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Sustainable food futures: Lessons for home economics pedagogy and practice

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Abstract

The need for a common theoretical framework with regards to the use of the term 'sustainability' in connection with food is important. Its current use covers a number of different meanings, ranging through economics and food supply systems to agri-food systems. This article explores the issue of sustainability, using the five-capital-assets model (natural capital; social capital; physical capital; human/political capital; and financial capital). Using this as a tool, the impacts of food security and the global food system are audited. This analysis is taken from a paper presented at the national conference of the Home Economics Institute of Australia in 2005 and is framed by the discussions that took place in the workshops. Conclusions are drawn for home economic teachers in terms of the role they play in food advocacy. This moves beyond teaching about the food system 'as-it-is', to education concerning the background to the food system and how we, as both consumers and citizens, can act and exercise power. The model can be used to both inform teaching practice about sustainability and to frame a response at a school/community level to wider influences in the food system. Education on its own is judged not to be sufficient and the need for action at a school level is explored.

Introduction

This article is based on a keynote address and feedback from two workshops in January 2005 at the national conference of the Home Economics Institute of Australia (HEIA) in Hobart, Tasmania. It sets out a model of food sustainability and how this can be related to the two selected areas of food security/poverty and working with the food industry (the focus of two workshops at the conference). It concludes by drawing out some key points for the home economics profession.

The need for a common conceptualization and language with regards to the use of the term 'sustainability' in connection with food is important, as its use covers a number of different meanings, ranging through economics and food supply systems to agri-food systems. For example, the food industry often conceives of sustainability within a corporate social responsibility framework, environmental impacts or even fair trade (see Box 1 for an example). In practical terms, this raises a problem for practitioners teaching about health, economics and agricultural sustainability related to food. The challenge remains for us to develop a way of thinking about sustainability that combines all the various aspects and dimensions, while allowing the

Box 1. Examples of the use of the word 'sustainable' from McDonald's (2004) Corporate Social Responsibility Report

- Plans for **sustainable** development, including supply chain programs, metrics and product innovation
- Energy use efficiency and use ecologically **sustainable** renewable sources when feasible (p.12)
- Explore opportunities for encouraging actions that support **sustainable** agriculture at the farm level (p.19)
- These conditions state that in a **sustainable** society, nature is not subject to increasing:
 1. Concentrations of substances extracted from the earth's crust;
 2. Concentrations of substances produced by society;
 3. Degradation by physical means; and that, in society:
 4. People are not subject to conditions that systematically undermine their ability to meet their needs (p.30).

*Emphasis has been added, not in the original.

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strengths of individual professions to shine through.

Box 1 highlights the problems with definitions of sustainable futures. In addition, sustainability can no longer be defined in terms of just local or national boundaries, but increasingly has to adopt a world or global view. The impact that food policies have on global health and sustainability should be a feature of any policy review or impact assessment. The decisions we make in the supermarket aisles and the manner in which home economics is taught and practised in the school environment are important aspects and contributors to sustainability.

Conceptualising sustainability

Pretty *et al.* (2000) set out a model for sustainability based on ‘five-capital-assets’ (Figure 1). This draws upon work that originated in the developing world for the purposes of environmental impact assessment. This model proposes five aspects that are fundamental for welfare and economic development:

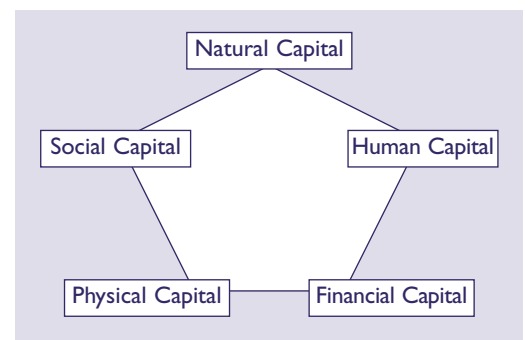
- **Natural capital (NC):** Any stock or flow of energy and matter that yields value in goods and services—natural environment, biodiversity, landscape features supported by sustainable food production or necessary for continued production of food.
- **Physical capital (PC):** Assets created by economic and food production—the local food economy infrastructure available to the local community or locally owned, such as shops, transport, warehouses etc.
- **Social capital (SC):** The value added to any activity or economic process by human relationships and co-operation—partnerships, links, networks and communication that help individuals or

organisations ensure equitable access to healthy diets.

- **Human and Political capital (HC):** Skills, training, learning and personal development needed for accessing and supporting healthy diets and sustainable food production—health gain from accessing healthy diet, influence over food policy, appropriate political frameworks and decision-making to protect and enhance healthy food production and access, food policy.
- **Financial capital (FC):** Stocks of money or other savings in liquid form, but including the physical infrastructure (shops, transport, warehouses etc.) owned and developed by the commercial sector—the amount of money circulating in the local food economy to ensure equitable access to an adequate and healthy diet.

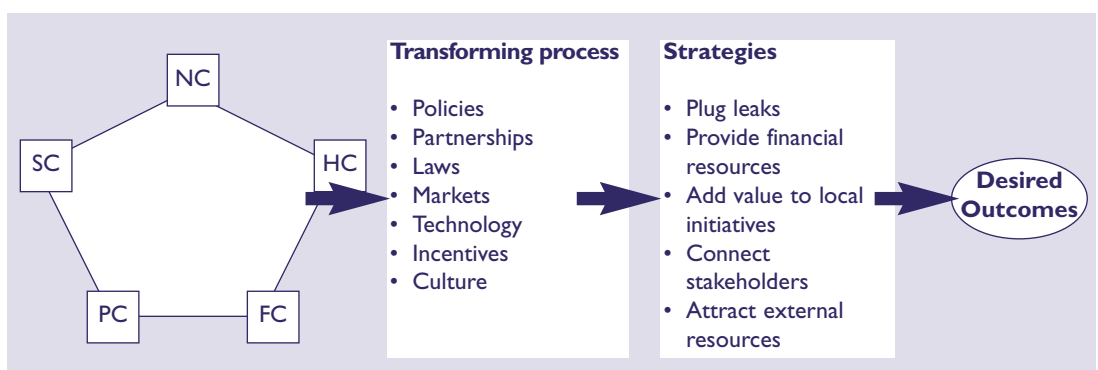
These five-capital-assets are linked as shown in Figure 1. For the remainder of the document, the abbreviations NC, PC, SC, HC and FC will be used to refer to the five capital assets as set out above.

Figure 1. The five-capital-assets model for sustainability



The interactions between the five capital assets are complex and both direct and indirect. For example, changes in financial capital such as wealth can influence human

Figure 2. The transformation of capital assets to desirable outcomes



capital such as health status, and vice versa. Equally, poor human capital can result in a decrease in wealth at both an individual and community level, and in social capital. The five capital assets combine to operate through the medium of policies and strategies as set out in Figure 2.

The two areas of food security and working with the food industry are now explored using the five-capital-assets as an analysis framework.

Food security and food policy

Understanding food security

The period following World War II (WWII) saw the establishment of both the World Health Organization (WHO) and the Food and Agriculture Organization (FAO) under the United Nations, and a policy priority was given to increasing food supply (NC & PC), with the focus on continents and nations. Since then, the term 'food security' has shifted its meaning from national or global supply of food being able to meet theoretical demand, to one where people (rather than nations) have enough resources (FC) to buy or otherwise obtain food for a healthy, active life (HC). There has been a shift from 'macro' to 'micro' perspectives in conceptualising and tackling food security (Maxwell, 1996). People and households have begun to matter in food security analysis as much as national balance sheets. The ways in which people obtain food—their livelihood security—and the priorities placed on food for different household members, have become important in the analyses of problems and priorities. Household food security is now often assessed in terms of a tiered rating system:

- food secure
- food insecure without hunger
- food insecure with hunger.

'Food insecure with hunger' can be subdivided into moderate or severe hunger. With moderate hunger, adults reduce their own food intake, often for the sake of children or other family members. Severe hunger is where the children of a household also have their food intake reduced.

By the World Food Summit in 1974, attention had shifted more towards household and individual access to food, which might be called micro-food security. Four core concepts for food security emerged:

- Sufficiency of food for an active healthy life [NC & HC]
- Access to food and entitlement to produce, purchase or exchange food [SC, PC & NC]
- Security: the balance between vulnerability, risk and insurance [SC & PC]
- Time: chronic, transitory and cyclical experiences [NC, HC & PC].

Relative poverty (and cultural norms)

The notion of relative poverty has introduced the concept that it is not just differences between countries that are important but also differences within countries (see Wilkinson, 1995 & 1996 for a discussion of this). For example, research in the UK by Tingay *et al.* (2003) showed that the Greater London area, with a population of over 7.1 million and a booming economy, has huge disparities in income and living standards. Nowhere is this disparity more apparent than in the area of food where food poverty and food security are among the problems for those on low incomes. It is apparent that the poor have problems accessing food shops, affording a healthy diet and being part of mainstream food culture and practice (Robinson, Caraher & Lang, 2001). The research by Tingay *et al.* (2003) shows that food insecurity may be a common feature of households that have incomes at the level of the UK national minimum wage or lower. In their research:

- 20% of their respondents were food insecure
- 6% were food insecure with hunger.

So even when food is available, household and individuals can be food insecure if they lack the means to access that food. Food policies aimed at healthy eating, such as fruit and vegetable schemes are not likely to succeed if people do not have access to a sustainable supply of culturally appropriate foods.

A 'new' analysis has proposed that the food revolution—particularly the hypermarket revolution of the second half of the 20th century—has created a new access problem in the developed countries' low-income populations (Riches, 1997; Lang, 1997; Reardon & Berdegue, 2002; also see all of volume 20 (4) of *Policy Development Review*, 2002 for a discussion of the impact of supermarkets in South America and

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Food policies aimed at healthy eating are not likely to succeed if people do not have access to a sustainable supply of culturally appropriate foods.
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Neven & Reardon (2004) for an example from Africa). This problem is now being exported to developing countries where large conglomerates control the majority of food spending and the food supply chain and thus introducing new problems of access.

The Irish government has introduced a new set of measures for food security (poverty)—these are set out as eating standards as opposed to nutrition standards. The measures include a measure of ‘consistent’ poverty that combines an income poverty index (households falling below a 50% or 60% relative income line) with a composite deprivation index of 8 items or indicators, three of which relate to food:

- Meal with meat, fish or chicken every second day
- A roast or its equivalent once a week
- Went without a substantial meal in last 2 weeks (National Anti-Poverty Strategy, 2000).

These indicators, however inadequately or inappropriately defined, attempt to locate food poverty within a context of food inadequacy and cultural norms, where an individual or family may be well nourished in a nutritional sense but experience deprivation through lack of access to highly valued foods, the preferred amount of food or inconsistent amounts of food. Sustainability within these terms has a new meaning, one that is cultural and social and relative to the norms within that society.

In contrast to the approach taken by the Irish government, the dominant approach to food security is more often measured by means of economic shorthand, as in financial capital terms—for example, Gross Domestic Product (GDP) or average household income.

Table 1. The old and new food poverties

The old food poverty	The new food poverty
Lack of food	Overabundance of processed food
Under-nutrition	Lack of balance in the diet
Basic food for living not affordable	Relative cost of food
Lack of access to food resulting in hunger	Entitlement as consumer—so may be socially and culturally isolated
Non-availability of food	Poor access (physical and financial) to available food
Hunger, underweight and stunting	Overweight alongside hunger
Food inequalities measured in absolute terms	Food inequalities measured in relative terms

The new food poverty/security

The new food poverty in the developed, and increasingly the developing world, is less to do with under nutrition than with imbalances (the shift from calorific inadequacy to a lack of balance in the diet). Table 1 sets out the key differences between the old and the new food poverty. What has occurred is the move from under-nutrition, as represented by insufficient calorific intake, to malnutrition represented by over-consumption of calories and nutrient deficiencies due to diets being energy dense but nutrient deficient (George, 1990).

One of the problems with the impact of food on health is that the major impacts are on chronic disease patterns and thus take longer to manifest; the spotlight often falls on the high profile cases such as contamination or food scares.

Many welfare schemes either ignore the level of income necessary to be able to afford a healthy diet or set it at minimum nutrition level and often ignore cultural preferences. Yet food is one of the goods that, as well as being necessary for physical development (HC) and the maintenance of health, also fulfils a social need. For these reasons, many countries and international organisations have welfare policies that deal with food as a social right and as a key determinant in health. Examples of this include food welfare services for vulnerable groups—for example, those living in poverty or unable to care for themselves—or school feeding systems. Entitlements to food occupy the contrasting realms of:

- citizenship (SC) where, as citizens, people and communities have a right to an adequate amount of safe wholesome food, and at the same time
- consumer rights, where the entitlement may be mediated by trade and financial rights (Sen, 1981).

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In public health and sustainability terms, the issue often becomes a tension with the food industry, which advocates an approach based on consumers and consumer rights. This brings to the fore issues between the role of the state and global organisations in promoting health through good nutrition and the selling of unhealthy foods.

Food policy

Food choice and availability are influenced not only by an individual's preference but also by policies, communities, governments (SC) and market forces (FC) (Dowler, 2000). A problem for food policy is that the many forms of food poverty/insecurity disguise its complexity. At first sight, the experience of an aboriginal family lacking food in the Northern Territory has little to do with the poverty amidst abundance encountered in Brazil or the food hardship experienced on a Scottish housing estate. An additional difficulty is that any strategic approach needs to be appropriate for intra-national as well as international food insecurity, with food poverty also existing in affluent societies (Dowler & Turner with Dobson, 2001; Köhler *et al*, 1997 as well as earlier discussion).

Case studies

The case study in Box 2 illustrates how the export of foods and the import of foodstuffs can have human impacts beyond the human capital benefits.

This case study demonstrates how fruit and vegetable initiatives such as 5-a-day, 6-a-day or even 10-a-day initiatives designed to improve the health of a population can have an impact on the food security of populations in other countries unless such initiatives embody the other aspects of fair trade and environmental sustainability (FC, SC and NC). It also underlines the importance of inter and intra-national aspects of food security. We do indeed live in a global village and our decisions about food can have wide ranging implications far beyond our ken. Impact assessments should be carried out to determine impacts on the wider issues and inequality.

This also displays the role of food as both a private good (for HC) in terms of individual consumption regulated by trade and retail, and as a public good (FC and PC) necessary for the health of the population and

mediated by concepts of public health and universal good (Lang & Caraher, 2001).

Box 2. Case study—The impacts of a national healthy eating policy on global health

Current initiatives across the developed world to increase the consumption of fruit are often measured on the basis of health impacts. There is a need to extend this to environmental and social issues. A substantial part of the increase in fruit consumption is related to an increase in fruit juice consumption. However, this is often juices from long-distant fruit, notably oranges from Brazil. A study by the Wupperthal Institute in Germany calculated that 80% of Brazilian orange production is consumed in Europe. Annual German consumption occupied 370,000 acres of Brazilian productive land, three times the land given over to fruit production in Germany. If this level of German orange juice consumption was replicated world-wide, 32 million acres would be needed just for orange production. In addition, the levels of income to the growers in Brazil are small with most of the profits going to intermediaries such as producers and retailers. In Brazil, the impact on local indigenous crops and traditional farming methods are enormous, with local crops being replaced with crops for export.

THE IMPACTS OF HEALTHY EATING INITIATIVES THUS HAVE WIDE RANGING IMPACTS.

(Source: Kranendonk & Bringezaul, 1994)

The case study in Box 3 provides an example of where United Nations agencies are using neo-liberal models to develop national food security policies.

Box 3. Case study—Food security, food development and economic policy

Food programs such as the World Food Program organised by the Food and Agricultural Organization (FAO) are moving from vertical models of delivering food to models that encourage local food production and development (Food & Agricultural Organization, 1999).

The new policy of enabling development fits well with Keynes' maxim in *National self-sufficiency* that ideas, art and culture should circulate freely across borders but that capital and goods should remain national. However, such enabling of development raises issues for food security. For example, in many sub-Saharan areas the staple diet is based on the production of maize. The problem is that maize is a cash poor crop and currently the focus is on raising the incomes of farmers by encouraging them to grow high-value crops. The tension here for food security is that such a policy leads to food becoming rivalrous in both the domains of consumption and production. Cash crops for farmers result in more money for the producer but more expensive and possibly less nutritious and less energy dense foods (for example it requires 440g of potatoes to provide the same kcal as 100g of maize). The recirculation of money may also only occur within a select elite group and have a trickle down or diverse impact. The idea is that such goods could command a cash price locally or internationally, resulting in the flow of money to buy maize on the international market. While farmers would benefit, the community in general may suffer if the international commodities market results in the price of potatoes dropping or the price of maize rising. Such a policy based on changing local food habits also runs the danger of having to overcome cultural barriers towards food.

The consequences of these moves are that those who produce cheap local food are themselves trapped in a cycle of food insecurity (HC and SC). This policy of encouraging development (FC) through growth appears to offer the benefits of creating less dependency and of encouraging both money and goods to circulate locally. This is in contrast to traditional models of food aid which were vertically-based, relying on food being bought on the world market and then brought across national borders and distributed to local distribution points. Yet both come with their problems.

School policy

Although the focus of food security is on households and individuals, the school can be a major focus for initiatives aimed at poverty alleviation:

- When we think of the developing world this is easily conceived in terms of school feeding systems that are meant to address the nutrient intake of the target audience
- In the developed world, in countries such as Australia and the United Kingdom, we need to reconfigure our ideas about food security. This may mean that instead of the idea that school food should contribute one third of total calories, as is often the case, we should move to a situation where school food policy addresses food security in terms of cultural and taste issues and consumption of a broad range of foods.

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The global food supply system is not held to account for the impacts that the system has on the environment or human or social health.”

Economic capital: The roles and responsibilities of industry

At this point-in-time, there is wide-ranging debate over the role of the food industry/global capital and how it influences food choice, food security/poverty and the global balance of trade (Deacon, Ollila, Koivusalo & Stubbs, 2003; Crister, 2003). The power of financial capital has a wide reach—it can be seen as the interface between the food system and food choice. What appears on our shelves is the result of a complex interplay of global supply, price and consumer preferences.

There is a very big question over the long and short-term sustainability of the current global food system, with aspects of the new local/regional food security and supply being examined. The current system is based on ‘false’ accounting, where the global food supply system is not held to account for the impacts that the system has on the environment or human or social health (Lang & Heasman, 2004). The World Health Organisation has challenged the global food industry over its role in promoting certain types of fats and processed foods and the impact on human

health (HC) (Fleck, 2003; WHO, 2003). The sugar lobby in the United States responded with threats to ‘scupper WHO’ by lobbying for an end to Government funding (Boseley, 2003).

The main drivers of the global food economy tend to be economic and commercial (FC and PC). The effects are widespread but often unaccounted for with disease patterns, pollution and loss of traditional cultures often the hidden or undocumented outcomes. There has been considerable change in economic rules at the regional (continental) and world level, whereas public health interventions tend only to receive modernisation when there is a crisis and often occur at the national level. Within the dominant neo-liberal economic model, health (both HC and SC) is seen as a ‘threat’ while trade (FC) is perceived as an ‘opportunity’ (Unwin *et al.*, 1998). The BSE crisis taught the European Union (EU) the need for stronger public health measures as health lacked a voice compared to trans-national trade lobbies (Commission of the European Communities, 2000). The result has been a greater emphasis on human capital/health but little additional emphasis on the overall food system that leads to such problems arising in the first place.

Food miles—a hidden cost

One of the fallouts of the global food chain is the movement of food between and within countries. The distance food travels in the United Kingdom between producer and consumer rose by 30% in 15 years at the end of the twentieth century (Paxton, 1994). This has been called the ‘food miles’ effect. The increase in food miles results in pollution, use of pesticides and packaging and a rise in hidden costs when effects are passed on to other areas. This ‘externalisation’ of costs results in damage to the environment and human health. The costs are paid through other budgets such as indirect health costs by a contribution to cardiovascular disease and food poisoning treatment (French Presidency, 2000) or environment costs such as pesticide and

Box 4. The story of the ostrich that could fly

In 1998, during the CJD/Mad Cow panic in England, British Airways replaced all their menus on their flights that contained beef. In first class, passengers could choose, among other things, Ostrich. The Ostriches came from a farm about 25 minutes drive from Murwillumbah in Northern New South Wales, Australia. Murwillumbah is about one hour drive from Coolangatta airport on the Gold Coast, the nearest airport. The bird meat went from there to Brisbane, one hour away, then to London a 15-hour flight. Then it was served to first class passengers on the London/New York Atlantic Concorde flight. Not bad for the world’s largest ‘flightless bird’.

nitrate pollution. In the European Union it is said that consumers pay three times for their food: firstly, across the counter as they buy it; secondly, as part of their contribution to subsidies of agriculture through the Common Agricultural Policy (CAP); and thirdly, in the form of cleaning up environmental pollution caused by intensive agriculture (Pretty *et al.*, 2000).

Winners and losers

The key point is that cheap food is an illusion. The costs are absorbed by someone, somewhere in the food chain whether the coffee grower in Africa who receives 9p per kilo for a product that eventually sells for £17.11 per kilo in the UK high street (see Table 2), or the loss of local diversity (NC), or the increase in food miles and pollution that the consumer eventually picks up in other areas. Policy makers tend to approach the five-capital-assets in silos rather than as aspects of a total food economy which meet and intersect at different points.

Table 2. Who makes money from coffee? Winners and losers

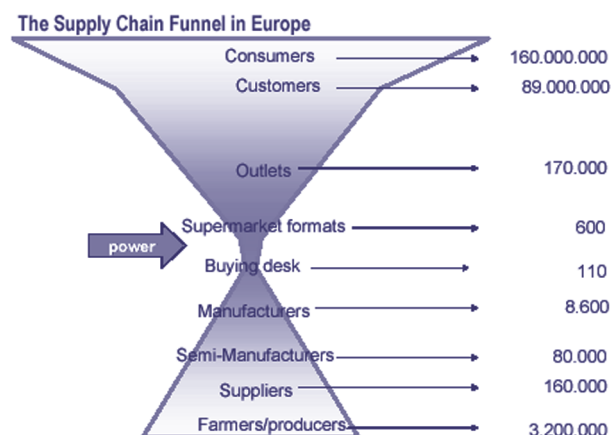
- Grower in Africa gets 9p per kilo for green coffee beans
- Exporter buys it for 17p
- Transport to port for grading etc. for 29p
- Importer in UK pays 34 p per kilo
- Roaster in Oxfordshire pays 41p (new price is £1.06, with moisture loss)
- Supermarket, having paid for processing, packaging, distribution and marketing now charge £17.11 per kilo—that is, between farm gate and shopping trolley, price goes up by 7,000%

(Source: Based on data in Pendergrast, 2001).

Concentrations of power

Figure 3 highlights the concentration of power for the majority of foods grown in Europe. This has implications for growers and the consumer with what is called the funnel effect, with this process of concentrating power being repeated globally with respect to most commodities. It results in a concentration of buying power, with fewer buying desks and fewer outlets. The buying desks of the large trans-national corporations, whether retail or fast food, do not want to be dealing with a large number of small producers. This leads to concentrations in the growing and production of food.

Figure 3. The supply chain funnel in Europe from farmers/producers to consumer



An example from Idaho in the United States, the premier potato growing state shows what can happen with such retail or restaurant power over the food system:

- In Idaho the average potato farm is 400 acres. Before selling anything the grower is half a million dollars down.
- Profit is premised on potatoes selling for \$5/hundred weight.
- Growing to specification for the fast food and major retailers leads to factory farming. Growers are reliant on one or two buyers for their produce (due to contract specification), thus leaving them vulnerable to price re-negotiations.
- In 1996 prices fell to \$1.50, influenced by cheap imports from Canada (Schlosser, 2001).

In Idaho in the past 25 years, the number of potato growers has halved while in the same period, land devoted to potato growing has grown. The results are pretty obvious—the demise of small growers, the growth of corporate farms and the demise of local communities.

In Australia, it is predicted that, driven by market forces, the number of farmers will decrease to 100,000 by 2020, with a corresponding increase in farm size by over 50% (Agra Europe, 2005). This prediction is based on a reduction by over 50% between 1961 and 2001. The minimum capital cost for a farm in Australia is A\$1.5 million, thus making it impossible for young people to enter farming, unless they take over the family farm. The same is true with concentrations in the food retail sector in Australia, with two companies accounting for 76% of all food shopping. This leads to vertical control of food growing and supply as well as dominance of shopping (Caraher & Coveney, 2004).

“The increase in food miles results in pollution, use of pesticides and packaging and a rise in hidden costs when effects are passed on to other areas.”

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The subsidy
program leads to
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growing and
production of
unhealthy
foodstuffs.
”

These market forces act in tandem with the social changes that are occurring to give large corporations power to dictate the agenda to growers and, as we saw in the previous section on food security, the demands of the global food economy and the pressure to grow crops for cash have implications for local communities. The economic reality is that small farms cannot survive in this global economy and must either amalgamate or sell out to bigger outlets or corporations. This has an impact on local communities in terms of their sustainability (HC, SC, NC and PC). In addition, as the Prevention Institute (2004) in the US points out, the links between agriculture (NC) and health (HC and SC) can be seen in the areas of:

- Over production of a range of unhealthy food products
- Use of and exposure to toxins
- Dangers to farmer and worker health and safety
- Antibiotic resistance
- Food-borne illness
- Respiratory illness and poor air quality.

The establishment of intensive agriculture in areas of the world where it is harder to measure or control the effects of such intensification can have an impact on local economies and cultures such as future degradation to the environment, as well as costs to the health care system as diet-related non-communicable diseases take a toll.

Subsidies

Such policies as outlined in the case study in Box 3, as well as being based on crops for cash (and export) are often accompanied by the removal of subsidies and support for farmers and crops (FC). The use of subsidies and its influence on global trade can be gauged from the fact that in 1999:

- In the UK £76billion was provided in support to farmers in Europe—this accounted for 49% of income per full-time farmer, which was estimated to be £11,221 per farmer.
- In New Zealand, which operates a similar scheme to Australia, the extent of support to farmers was £60million and this accounted for 2% of income or £660 per full-time farmer.
- In contrast, the situation in Poland was that the total subsidy was £2billion and this accounted for 25% of total farm

income but only £660 per full-time farmer (See Lang & Heasman 2004 for a discussion of this).

Farmers sometimes change their mix of crops in response to the removal of subsidies or because of low prices for one crop, but frequently they do not or cannot. The behaviour of Ethiopian farmers, decreasing the cropland they plant following a year of prices disastrously below their costs of production, is different from farmers in the United States, Canada, or Australia who are able to withstand a season or two of low prices. In return, the subsidies given to farmers in the developed world in areas such as the European Union and America result in the subsidisation of cheap exports to the developed world.

The relationship between the level of subsidies in the European Union Common Agricultural Subsidy Program and rises in exports is clear—the subsidisation of high-cost agricultural systems such as that in the European Union allows foodstuffs to be dumped on the world market and particularly the developing world (Lang & Heasman, 2004). Subsidised agriculture in the developed world can be seen as a form of protectionism and has influences on food security both in the country of origin and the global market where it can be argued it allows unfair trade. It both externalises the cost of ‘cheap’ food and even exports the negative health consequences. Here we see the negative impacts of FC—influencing food prices—on HC, SC and PC. In addition, subsidies may lead to increases in intensive agriculture with a subsequent impact on natural capital in terms of increased pollution.

The same argument can be made with respect to the reduction or removal of subsidies—this forces farmers to resort to more intensive farming methods with subsequent impacts on the natural environment (NC) and the health of local farming communities (HC and SC) as well as the physical and financial infrastructures (PC and FC). Australia sows the consequences of these developments.

On the other hand there are benefits, depending on how you conceive your subsidy policies.

The current restructuring of the Common Agricultural Programme (CAP) in Europe

heralds a return to its social roots where the purpose is to keep farmers and communities on the land and encourage environmental stewardship and livelihoods (FC, SC, NC and HC). In addition, there is an attempt to divert subsidies from large landowners and companies to smaller units. Such an approach recognises the importance of agriculture to society and in helping create urban/rural links (HC and SC).

In the UK/Europe and the US, the subsidy program leads to support for the growing and production of unhealthy foodstuffs, the surplus of which often finds its way onto the global market and contributes to the nutrition transition. This often results in an increase in fat and processed food in the developing world. Irz, Shankar and Srinivasan (2003) have estimated that to bring food production into line with WHO/FAO healthy eating guidelines, production of:

- Pig meat would need to be decreased by 5%
- Butter would need to be decreased by 13%
- Cream would need to be decreased by 18%
- Animal fat would need to be decreased by 31%
- Soybean oil would need to be decreased by 14%
- Rapeseed oil would need to be decreased by 30—35%.

And production of the following would need to be increased:

- Fruit production UP by 100%
- Vegetables UP by 100%
- Cereals production UP
- Nut production UP
- Fish catch and production UP (Irz, Shankar & Srinivasan, 2003).

Recognising a need to be more competitive on the international market, over the last two decades Australia has been a great advocate of neo-liberal free-market reforms. The Australian government has weaned farmers off subsidies that protect local industries, and tariffs have been gradually lifted. In this new world order, Australian farmers had to produce and export more to stay viable. We know that the share of national income in Australia from agriculture is less than 10% total GDP and its food imports are less than 10%. So, at one level, Australia is okay, with its surplus production and low level of food imports.

But the consequences are that the total amount of cropland may well stay the same or increase. The effect of this has been a 'worsening' of the global market (through oversupply) and continued environmental degradation of the land through unsustainable farming practices (Vanclay & Lawrence, 1995).

So, it is a case of damned if you do and damned if you don't. The effects have been devastating for the health and welfare of the Australian rural sector, with fewer family farms and a growth of corporate forms of agricultural production (Lawrence, Share & Campbell, 1992).

Australia is no stranger to the externalised costs of food policy. With a population of 18 million, Australia grows enough to feed 60 million people (Bawden, 1999), and food now comprises some of the country's most lucrative exports. While the externalising costs of food exports are, as usual, hidden, starkly visible are the effects of such intensified food production systems in the vast amounts of once arable land now laid barren by loss of top soil and salinity problems, and waterways and rivers polluted by toxic algal bloom produced by fertiliser run-off (Coveney, 2000; Caraher & Coveney, 2004). Tudge (2003) says of Australia and its future sustainability, that the natural capital in terms of climate and land may not be amenable to current agriculture and horticultural practices and that *'spectacular though they can be with all that rolling wheat and fruit and cattle and sheep, are precarious. The climate is too changeable for comfort as it is, but if I were an Australian I would prefer the devil I know'* (p 41).

Current policy neglects to take account of the consequences of the export of food and food systems for the receiving countries. In the UK, the importation of foodstuffs has consequences in Africa where local indigenous crops are replaced with crops for export to the capitals of Europe. These create a new dependency and leaves growers subject to the vagaries of market forces. The hidden or externalised costs are factors that are rarely factored in.

The nutrition transition

Such changes as referred to above are known as the nutrition transition; this is where changes in the diet due to high fat

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and processed foods are inherent in the emergence of new disease patterns alongside older ones, so both under- and over-nutrition exist side-by-side. This is related to developments in both global and national food economies and cultures. Obesity and Coronary Heart Disease (CHD) wreak a considerable toll in developing countries (Popkin, 2002; Shetty & Gopalan, 1998; WHO/FAO, 2003). In developing countries, obesity now exists alongside more traditional problems of under-nutrition (Pena & Bacallao, 2000). Some of these nutrition and epidemiological changes are partially due to developments in the production and manufacturing of food and not solely the consequence of individual consumer choice (Caballero & Popkin, 2002).

Sponsorship

The extent to which food marketing is undertaken in the guise of hidden marketing, or what is called relationship marketing, should be questioned and active as well as passive approaches explored and analysed. As Hawkes (2004) notes with respect to the regulation of non-traditional approaches, as opposed to TV advertising, *'sponsorship, product placement and sales promotions can be described as patchy with regard to children. Although regulations on sponsorship and sales promotions are fairly common, very few countries have regulations on these forms of marketing that are specific to children and/or food. Partly because of the embedded nature of product placement, regulations on this form of marketing are especially open to the vagaries of interpretation'* (p iv).

The following two examples, from Australia, relate to the practice of working with industry sources in the classroom:

- The National Code on Commercial Sponsorship and Promotion in School Education states that: *'sponsorships and promotions should avoid placing undue pressure on children, parents or schools to purchase particular products or services; organizations should not seek endorsement of their products or services as a condition of a sponsorship or of participation in a promotion'* (Australian Education Council, 1992).
- The Queensland Code of Practice on Commercial Activities in Schools states that *'all commercial activities must be subjected to cost-benefit and risk*

analysis. Risk management must be a major consideration of any decision to become involved in a commercial activity' (Queensland Department of Education, 1999).

While most of us accept commercially sponsored material as a stopgap, there is a serious question here as to the extent that we are colluding—working with the industry to help them develop brand awareness and future customer loyalty.

Discussion

From the two strands of food security and the food industry, it can be seen how the use of the five-capital-assets model can be used to unpack the issues and the sustainability of the endeavours questioned. This enables us to broaden the debate by extending the dimensions of sustainability and the area that a policy can impact on. Despite this, some tensions remain in the making of food policy, including:

1. The financial and natural capital aspects are absent from the policy arena and are not regulated for. This is despite the development of industrialisation of food supplies and increased corporate control. The focus is on the welfare aspects of food.
2. The global epidemic of obesity makes it imperative that some of the concepts from the 1974 World Food Summit be brought up-to-date. For example, 'sufficiency' may need to be re-conceptualised in terms of adequacy and proper diets (nutrient-dense as opposed to energy-dense diets).
3. The focus on households and communities (micro or downstream policy approaches) may divert attention from where the real power lies in terms of the food supply (macro or upstream approaches) (see McKinlay & Marceau, 2000). This means that it is important not just to see food availability and access as individual lifestyle issues but also dependent on the global economy. Developing countries, with cheap land and labour, are encouraged to grow food for the global market, resulting in the demise of local systems of agriculture (SC and NC). This can lead to a situation where food is exported when there is need locally, something that happened in the Irish Famine in the 19th

“Nutrition and epidemiological changes are partially due to developments in the production and manufacturing of food and not solely the consequence of individual consumer choice.”

century, and repeated at the height of the famine in Ethiopia in 1984/5, with green beans still being exported to UK supermarkets (Athanasίου, 1996).

The old adage *'think global, act local'* seems apt when thinking about food security. At a global level, there are many policies that have an impact on food security. The 1992 *International Conference on Nutrition* and 1996 *World Food Summit* (WHO/FAO, 1992) attempted to address food security in a more comprehensive manner, with both building upon long processes of national and regional governmental consultation. Despite this, the focus on food security is in the realms of social and human capital and, to a lesser extent, natural capital. The international focus is still on food aid to tackle under-nutrition or lack of nutrition in times of famine or war. The broader aspects of financial and natural capital remain largely untouched, certainly in terms of regulation (see Lang & Caraher, 2001; Caraher, 2003). The recent moves to address debt relief are a welcome development but need to be located alongside food security for nation states and not simply opening up of the markets.

In terms of measuring the impact of a policy related to food, there is a need to have all the indicators included in an impact measurement process. Food security provides an example of where one indicator of success—for example, human capital—on its own is unlikely to be successful. Attempts to address food security as simply a human need (hunger) are likely to fail as they do not address the issues of supply and regulation of demand (Griffiths, 2003; Kingsnorth, 2003). As an example of integration, Norway's national food and nutrition policy sets out four main goals:

1. To encourage a health-promoting diet, reducing fat consumption, especially saturated fats, and replacing them with polyunsaturated fats, whole grains and vegetables
2. To promote domestic food production and reduce food imports, increasing national self-sufficiency from 39% of total calories to 52% by 1990
3. To promote agricultural development in the country's less advantaged areas, outlying regions with due regard for preserving the environmental resource base

4. To contribute to world food security, promoting production and consumption in poor countries.

So, in Norway, food policies are related to wider environmental and social issues and have an awareness of the impact of the state on food security in other countries (World Health Organization, 2004). This approach can be copied at a school or community level. If public health is to tackle the health-promoting effects of settings and environments (Baum, 2002), then the evidence from current trends and problems in the food supply chain suggest that it is time for these to be included in any food policy and educational approaches. The relationship between mismanagement of the natural environment and human health is well documented (McMichael, 2001; Sherman & Sauer-Thompson, 1998). The less well-known and documented effects are on rural communities and those who live in deprived circumstances.

Implications for the teacher in the classroom

The above has implications for both the example set by schools and teaching in the classroom. School policies in relation to teaching and the provision of food in the school setting can be formulated to act on and influence the various aspects of sustainability. The five-capital-assets model can act as a template for sustainable food policies at a school and community level.

Setting an example

Schools could use the following as a starting point for action:

1. Advocating for and addressing food security* in whole school policies and structures such as those related to, for example:
 - The curriculum intent across the key learning areas
 - Expectations in practical foods classes
 - School canteen
 - Vending machines
 - School sporting events

*that is, food availability and accessibility for a healthy, active life, recognising the cultural aspects of different groups.
2. Advocating for and implementing the application of the five-capital-assets model to structures and policies related to the provision of food at:
 - Practical foods classes
 - School canteen

“Implications for both the example set by schools and teaching in the classroom.”

Sample school food and nutrition policy goals based on Norway's food and nutrition policy:

1. To encourage a health-promoting diet, with due regard for availability of and access to foods for a healthy, active life and recognising the cultural aspects of different groups
2. To promote local food production and reduce 'food miles' and food packaging with due regard for preserving the environmental resource base
3. To promote world food security and sustainable food futures.

- Vending machines
- School sporting events
- Hospitality functions.

3. Advocating to overcome barriers to healthy eating (see, for example, Chapman & Lupton, 1994). Apart from school-based structures and policies as outlined above, this could include:

- Working with the community and local businesses to promote healthy eating in the out-of-school environment—for example, those places students visit on the way to and from school
- Running cooking classes for students and their family members
- Addressing parent groups on issues of food advertising to students
- Developing a school policy on sponsorship by food companies.

Classroom teaching

The implications of all of this for the teacher in the classroom can be thought of in terms of the following principles for education concerning food:

1. Education about and for food should be more than short-term solutions to larger problems—for example, it must go beyond skilling the consumer to be able to make healthy choices from a range of unhealthy ones. Students should use critical thinking skills as they come to understand, for example:
 - a. What constitutes healthy choices, going beyond nutritional values—consider, for example, cultural norms and expectations, 'food miles', environmental impacts (how it was grown, packaged etc)
 - b. Why unhealthy choices are available, in whose interest is this? What is the impact of multi-national companies, unions (eg the farmers union), parents etc?
 - c. Why it is that some people do not have access to healthy foods when they are available?
2. Education concerning food must address multiple problems at the same time, including some combination of:
 - a. Availability of food for a healthy, active life, including the quality of the food
 - b. Accessibility to this food: price, physical accessibility, cultural acceptability
 - c. Impact of industry and other power brokers on the foods available and how they are promoted

- d. Relationship of food to social capital
- e. Impacts of the way foods are grown, packaged, transported and stored on the natural environment
- f. How food is costed—not only the retail cost, but costs along the chain from production to supermarket, and implications for buying locally grown foods
- g. Aspects of the global food supply, links between the developed and the developing worlds and the interdependence of each in the pursuit of global equity.

3. Education must account and tackle explicitly the deskilling involved in the global industrial food market and the increased use and promotion of pre-prepared foods, by

- a. Understanding, for example:
 - i. the disadvantages as well as advantages of pre-prepared foods (consider the food miles and packaging of pre-prepared food, impact on local growers, long term implications of who controls what we eat, nutritional value of foods, time, pleasure etc)
 - ii. the systems in one's community that make choices about the nature of pre-prepared foods that are available, and gaining a sense of being able to manoeuvre within them
- b. Developing skills in preparing a range of foods.

4. Food education must seek to deliberately take back some degree of control of food distribution from the dominant food system and re-invest distribution in community and public spaces—schools, community facilities, social housing complexes, health centres. Students and teachers could consider, for example:

- a. School community gardens
- b. Developing a policy or strategies related to access to locally grown foods.

5. Resources used in food education should be examined for both the direct and indirect messages, and should include questioning the role of food companies in marketing in the educational environment. If marketing in the classroom is accepted, then students should be able to locate the information provided in a critical framework for decision-making.

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HEIA position and values

All the above can be related to the HEIA position statement on home economics education which states that home economics education embodies the 'the dynamics of change' (HEIA, 1997, p.1). However, HEIA should consider the need for the statement to include in its examples the wider aspects of food security and the power of the food industry. All of us involved in food education should ask ourselves to what extent we focus on individual wellbeing at the expense of community and societal wellbeing. Home economics in the new millennium needs to (re)locate the concept of individual wellbeing of people in their everyday living within a global context and a sustainability agenda based on mutual global dependence not on McWorld (one global village with identikit high streets/conformity) or even on Jihad (multi-cultural/divergent agendas) agendas (Ritzer, 2000; Barber, 1995). This is similar to the position put forward by Pendergast (2001) when she advocates home economics shift its vision and practice in the post modern world to address regimes of gender and power.

That part of the HEIA position statement that highlights the importance of 'developing a society which promotes ecological sustainability' (p.1) could adopt the use of the five-capital-assets as a tool to explore those 'societal practices and structures, processes and systems which favour some groups more than others' (p.2), including perhaps those often for different reasons not talked about or hidden.

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References

- Agra Europe. (2005, March 4th). Australian farm numbers shrinking. *Agra Europe*, no 2146, p 6.
- Athanasios, T. (1996). *Slow reckoning: the ecology of a divided planet*. London: Secker and Warburg.
- Australian Education Council. (1992). *National code on commercial sponsorship and promotion in school education*. Canberra: Australian Education Council. Accessed 4 November 2004 from <http://www.curriculum.edu.au/mceetya/public/pub3311.htm>
- Barber, B. (1995). *Jihad Vs McWorld: How the planet is both falling apart and coming together and what this means for democracy*. New York: Times Books.
- Baum, F. (2002). *The New Public Health: An Australian perspective* (2nd ed.). Melbourne: Oxford University Press.
- Bawden, R. (1999). *Eating into the environment*. Paper presented at the Eating into the Future Conference, Adelaide, <http://pandora.nla.gov.au/tep/10511>
- Boseley, S. (2003, April 21st). Sugar industry threatens to scupper WHO. *The Guardian*, Monday, pp.1 & 2.
- Caballero, B. & Popkin, B. (2002). *The nutrition transition: Diet and disease in the developing world*. London: Academic Press.
- Caraher, M. (2003). Food protest and the New Activism. In: S. John & S. Thomson (Eds.), *New Activism and the corporate response* (pp. 185–205). Basingstoke: Palgrave.
- Caraher, M. & Coveney, J. (2004). Public health nutrition and food policy. *Public Health Nutrition*, 7(5), 591–598.
- Chapman, S. & Lupton D. (1994). *The fight for public health: Principles and practice of media advocacy*. London: BMJ Publishing Group.
- Commission of the European Communities. (2000). *White Paper on Food Safety*. Brussels 12 January 2000. COM(1999) 719 final. Brussels: Commission of the European Communities.
- Coveney, J. (2000). Food security and sustainability: Are we selling ourselves short? *Asia Pacific Journal of Clinical Nutrition*, 9, S97–S100.
- Crisler, G. (2003). *Fat land*. Boston: Houghton Mifflin Company.
- Deacon, B., Ollila, E., Koivusalo, M. & Stubbs, P. (2003). *Global social governance: Themes and prospects*. Helsinki, Finland: Ministry for Foreign Affairs of Finland.
- Dowler, L. (2000). The role of community food initiatives. In J. McCormick (Ed.), *Healthy Food Policy: on Scotland's menu?* Edinburgh: Scottish Council Foundation/Joseph Rowntree Foundation.
- Dowler, E., Turner S. with Dobson, B. (2001). *Poverty Bites: food, health and poor families*. London: Child Poverty Action Group.
- Fleck, F. (2003). WHO challenges food industry in report on diet and health. *British Medical Journal*, 326, 515.
- Food and Agricultural Organization. (1999). *Enabling development*. Policy Issues Agenda item no 4. Rome: FAO. Available on http://www.wfp.org/eb_public/Eb_Home.html
- French Presidency. (2000). *Working paper: Health and Human Nutrition: Elements for action*. Brussels: European Commission.
- George, S. (1990). *Ill fares the land: Essays on food, hunger and power*. Harmondsworth: Penguin Books.
- Gillies, P. (1998). Effectiveness of alliances and partnerships for health promotion. *Health Promotion International*, 3(2), 99–120.
- Griffiths, P. (2003). *The economist's tale: A consultant encounters hunger and the World Bank*. London: Zed Books.
- Hawkes, C. (2004). *Marketing food to children: The global regulatory environment*. Geneva: WHO.
- Home Economics Institute of Australia (HEIA). (1997). *Understanding home economics education*.
- Irz, X., Shankar, B. & Srinivasan, C. (2003). *Potential impact on consumption, production and trade of selected food products: Report for the International Federation of Agricultural Producers & Institute for European Food Studies*. Reading, UK: University of Reading Dept Agricultural and Food Economics.
- JP Morgan. (2003). *Food manufacturing: Obesity the big issue*. London: JP Morgan European Equity Research.
- Kingsnorth, P. (2003). *One no, many yeses: A journey to the heart of the global resistance movement*. London: Free Press.

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- Köhler, B.M., Feichtinger, E., Barlösius, E. & Dowler, E. (Eds.). (1997). *Poverty and food in Welfare Societies*. Berlin: WZB.
- Kranendonk, S. & Bringezaal, B. (1994). *Major material flows associated with orange juice consumption in Germany*. Wuppertal, Germany: Wuppertal Institute.
- Lang, T. (1997). Dividing up the cake: Food as social exclusion. In A. Walker & C. Walker (Eds.), *Britain divided: the growth of social exclusion in the 1980s and 1990s* (pp. 213–228). London: Child Poverty Action Group.
- Lang, T. & Caraher, M. (2001). International Public Health. In D. Pencheon & D. Melzer (Eds.), *Oxford Handbook of Public Health Practice* (pp. 168–176). Oxford: Oxford University Press.
- Lang, T. & Heasman, M. (2004). *Food wars: The global battle for mouths, minds and markets*. London: Earthscan.
- Lawrence, G., Share, P. & Campbell, H. (1992). The restructuring of agriculture and rural society: Evidence from Australia and New Zealand. *Journal of Australian Political Economy*, 30, 1–23.
- Maxwell, S. (1996). Food security: A post-modern perspective. *Food Policy*, 21(2), 155–170.
- McDonalds. (2004). *McDonald's Worldwide. Corporate Responsibility Report 2004*. Oak Brook, IL: McDonald's Corporation.
- McKinlay, J.B. & Marceau, L.D. (2000). Upstream health public policy: Lessons from the battle of tobacco. *International Journal of Health Services*, 30(1), 49–69.
- McMichael, T. (2001). *Human frontiers, environments and disease: Past patterns, uncertain futures*. Cambridge: Cambridge University Press.
- National Anti-Poverty Strategy. (2000). *Social inclusion strategy: Annual Report of the Inter-Departmental Policy Committee 1999/2000*. Dublin: National Anti-Poverty Strategy (NAPS).
- Neven, D. & Reardon, T. (2004). The rise of Kenyan supermarkets and the evolution of their horticulture product procurement systems. *Development Policy Review*, 22(6), 669–699.
- Paxton, A. (1994). *The Food Miles Report*. London: Sustainable Agriculture, Food and Environment (SAFE) Alliance.
- Pena, M. & Bacallao, J. (2000). *Obesity and poverty: A new public health challenge*. Washington: Pan American Health Organization.
- Pendergast, D. (2001). *Virginal mothers, groovy chicks & blokey blokes: Re-thinking home economics (and) teaching bodies*. Brisbane: Australian Academic Press.
- Pendergast, M. (2001). *Uncommon ground*. London: Texere.
- Popkin, B.M. (2002). An overview on the nutrition transition and its health implications: The Bellagio meeting. *Public Health Nutrition*, 5(1A), 93–103.
- Pretty, J., Brett, C., Hine, R.E., Mason, C.F., Morison, J.I.L., Raven, H., Raymnet, M.D. & van der Bijl G. (2000). An assessment of the total external costs of UK agriculture. *Agricultural Systems*, 65, 113–136.
- The Prevention Institute. (2004). *Cultivating common ground: Linking health and sustainable agriculture*. California: The Prevention Institute Oakland.
- Queensland Department of Education. (1999). *Code of Practice: Commercial Activities in Schools*. Brisbane: Queensland Department of Education. Accessed 4 November 2004 from <http://www.curriculum.edu.au/mceetya/public/pub3311.htm>
- Reardon, T. & Berdegue, J.A. (2002). The rapid rise of supermarkets in Latin America: Challenges and opportunities for development. *Policy Development Review*, 20(4), 371–388.
- Robinson, N., Caraher, M. & Lang, T. (2001). Access to shops; the views of low-income shoppers. *HEJ* 59(2), 121–136.
- Riches, G., (Ed). (1997). *First world hunger: Food security and welfare politics*. Basingstoke: Macmillan Press.
- Ritzer, G. (2000). *The McDonaldization of society: The Millennium Edition*. Thousand Oaks, California: Pine Forge Press, Sage.
- Sen, A. (1981). *Poverty and famines*. Oxford: Oxford University Press.
- Schlosser, E. (2001). *Fast food nation: The dark side of the all- American meal*. Boston: Houghton Mifflin Company.
- Sherman, D. & Sauer-Thompson, G. (1998). *Green or gone: Health, ecology, plagues, greed and our future*. South Australia: Wakefield Press.
- Shetty, P. & Gopalan, G. (Eds.). (1998). *Diet, nutrition and chronic disease: An Asian perspective*. London: Smith-Gordon.
- Tingay, R.S., Tan, C.J., Tan, N.C.W., Tan, S., Teoh, P.F., Wong, R. & Guilliford, M.C. (2003). Food insecurity and low income in an English inner city. *Journal of Public Health Medicine*, 25(2), 156–159.
- Tudge, C. (2003). *So shall we reap (How everyone who is liable to be born in the next ten thousand years could eat very well indeed: and why, in practice, our immediate descendants are likely to be in serious trouble.)* London: Allen Lane.
- United Nations Committee on Economic, Social and Cultural Rights. (1999). *Substantive issues arising in the implementation of the International Covenant on Economic, Social and Cultural Rights: General Comment 12: The Right to Adequate Food (article 11)*. 12/05/99 E/C.12/1999/5, 20th Session. Geneva: United Nations Economic and Social Council
- Unwin, N., Alberti, G., Aspray, T., Edwards, R., Mbanya, J.C., Sobngwi, E., Mugusi, F., Rashid, S., Setel, P. & Whiting, D. (1998). Economic globalisation and its effect on health. *British Medical Journal*, 316, 1401–1402.
- Vanclay, F. & Lawrence, G. (1995). *The environmental imperative: Ecosocial concerns for Australian agriculture*. Rockhampton: Central Queensland University Press.
- Wilkinson, R. (1995). Variations in health. *British Medical Journal*, 311, 1177–1178.
- (1996). *Unhealthy societies: The afflictions of inequality*. London: Routledge.
- World Cancer Research Fund. (1997). *Food, nutrition and the prevention of cancer*. Washington DC: World Cancer Research Fund /American Institute for Cancer Research.
- World Health Organization /Food and Agricultural Organization. (2003). *Diet, nutrition and the prevention of chronic diseases. Report of the joint WHO/FAO expert consultation. WHO Technical Report Series, No. 916 (TRS 916)*. Geneva: World Health Organization & Food and Agriculture Organisation.
- World Health Organization. (2004). *Food and health in Europe: A new basis for action. European series No 96*. Copenhagen, Denmark: WHO.
- World Health Organization /Food and Agricultural Organization. (1992). *World declaration and plan of action for nutrition. FAO/WHO International Conference on Nutrition, Rome*. Rome: Food and Agriculture Organisation.