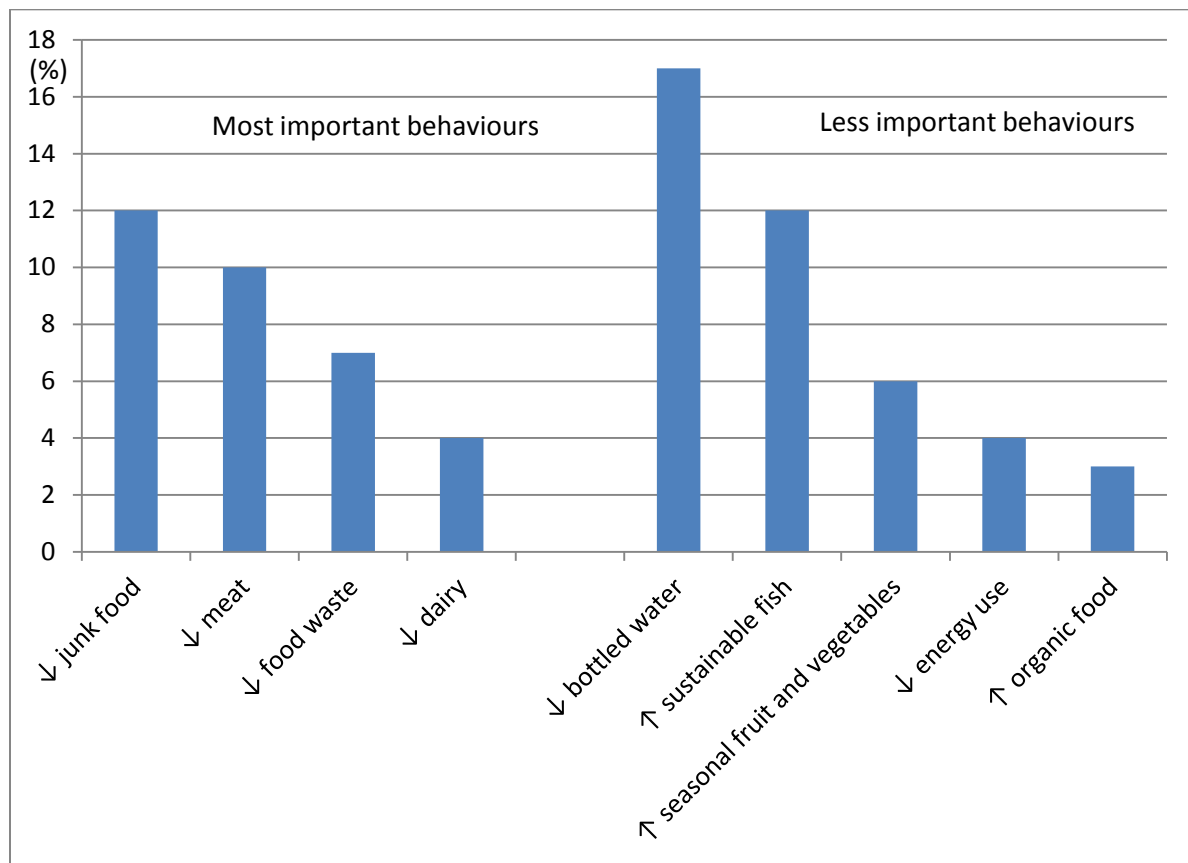
Conclusions from recent research undertaken in the ACT suggests that a significant portion of the population are already engaged in behaviours and that are contributing to reducing the environmental impact of their diet⁶⁰ (Figure 4). For example, 12 % of the consumers surveyed claim that they have reduced their consumption of junk food.

⁵⁸ *ibid*, p. 27

⁵⁹ *ibid*, p 27, p.46.

⁶⁰ Unpublished research undertaken by the author, some of which was presented as Pearson, D., Rowe, P., & Minehan, M. (2011). *Sustainable diets: What are consumers already doing and what will they do?* Oral presentation at 2nd World Social Marketing Conference, Dublin, 11-13 April.

Figure 4: Percentage of ACT consumers engaging in behaviours that support a more sustainable diet



The results in Figure 4 should be considered as indicative as they are based on a pilot study that incorporated focus group discussions followed by 163 responses from University employees living in Canberra to an online questionnaire. The questionnaire focused on the priority areas for change identified by the UK Sustainable Development Commission and asked questions about what changes consumers had made, or were willing to make, in these areas. As anticipated in a survey of household food buyers, the majority of the respondents (75%) were female and most households (73%) had children living at home. They represented all age groups and living arrangements, ranging from unrelated single adults through the various stages of having children to empty nesters. As would be expected their average levels of education (68% with Bachelors Degree) are higher than the average in the ACT (30%) and Australia (19%). In a similar manner they have relatively high levels of income. With this higher level of knowledge and purchasing power they, on average, are likely to be leaders in terms of their behaviour with respect to reducing the ecological impact of their diets. In terms of the methodology used it is important to note that the collection information was based on self reported behaviour. Hence the results are likely to be overstated as it's how consumers would like to behave rather than how they will actual behave.

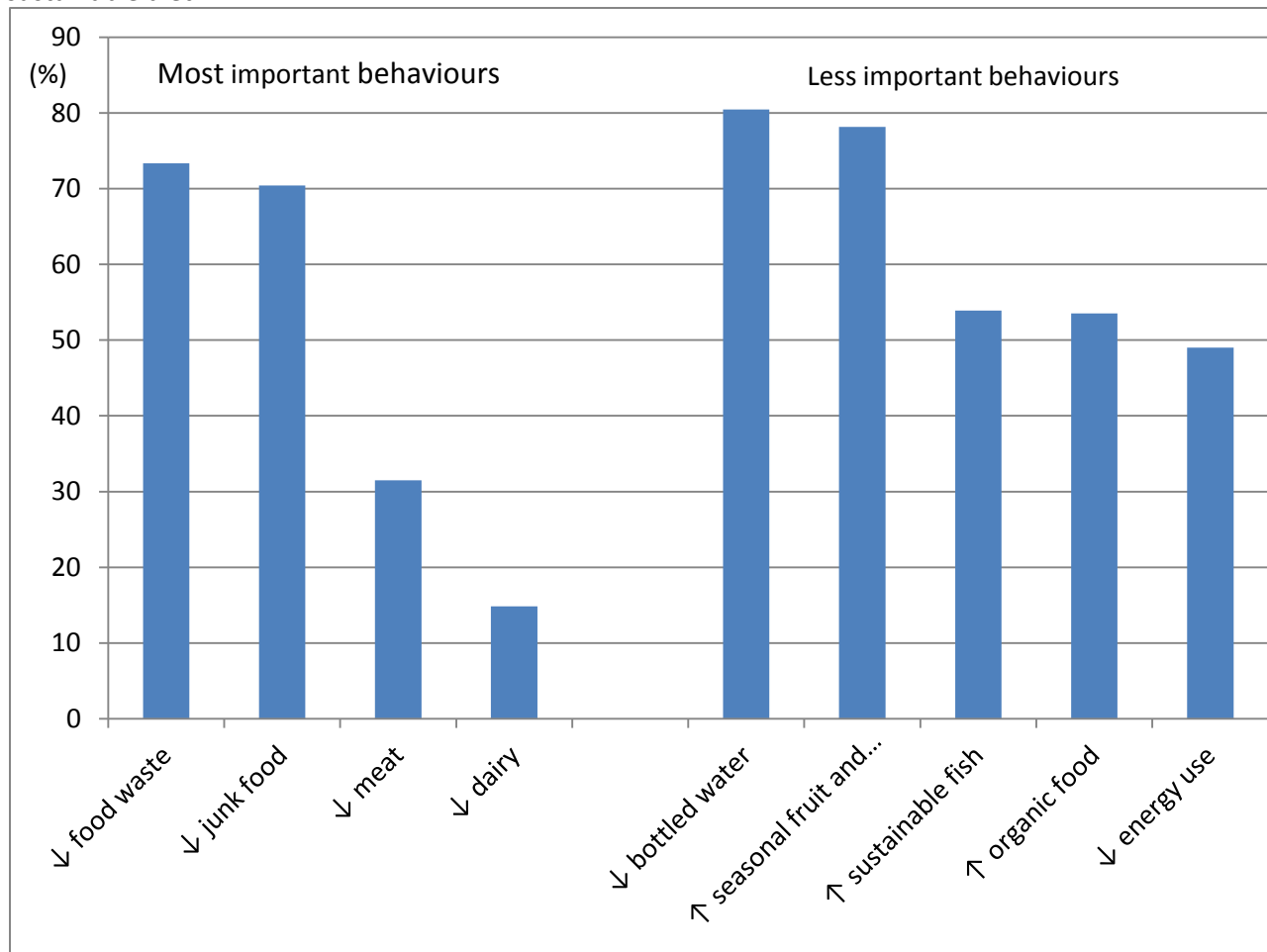
The results in Figure 4 show that in relation to the Sustainable Development Commission's identified high priority areas around 10% of food buyers have already stopped eating junk food and meat. However, it is important to note that the motivation for this may not be concern for the natural environment. Respondents cited reasons such as the impact of these behaviours on their own health as well as animal welfare concerns. This offers a good example of situations where a reduction in the ecological impact may be achieved from indirect motivations and associated actions. Although around

7% of food buyers claim that they do not waste food, within the vast majority of the population who waste food, there are the combined issues of throwing food out as well as eating more than is required. This latter issue is important as a significant portion of the survey respondents, around 30%, were classified as being overweight or obese. The range of motivations for those who have already given up eating dairy products are similar to those for meat. However, they represent a much smaller portion of the population surveyed, at around only 4%.

In relation to the lower priority behaviours almost 20% do not purchase bottled water. Over 10% of food buyers either do not purchase fish, or only purchase fish that has been sourced from sustainable sources. Just over 5% believe that they eat sufficient seasonal fruits and vegetables. Only a small portion, around 4%, have reduced the energy used to purchase, store and cook their food. And finally, around 3% feel that they are purchasing all the organic food that they can.

This research also investigated how likely these food buyers were to change their behaviour when confronted with the statement that it would improve the environmental sustainability of their diets (Figure 5). For example, over 70% of the consumers surveyed would consider reducing the amount of food waste that they generate.

Figure 5: Percentage of consumers in the ACT who would change their behaviour to support a more sustainable diet



In relation to the four most important areas (Figure 5), food buyers in around 70% of households would consider reducing their food waste and consumption of junk food. Around 30% would reduce their

purchases of meat but only 15% would reduce their consumption of dairy products. In relation to the less important areas around 80% would consider reducing their purchases of bottled water and increasing their purchases of seasonal fruits and vegetables. In contrast, around 50% would increase their purchases of organic food and sustainably sourced fish and reduce energy use. Hence the results from this research suggest that reducing food waste and consumption of junk food are priority areas for any behavioural change initiatives that aim to reduce the ecologic impact of food choices for consumers in the ACT.

5.2 Current behavioural changes initiatives

Government

Many governments have been proactive in using their purchasing power to influence the development of more sustainable food systems. This is often referred to as green public procurement of food. They may recommend specific actions to address different environmental impacts in relation to food, including how food is prepared and served, as well as which products are purchased. Examples range from the European Commission⁶¹ through to Blue Mountains City Council⁶².

The 'Healthy and Sustainable Food Choices' guideline provided by the Blue Mountains City Council their food venues now use organic eggs, flour and some regionally sourced meats. Approximately 10% of all ingredients are organic, and 10-20% of fresh produce is locally sourced. There have been minor price increases to some items sold as a result of these changes, and current challenges to further implementation of the guidelines are the cost of organic ingredients and availability of local produce⁶³. The Council also provides information on food sustainability for individual consumers as part of its online 'Sustainable Action Guide.' This includes fact sheets on 'Eat less meat' and 'Buy local and seasonal food.'⁶⁴

Byron Bay Shire Council is developing a Sustainable Food Directory that will feature local businesses and community enterprises that support sustainable food practices which they see as supplying locally-grown food, fair-trade, free-range and organic products⁶⁵.

Some governments have programs that focus on specific aspects of food sustainability. For example, the NSW Government is currently running a campaign for consumers titled 'Love food - hate waste'⁶⁶. This has been adapted from a similar program in the UK. It aims to reduce food waste by suggesting that consumers purchase appropriate amounts, eat before spoilage occurs, re-use cooked food, avoid overeating, and finally recycling any food waste by feeding it to animals or by composting. It is an example of public education through information, most of which is delivered by advertising. This is similar to the Victorian Government's 'Foodsmart' campaign⁶⁷.

⁶¹ http://ec.europa.eu/environment/gpp/pdf/toolkit/food_GPP_background_report.pdf [accessed 19/8/11]

⁶² <http://www.sustainablebluemountains.net.au/imagesDB/resources/BMCChealthysustainablefoodguide.pdf> [accessed 19/8/11]

⁶³ Coburn, J. Personal communication, 11/8/11

⁶⁴ <http://www.sustainablebluemountains.net.au/resources/sustainable-action-guide/food-and-drink/> [accessed 19/8/11].

⁶⁵ www.byron.nsw.gov.au/media-releases/2011/04/01/sustainable-food-directory-free-advertising-spaces [accessed 26 July 2011].

⁶⁶ <http://www.lovefoodhatewaste.nsw.gov.au/> [accessed 27 July 2011].

⁶⁷ <http://www.foodsmart.vic.gov.au/FoodSmartWeb/> [accessed 9 August 2011].

It is interesting to note that the Australian Government is not inclined to legislate for additional labeling on food products that would provide an indication of their environmental impact. A recent multi-departmental government review placed labeling in relation to 'consumer values,' which would include ecological sustainability, as last in a hierarchy of priorities⁶⁸. Not surprisingly human health remains the highest priority for them in relation to food labeling information for consumers .

Not-for-profit organisations

The Food For Life Partnership⁶⁹ is an example of not-for-profit organisations working together to improve the quality of food in UK schools. They provide three levels of awards for achievements that are centred around the development of leadership in food activities, its quality and provenance, education, culture, and community involvement. For the top level gold award the school must be a hub of good food culture in their community, actively involving parents and community groups in cooking and growing activities. Further, their school meals must be at least 75% freshly prepared, 50% local and 30% organic. In addition more than 70% of pupils must choose to eat school meals.

Ozharvest – Canberra⁷⁰ is an example of a not-for-profit organisation which directly reduces food waste by collecting excess perishable food from caterers, restaurants and grocers and distributing it to charities which provide food for disadvantaged people in Canberra and Sydney.

Other organisations focus on the ACT. These include Real Food Canberra who see their mission as 'redefining food for the earth and the eater' through educating 'young people about the benefits of eating sustainable (environmentally, ethically and nutritionally) food'⁷¹ and Canberra Organic Growers Society who aim to 'encourage the general public to adopt organic growing methods'⁷².

Universities

Bruce Hall, which is a residential college for students located at the Australian National University, has recently introduced food sustainability initiatives in both its catered and self-catered areas. These programs arose out of two student projects in association with the ANU Sustainability Office 'ANUgreen'⁷³. While the Hall's kitchen was already composting all food waste, the new programs have increased the proportion of local produce used from about 20% to up to 80%⁷⁴. Meat options have been reduced from two choices to one at each meal, and a vegetarian choice is now available to all students, rather than being restricted to 'special diets'. The college also uses posters and on-table flyers to promote these initiatives at functions and provides information on where to buy local produce to self-catering students. The same local produce suppliers are also used by another ANU student residence, Ursula Hall⁷⁵.

⁶⁸ COAG (2011). *Labelling logic*. Canberra: Council of Australian Governments, p. 45.

⁶⁹ <http://www.foodforlife.org.uk/> [accessed 22 July 2011].

⁷⁰ <http://www.ozharvest.org/index.asp> [accessed 9 August 2011].

⁷¹ <http://realfoodcanberra.org/> [accessed 6 September 2011].

⁷² <http://www.cogs.asn.au/> [accessed 6 September 2011].

⁷³ Shiner, A. 2009, *Bruce Hall Dining Hall Sustainability Audit: Student Factsheet*, <http://www.anu.edu.au/anugreen/index.php?pid=1211>; Christoe, S. (2010) *Sustainable Campus Dining at Bruce Hall: Student Factsheet*, unpublished.

⁷⁴ 'Local' is defined as from the Australian Capital Region, an identified aggregation of local government regions with a radius of approximately 100 km from Canberra. The proportion of local produce used in 2011 has been affected by the 2010 Queensland Floods, as local growers have had access to more lucrative markets previously supplied by Queensland growers.

⁷⁵ Wanell, D. personal communication, 17/8/11.

The Halls' Executive Chef reports that these changes have been very positive, as the local produce is of noticeably higher quality and the changing seasonal produce necessitates a more creative approach to menus. While there have been minor cost increases associated with the changes these have not been passed on to residents as there have been savings in other areas. Possible expansions of the program – for example to include organic produce – are unlikely at this time due to prohibitive costs and issues with reliability of supply⁷⁶.

A further development of this project has been the creation of a set of sustainable food guidelines for caterers⁷⁷. This was produced as a student project in association with the not-for-profit group Real Food Canberra as previously mentioned. It highlights the environmental, health and financial benefits that can result from making catering systems more sustainable. At this stage no other ANU residential colleges have adopted these guidelines⁷⁸.

The University of Canberra became a 'bottled water free' campus in early 2011⁷⁹. New water bubblers and bottle refill stations have been installed for students and staff that offer a chilled water alternative to bottled water. Previously Bundanoon in the Southern Highlands of NSW became Australia's first bottled water free town⁸⁰.

5.3 Implications for achieving change

On the basis of the preceding review of the publically available information there is evidence of numerous activities encouraging a more ecologically sustainable diet, most of which are being led by Government and Non-Government organizations, rather than industry. Further these activities are generally targeting the areas that are having the largest impact on the environment, namely the reduction of food waste, junk food and meat products.

Most of these activities are using information campaigns to provide consumers with knowledge thus allowing them to make more informed choices. As such they have the capacity to provide a gradual change in the values and attitudes held by consumers. However, consideration of more interventionist approaches that take into account and respond to the complex of issues informing individual choices (as discussed in Section 3.2), such as increasing the price of products that have a high ecological impact through increased taxation, or removing them from the marketplace as an extreme example of 'choice editing' may be justified if more rapid reductions in ecological footprint are considered necessary.

6. Conclusions

To reduce the ACT's ecological footprint in an absolute, as well as on a per capita basis, it will be necessary to address many aspects of sustainable consumption and production. Influencing values and attitudes provides one perspective for nudging individual choices towards more environmentally sustainable alternatives. However many of these choices are so deeply embedded in social and structural contexts, as well as habit, that changing these behaviours is far from straightforward.

⁷⁶ *ibid.*

⁷⁷ http://realfoodcanberra.org/wp-content/uploads/2011/01/TRANSITION-GUIDE_FINAL.pdf [accessed 22 July 2011].

⁷⁸ Christoe, S. personal communication, 2/8/11.

⁷⁹ <http://www.canberra.edu.au/monitor/2011/feb/10-bottledwater> [accessed 6 September 2011].

⁸⁰ <http://www.news.com.au/nsw-town-of-bundanoon-votes-to-ban-bottled-water/story-0-1225747578818> [accessed 25 Oct 2011]

It is vital to include consideration of food in reducing the ACT's ecological footprint. This is because it represents a significant proportion of the Territory's footprint and offers an opportunity to engage all residents by embedding changes in their daily habits. This is not to dismiss other lower impact areas where many consumers frequently exercising small impact choices for sustainability will add up to something significant⁸¹. It is recognised that diets and their associated food systems are hugely complex and that there are many areas in which environmental sustainability of food production and processing systems may be improved. However, engaging consumers in a number of interrelated behavioural changes can create an important demand led pressure on the rest of the system. For this reason it is necessary to consider actions that address food purchases, consumption and disposal.

In considering what actions governments, industry and non-government organisations may take to encourage consumers to make sustainable food choices it is important to consider the data presented in this report in terms of what changes will have the greatest impact and what changes consumers are actually willing to make. For example, although providing information about the impacts of high meat consumption is a positive step, only a modest number (around 30%) of ACT food buyers are likely to reduce their meat consumption. Thus achieving a significant behaviour change is likely to require a substantial investment. On the other hand, many more ACT food buyers (over 70%) are likely to reduce food waste and consumption of junk food. This suggests that programs such as the NSW Government's 'Love food - hate waste' have a higher chance of creating behaviour change that results in a positive ecological impact in the ACT. In addition, engaging in activities that aim to reduce consumption of junk foods will provide co-benefits of reducing the ecological footprint whilst simultaneously improving human health. Also, it is interesting to note that non-government organisations are showing visible support for these government initiatives, whilst support from industry is less visible.

Thus in conclusion, in the absence of a single solution, it would appear that a mix of interventions would be required to reduce the ecological impact of the food system in the ACT. Further research could be undertaken to identify more details of actual food consumption patterns prior to recommending priority areas for intervention. Ultimately, it is likely that significant change could be achieved when consumers are nudged through prompts and encouraged by individuals and their physical environment to make many incremental and enduring adjustments in their habits.

⁸¹ Ryan, S. (2011). *Buying Choices for a more sustainable Canberra*. Canberra: Office of the Commissioner for Sustainability and Environment, p. 46.