



AGRICULTURE RESEARCH GROUP ON SUSTAINABILITY



ARGOS Research Report: Number 05/04

ISSN 1177-7796

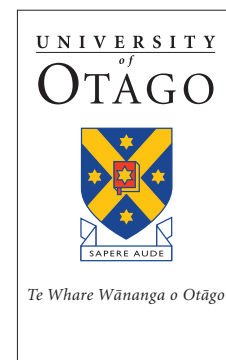
Food Markets: Trade Risks and Trends

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May 2005



Lincoln
University
Te Whare Wānaka o Aoraki



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Acknowledgements

This work was funded by the Foundation for Research, Science and Technology (Contract Number AGRB0301). ARGOS also acknowledges financial assistance from ZESPRI Innovation Company, Fonterra, Merino New Zealand Inc., COKA (Certified Organic Kiwifruit Growers Association) and in-kind support from Te Runanga O Ngāi Tahu).

The information in this report is accurate to the best of the knowledge and belief of the author(s) acting on behalf of the ARGOS Team. The author(s) has exercised all reasonable skill and care in the preparation of information in this report.

1. INTRODUCTION

The aim of this report is to address the effects on past and future primary sector returns due to trade policy, changing consumer behaviour, market access and commodity prices. The importance of providing products that consumers demand has never been clearer in New Zealand (NZ), and this requires the creation of new production systems, or at least innovation within the existing systems. As consumers increasingly express these changes in demand, the signals to producers will also change.

This paper aims to provide a background for these trends and the underlying factors which are driving them. The following section begins the report with a background to the NZ agricultural sector and the developments it has undergone in the last 50 years. International trade policy, with a particular emphasis on the policies of the European Union (EU) is then described, and the section concludes with an outline of the components of farm gate prices.

Section 3 covers eco-labelling, and discusses and describes the role of eco-labels as environmental and policy tools, as well as marketing communications. The section continues with an analysis of the market for eco-labelled products, including organic products.

The paper provides a background to the rationale of the economic research objective of the ARGOS Programme. The main focus of the economic objective in ARGOS is the relationship between agricultural markets and resource allocation in New Zealand. This includes a detailed understanding of the economics at farm level, industry level, as well as on a global trading level.

The economic objective links with the overall rationale of the ARGOS Programme, to better understand how the environmental, social and economic aspects of different farming practices will help New Zealand achieve an enduring accommodation with the New Zealand environment and continue to satisfy the demands of markets and community stakeholders.

Thus, ARGOS is very much geared towards working with industry to respond to market drivers, both in terms of long term trends and more immediate issues. This paper is the first in a series of reports providing information to stakeholders, to help them respond to market drivers.

2. INTERNATIONAL TRADE AND FOOD PRODUCTION

2.1 Background

The objective of this section is to highlight the importance of agriculture and trade to the NZ economy. This section will also highlight some of the factors which have, and continue to affect the development of the agricultural sector and its potential future prosperity.

NZ is a nation that is heavily dependent upon trade for its prosperity. Agricultural commodities have historically dominated NZ's export trade and, excluding forestry, account for between 40 and 50 per cent of exports. The success of the agricultural sector therefore is an important determinant of the economic well-being of NZ.

The contribution of the agricultural sector to NZ's prosperity is unusual among developed countries. Moreover, primary producers in NZ are unusual amongst developed countries in that they are almost totally exposed to world market forces, receive no Government subsidies and must compete with subsidised production in other countries.

2.1.1 History of NZ Agricultural Trade

NZ agriculture developed to service the United Kingdom (UK) market. This was enhanced by preferential agreements with the UK, beginning with the Ottawa agreement in 1933 and followed by bulk purchase agreements during and immediately after the Second World War where the UK agreed to take all NZ agricultural exports. It is not surprising then that around 90 per cent of exports from NZ went to the UK and its agriculture sector developed to service that market. During the late 1950s and early 1960s there were some threats to NZ imports into the UK from other competitors but the response of the UK was again to offer preferential access to NZ.

However over the 1960s it became clearer that the UK would enter the European Community (EC) and that NZ trade would be seriously affected. In response NZ did start to diversify and by the time the UK entered the EC in 1973 exports to the UK had dropped from over 90 per cent after the Second World War to under 40 per cent. However the UK was still an important market for NZ, especially for dairy and sheepmeat exports.

Therefore, when the UK joined the EC and adopted the Common Agricultural Policy (CAP) (after a transitional period of five years), the threat to NZ trade was acute. The CAP was based upon fixed support prices with barriers to entry of third country imports. The European Union (EU), then called the European Community, was established on 25 March 1957 when the Treaty of Rome was signed. The CAP was established in 1963 which effectively set internal minimum prices well above world market levels.

The importance of the UK to NZ as an export market was reflected in a report written by the Monetary and Economic Council in 1970. This report estimated that if the EU's common agricultural policy for dairy products was applied to the UK, NZ would have lost \$150 million in butter and cheese export earnings (NZ Official Yearbook, 2002). In response to the findings of this report the NZ government sought a special arrangement with the European Commission to provide continued access into Britain at negotiated prices for NZ exports of butter, cheese and sheepmeat. This agreement was called Protocol 18, under which NZ could export limited amounts of butter and cheese and later under a different regulation, sheepmeat, in return for higher prices. This led to the earning of quota rents from these exports, that is, the difference between what NZ would have been willing to supply the market at, and the higher prices it obtained on the EU market. These quota rents have gone some way to compensate for the loss in market access.

The access for NZ exports to the EU has continued to the present although it has been somewhat reduced. However it is still significant and may be under threat given EU policy and WTO trade negotiations. This is dealt with in much more detail in section 2.2.

2.1.2 Deregulation of the NZ industry

An important factor that has affected NZ agriculture is the deregulation of the industry. Prior to 1984, NZ had a relatively high degree of regulation throughout its economy. In 1984, with a change in government and a looming financial crisis, NZ undertook widespread liberalisation. This is often referred to as being ‘...faster, further and across a broader front than in any other country’ (Bale, 1998). In summary, NZ removed all financial controls, floated its exchange rate, undertook major privatisation of state enterprises, relaxed labour market controls and removed most import tariffs and regulations.

In the agricultural sector there had only been a low level of support until the mid 1970s. However, the level of agricultural support was dramatically increased during the mid 1970s in response to falling prices at the farm gate. The introduction of Supplementary Minimum Payments (SMPs), a form of deficiency payment, followed swiftly by a raft of other measures marked a rapid escalation in support levels. The other measures included: incentives for land development; concessionary livestock valuation schemes; preferential credit for farm purchase; tax concessions; and fertiliser subsidies. One of the effects of support for the agricultural sector was a continuation of the traditional forms of land use in the agricultural sector when changing market conditions may have suggested better economic options.

The advent of the Labour Government in 1984 brought a newfound faith that market forces were the best solution for finding efficient outcomes for the economy. One aspect of this philosophy was a vastly reduced role for Government in the economy. For the agricultural sector this entailed the removal of Government support. One of the effects of the deregulation has been that agricultural producers have sought to maximise the use of the available resources. In some cases this has seen a diversification of the means of production, the development of new products and an overall rationalisation of the agricultural sector. The impact of this change in NZ agriculture can be found in detail in Cagatay & Saunders (2003).

2.1.3 Changing consumer behaviour

The other factor influencing recent developments in agriculture is changing consumer behaviour. Some of these changes are introduced here but their potential future impact will be described in more detail later on. Fundamentally the proportion of consumer expenditure spent on food in the EU has fallen over the last two decades, and between 1995 to 1999 it decreased from 14.2 per cent to 12.9 per cent, with UK expenditure down to 9.1 per cent in 2003 (European Commission, 2002; National Statistics, 2005). The corresponding figures for NZ show an almost stable evolution; from 16.6 per cent in 1989, with a slight increase in the beginning of the 1990s, back to 16.5 per cent in 2003 (Statistics New Zealand, 2005).

Moreover, the proportion of this expenditure received by the farmer, has also decreased with both the rise in expenditure on ready prepared meals and catering expenditure outside the home. In NZ, 26 per cent of food expenditure is on such foods (Statistics New Zealand, 2004) and this trend is even more prominent in the EU. Thus the proportion of income spent on basic commodities has fallen, and is likely to continue to fall, as incomes rise and consumer behaviour continues to alter.

This trend is also reflected in the average ‘hands-on’ preparation time for the main meal of the day, which has reduced from 60 minutes in the 1980s to 20 minutes just 20 years later, and 56 per cent of the main-meal of the day is prepared in 10 minutes or less (Geest, 2005).

Accompanying the decline in relative income spent on food has been a change in consumer preference as to the type of food consumed. Over the course of the last century, food went from being a scarce resource to one of which there was an overabundance in the developed world. This has resulted in consumers’ preferences moving away from the nutritional aspects of food towards other attributes (Sijtsema et al, 2002). An example of this trend has been the growth of the organic movement, fuelled by consumer demand for food products that are perceived to be healthy, safe and environmentally friendly (O’Donovan and McCarthy, 2002).

This has important implications for New Zealand as will be discussed in more detail later in this report.

2.1.4 The Greening of Business

The landscape has also changed for non-agricultural businesses as a result of changing consumer preferences. Historically there has been a tendency for businesses to prioritize production costs over environmental costs in order to ensure that they remain competitive. Business opinion has, however, gravitated towards a greater concern for the environment. This has been motivated by the growth of green consumerism and higher standards set by environmental legislation (Roarty, 1997). The trend towards environmental protection is not confined to specific industries but affects business generally. A recent UK survey conducted by the Department for Environment, Food and Rural Affairs shows that environmental spending is not limited to any particular industry.

Table 1. UK Environmental Protection Expenditure by Major Industry Sectors – 2002. Values in £ million.

Chemicals and man-made fibres	Food, beverages and tobacco	Mining and quarrying	Energy production and water	Machinery and equipment
399 (16%)	492 (19%)	134 (5%)	386 (15%)	85(3%)

(Department for Environment, Food and Rural Affairs, 2005)

The nature of environmental capital spending is also being transformed with an increased focus on new or modified production facilities that incorporate environmental protection as an integrated part of the production process. This has increased 266 percent during the period 1997 – 2000 (DEFRA, 2002). In contrast, the capital spending on ‘end of pipe’ solutions has decreased by 25 percent in the same period.

Growing worldwide concern over environmental issues has driven the movement towards environmentally sensitive practices by industry. It has been claimed that it is no longer possible for industry to ignore the impact of their business activities on both society and environment, regardless of how an organisation wishes to be perceived by the public (Prothero and McDonagh, 1992). Indeed, there are numerous examples of organisations and industries that have suffered immensely as a result of continuing with what are perceived by the public to be unsustainable practices.

In contrast, there is evidence to suggest that organisations that prioritise sustainability tend to outperform those that do not. For example, the Dow Jones Sustainability Index that includes the top ten percent of sustainable organisations based on economic, environmental and social indicators has consistently outperformed the mainstream market since its inception in 1999 (Dow Jones, 2003).

Non-agricultural industries have generally been subjected to environmental legislation more than their agricultural counterpart. This has been a major driver behind the production of 'green' products.

2.1.5 NZ Agriculture

NZ's agricultural sector has diversified as a result of several factors that include the diminished access to the UK market, changing consumer behaviour worldwide and the deregulation of the NZ industry, outlined above. This has led to changes in land use, as illustrated in Table 2 (see next page). This shows that the area of pasture and arable land has fallen by 13 percent whereas the area of horticultural land has increased by 16 per cent from 1994 to 2003. The area of plantation forest has increased by 24 per cent over the same period.

The numbers and type of livestock have also changed from 1994 to 2003, as illustrated in Table 3. The largest change has been the fall in number of sheep and beef at 20 and 8 per cent respectively, with an increase in dairy cow and deer numbers by 33 and 37 per cent respectively. This may well have important implications for the environmental quality of NZ given the different environmental impacts of these livestock production systems.

The increase in horticultural area reported in Table 2 has been broken down into changes in fruit and vegetable area in Tables 4 and 5. Table 4 shows that the area of apples has dropped by nearly a quarter from 1994 to 2002, whereas kiwifruit area has remained fairly constant and the area of avocados has increased substantially, albeit from a low base.

The area of vegetables has increased with a 15 per cent increase in the area of potatoes and 16 per cent in the area of onions as shown in Table 5. The area of squash has fallen.

Table 2. Change in Land Use 1994-2003 (Hectares 000s)

Grazing, Arable, Fodder & Fallow Land			Horticultural Land			Planted Production Forest			Other Land		
1994	2003	%Change	1994	2003	%Change	1994	2003	%Change	1994	2003	%Change
13,536	11,709	-13%	104	121	16%	1,489	1,840	24%	1,479	1,767	19%

(Statistics New Zealand, 2005)

Table 3. Change in NZ Livestock Numbers 1994-2003 (000s)

Sheep			Dairy			Beef			Deer		
1994	2003	%Change	1994	2003	%Change	1994	2003	%Change	1994	2003	%Change
49,446	39,688	-20%	3,839	5,106	33%	5,048	4,644	-8%	1,231	1,689	37%

(Statistics New Zealand, 2005)

Table 4. Change in Net Area Planted in Fruit 1994-2003 (Hectares)

Apples			Kiwifruit			Avocados			Olives		
1994	2003	%Change	1994	2003	%Change	1994	2003	%Change	1994	2003	%Change
15,300	12,200	-20%	12,200	12,400	2%	1,400	3,200	129%	-*	2,700	-*

(Statistics New Zealand, 2005)

*The net area planted in olives was not included in earlier agricultural production surveys

Table 5. Change in Selected Vegetable Crops 1994-2003 (Area Harvested, Hectares 000s)

Onions			Potatoes			Squash		
1994	2003	%Change	1994	2003	%Change	1994	2003	%Change
4,900	5,700	16%	9,500	10,900	15%	7,500	6,800	-9%

(Statistics New Zealand, 2005)

The change in the area of crops and number of livestock is of course reflected in the composition of NZ exports. These are illustrated in Table 6 for 1999 to 2004. This shows the increase in exports of dairy products, again reflecting the increase in dairy cow numbers. Interestingly the greatest increase in dairy products exports, at 54 per cent, is of concentrated milk and cream, a potentially lower value product than other dairy exports.

Exports of meat have also increased in value by between 50 and 80 per cent. This may seem surprising given the fall in area and sheep and beef numbers, but reflects more targeted marketing and overseas markets trends, as well as the exchange rate. Exports of fruit and vegetables have increased by just under a third, whereas the value of exports of wool and hide-based products has fallen.

Table 6. Exports of Agricultural Commodities (NZ\$000 FOB)

	1999	2000	2001	2002	2003	2004P	% Change (1999 – 2004)
Beef, Fresh, Chilled	132,687	151,268	178,378	168,430	199,313	212,720	60%
Beef, Frozen	954,538	1,252,566	1,499,336	1,520,567	1,426,721	1,691,827	77%
Sheepmeat	1,503,730	1,698,765	2,125,829	2,286,372	2,210,834	2,242,249	49%
Milk & Cream, Concentrated	1,698,567	1,793,053	3,129,498	2,724,848	2,633,106	2,608,021	54%
Butter	990,006	923,153	1,102,593	1,051,499	944,683	959,626	-3%
Cheese & Curd	983,288	990,503	1,272,818	1,177,015	963,327	1,044,808	6%
Casein and Caseinates	762,892	805,603	1,213,324	1,020,457	830,425	705,934	-7%
Wool	950,046	928,008	1,007,240	957,576	894,402	854,916	-10%
Hides, Skin and Leather	614,154	559,250	846,232	699,539	594,472	516,544	-16%
Fruit and Vegetables	1,547,273	1,448,329	1,673,494	1,709,180	1,589,596	1,963,851	27%
Other Agriculture	-	1,215,499	1,498,838	1,960,899	1,957,372	2,394,385	-

(Ministry of Foreign Affairs and Trade, 2004)

Table 7 shows the percentage of exports by the major export markets for the main agricultural products. This shows that for fresh chilled beef, the US and Japan are NZ's main markets, both these markets however, as stated later on, have restricted entry for imports. The US is by far the most important market for frozen beef, accounting for over 50 per cent of NZ exports in 2004. The EU is the main market for NZ sheepmeat with the UK the most important, although that is declining as other EU markets increase their imports, particularly since restrictions on NZ exports of chilled lamb have been removed.

Table 7. The percentage of exports to the top three export destinations for NZ main agricultural exports. 2004 provisional data.

	Rank		
	1	2	3
Beef, Fresh, Chilled	United States *(1) 21.0%	Japan *(2) 18.2%	Taiwan *(3) 14.0%
Beef, Frozen	United States *(1) 51.2%	South Korea *(4) 12.7%	Japan *(5) 8.9%
Sheepmeat	United Kingdom *(1) 24.4%	Germany *(2) 12.8%	United States *(4) 10.7%
Milk & Cream, Concentrated	China *(2) 11.8%	Philippines *(4) 8.2%	Malaysia *(1) 8.1%
Butter	Belgium *(1) 15.8%	Denmark *(22) 14.6%	United States *(4) 9.5%
Cheese & Curd	Japan *(2) 18.2%	United States *(1) 15.1%	Australia *(3) 14.5%
Casein and Caseinates	United States *(1) 43.7%	Germany *(2) 13.0%	Japan *(3) 13.0%
Wool	China *(1) 18.0%	Australia *(2) 16.9%	United Kingdom *(3) 12.3%
Hides, Skins and Leather	Italy *(1) 35.0%	China *(3) 18.0%	South Korea *(2) 14.1%
Fruit and Vegetables	Japan*(1) 21.3%	European Union *(2) 18.9%	Australia *(3) 13.1%

* 2002 Rank where available
(Ministry of Foreign Affairs and Trade, 2004)

The destination for dairy products varies over time and by product. Destination for milk powders probably changes the most within Table 7, China being the most important market but in previous years, this was Mexico among other countries. The most important market for casein is the US and the most important markets for butter have changed from being the UK to Belgium, however given that NZ has a processing factory in Belgium this may be entrepot trade. The main markets for cheese are Japan, the US, and Australia.

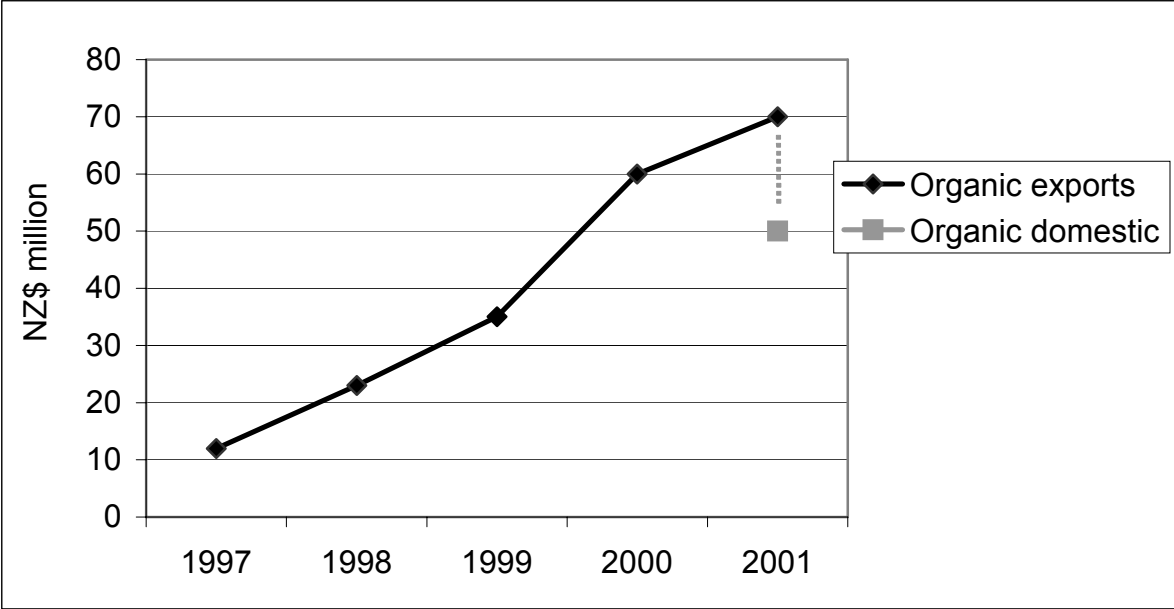
The most important market for wool is China, which is also the second most important market, following Italy, for hides, skin and leather. The most important markets for fruit and vegetables are Japan followed by the EU and then Australia.

2.1.6 Sustainable Agriculture

Another area of diversification within the agricultural sector has been a movement towards 'sustainable agriculture.' This movement has been prompted by the price premiums that environmentally friendly products can obtain in key markets, consumer concerns regarding

food safety, and philosophical support from some sectors of the farming community. A manifestation of this movement has been the development of the trade in organic commodities.

Organic exports have grown considerably from NZ\$12 m. in 1997 to NZ\$70 m. in 2001, but this is still insignificant compared to total NZ exports. In 2001, domestic sales are estimated to be between NZ\$ 50-70 m (Figure 1) (BioGro, 2004). These figures are now quite outdated but no information has been collated since.



(BioGro, 2004)

Figure 1. NZ organic exports and domestic sales.

Organic horticulture (vegetable and kiwifruit production) is relatively well established within NZ. In 2001 to 2004 approximately 3.5-3.8 percent of the yearly NZ of kiwifruit crop (number of trays) was organic (Zespri Group Limited, 2004). Organic livestock and arable farms, however are a relatively low proportion of their sectors (Ministry of Agriculture and Forestry, 2002), less than 1 per cent according to Willer & Youssefi (2004). Thus, organic raw milk production is insignificant compared to the total NZ milk production of 14,016 million litres (Fonterra Co-operative Group, 2004). In NZ in 2002 there were around 4,500 cows on organic farms, each producing 6,000 litres of organic milk, that is 27 million litres in total (not all of this is sold as organic milk though) (Mason, 2002). However, Fonterra has recently shown a commitment to expand organic milk production offering a 20 percent producer premium for organic raw milk. The retail price premium within NZ for organic dairy products is considerable – especially for organic liquid milk, with a mark-up in 2001 of 51 percent on organic liquid milk in retail stores.

The main export markets for NZ organic products are Europe and Japan, with the US and Australian markets developing quickly (Table 8). The main processors behind the export of organic produce are Heinz-Wattie NZ (WFF) and Zespri International Ltd (NZKMB) for products such as peas, potatoes, sweet corn, beans and carrots and kiwifruit.

Table 8. NZ organic exports by market and year.

Market	June 2002 (\$NZ m)	June 2001 (\$NZ m)	June 2000 (\$NZ m)	June 1999 (\$NZ m)	June 1998 (\$NZ m)	June 1997 (\$NZ m)	June 1996 (\$NZ m)

Asia	15.08	17	15.1	16.12	17.5	15.75	5.28
Europe	23.95	22	28.7	11.07	8	2.1	2.56
Nth America	8.47	12	8.02	1.3	1.4	1.5	1.63
Australia	0.85	2	2.82	1.79	1.3	0.62	0.89
Other	9.6	3	4.43	3.8	0.5	0.02	0.08

(OPENZ, 2002c)

Demand for organic products on the Japanese market increased at an annual rate of 20 per cent from the mid 1980s, and Japan is one of the important organic exports markets for NZ. Domestic Japanese organic production is small, creating opportunities for NZ organic exporters. However Japanese customers are very concerned with food safety and the origin of products, thus emphasising the importance of supply chain management.

Europe is one of NZ's traditional export markets for agricultural products in general, and has also become an important organic export market. However, development of organic farming in Europe is rapid and mainly driven by policy rather than market signals, making Europe a potential competitor of New Zealand in the organic sector.

The US is big potential organic export market. American consumers have increased their awareness of food safety and quality and thereby have an increased interest in organic products. Furthermore Australia is a large potential export market and competitor. However Australian organic production is not highly developed yet and export targeting has not been as aggressive as in NZ (Saunders, 1997a; OPENZ, 2002b; OPENZ, 2002c).

2.2 International Trade Policy and NZ Agriculture

2.2.1 International Trade Policy

As stated earlier, agriculture is the sector that has suffered the most in terms of restricted access and government intervention, especially in developed countries, which has had important implications for NZ agriculture.

After the Second World War there was considerable success in the reduction of tariffs in the international trade of manufacturing goods. This was mainly through the General Agreement on Tariffs and Trade (GATT) and a series of 'rounds' of negotiations, which succeeded in reducing tariffs. However, agriculture was effectively excluded from the reform process until the Uruguay Round in 1994. Therefore until this time, access to agricultural markets has remained restricted.

Trade restrictions include not only tariffs, but especially in the agricultural sector they also include domestic policies, such as production quotas, domestic price support and direct payments, which may or may not be coupled with production. They also include quotas and export subsidy policies, such as tariff quotas and limits on export quantities. Export subsidies are possibly the most trade-distorting support mechanism (MAF and MFAT, 2002).

The Uruguay Round 1986 – 1994 of GATT was the first round of international trade negotiations that included agriculture. Moreover, it attempted to include not just tariffs but many non-tariff barriers, which had been growing in significance in distorting the agricultural sectors in developed countries. The growth in non-tariff barriers had increasingly affected NZ's trade, particularly the existence of import quotas into developed country markets. Whilst these still exist, under the Uruguay Round they were expanded and secured, for example the NZ butter quota to the EU increased by 25 thousand

tonnes, sheepmeat quota by 25 thousand tonnes, and access to the Korean beef market to 225 thousand tonnes (Saunders and Cagatay, 2001).

The level of restrictions on agriculture is illustrated in Tables 9 and 10 which show the level of restriction using Producer Support Estimates (PSEs), a measure of trade and policy intervention in agriculture, for the main countries and commodities which affect NZ.

Table 9. Percentage Producer Support Estimates (PSEs) by OECD countries from 1986 – 2003.

	1986-1988	2001-2003	2001	2002	2003p
Australia	8	4	3	4	4
Canada	34	19	17	20	21
EU	39	35	34	35	37
Japan	61	58	59	57	58
Mexico	0	21	20	25	19
New Zealand	11	2	0	2	2
Switzerland	76	73	72	74	74
United States	25	20	23	19	18
OECD	37	31	31	31	32

(Organisation for Economic Co-operation and Development (OECD), 2004; p = provisional)

It can be seen in Table 9 that for most of the countries shown, PSEs have fallen between the periods 1986 – 1988, and 2001 – 2003. Since the reform of the agricultural sector, NZ clearly has had next to no PSE, whereas countries such as the EU, the US, and Japan still have significant support, and these also happen to be NZ's major markets.

Table 10 shows the percentages of PSEs by commodity between 1986 and 2003. All of the commodities, except Beef and Veal, have lower percentages of PSEs in 2003 than they did between 1986 and 1988. Beef and Veal do have the lowest PSE percentage of the commodities shown however, while milk retains the highest PSE at 49 per cent in 2003. The average percentage of all commodities has decreased by four percentage points over the period 1986 to 2003.

Table 10. Percentage PSEs by Commodity between 1986 and 2003 for OECD

	1986-88	2001-2003	2001	2002	2003p
Wheat	47	37	37	36	37
Milk	59	48	46	48	49
Beef and Veal	32	33	30	34	35
Sheepmeat	55	38	40	32	42
All Commodities	37	31	31	31	32

countries.

(Organisation for Economic Co-operation and Development (OECD), 2004; p = provisional)

A study prepared by MAF and MFAT (2002) estimated that the Uruguay Round Agreement could potentially benefit all NZ exporters (both agricultural and non-agricultural) by NZ\$3.1 billion over the period 1995 – 2004. That study focused on tariff reductions, tariff quota increases and export subsidy reductions, so the total gains to NZ are likely to be underestimated (MAF and MFAT, 2002).

The Uruguay Round established the WTO (World Trade Organization) to replace the GATT with a greater remit, which includes a role in Trade and the Environment. This reflects the changing attitudes around the world towards considering the wider impact of trade and its consequences. This change in attitude is reflected in changes in policy in many countries, not least the EU, and these changes are discussed in more detail for the EU and their potential impact on NZ below.

The current WTO round of negotiations was re-launched at Doha in November 2001. These negotiations covered a number of important factors, especially in relation to the reduction in export subsidies, the improving of market access, the rules for domestic subsidies as well as the technical grounds for restricting trade. The further removal / reduction in export subsidies and improving market access will not be without controversy and negotiation, however, both the EU and the US have agreed to this in principle and began the process under the last round and subsequent policy changes. The rules governing compensation payments as well as the technical barriers to trade are expected to be the most controversial areas of negotiation between the EU and the US. However, the EU/US trade pact announced in August 2003 shows willingness to negotiate despite the criticism from other countries that this pact contains little detail and may not meet demands of certain groups, notably the Cairns group (Agra Europe, 2003).

Negotiations towards achieving the objectives of trade liberalisation under the Doha Declaration of November 2001 are still underway. The final deadline for completing the negotiations under the Doha declaration was January 1st 2005; however this deadline has been postponed, without a new date being set.

The Doha Declaration builds on work already undertaken in the previous agriculture negotiations, confirms and elaborates the objectives, as well as sets a timetable. As mentioned above, member states have committed themselves to comprehensive negotiations aimed at

- Market access: substantial reductions
- Export subsidies: reductions of, with a view to phasing out, all forms of these
- Domestic support: substantial reductions for support that distorts trade (World Trade Organization, 2004).

The modalities programme aims to set targets for achieving the objectives set out in the Doha Ministerial Declaration. Members failed to achieve the 31 March 2003 deadline for these modalities, but agreed on a framework in the decision of July 2004, now officially document WT/L/579. Annex A, the “Framework for Establishing Modalities in Agriculture” outlines the key features of the modalities, without going into detail. This agreement is now the working document before the negotiators. The main features of the agreement, for the three “pillars” of the Doha Round, are described below:

Export subsidies

There were a number of proposals for dealing with export subsidies, with some countries proposing the total elimination of all forms of export subsidies, while others were prepared to negotiate further progressive reductions without total elimination. One proposal involves a 50 percent reduction as an immediate down-payment, followed by eliminating subsidies completely in three years (for developed countries) or six years (for developing countries). Another proposal is similar, but has more flexibility for developing countries. An alternative to this type of proposal has more moderate reductions in some products, balanced by steeper reductions on other products, without eliminating export subsidies.

The draft modalities decision on export subsidies, agreed on by the WTO in July 2004, is based on the proposals from different countries and proposes a elimination at two speeds: in five years (ten years for developing countries) for one set of products, and nine years (12 years for developing countries) for the remaining products (World Trade Organization, 2004).

Market Access

Since the Uruguay Round, discussion on market access has tended to focus on two main issues: the high levels of tariffs outside quotas, and the quotas themselves. The discussions in the modalities phase cover six main areas: tariffs; tariff quotas; tariff quota administration; special safeguards; importing state trading enterprises, and other issues.

Two general proposals have emerged for tariff reductions. The first is known as the “Uruguay Round approach” and would follow the formula of the UR negotiations, which used an average linear reduction over all products, allowing some variation within this, providing a minimum reduction was met. Supporters of this approach claim it is simple and flexible, while opponents doubt it would produce significant improvement in market access, and would not deal with tariff peaks and escalation.

The “Swiss formula” approach envisages a flat rate percentage reduction for all products, with additional “non-linear” reductions on higher tariffs, expanding quotas and special treatment for developing countries. This would produce much steeper cuts on higher tariffs. Critics of this approach claim it would be too ambitious, would require too much adjustment, would be too complicated and could be inequitable.

The draft modalities approach suggests a compromise between the two approaches described above. The proposal for developed countries is shown in Table 11 below:

Table 11. Developed countries: three bands of tariff rates cut over 5 years.

Tariff Rate	Average cut	Minimum cut for any product
90%+	60%	45%
15 – 90%	50%	35%
0-15 %	40%	25%

(World Trade Organization, 2004)

The revised first draft modalities on tariff quotas proposes expanding the tariff quota volumes to 10 percent of domestic consumption for developed countries over five years, with no obligation to reduce in-quota duties (with some exceptions). The draft also proposes some flexibility, in that one quarter of total tariff quota is allowed to increase to only eight percent, providing another quarter is increased to 12 percent.

Domestic Support

The Amber Box consists of those measures which are considered to distort production and trade. The revised first draft modalities on aggregate measurement of support (AMS) would be reduced from final bound levels by 60 percent over five years. Developed countries *de minimis* levels of support would be halved from five percent of agricultural production to 2.5 percent over five years.

Green Box subsidies are those which cause minimal trade distortion, and must not involve price support. They include environmental protection and regional development programmes. It was proposed that the Green Box would be maintained, with possible amendments such as adding fixed or unchanging reference periods, tightening rules on criteria for compensation that is allowed in the Green Box, and allowing compensation for increased costs of protecting animal welfare.

The Blue Box is an exemption from the general rule that all subsidies linked to production must be reduced or kept within *de minimis* levels, such as payments directly linked to animal numbers or acreage. Under the current first draft on the Blue Box, current payments would be capped and bound. They would then either be halved over five years, or merged into the Amber Box (World Trade Organization, 2004). The new agreement would cap Blue Box payments at five percent of the total value of each country's agricultural production (Agra Europe August 13, 2004).

It was agreed that overall domestic support ceilings (AMS plus Blue Box and *de minimis* subsidies, would be reduced by 20 percent in the first year of the agreement (Agra Europe August 6, 2004).

A reasonable outcome is expected for export subsidies (i.e. their elimination in the not-too-distant future). The outcome on domestic subsidies may also be reasonable, depending on the definitions and loopholes countries negotiate. However there is unlikely to be any movement on market access, which is where the greatest economic and welfare gains are to be made (Anderson & Martin, 2005).

By 2000, many OECD countries, including the EU and Japan, had moved away from focusing on market support, to focus on issues such as structural change, rural development, and environmental quality, rather than long term reductions in support measures (OECD, 2001). Support prices rose in nominal terms for some Eastern European countries, as well as Iceland, Korea, Mexico and Turkey, while Japan and Norway made decisions to lower support prices for most commodities. However, many OECD countries continued the trend of introducing agri-environment policy measures, including focusing on such factors as improving water quality and promoting organic agriculture. Food safety policy issues were introduced in recent years in a number of OECD countries, including food-labelling requirements, particularly for genetically modified food. These all have important implications for NZ exporters in terms of the quality of exported goods, but also how the good is produced. This is seen in various quality assurance schemes as illustrated in Table 20.

2.2.2 EU Trade Policy

This report focuses on the trade policies of the European Union (EU) in particular, because of the importance the EU has as a market for NZ, and as a competitor in other markets. Moreover, EU policy is important in influencing WTO negotiations.

The European Community was founded by the Treaty of Rome in 1957, with Article 39 concerned with the development of a common market and policy for agriculture which was seen as essential for the Community's formation. The specific original objectives of the Common Agricultural Policy (CAP) of the EU were to:

- increase agricultural productivity,
- ensure fair standard of living for those engaged in agriculture,
- stabilise markets,
- availability of supplies,

- quality food production at reasonable prices.

The basic system of trade policies was originally based on the fixing of target prices, that is, providing a guaranteed ideal price for producers. This provides the basis for intervention and threshold prices, which are generally set well above world market prices and often have the effect of prohibiting imports. This leads to increases in production within the country imposing the restrictions, and a disruption of world markets, particularly for traditional food exporters such as NZ (Saunders & Cagatay, 2001).

These policies, particularly in the EU, have led to a number of well-documented problems, not least the inability to meet most of the initial objectives as outlined above, as well as the rising cost of financing the support policies, the deterioration of international relations, and environmental degradation. Other negative consequences of these trade restrictions include high consumer prices, inequitable distribution and poor transmission of support to farmers. For agricultural exporting countries such as NZ, the major problems with these policies restricting trade are the distortions to the market, resulting in lower world prices and restricted access to markets.

2.2.3 Access for NZ Exports into the EU

As stated earlier in this report, the consequence for NZ of UK entry into the EC was the loss of its main export market. NZ negotiated successfully however, for some access to the UK market, under protocol 18, for butter and cheese. Initially preferential access was to the UK market alone but gradually this has been relaxed to include the entire EU. This preferential access is described in more detail below by commodity.

Butter

Figure 2 shows the maximum amount of butter imports allowed under Protocol 18 and subsequent arrangements and the actual level of butter imports from NZ into the UK. During the UK's transitional period of the CAP the import levels provided by Protocol 18 did not limit the amount of butter sent to the UK. Protocol 18 had provision for the extension of NZ's exports to the UK after the UK's five year transition period was completed.

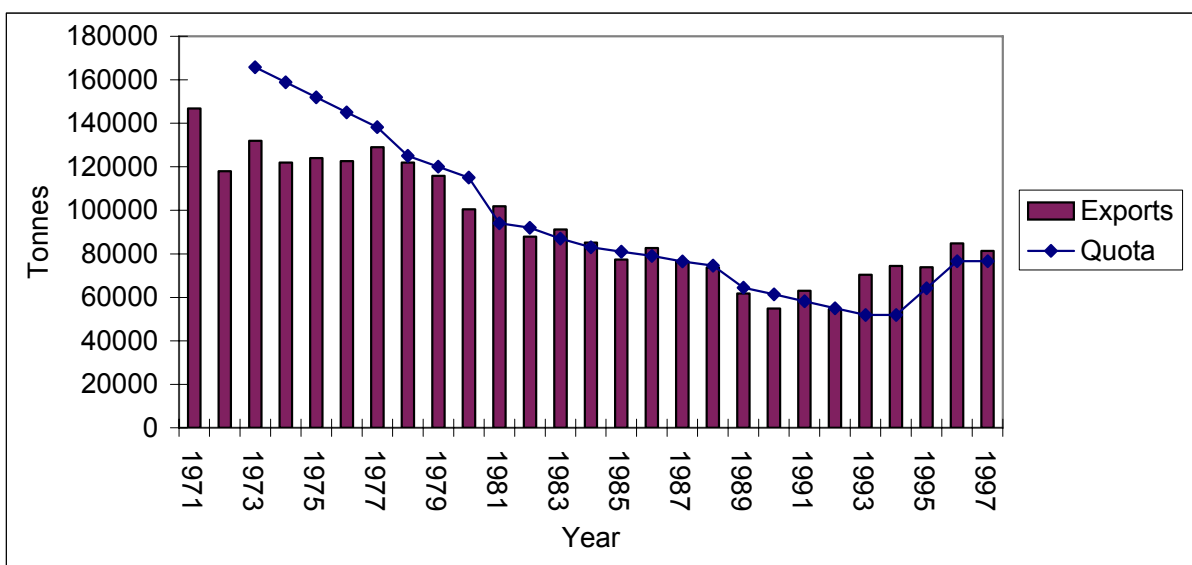


Figure 2. NZ Butter Access and Exports to the EU

NB: 1978 includes 8800 tonnes of butter claimed under 1977 levy arrangements but recorded as January 1978 shipment by customs (Dairy Facts and Figures, 2001).

Negotiations for the extension of NZ's access into the UK post 1978 culminated in 1976 with the passing of Council Regulation 1655/76 which laid down the quantities of NZ butter that the UK could import for the years 1978 to 1980. In addition, if NZ exported over 25 per cent of the UK's butter consumption, then NZ was liable to pay a levy on the residual. The minimum cost including freight (c.i.f) price paid to NZ was calculated from NZ's production costs, the cost of transporting butter to the UK, developments in world and domestic supply and demand for dairy products, and the EC prices including the intervention price (Dairy Facts and Figures, 2001).

By the beginning of 1978, the UK had completed its five year task of lifting support prices to full EC levels. In 1977 to 1980 the increase in UK prices increased UK dairy production and reduced domestic demand, resulting in a build up of butter stocks. As a consequence, NZ butter sales to the UK fluctuated in 1979 and 1980 and 19,000 tonnes of NZ butter was not sold in 1979 (Amor & Saunders, 1999). During 1980, NZ had difficulties in meeting its butter quota. As a result NZ voluntarily reduced its butter import quota by 20,000 tonnes in 1981 in return for an increase in the minimum c.i.f price to 75 per cent of the EC intervention price. This arrangement was to continue only until the end of 1983, although in 1984 the UK's authorisation to import butter from NZ was extended to 31 December, 1989.

The commission of the EC proposed that the 1984 quota should be set at 83,000 tonnes reducing by 2,000 tonnes per annum to 75,000 tonnes in 1988. The butter quota was successively reduced until the completion of the Uruguay round of GATT talks in 1994, when NZ's country specific butter access was increased to 76,667 tonnes per annum.

Cheese

Provisions for NZ to export cheese into the UK were also covered under Protocol 18. Figure 7 shows the maximum quota and the actual level of UK imports of NZ cheese. Under Protocol 18 maximum cheese quota levels were to decline from 68,580 tonnes in 1973 to 15,400 tonnes in 1977. Unlike butter, Protocol 18 did not provide for an extension for NZ to import cheese into the UK after the transitional period was up in 1978. However, at the Dublin Summit (March 1975) the European Council approved, in principle, an extension for NZ cheese imports. NZ was then successful in negotiating an agreement with the EC of an annual quota for cheese exports of 9,500 tonnes. This comprised of 6,500 of cheddar for retail and 3,000 for processing. This level of access continued until the Uruguay Round of the GATT finished in 1995, when negotiations resulted in cheese access remaining at 9,500 tonnes at a tariff of \$340/tonne.

In addition to the above the Uruguay agreement under the GATT resulted in the EU providing a most favoured nation clause (MFN) for cheese of 18,000 tonnes in 1995 rising to 104,000 tonnes in 2000, of which NZ has access to in competition with other countries. The impact of this is seen in figure 7 where actual exports to the EU are above the access arrangements.

Since 1993, the European Commission allowed NZ to export butter and cheese into the rest of the European Union. From 1996 the EU increased NZ's country specific access to 11,000 tonnes as compensation for the accession of Austria, Finland and Sweden into the EU. This increase comprises an extra 1,000 tonnes of processing cheese and an extra 500 tonnes of cheddar cheese for direct consumption.

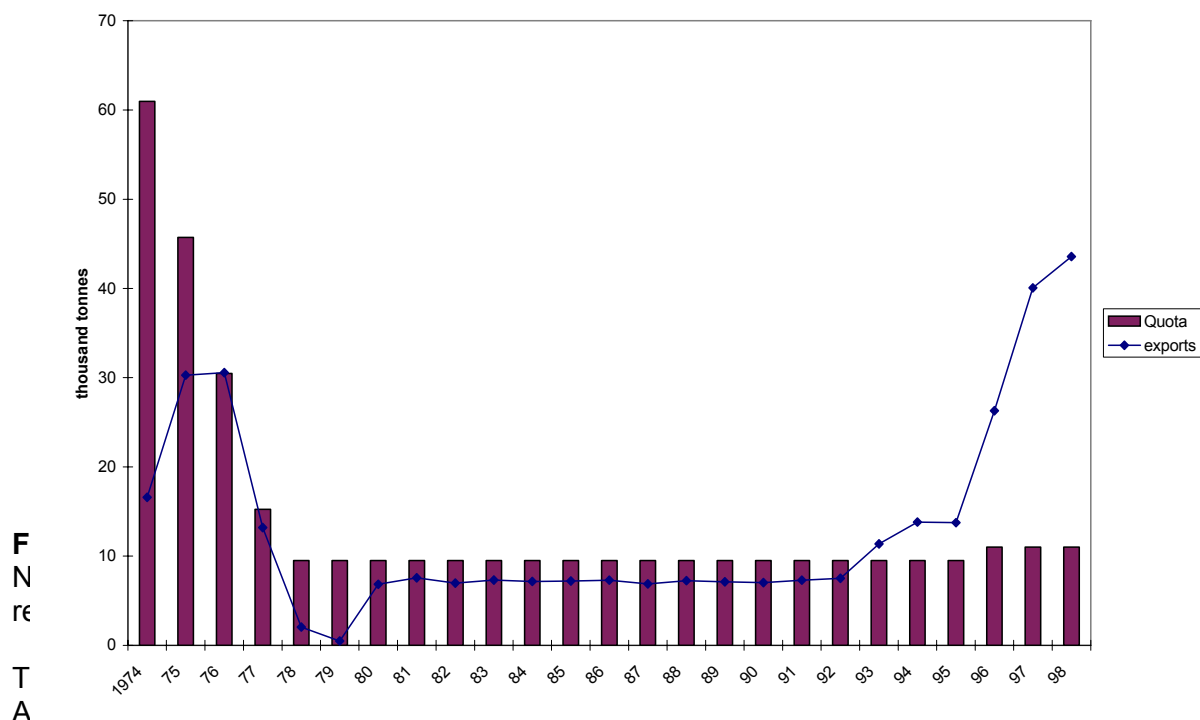


Table 12. EU Country Specific Dairy Market Access 1998-2001. Import Commitments: 'current access' quotas.

Product	Country of Origin	Quota (Tonnes)	Tariff ¹ (ECU's per 100kg)
Cheddar	NZ	7,000	17.06
	Australia	3,250	17.06
Mature Cheddar	Canada	4,000	13.75
Cheese for processing	NZ	4,000	17.06
	Australia	500	17.06
Butter	NZ	76,667	86.88

(Dairy Facts and Figures, 2001)

Sheepmeat

Sheepmeat exports to the UK/EC were not covered by Protocol 18 and therefore initially had no special arrangements. When the UK entered the EU a common external tariff (CET) of 20 per cent was to be applied to imports of sheepmeat after the transitional period, from 1973 to 1977. So from 1977 to 1980 NZ had no special access into the UK/EU. In 1980 a voluntary export restraint was introduced and NZ agreed to limit access of sheepmeat to 245,000 tonnes to the UK in return for a lowering of the CET to 10 per cent. In 1984 a sensitive market access was agreed which allowed 3500 tonnes into France which could be expanded by 10 per cent per year. In 1989 the preferential access was reduced to 205,000 tonnes in return for a zero CET. Access increased in 1994 to 205,600 when the Canary Islands entered the customs union. A quota of 6,000 tonnes was given for chilled lamb within the overall quota in 1989 and this was to be increased by 1,500 tonnes per year and reached a possible quota of 13,500 in 1994, although this was not always met. In 1993 and 1994 the agreements were rolled over awaiting the outcome of the Uruguay round of the WTO.

¹ Reduced in-quota tariff rate.

Under the Uruguay round the preferential access was increased to 225,000 tonnes rising to its current level with the last enlargement of the EU at 226,700 tonnes. There is, in theory, no limit for chilled exports from NZ to the EU, which in 2000 were 27,000 tonnes. Any imports in excess of this amount have to pay out of quota tariff of between 80 to 100 per cent, which is clearly prohibitive.

Beef

In the case of beef there is no preferential access into the EU for NZ, the exception being two hundred tonnes of high quality beef. When the UK entered the EU, NZ, as others, found their beef exports were effectively banned. The only access into the EU is a general import quota negotiated under the Uruguay agreement of 53,000 tonnes. However this is administered by EU importers who source imports. Thus NZ not only does not obtain the quota rent but in addition only generally obtains a small amount of this quota.

The EU is a net exporter of beef thus the main policy is the intervention price and surplus disposal of stocks on world markets with the aid of export subsidies. A main pressure for further reform of the beef regime is the commitment to reduce export subsidies under the Uruguay round. Under the Uruguay agreement the EU agreed to restrict its export refunds. The reduction was to be 38 per cent over 6 years based upon expenditure in 1986-90, to 817 thousand tonnes by 2000. If the EU surplus (given allowance for imports as well) is above this amount then clearly the EU internal support price is not sustainable in the medium term. Prior to recent problems in the EU this looked likely; however after the BSE and foot and mouth outbreaks with consequential mass slaughter programmes the pressure for reform may have been reduced.

2.2.4 EU Policy Reform

There have been various reforms to the CAP, on a piecemeal basis, since the 1980s. However it was not until the McSharry reforms in 1992, which reduced fixed prices to, or closer to, world market levels, and compensated producers with direct payments based upon past production patterns, that serious changes in the underlying CAP policy could be seen. These reforms also increased the amount of funds available for structural policies which included agri-environmental schemes as well as allowing member states to supplement funding for these schemes.

The impact of these reforms, and changes elsewhere in the EU, has reduced the importance of the CAP in the EU. However, the level of support given to agricultural commodities is still considerable, at 43.6 billion ecu in 2005 (Agra Europe).

The EU has also introduced measures to encourage the development and continuation of measures/policies to encourage low input (including organic) farming. These measures are specific to member states and generally relate to designated areas (Environmentally Sensitive Areas (ESA)). They were first recognised in EU policy in 1987 with regulation 760/87 and were strengthened in the 1992 reforms.

Agenda 2000 was the next major review of the CAP and was agreed on in March 1999 in Berlin. The agricultural policy reforms under Agenda 2000 were cautious and built on the McSharry reforms, with further proposed cuts in price and increases in direct payments as shown in Table 13. The most radical reform of the Agenda 2000 reforms was the removal of the objectives of agricultural policy established in the Treaty of Rome and their replacement with objectives for a rural policy.

The new objectives for rural policy under Agenda 2000 are as follows:

- increased competitiveness internally and externally,
- food safety and food quality are a fundamental obligation towards consumers,
- integration of environmental goals into the CAP,
- creation of alternative job and income opportunities for farmers and families,
- simplification of EU legislation,
- ensuring fair standard of living for the agricultural community and contributing to the stability of farm incomes.

These differ from the original objectives of agricultural policy and show the change in emphasis from the EU. They also illustrate areas that may cause tension in the next WTO round of negotiations, such as the emphasis on food quality and environmental objectives. The change in emphasis in these objectives is a radical shift as is the very existence of a rural policy. It is this that bodes well for the future reform of the CAP and finally movement away from market based support.

Table 13. EU Prices and Subsidies in the Cereal, Dairy, and Beef Regimes under the McSharry, Agenda 2000 and the Mid-Term Review Reforms.

	McSharry Reforms	Agenda 2000	Mid-Term Review
Cereal prices	119.19 ecu/t	101.31 ecu/t	95.35 ecu/t
Arable area payments	54.34 ecu/t	63 ecu/t	66 ecu/ t
Beef prices	2780 ecu/t	2224 ecu/t	
Suckler cow premium	145 ecu/head	200 ecu/head	
Special beef premium			
Bulls	135 ecu/head	210 ecu/head	
Steers	109 ecu/head	150 ecu/head	
Cattle Slaughter premium >8months		80 ecu/ head	
< 8 months old		50 ecu/head	
Dairy Intervention price – butter -SMP		2789.7 ecu/tonne 1746.9 ecu/tonne	2371.2 ecu/t 1656.6 ecu/t
Dairy cow premium		17.24 ecu	Area payment
Production Quota		Quota increase by 2.39%	3% increase

(Agra Europe)

The Agenda 2000 reforms were then followed by the Mid-Term Review of the CAP in 2002. Under the Mid-Term Review cereal and dairy prices were cut further, with a corresponding increase in direct payments, building again upon the principle of the McSharry reforms. However, the Mid-Term Review also included other changes, such as entitlement to direct payments being conditional on cross compliance, including needing to meet legislative obligations as well as good farming practice. The Mid-Term Review also strengthened policies encouraging food quality and animal welfare.

The package agreed to by the Agriculture Ministers in Luxembourg in June 2003, was an extension of the Mid-Term Review and renamed as “A long-term policy perspective for sustainable agriculture”, also known as the Fischler reform. These reforms do reinforce,

and in some cases increase, the price cuts agreed in the Mid-Term Review. Thus it is proposed to further reduce cereal, Skim Milk Powder and butter prices and there is an increase in the milk production quota of 1.5 per cent per year in 2004, 2005 and 2006.

The major part of the Fischler reforms is the introduction of a Single Farm Payment Scheme (SPS) to replace all the direct hectare and headage payments. This is predicted to involve a transfer of funds of 9 billion ecu between 2005 and 2013. Whilst the details of how this are yet to be determined, and will also vary across countries, it does potentially decouple support even further. The degree of decoupling will vary across countries, and the SFP does depend upon certain environmental, food safety, animal and plant health and welfare standards being met.

The actual implementation of the SFP is very complex, with each country choosing its own implementation. It seems that no two states will apply the same scheme and in the case of the UK, the four countries may adopt different schemes, (Swinbank, 2005). There are two main ways the SPS can vary. This first is partial decoupling to avoid desertification. Thus in France and Spain 25 per cent of payment are attached to arable aid, in Austria, Belgium, France, Portugal and Spain 100 per cent of suckler cow premiums and in Denmark, Finland, France, Greece, Spain and Portugal 50 per cent of ewe premiums paid are tied to production (Agra Europe, 2004). Secondly, the payments can be regionalised so the amount of money which the farms in a region could be entitled to can be pooled at regional level and a flat rate payment paid across all the land. Or, some combination of the two can apply, for example in England 10 per cent is to be regional rising to 100 per cent in 2012; in Northern Ireland, Sweden, Denmark and Luxembourg there will be combination of the two schemes with no transition (Agra Europe, 2004).

The impact of all these reforms, and changes elsewhere in the EU, has reduced the importance of the CAP in the EU. The CAP now only takes around 45 per cent of the EU budget, compared to 90 per cent in 1970. However, the level of taxpayer support given to agricultural commodities is still considerable at a proposed 43.613 billion ecu in 2005, with an additional 6.841 billion ecu on rural development and transitional arrangements, although the extra cost to consumers has been reduced (Agra Europe, 2003). Market support has thus fallen from 91 per cent of the total in 1986 - 88 to 61 per cent in 2000 - 02, while area/headage payments rose from 2.8 per cent in 1986-88 to 27.3 per cent in 2000 - 02, (Agra Europe, 2004).

How these changes affect and are affected by the current WTO negotiations has yet to be seen. As stated in section 2.1, the current WTO negotiations propose a ceiling on domestic support. It will be controversial whether the single farm payment is blue or green box, with the EU arguing that the change in systems shifts the payments from the blue box into the green box. However, the details have yet to be worked through. In addition, there are calls from Australia and the G-20 countries for the definition of the green box to be challenged to ensure payments are genuinely decoupled and do not encourage farmers to produce more, (Agra Europe, 2004).

Table 14. EU support levels for selected products 1986-88 and 2001/02 billion ecu.

	1986-88 base EU 12	AMS 2001/02 EU 15	Blue Box 2001/02 EU 15
Cereals	20117	3659	13648
Sugar	5266	5732	
Dairy	8145	5814	
Beef	18485	9709	5028
Sheepmeat	918		

The framework agreement between the EU and the US commits members to blue box payments of no more than 5 per cent of the value of farm production (this would restrict EU blue box payments to around 12 billion ecu). Under current proposals if the Single Farm Payment is defined as green box this should not be an issue for the EU, with the EU claiming it will transfer close to 90 per cent of blue box payments into the green box, (Agra Europe 2004). Also the agreement included a reduction in the Aggregate measure of Support (AMS) by 60 per cent over 5 years, with specific ceilings on support for specific products. Again, given the base year, this is not anticipated to be a problem for the EU, for example in 2001/2 the AMS was 39.3 billion ecu which was well under the ceiling of 63.1 billion ecu (Agra Europe, 2005). However, this will become more problematic if the commitment on framework agreement is held that product specific AMSs are capped at their respective average levels. This will certainly affect the EU sugar regime. The total budget for the CAP is to be a maximum 42.293 billion ecu in 2013 with only 3.6 billion ecu for market support (Agra Europe, 2005)

Table 15. The EU's level of support broken down into its commitment, declared and blue and green boxes. (Million ecus)

	AMS Commitment	AMS Declared	Blue Box	Green Box	Blue box as % of agricultural production
1995/6	78672	50026	20845	18779	10.1
1996/7	76369	51009	21520	22130	9.8
1997/8	74067	50194	20442	18166	9.4
1998/9	71765	46683	20503	19168	9.6
1999/0	69463	47885	19792	19930	8.5
2000/1	67159	43654	22222	21844	9.1
2001/2	67159	39281	23725	20661	9.6

(Swinbank, 2005)

The other pressure on the EU for reform is its commitments under WTO export constraints. In general these are not seen to be constraining for most commodities, with the exception of rice, sugar, wine, and fresh fruit and vegetables. The problems with sugar and rice regimes are being addressed under current reforms with proposed cuts in the sugar intervention price from 632 ecu to 421 ecu equivalent to a 50 per cent cut in MFN tariff, (Swinbank 2005). In the case of rice again a 50 per cent cut in intervention price is proposed.

It must be emphasized that EU agriculture will receive some form of assistance for the foreseeable future. The direct payments seem to be the most likely form this will take. However how these will be designed to meet green box requirements will be a matter of considerable interest.

The other main area of contention between the EU and the US are the existence of trade restrictions based upon types of production whether defined under SPS or technical barriers to trade. The former has been seen under EU bans on imports of beef produced with hormones and the EU attitude to GMOs, all belying a fundamental difference between the two blocks towards attitudes towards agriculture and food. This has been fuelled by differences in consumer attitudes towards food and science with consumers more sceptical in the EU, possibly due to the BSE debacle. The EU is also raising the importance of the multi-functionality of EU agriculture, something more important in the EU which depends upon agricultural land for its wildlife and recreation, compared to NZ and the US who have wilderness for the latter. Thus the feasibility of restricting trade due

to the method of production is likely to become a major issue. There are indications that the reasons above may be used to further restrict agricultural trade.

However under current rules, restricting trade purely on production and process methods is limited. A WTO member therefore cannot unilaterally restrict trade because of the environmental effects of its production in the exporting country. Some argue however, that this is contrary to Principle 2 of the Rio declaration which is 'to ensure that activities within their jurisdiction do not cause damage to the environment of other states or of areas beyond the limits of national jurisdiction'

US agriculture policy has also been criticised by WTO Members as being not only a demonstration of poor trade policy, going in the opposite direction to freer farm trade, but also for the negative effects it has on the direction and pace of agriculture reforms being negotiated in the WTO (MAF. 2002). The commitment of the US to continue the process of agriculture trade reform is not clear, given the direction away from market-oriented farm policy established in the Federal Agricultural Improvement and Reform (FAIR) Act of 1996. This FAIR Act made significant changes to the traditional US Farm Bill Legislation, bringing in a new system of income support (ibid).

The Farm Security and Rural Investment (FSRI) Act of 2002-2007 is the latest piece of US agricultural legislation. Critics within the US have observed that the FSRI Act is poor domestic policy that is badly targeted, with the bulk of the payments going to the large farms and corporate owners, and does nothing to help farmers make the necessary adjustments to become more competitive and market-orientated in a global economy (ibid).

Thus reform of agricultural trade policies continues to happen, albeit at a slow pace and not without issues. There is a threat to NZ that although market access may be improved in terms of the removal of tariffs and other import barriers, exports may be constrained based upon production method.

2.3 Components of Farm Gate Prices

Commodity prices are generally separated into three separate definitions of price: The "c.i.f" price (i.e. the price received in markets overseas, including the costs of insurance and freight), the "f.o.b" price (free on board - the border price before any transport costs or tariffs have been added to it), and the farm gate or schedule price, the price the producer actually receives. These prices are subject to various influences that determine their final level and the schedule price is determined to a large extent by the FOB price, which in turn is influenced greatly by the c.i.f price.

For livestock products such as beef and sheep, the farm gate price is influenced to the greatest extent by the FOB price, prices of secondary products such as hides, pelts and wool, and possibly seasonal and/or climatic influences (Wreford and Saunders 2003).

2.3.1 The Effect of Exchange Rates

The FOB price is generally determined by the international price for that commodity (e.g. the US for beef and the UK for sheep meat) and the exchange rate between the NZ dollar and the relevant currency (e.g. the US dollar for beef and the UK pound for sheep meat). Therefore exchange rates do play an important role in determining the price received at the farm gate, through the FOB price. In a recent study it was found that the coefficient on the exchange rate in explaining the FOB price of beef was -2.48 , and $-.42$ in explaining the FOB price of sheep (Wreford & Saunders 2003). Clearly, the exchange rate plays a significant role (most markedly in the beef price).

The two charts below show historical values for Beef and Sheep Schedule Prices, alongside the relative exchange rates (i.e. the US and UK respectively). It is clear that although there are other influencing factors, there is a reasonably strong negative relationship between these two variables. As the exchange rate increases, the prices generally fall, although this may have a lagged effect.

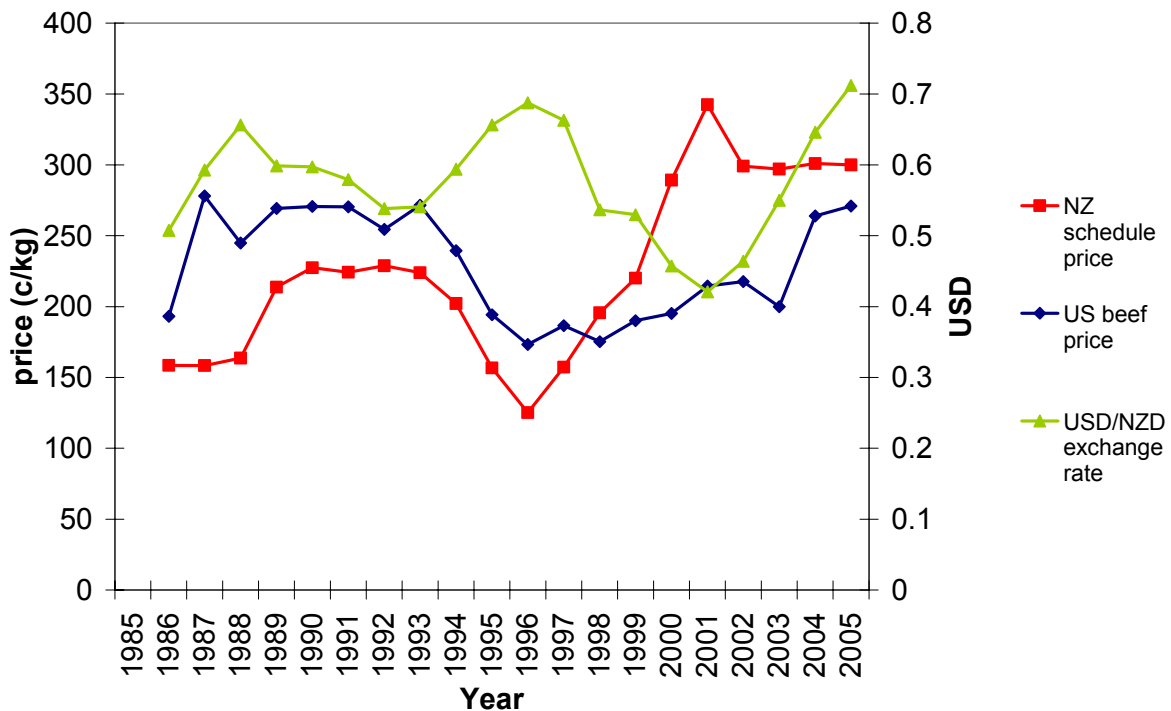


Figure 4. Beef Schedule Price against Exchange Rate.

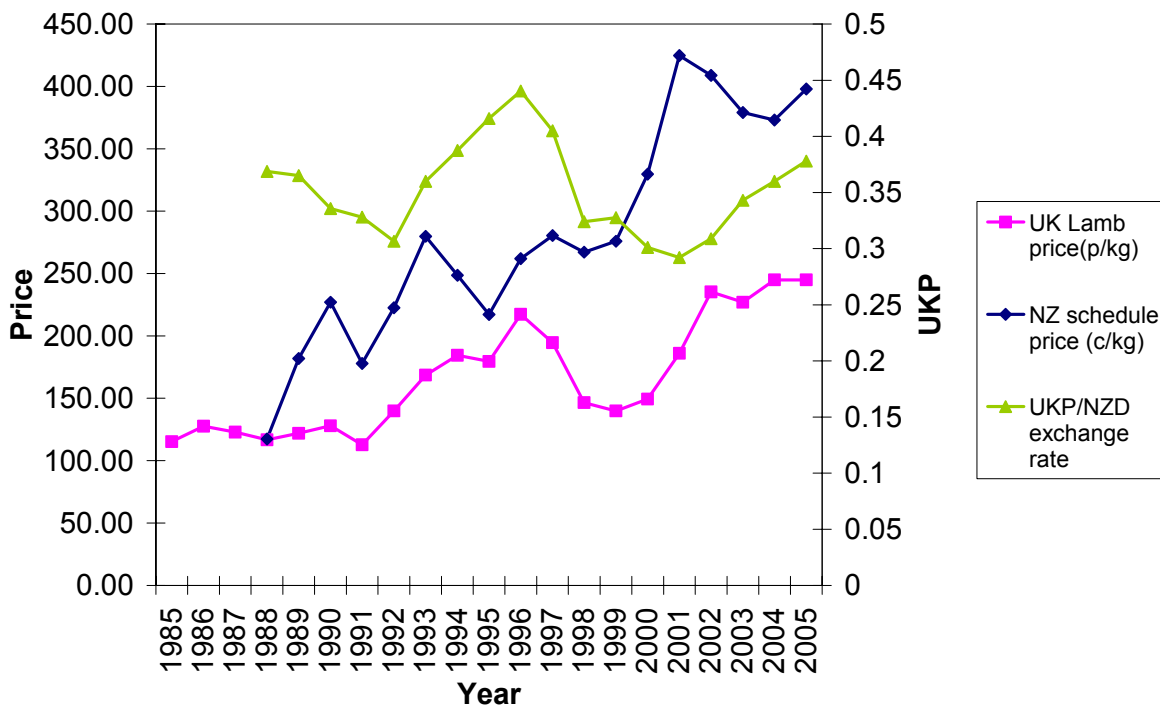


Figure 5. Sheep Schedule Price against UK Exchange Rate.

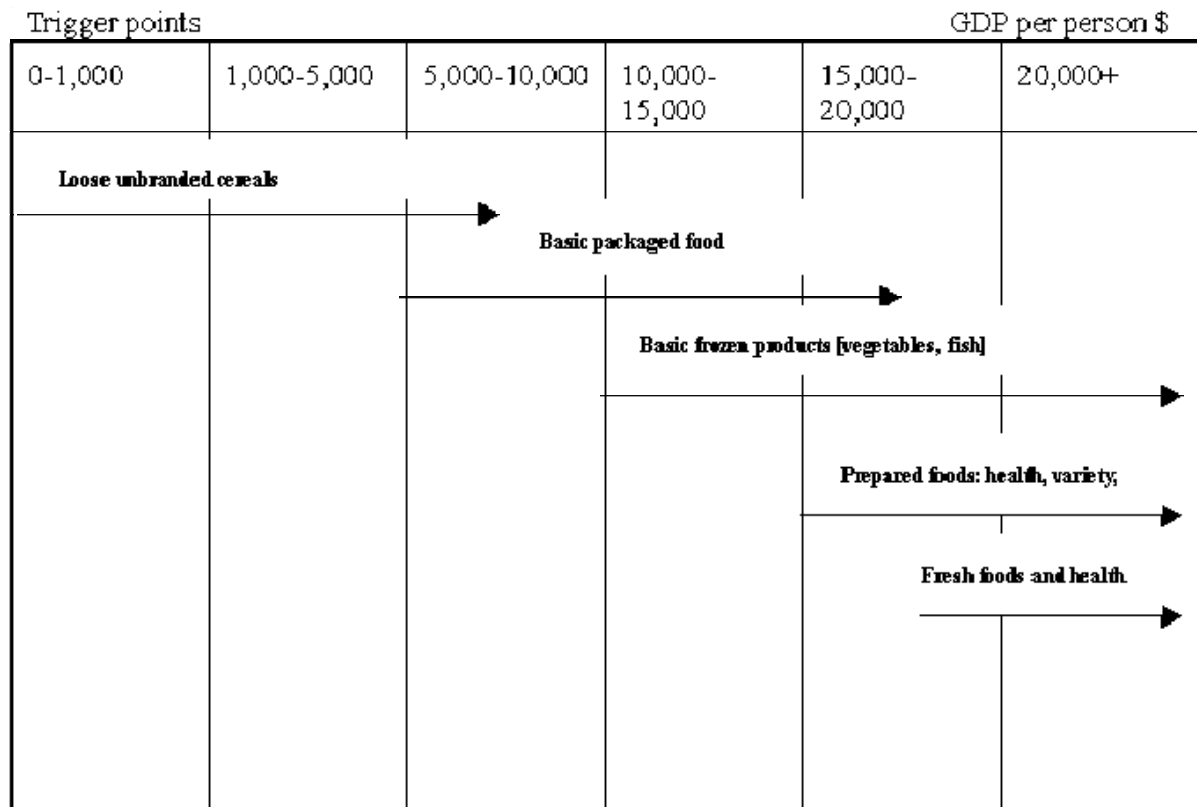
3. TRENDS IN FOOD CONSUMPTION

This section reviews in more detail earlier analysis of changes in food consumption. Clearly this is of vital importance to NZ given the importance of food exports for NZ's trade.

The change in income, which illustrates changes in consumer expenditure, can be used to further predict medium to long-term changes in the market using the concept of income elasticity of demand. This shows how consumption changes relative to changes in income, known as Engel's law (Samuelson and Nordhaus 1995).

The economic theory of income elasticity suggests that there will be a change in quantity demanded of a product as incomes change (Varian, 1996). High-income elasticity tends to be a characteristic of luxury items. That is the demand for luxury goods increases as incomes increase.

In developed country markets the income elasticity of demand for basic food commodities is either negative or very low, thus indicating that as income rises we actually spend either less in total, or at best very little more, on basic food commodities (Figure 6 & 7), thus partly explaining NZ's relatively poor economic performance in comparison with other OECD countries. However, there are ways by which NZ could target exports of those products for which there is a high-income elasticity of demand.



Source: Unilever; cited in Steenkamp, 1996

Figure 6

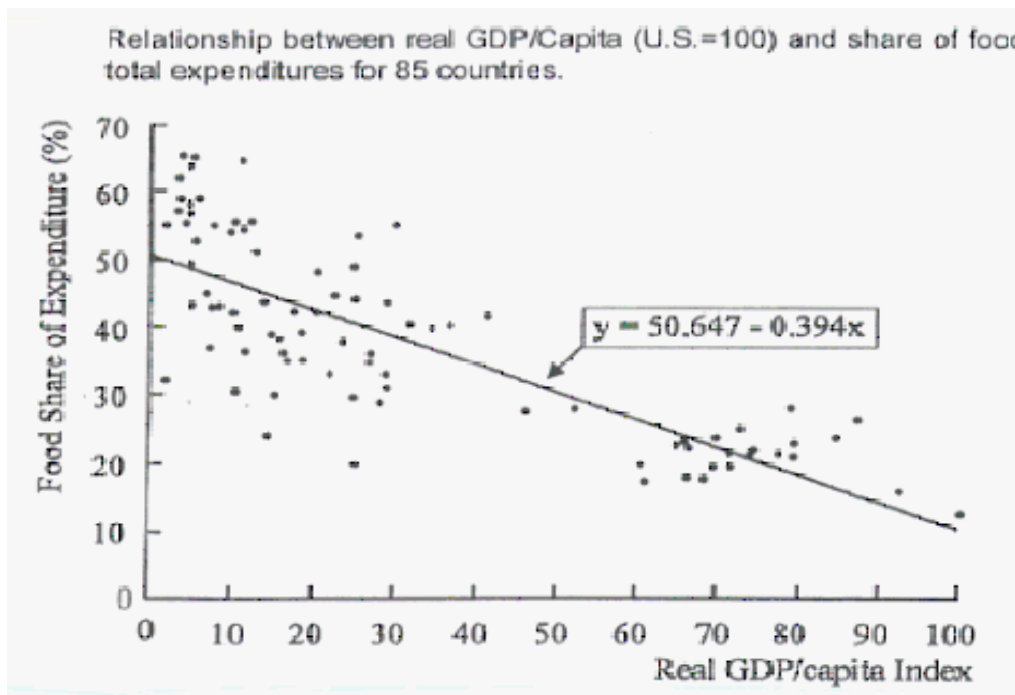


Figure 7. Relationship between real GDP/capita and food total expenditure (Steenkamp, 1996)

It has been argued that consumers do not value products *per se* but the attributes or characteristics of a product (Lancaster, 1971, p.7). Each product should be considered as comprising several different attributes that provide utility rather than considering the product as a single entity (Griffiths & Wall, 1996).

Lancaster theory posits that consumers do not choose a product simply on the basis of price comparison. They also factor in the perceived benefits to themselves that are derived from the purchase (consumption) of different product attributes (Dalglish, 2003). In this manner, an apple will vary from other varieties of apple not only in terms of core product attributes such as taste and quality, but also in terms of the additional benefits that are claimed for the product. Thus an apple may also possess attributes such as greenness, sustainability, status and safety. In this sense consumption can be seen as an activity that extracts characteristics from goods (Gravelle & Rees, 1992).

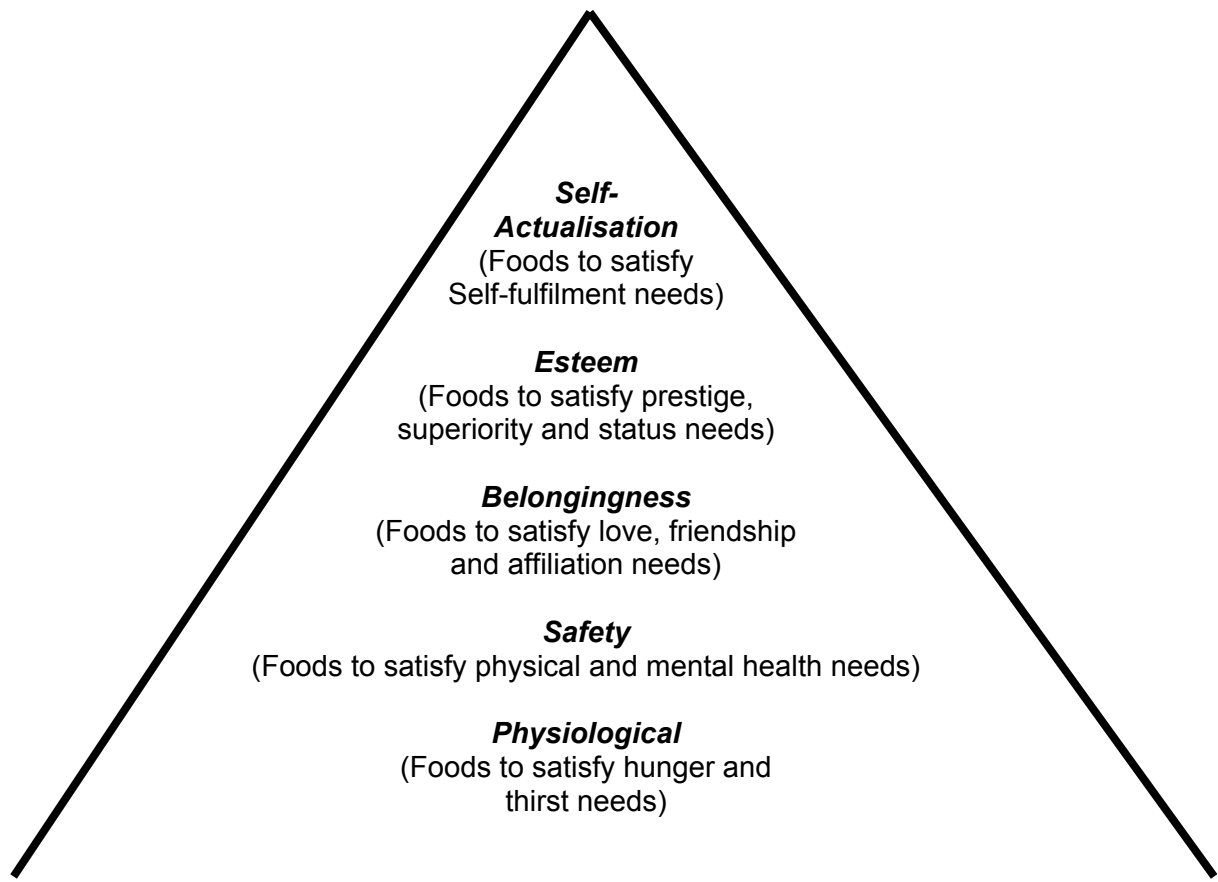
The income elasticity for attributes of food, which stress quality, especially in terms of food safety, and environmental factors, have high and even greater than unitary income elasticity, indicating that as we get richer we are actually willing to spend more on commodities with these attributes. Therefore if NZ wishes to continue to target the developed countries high value markets it is important to give attention to the attributes of food these markets demand.

Table 16. Attributes as Income Elasticities of Demand

Calories	Close to Zero; negative for many
Fat and Cholesterol	Low; strongly negative for many, (low fat: 42%)
Nutritional / Health Value	Positive; high for many (69%)
Food safety	High
Greenness and Sustainability	High; especially for some
Natural	High for some
Taste	Very high for practically everyone (97%)
Experience	High; especially for some
Status and Prestige	High; especially for some
Value (quality / price)	Desired even at high incomes (cost/price: 74%)

(Saunders & Mayrhofer, 2003)

This implies that whilst agricultural commodities may have a certain value to the consumer, due to their taste or nutritional value, their value might be increased if they can be shown to have additional attributes. This is particularly true of developed countries with their high comparative incomes. The characteristic of environmental friendliness is often perceived to be a luxury. That is, it is not satisfying the basic physiological need of sustenance. As income increases, the consumption of food can be motivated by reasons other than hunger. Maslow's hierarchy of needs pyramid has been applied to food consumption as illustrated in Figure 8.



Adapted from Senauer (2001).

Figure 8. Maslow's Hierarchy of Needs for Food as a Source of Satisfaction

The suggestion is that individuals with limited incomes will seek to satisfy the basic physiological needs for food. More affluent individuals may seek to satisfy higher order needs in their food consumption (Dalglish, 2003). Thus an individual motivated by status may consume foods such as caviar and lobster that are often associated with wealth and power. An individual that pursues self-actualisation might consume environmentally friendly products due to the esoteric benefits they may receive. It should be noted, however, that not all 'green' consumers could be considered wealthy by western standards. Therefore the assumption that only affluent individuals will have higher order motivations pertaining to their food consumption is suspect. Despite this reservation Maslow's hierarchy does provide some insight into why the demand for food products that satisfies higher order needs increases as income increases.

There are several agricultural product attributes, with relatively high income elasticity, that relate to the way in which commodities are produced. It is important to understand that these attributes are those that are perceived to exist by the consumer and are often derived from the means of production. These include healthiness, food safety, greenness and sustainability, naturalness and taste. The motivation for purchasing food products with low input production methods may be derived from either ethical or environmental concerns. However, most studies have identified that perceived health benefits are more likely to motivate purchase (Wier and Calverley, 2002). These attributes are not readily apparent to the consumer at the point of purchase. As such they are considered to be credence attributes.

Credence attributes are one aspect of a tri-partite typology of product attributes that consumers may value in a product (Nelson, 1970; Darby & Karni, 1973). Search attributes are generally available to the consumer at the time of purchase and include attributes such as price and the quality and condition of the product. Experience attributes are those that are not realized until the point of preparation and / or consumption and may include attributes such as taste, crispness, ripeness and moisture content in the context of fresh produce. Credence attributes are product attributes that cannot be easily detected by the consumer. Credence attributes include the absence of pesticides and herbicides, the presence or otherwise of genetically modified organisms and the level of ecological sensitivity involved in the production process.

As consumers are unable to discern the presence of credence attributes at the point of purchase it is necessary that they be informed as to the presence of these attributes. The literature frequently advocates eco-labelling as a market-linked tool that addresses the asymmetrical information problem by conveying information to consumers about the environmental impact of goods (Bougherara & Grolleau, 2002). Thus eco-labels, in an ideal world, are perceived as providing a mechanism whereby consumers are informed of attributes for which they may be prepared to pay a premium. These attributes may be either environmental in character or perceived benefits such as food safety that are viewed as collateral to the means of production.

3.1 Eco-Labels and Eco-Certification

In short, an eco-label is a claim that the production and / or consumption of a product have a minimal level of negative environmental impact (Blend & Van Ravenswaay, 1999). An eco-label can take a variety of different forms. The International Standard Organization (ISO) identifies three types of eco-labels based on the presence or absence of third party certification and the types of characteristics certified.

Table 17. A Classification of Eco-labels (International Organization for Standardisation, 1998)

Type of Eco-label	Definition by the ISO
Type I: Environmental Labeling Program	Voluntary, multiple-criteria-based third party program that awards a license which authorizes the use of environmental labels on products indicating overall environmental preference of a product within a particular product category based on life cycle considerations.
Type II: Self-Declared Environmental Claims	Environmental claim that is made, without independent third-party certification, by manufacturers, importers, distributors, retailers or anyone else likely to benefit from such a claim.
Type III: Environmental Declaration.	Quantified environmental data of a product under pre-set categories of parameters set by a qualified third party.

A more descriptive typology of the different types of eco-labels is provided by Woodward-Clyde (1999):

- **Mandatory Labelling:** Different jurisdictions have mandatory product information that needs to either be affixed to the product or its packaging. An example of mandatory labelling might be a warning that a consumer product contains hazardous poisons.
- **Single-Attribute Environmental Claims:** The label claims that the product has one particular environmental attribute. Examples of single-attribute environmental claims include 'GE Free', 'Dolphin-Safe', 'Recyclable' and 'Biodegradable.'
- **Resource-Based Labels:** This type of label communicates to the consumer the particular environmental impacts that are mitigated or avoided during the production process. Examples include 'chlorine-free paper', and 'pesticide-free.'
- **Report Card Labels:** This type of eco-label is similar to the nutritional food label found on many products in that it lists the environmental attributes of a product and assigns a value to each.
- **Superior Overall Environmental Performance Labels:** This type of label is otherwise referred to as a 'seal of approval.' The label claims to certify the products overall environmental worthiness. Certified products are generally entitled to display a logo on the product or it's packaging. Third party organization or governments usually sponsor these schemes. Examples include the Scandinavian 'Nordic Swan' or the German 'Blue Angel.'

Eco-labels, despite the variety of form, have two main objectives: To act as a market based environmental policy instrument and to act as a marketing communication.

3.1.1 International Voluntary Certification Schemes

There is no one internationally eco-label or eco-label scheme that is recognized internationally as the sole certifier of sustainable development. There is however a number of voluntary labels that operates on a global scale. These include the following:

International Federation of Organic Agriculture Movements [IFOAM]: The worldwide umbrella organization for the organic agriculture movement, with 750 member organizations in 100 countries. Whilst there is no single worldwide organic label, IFOAM operates a basic standard and provides an accreditation scheme for non-governmental organic certifying organizations (NZ – BIO-GRO) (www.ifoam.org).

Forest Stewardship Council [FSC]: This organization operates a worldwide eco-label that certifies that forest products are derived from a forest that is managed according to sustainability principles. FSC provides an accreditation scheme for certifying organizations (www.fscoax.org).

Marine Stewardship Council [MSC]: This organization is in the process of developing a worldwide eco-label that will certify that fish products come from a sustainable fishery. There are a number of NZ fishing companies that have achieved certification in respect of some products (www.msc.org).

There are other worldwide organizations that certify sustainability at the global level, however, these are not related to primary production or are not relevant in the NZ context. These include Social Accountability Limited (www.sa-intl.org), Fair Trade Labelling Organisations International (www.fairtrade.net), Sustainable Agriculture Network (www.rainforest-alliance.org/programs/cap), and Green Globe 21 (www.greenglobe21.com).

There are numerous other voluntary labelling schemes that operate at either the regional or national level.

3.1.2 NZ Certification Schemes

In New Zealand there are a variety of eco-certification schemes. Perhaps the most widely recognised are those relating to the labelling of organic produce.

The Organic Products Exporters of NZ [OPENZ] requires that its members' products are certified to international standards (NZ yearbook, 2002, p. 554). There are currently three certifying agencies associated with OPENZ: Agriquality NZ Ltd, Bio-Gro NZ and Bio Dynamic Farming and Gardening Association [Demeter] (www.organicnewzealand.org.nz). A brief description of each of these certification schemes follows:

Agriquality: AgriQuality is a state-owned enterprise (formerly part of MAF Quality Management) that has been providing certification through its certification business CERTENZ since 2000. CERTENZ is based on Codex Alinorm 99/22, EU Regulations and Australian National Standard. It has ISO 65 accreditation and is currently under approval for the IFOAM standards (AgriQuality, 2002; Manhire, 2002) It takes two years to convert production systems (same time horizon as within the EU) (Manhire, 2002).

Bio-Gro: Formed in 1983, BIOGRO is one of 17 IFOAM accredited certifiers. It takes three years to convert under the BIOGRO system. The majority of NZ exporters (under OPENZ) have chosen to use BIOGRO standards for certification of their organic products (BIOGRO, 2002). BIO-GRO is primarily concerned with organic production and does not certify other environmental attributes. BIO-GRO certifies over 700 producers across a range of industry sectors and \$100 million worth of product annually, of which \$60 million is exported.

Demeter: Demeter is a worldwide certification system, used to verify to the consumer that the product has been produced by biodynamic methods. The Bio Dynamic Association is

the certifier in NZ. Biodynamics is a holistic approach to organic agriculture (OPENZ, 2002a).

Table 18. Division between BIOGRO, CERTENZ and Demeter of the total certified organic land in NZ.

Hectares/ Year	2001	1999 est.	1998	1997
BIOGRO	31.185	14.000	10.694	8.860
CERTENZ	13.184	0	0	0
Demeter	2.155	2.500		
Total	46.525	16.500	10.694	7.359

(AgriQuality, 2002; Saunders, 1997a)

A summary of certification schemes that are available for NZ based organic producers is contained in table 19. In addition to the NZ based schemes it is possible for NZ producers to gain certification under the internationally recognised blue angel scheme.

Table 19. Types of Accredited Eco-Labels Available for Organics in NZ

Type of Eco-Label	Acceptance	Verification	Type of Product / Services	Lead in time for Full Accreditation	Expense	Size / Type of Business Suitable for
Agriquality	NZ	Yes- Through the state owned subsidiary from MAF	Plant / Animal	1 Year	Auditing Cost, Soil / Water Testing	Small to Medium size businesses into agriculture / horticulture / food stuffs
Bio-Gro	NZ (internationally through IFOAM)	Yes – Through Bio-Gro Ltd (accredited by IFOAM)	Plant / Animal, Processes	3 Years	Auditing Cost, Soil / Water Testing, Farmers need to be able to finance themselves up until accreditation	Small to Medium size businesses into agriculture / horticulture / food stuffs
Demeter	International	Yes- Through the Bio-Dynamics Organisation	Plant / Animal Products	7 Years	Auditing Cost, Soil / Water Testing, Farmers need to be able to finance themselves up until accreditation	Small to Medium size businesses into agriculture / horticulture / food stuffs
Blue Eco Angel	Europe, USA, NZ	Yes- Through the German Federal Environmental Agency	Everything	Varies depending on the Product or Service	Auditing Cost, Residue testing	Small, Medium and Large Businesses

(Iremonger, 2000)

Recently a national standard [NZS 8410:2003] for organic production was introduced by Standards NZ. This is a voluntary document that is proposed as a benchmark for industry certification (New Zealand Herald, 2003).

A range of other quality assurance and sustainable management system programmes have been developed at an industry / organization level within the NZ agricultural sector. These programs have been driven by a variety of reasons including marketing advantages, market access and environmental concern. The bulk of these schemes have been developed in response to actual or potential market demands. A brief synopsis of some of the major industry programmes is contained in Table 20.

Table 20. Major quality assurance and sustainable management system.

Programme and Lead Organisation	When Established	Type of Programme	Driver(s) for Establishment	Adoption Level
Deer QA (Game Industry Board, Deer Industry NZ)	1991	Voluntary, Quality Assurance Programme	Marketing, variations in animal and meat quality	62% of (2700 / 4300) deer farmers. Most venison processing companies
Fresh Produce Approved Supplier (Vegfed)	1999	Voluntary, HACCP based food safety programme	Market – Food Safety Issues To minimize regulatory controls being imposed	80% of vegetable production, lower in fruit sector due to industry specific programmes.
KiwiGreen (NZ Kiwifruit Marketing Board)	1993	Compulsory, Integrated Pest & Residue Management Programme	Market Access, Residues	100% of Kiwifruit Growers
EUREGAP (Zespri TM Int Ltd)	2002	Voluntary Sustainable Management System	Market Access	100% of Kiwifruit Growers
Sustainable Winegrowing NZ	1995	Voluntary Sustainable Management Programme	Environmental Protection	60% of Grape Production Area

(Wharfe, Manhire & Ford, 2003)

E-mail and telephone contact with key people within these industries ascertained that they believed that these schemes were important for market access and credibility. However, they were unable to place an actual value on the worth of these schemes or the premium that can be obtained.

3.2 Market Access

This section reviews market access issues surrounding environmentally friendly or green produce and reviews the potential for New Zealand Exports.

An area that is currently of interest to the agricultural sector is that of sustainable agriculture. What practices actually constitute sustainability is a debatable question from both an academic and practical viewpoint. The approach that is taken in this section towards what constitutes sustainable agriculture has been to cast the net as wide as possible and incorporate any claims that may be regarded by consumers as constituting sustainable practice. The bulk of the research and the literature have focused upon the organic sector, as it has a relatively long history and assumes a great deal of currency in the minds of the consumer.

Prior to a review of the organic sector it is important to define what organics is. Organic foods can be distinguished from non-organic by methods of production and processing. However, being credence goods, organic food items usually do not have any observable or testable characteristics. This makes a credible third party certification and labelling system - that consumers are familiar with and trust - crucial for organic suppliers.

There is a large range of standards that define organics; generally accepted organic rules are (Lohr, 2001):

- No use of synthetic fertilizers, pesticides, growth regulators and livestock feed additives.
- No use of genetically modified stock, no application of sludge to organic acreage and no food irradiation.

Attempts to harmonize definitions of what is organic are currently taking place among the major markets as the exchange of organic products internationally increases (Lohr, 2001). Several markets have recently developed their own national standard as to what constitutes organic production.

As the consumption of organic products has increased in recent years so have concerns that the labelling of some products as organic may in fact be misleading. As a consequence various countries have developed or are in the process of developing national standards for the production of organic products. These standards are also applicable to imported products. In some instances eco-certification by third party organizations will be sufficient for market access. A summary of these standards is contained in Table 21.

Table 21. Summary of International Standards for Organics

Country	Relevant Standards
Australia	National Standard for Organic and BioDynamic Produce adopted by the Organic Produce Advisory Committee March 1997 (Outlines minimum standards that have to be achieved before produce can be classified as organic). Australian Organic Production and Processing Standards have been developed to ensure verification and validity of organic products.
United States	The United States Department of Agriculture recently completed the development of their National Organic Programme (NOP), fully implemented in October 2002. Under the NOP, imported products must be certified by a certification body approved by the USDA or be from a country recognized by the USDA as operating an equivalent organic programme.
Europe	European Union Regulation 2902/91 for production, processing and labelling of organic produce (currently standards are limited to crops and vegetables). This regulation was amended in 1995 and places organic produce into different categories depending on the percentage of ingredients that are organic. Article 11 of this regulation states organic food can be imported from countries administering legislation that is equivalent to the European Union. There is an approved free access list, for other suppliers an individual authorization process has to be followed. Standards are currently being developed for livestock production.
Japan	Currently in the process of developing organic standards

The NZ Food Safety Authority (NZFSA) has established the Official Organic Assurance Programme (OOAP). The purpose of this programme was to ensure that official assurance was provided to the EU, that organic products exported to the EU are in fact organic in line with the requirements of EU Regulation 2902/91 (New Zealand Food Safety Authority (NZFSA), 2003) The United States Department of Agriculture has accepted the NZFSA's programme for recognizing organic certifying bodies. The NZ Organisations that are currently certified under this scheme are BIO-GRO and Certenz (Agriquality).

3.2.1 Eco-Labels as an Environmental Policy Tool

An eco-label can be thought of as an informational policy tool when placed in the context of environmental protection. Informational mechanisms that operate in market conditions are only one of several policy instruments that are available for environmental protection. A typology of policy instruments is illustrated in Table 22.

Table 22. Typology of Economic Policy Instruments

Regulation	Economic Instruments	Information
<i>Sticks:</i> Highly Choice Constraining	<i>Carrots:</i> Moderately Choice Constraining	<i>Sermons:</i> Facilitates and Informs Free Choice

Based on Bemelmans-Videc et al (1998)

It can be argued that eco-labels and eco-certification provide a mechanism for the market to provide a degree of protection for the environment without government intervention. It can be hypothesized that consumers are willing to pay a premium in order to obtain the additional utility of environmental well-being, as well as associated benefits. Consumers will be willing to pay a premium for environmentally sensitive commodities until the marginal benefits of the environmental attributes equal the marginal cost, represented by the price premium (Moon et al, 2002). The higher price that can be obtained for environmentally sound commodities should in turn send a price signal to producers that

care for the environment is economically beneficial. As a result producers should switch to methods of production with low environmental impacts.

The effectiveness of eco-labels as a policy tool for environmental protection has been questioned. It has been identified that the use of eco-labels faces two issues that disrupt the market mechanism: consumers limited ability to process information, and the public good characteristic of the environment (Bougherara & Grolleau, 2002).

A significant number of consumers view the environment as a public good and do not perceive that they should take individual responsibility for its protection through higher prices for 'green' commodities (Svedsater, 2003). Public goods are those that when used by one person is not 'consumed' but are available for the enjoyment of all others. It is therefore difficult to exclude people who do not pay (St John & Stewart, 2000, p. 20). This implies that the purchase of eco-labelled goods does not provide the consumer with exclusive utility from the environmental well-being that results from their purchase (Bougherara and Grolleau, 2002). It is also not possible to stop free rider behaviour, i.e. consumers who are not willing to pay for the environmental benefit, as they believe that others will pay even if they do not. If all consumers act in this manner the environmentally friendly goods will not be produced (St John and Stewart, 2000, p. 221).

As a public good eco-labels also suffer an assurance problem. This means that a consumer may not contribute to the production of a public good if they do not believe that the good will be produced. The production of a public good, such as environmental well-being, requires a minimum public contribution. The individual will think that their contribution is meaningless if they do not believe the minimum contribution will be obtained and will be unlikely to contribute (Schmidtz, 1991). In contrast to the free-riding situation, the assurance problem does not occur as a result of the consumers' self-interest, rather it occurs because the consumer does not feel that their contribution will make a difference.

The adverse effect of free-riding and assurance is mitigated if an eco-labelled food product is considered not merely as a public good but as a set of attributes. An eco-labelled food product can be thought of as possessing both public and private attributes (Brougherara and Grolleau, 2002). The public attributes relate to the enhancement of the environment, the private attributes relate to characteristics such as taste, safety and nutrition. Whilst a consumer may not be motivated to purchase an eco-labelled product for its public attributes they may nevertheless be motivated to purchase the product for its private attributes.

One of the frequently cited benefits of eco-labels is that they provide a means of overcoming the market failure of asymmetrical information between consumer and producer (Moon et al, 2002). However, the provision of information can be an additional cause of market failure. There are limits as to how much information a consumer can process (Miller, 1956). As consumers become overloaded with information their attention becomes a scarce resource (Bougherara and Grolleau, 2002).

It is possible for producers to cheat by providing false information to consumers (Akerlof, 1970). This is more likely to occur when environmental claims are made directly by the producer or another party that stands to benefit from the claim and the claim is unsubstantiated by a third party. This can lead to a situation where consumers do not trust environmental claims that are made by producers seeking to capture the premium that consumers are willing to pay for eco-friendly produce. This might lead to a reduction in the willingness of consumers to pay for supposed environmental benefits.

3.2.2 Eco-Labels as Marketing Communications

In addition to providing a market-based means of enhancing environmental well-being, eco-labels also have the objective of attempting to increase the attractiveness of products for consumers. As a marketing tool eco-labels leverage several consumer characteristics to enhance the appeal of the product.

A multi-disciplinary model of consumer behaviour as it pertains to food consumption is contained in figure 9. From a marketing perspective an eco-label can be seen as a tool for assisting the consumer in their search for information.

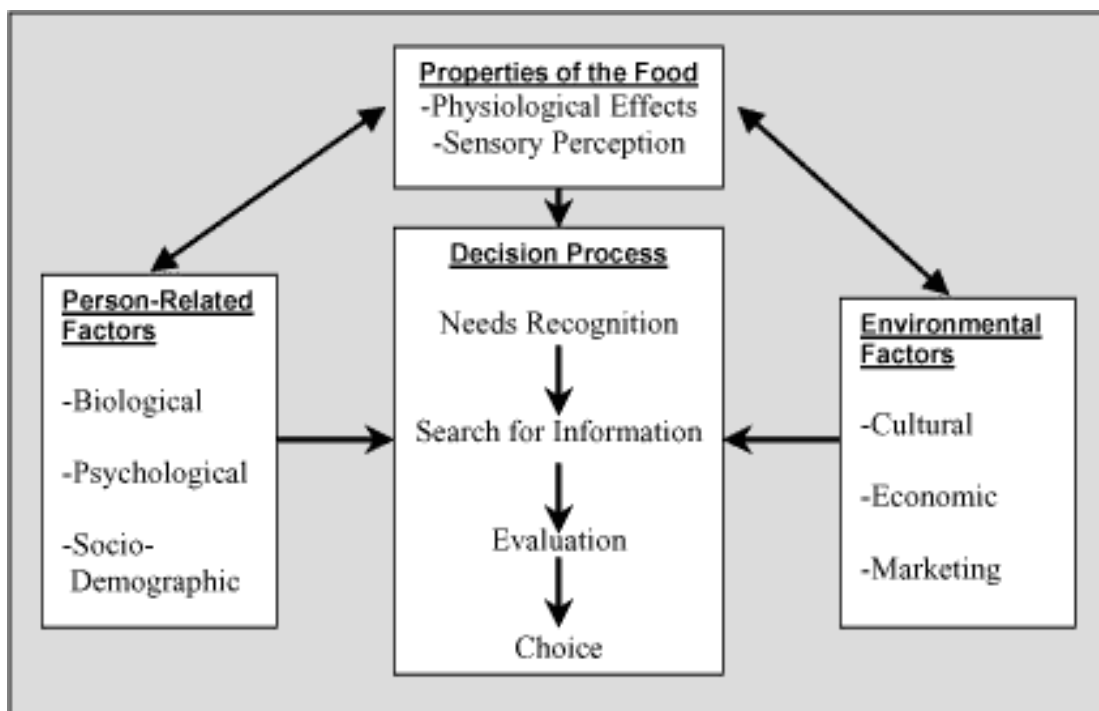


Figure 9. Conceptual Model for Consumer Behaviour with Respect to Food (Traill, 1999)

The purchase of conventional food is generally a low involvement process that is performed out of habit and convenience. As food is a low involvement purchase item, consumers will tend to process information through a peripheral route rather than a central route. As such, familiar cues, such as a brand or a label, serve as a purchase trigger rather than more in-depth communication messages. A consumer is more likely to register a recognised eco-label than in-depth information regarding the means of production.

As consumers are unwilling to spend a great deal of time analysing product information a demand is created for someone else to ensure that their food is safe. For example why should a consumer learn about the 'safe' levels of a range of chemical contaminants when this can be delegated to governments or certification organisations (Traill, 1999)? The eco-label acts as a communication to consumers that a product possesses certain attributes that would be excessively time consuming to assess or beyond the expertise of the consumer.

The attributes that are often identified by eco-labels can be physiological or sensory (taste, safety or nutrition) or psychological (ethics, attitudes to technology etc). As has been discussed earlier, these are attributes that may possess a relatively high-income elasticity of demand. As such they are attributes for which consumers are often willing to pay a premium over and above what they would pay for similar products, which do not

possess these attributes. It is possible for any producer to claim that their product possesses these attributes. Certified and recognised eco-labels introduce an element of trust into the consumers processing of the information.

3.2.3 The Market for Eco-Labelled Food Products

At one level the market for eco-certified food products currently only comprises a small percentage of total food consumption in developed countries. However, it must be stressed that there is a growing importance of these in key markets such as UK supermarkets. There appears to be a paucity of information as to the size of the market for all forms of eco-labelled products. There is, however, information available as to the size of the organic market in developed countries. This may provide an indication regarding the market for eco-labelled goods generally. This information indicates that the organic market in developed countries is generally only 1-2 percent of the total but that significant rates of growth are still present.

Table 23. Estimates of organic retail value, retail share and projected annual market growths 2003.

Market	Retail value (million €)	Retail share (% organic of total sales)	Annual market growth 2003-2005 (%)
Austria	325-375	2.0-2.5	5-10
Belgium	200-250	1.0-1.5	5-10
Denmark	325-375	2.2-2.7	0-5
France	1200-1300	1.0-1.5	5-10
Germany	2800-3100	1.7-2.2	5-10
Italy	1250-1400	1.0-1.5	5-15
Netherlands	425-475	1.0-1.5	5-10
Ireland	40-50	<0.5	10-20
Sweden	350-400	1.5-2.0	10-15
Switzerland	725-775	3.2-3.7	5-15
United Kingdom	1550-1750	1.5-2.0	10-15
Other Europe	750-850	-	-
Japan	350-450	<0.5	n.a.
China*	6	n.a.	n.a.
Taiwan*	9.7	n.a.	200
Australia*	123-130	0.2	400
United States	11000-13000	2.0-2.5	15-20
Canada	850-1000	1.5-2.0	10-20
Mexico*	12	n.a.	n.a.

(Willer & Yussefi, 2004)

*1998 estimates from Lohr (2001).

It is difficult to obtain consistent data on the development of the organic market. This information is of importance to the sectors, as they have to make decisions 2 to 3 years in advance due to the time involved in the conversion of production to organic and the marketing of produce.

3.2.4 Consumers' Willingness to Pay a Premium for Eco-labelled Products

It is generally accepted that there are consumers who are willing to pay a premium for food that is 'green' in origin. The willingness to pay a premium is not uniform as there are consumers that are indifferent towards 'green' produce or in some cases in favour of non-

organic produce (VanWechel and Wachenheim, 2002). Whilst there are some consumers who are willing to pay a premium for 'green' produce the willingness to pay the premium varies from country to country and commodity to commodity (Dalglish & Saunders, 2003). The willingness of consumers to pay a premium also varies within countries and individual markets can be segmented on this basis.

A consensus as to the size of the premium that consumers are willing to pay for eco-labelled produce has not emerged in the literature. In part this is due to the different methodologies that have been employed to assess the willingness of consumers to pay a premium. There are four main streams of research: attitudinal studies, contingent valuation studies, real market studies and reporting of actual premiums obtained for green products. Regardless of the methodology employed, the research has consistently shown that there is a consumer segment that is willing to pay a premium for eco-labelled or green products.

The majority of research that has been conducted into consumers' willingness to pay for 'green' labelled goods has used questionnaires that have asked how consumers would act when faced with a choice between labelled and unlabeled goods (Moon et al, 2002; Donath et al, 2000; Loureiro et al, 2001; Roe et al, 2001a and 2001b; Ethier et al, 2000; Jaffry et al, 2000; Tiilikainen & Huddleston, 2000; Blend & Van Ravenswaay, 1999; Forsyth et al, 1999). This approach is similar to the contingent valuation method of ascertaining the economic value of the environment. It is estimated that there are over 2000 publications of this nature (Chapman, 2000). By and large this body of research indicates that consumers are willing to pay a significant premium for eco-labelled produce. A summary of some of this research is presented in Table 24.

There is only a small body of research that empirically measures consumer responses to environmental information (Bjorner, Hansen & Russell, 2002; Durham, McFetridge & Johnson, 2002; VanWeschel and Wachenseim, 2002; Roe et al, 2001a; Blamey & Bennett, 2001; (Blamey, Bennett, Louviere, & Morrison, 2001); Thompson & Kidwell, 1998; Henion, 1972). The research generally does not investigate commodities that are widely traded by NZ. The research is also inconsistent in terms of the type of label or certification utilized, the environmental attributes that are claimed, and the methodology used to assess the willingness to pay. The research does provide support for the results of the 'intentional' studies: consumers are willing to pay a premium for eco-certified and labelled products.

It is difficult to obtain consistent data on the development of the organic market. This information is of importance to the sectors, as they have to make decisions 2 to 3 years in advance due to the time involved in the conversion of production to organic and the marketing of produce.

Table 24: 'Intentional Studies': Consumers Willingness to Pay a Premium for Eco- Labelled Products.

Reference	Method / Data	Market	Country	Type of Label or Environmental Characteristic	Will Label have an Effect	Premium willing to pay
Forsyth et al, 1999		Wood Products	Canada		Yes	67.3% WTP 5%; 28.3% WTP 10%; 13% WTP >10%
Ethier et al, 2000	Telephone survey	Electricity	America		Yes	30.6% willing to pay US\$6 extra per month
Moon et al, 2002		Food	Germany			83% WTP a premium; 17% WTP >30%; mean WTP = 18%
Donath et al, 2000		Seafood	Norway & America	Certified as sustainable fishing - existing label	Yes	Norway 50% WTP 22%; US 72% WTP 12%
Conner, 2002	Survey (contingent valuation) & 2nd price auction	Food	America	GMO's, Biosolids, and Irradiation	Yes	15-95%

Table 25: Empirical Research: Consumers Willingness to Pay a Premium for Eco-Labelled Products

Reference	Method / Data	Market	Country	Type of Label or Environmental Characteristic	Did Label have an Effect	Premium willing to pay
Henion (1972)	Real Market Experiment in 4 Stores	Detergents	America	Content of Phosphate	Yes	Not Specified
Teisl et al (2002)	Real Market Behaviour using aggregate monthly time series data (using an 'almost ideal demand system' specification)	Canned Seafood and Substitute Meat products	America	Dolphin-Safe Label	Yes	Significant but not specified
Blamey & Bennett (2001), Bennett et al (2001)	Real Market Behaviour in discrete choice models (also combined with stated preference data)	Toilet Paper	Australia	Unbleached Recycled	No Yes	A\$0.66 extra per roll (base price not mentioned)
Nimon & Beghin (1999)	Hedonic regression using catalogue prices	Apparels	America	Environmentally Friendly Dyes Organic Cotton	No Yes	33.8% for organic cottons, minimal for environmentally friendly dyes
Roe et al. (2001b), Teisl et al (1999)	Hypothetical market (validated with hedonic regression based on electricity prices)	Electricity		Certified Green Electricity	Yes	
Bjorner, Hansen and Russell (2002)	Real Market behaviour using weekly purchase diary data	Toilet Paper, Paper Towels and Detergents	Denmark	Hybrid Environmental Label certified by Third Party	Yes	10-17% for Toilet Paper & Detergents / Minimal for paper towels

The willingness to pay a premium for 'green' produce is reflected in the actual prices paid for 'green' produce. Price premiums vary across commodities and also vary according to what 'green' attributes are claimed for a commodity. Information regarding actual price premiums paid is most readily available for organic produce.

Price premiums on organic products vary a lot between different countries; Lohr (2001) found that price premiums for key markets were between 10 and 100 per cent above conventional products (Table 26). In 2003, price premiums were estimated to range between 10-400 per cent in China and between 50-75 per cent in Australia (Willer & Yussefi, 2004). Premiums in Europe vary considerably between countries as well as products, from 31 to 133 per cent (Hamm, Gronefeld, & Halpin, 2002) (15 to 77 per cent (La Via & Nucifora, 2002)). The La Via & Nucifora (2002) study of retail chains in Europe found the average premium across all types of outlets for organics was 51 per cent whereas the difference in premium across product categories within individual stores were only 14 per cent. The study does suggest that in the longer run a premium of between 20-30 per cent in the large retail stores is most likely. In more mature markets such as Denmark, Sweden and Switzerland, a more stable price premium between 10 and 30 per cent for dairy and meat products seems to be most common (Millock & Hansen, 2002; Teagasc, 2004).

Table 26. Price Premium for Organics in Key Demand Centres

Market	Price Premium (percent above conventional price)
Austria	25-30
Denmark	20-30
France	25-35
Italy	35-100
Germany	20-50
Netherlands	15-20
Sweden	20-40
Switzerland	10-40
United Kingdom	30-50
Japan	10-20
United States	10-30

(Lohr, 2001)

The willingness to pay a premium for organic produce is also apparent in the NZ market. One of the few sectors where data is available is the dairy sector. The retail price premium within NZ for organic dairy products is considerable – especially for organic liquid milk. Table 27 shows a mark-up in 2001 of 51 percent on organic liquid milk in retail stores.

Table 27. Retail premiums for some NZ organic dairy products (2001).

Product	Certification	Organic Retail Price	Conventional Retail price	% premium
BIO Farm Organic Milk (1L)	BIOGRO	NZ\$2.65	NZ\$1.75	51%
BIO Farm Natural Yoghurt (500 gm)	BIOGRO	NZ\$3.91	NZ\$3.16	23%
Cyclops Sour Cream (250 gm)	BIOGRO	NZ\$2.18	NZ\$1.76	23%

BIOGRO, 2002a

From the preceding discussion it can be seen that regardless of the methodology used, it emerges that consumers are willing to pay extra for 'green' products. The difficulty lies in quantifying the premium. There is a wide divergence of results that appears to be based on both markets and commodities. This suggests that although there is a generic willingness to pay a premium for 'green' products, it is impossible to assess a generic premium that consumers will pay.

For some commodities the premium that consumers are willing to pay is likely to be inflated by the characteristics of consumers of the product. Health conscious single females dominate the market for tuna, as tuna is high in protein and low in fats (D'Souza, 2000). Health conscious consumers comprise a sizeable segment of the market for organic produce (Chinnici, D'Amico, and Pecorino, 2002). There is also a strong possibility that consumers in this demographic also hold strong views about the environment. This may account for the significant relationship that has been found to exist between the 'dolphin-safe' label and market share for tuna (Teisl et al, 2002). The widespread adoption of the dolphin-safe label by the leading brands in the tuna market may have also influenced customer perceptions. Other market variables including communication strategies may also contribute to an organisation's market share (D'Souza, 2000).

The type of commodity was also found to influence the impact of an eco-label on the market price in a Danish Study. The eco-labelling of paper towels was found to have a negligible effect on market prices whereas eco-labelled toilet paper and detergents commanded a significant premium. The reason advanced for this discrepancy was that green consumers were unlikely to purchase paper towels preferring reusable dishcloths as a commodity (Bjorner, Hansen and Russell, 2002)

3.2.5 Maturity of the 'Organic Market'

The market for 'green' produce in different countries generally passes through different levels of maturity as illustrated in Table 28:

Table 28: Change in Organic Markets over Time

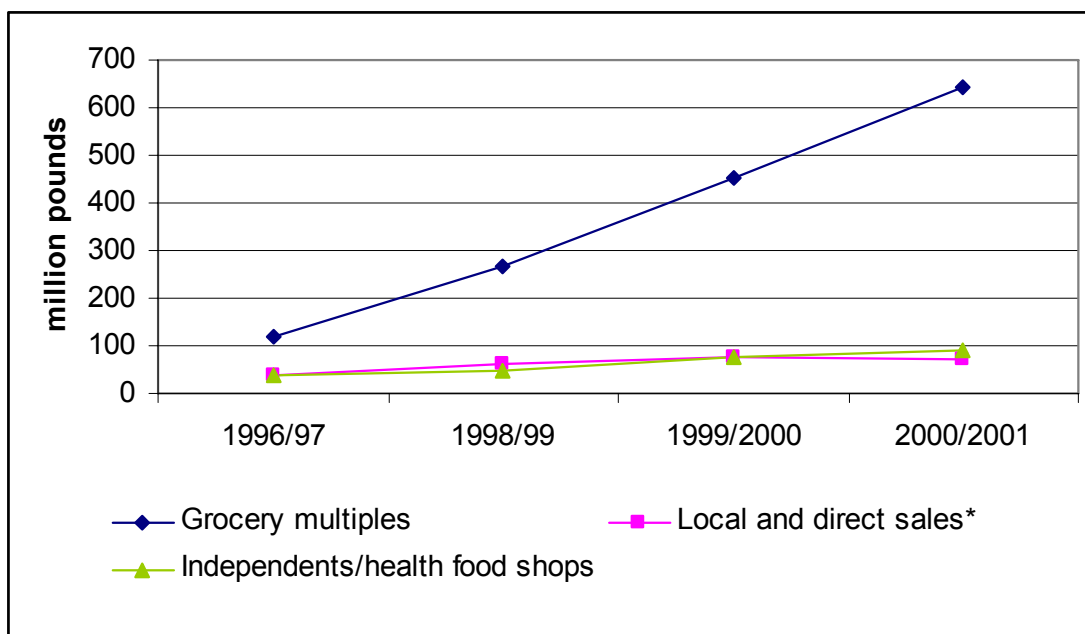
	Niche Market	Upscale Production	Mainstream Production
Suppliers	Very Small Number Low Competition	Increased Number	Many: Competitive Supply
Availability	Poor: Difficult to Obtain	Limited	Strong: Easy to Obtain Organic Products
Market Outlet	Producer Direct	Specialty Stores	Supermarkets



Increasing Market Maturity

(Adapted from Christensen & Saunders, 2003)

The structure of organic food retailing appears to go through three stages over time from niche to maturing market with availability of organic products mainly sold in supermarkets (retail-chain-stores). Initially organic sectors are small with produce typically sold directly from producer to consumer. The market then develops, with an increase in amount sold through specialist stores. Final stages tend to have high processing and marketing costs. As the market goes through these three stages the organic market share grows (Christensen & Saunders, 2003).



(Organic Trade Services, 2005)

Figure 10. U.K. Retail Sales of Organic Food by Distribution Channel

Thus organic products are mainly distributed through supermarkets (retail-chain stores), specialty stores and/or producer direct sales, as illustrated in Table 29. Retail-chain distribution is a strong factor for the continuing growth of organic market share beyond what is possible through direct sales or through specialty stores. Due to a large customer base, supermarkets can generate turnover more quickly, thus reduce costs and maintain product appearance and quality. Furthermore, supermarket availability makes organic produce more accessible for the consumers.

Table 29. Percentage shares of organic retail market by distribution channel

Market	Supermarkets ¹	Specialty stores ²	Producer direct ³
Austria	77	13	10
Denmark	70	15	15
France	45	45	10
Italy	25-33	33	33-42
Germany	25	45	20
Netherlands	20	75	5
Sweden	90	5	5
Switzerland	60	30	10
United Kingdom	65	17.5	17.5
Japan ⁴	High-end-stores	Widely available	Widely available
United States	31	62	7

¹Includes supermarkets and hypermarkets that offer conventionally grown foods

²Includes organic supermarkets, natural products and health food stores, cooperatives and other

³Includes on-farm sales, farmer markets, box schemes, CSAs, teikei and other

⁴Share data not available for Japan, but qualitative information suggests the relative availability of product in each country
(Lohr, 2001)

Thus, as illustrated in Table 29, in Europe the majority of organic produce is distributed through supermarkets (retail-chain stores) which may help to explain the relatively large share of organic produce in these markets. Moreover it is argued that as the US has

moved away from a specialty-store-dominated distribution system this has contributed to the highest growth rates in organic sales of any country of 12 per cent in 2002 (Willer & Yussefi, 2004). This growth has also been fuelled by the establishment of a common organic standard. The continuing strong growth of organics market share in Switzerland has been attributed to the high involvement of the large retail chains (Willer & Yussefi, 2004). Similarly, the slowing of growth in organic sales in Denmark is sometimes attributed to the weak interest of the leading retail chains (Agra Europe, 2004; Willer & Yussefi, 2004). An exception to this dominance of retail outlets is the Japanese market where organic produce is mainly distributed directly from the producer or through specialty stores (Lohr, 2001).

Willingness to pay a premium for green products is thought to vary according to the sales channel. In Germany, where consumers appear willing to pay a high premium for organic produce (Fricke, 1996), the dominant sales channel for organic produce is specialty stores. In contrast, in Scandinavia and the UK where the dominant sales channel for organic produce is supermarkets, the premium consumers are willing to pay is substantially lower. This has been attributed to price being one of the most important competition parameters in the supermarket context (Wier & Calverley, 2002). Indeed, in the German context consumers are willing to pay a higher premium in specialty stores rather than in supermarkets.

The level of organic market maturity may affect the importance that consumers attach to eco-labelling and eco-certification schemes. It can be assumed that consumers in the more mature organic markets will have a higher level of sophistication as regards their assessment of credence attributes such as production methods. In this regard it is likely that they will have a higher level of awareness of eco-labels and eco-certification schemes as a mechanism for advertising the greenness of a product.

The consumer is likely to become more reliant on third party verification of the credence attributes of a product as the act of consumption becomes further removed from the source of production.

Eco-labels have been viewed as being more effective in markets or market segments where green consumerism is strong (Jordan, Wurzel and Zito, 2003). In mature 'green' markets producers may be at a competitive disadvantage if they are not eco-certified *vis-à-vis* eco-certified competitors. In markets where the 'green' consumer does not wield great influence the presence of an eco-label is unlikely to make a material difference (Jordan, Wurzel and Zito, 2003).

There is some evidence that there has been a slowdown in the rate of growth in the most mature organic markets. In Denmark, which has long been considered a leader in organic consumption, the market stagnated in 2001 and as a whole declined in 2002 (Kortebech-Olesen, 2003). By way of contrast several transition European economies, such as the Czech Republic, Poland and the Baltic States, are seen as promising growth markets for organic products (Kortebech-Olesen, 2003). This can be seen as reflective of the product life cycle in different markets.

3.2.6 Market Segmentation

In order to maximize the price premium that can be obtained for 'green' produce it is necessary to first segment the market according to levels of pre-environmental purchase behaviour and then target marketing efforts towards the greener segments (Schlegelmilch, Bohlen & Diamantopoulos, 1996; Forsyth, Haley and Kozak, 1999).

Research dating back over a decade has indicated that the appeal of green foods varies according to market segments (Grunert, 1993). This suggests that the willingness to pay a premium for organic produce will also vary across market segments. As illustrated in Table 28 some consumers are willing to pay a far higher premium for organic produce than others. For instance, Grunert (1993) found that 10 per cent of the most environmentally conscious segment of Danish society was willing to pay more than 30 per cent extra for organic produce whilst only two percent of the least environmentally conscious segment was willing to pay this premium. Similarly in the UK 44 per cent of the population is willing to pay a premium of 10-18 per cent for 'ethical' products whilst the remainder of the population is less enthusiastic (Bird & Hughes, 1997).

Table 30. Willingness of Consumers to Pay a Premium for Organic Produce at Different Price Premiums.

		Price Premium for Organic Foods (%)							
		5-10%	10-20%	20%	20-30%	30-40%	40%	40-50%	50-60%
Study	Country and Survey Year	Proportion of Consumers that will Buy Organic Foods (%)							
Drake and Holm, 1989	Sweden, 1987	45%	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Beharrel and MacFie, 1991	UK, 1989	50-80%	25-50%	n.a.	15-20%	18-20%	n.a.	16-18%	15-16%
Coopers and Lybrand Deloitte, 1992	UK, 1989	50-65%	25-50%	n.a.	20-25%	15-20%	n.a.	13-15%	11-13%
Bugge and Wandel, 1995	Norway, 1993	70	40	n.a.	10	n.a.	n.a.	3-5%	n.a.
Bjerke, 1992	Denmark, 1990	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	15%	n.a.
Grunert and Kristensen, 1995	Denmark, 1991	n.a.	n.a.	54%	n.a.	5%	n.a.	n.a.	n.a.
Scan-Ad, 1998	Denmark, 1998	65%	20%	n.a.	11%	n.a.	n.a.	n.a.	n.a.
Hack, 1995	Netherlands, 1991	95%	90%	n.a.	85%	n.a.	80%	n.a.	60%
Kramer et al, 1998	Germany, n.a.		31%	n.a.	n.a.	n.a.	52%	n.a.	9%
Fricke, 1996	Germany, 1994	30%	26%	n.a.	n.a.	n.a.	25%	n.a.	4%
CMA, 1996	Germany, 1996	29%	28%	n.a.	n.a.	30%	n.a.	n.a.	3%

(Wier & Calverley, 1999)

However until very recently there have been relatively few attempts to segment markets based on an actual preference for 'green' products. The more common approach has been to segment markets on traditional approaches such as socio-demographics (Schlegelmilch, Diamantopoulos & Bohlen, 1994) or personality measures (Balderjahn, 1988) and then profile segments in terms of their environmental consciousness.

Recently there have been several attempts to segment individual markets based on the consumers' inclination towards either organic or GE Free produce. An example of this approach was a study done in Belgium that segmented the market into four categories based on their attitude towards genetically modified produce. 23.5 per cent of consumers were found to have positive attitudes towards GE products [Enthusiasts]. 15.5 per cent were strongly opposed to GM [Green Opponents]. 61 per cent of the market was either neutral or slightly negative in their attitude towards GM (Verdurme & Viaene, 2003). This suggests that there is a sizeable segment of the Belgian population that prioritizes the consumption of organic produce. There is an even larger segment that may consume organic produce if they are presented with the right marketing mix. Although the size of the segments may vary, this pattern can be generalized to other countries.

The segmentation described above is reinforced by research indicating that a significant group of consumers (20-30 per cent) would stop purchasing NZ produce if genetically modified organisms are released in NZ. The bulk of consumers (40-70 per cent) indicated that they would not alter their purchasing habits. The remainder of consumers indicated that they are price sensitive (Sanderson et al, 2003). In terms of the consumers' willingness to pay more for eco-labelled and eco-certified goods it is the segment that is diametrically opposed to genetic modification that is of most interest. These consumers do not appear to be price sensitive and are likely to pay a premium to ensure that they consume 'green' commodities (Sanderson et al, 2003).

There is a large amount of heterogeneity amongst consumers of organic produce. A recent Italian study identified four clusters of organic consumers: Pioneers, Pragmatists, Nostalgic and Health Conscious (Chinnici, D'Amico, and Pecorino, 2002).

Pioneers are characterized by occasional consumption of organic produce that is mainly motivated by curiosity. The bulk of this segment's food purchases are made at the supermarket. There is a preponderance of women in this group and are largely aged 24-44. Household income is moderate.

Pragmatists are consumers who have a preference for organic foods due to perceptions of better taste and nutrition. However they often forego organic produce (20-30 per cent premium) as they are largely motivated by price. The definable characteristics of this segment are similar to the characteristics of 'Pioneers.'

Nostalgic consumers of organic produce are characterized by a tendency to associate the consumption of organics with the genuineness and tastes of the past. This segment largely consists of male pensioners who are in possession of a modest income.

Health conscious consumers are primarily motivated to consume organic produce by perceived health benefits. These consumers are willing to pay and expect to pay a premium of 20-30 per cent for organic produce. This tends to be reflective of a high family income. This consumer group consists of both males and females and is generally in possession of a high level of education.

In France consumers of organic products have been classified under three categories: politically / ideologically motivated, health conscious and switchers (FAS, 2001).

Politically and ideologically motivated consumers are motivated by concerns over the environment, animal rights and personal health. Typically they display little concern for price and accessibility. Demographically they are middle aged and well educated with mid-high levels of income.

Health conscious consumers are primarily motivated by perceived health benefits of organic produce. Price and convenience are factored into their purchase decision. Demographically they are professionals aged over 25.

Switchers are consumers who are highly susceptible to media influence. Food scares such as BSE tend to influence their purchase decisions, as do price and convenience. For this segment price premiums must be justified by taste and health benefits.

The segments identified above are limited to Sicily and France, however it is reasonable to assume that the market for green products in other countries can also be broken down into diverse components. These studies illustrate that different segments of the green market possess different motivations for consumption and differing levels of price sensitivity. It follows that the willingness to pay a premium for organic produce is not a uniform characteristic of green consumers. The marketing mix for green consumers should reflect this diversity.

An understanding of the organic market segments in key markets may assist in ascertaining eco-labels and environmental attributes will be able to obtain the greatest premiums and why. This is an area where an integrated marketing and economics approach could yield significant benefits. The marketing research has tended to concentrate on the characteristics and size of the green segment whereas economic research has assessed consumers' willingness to pay. What is lacking in the literature is an understanding of what environmental attributes consumers are willing to pay for, which consumers are willing to pay for these attributes and why. Such an understanding would enable targeted marketing of different eco-labels in order to maximize the premium that could be obtained.

One clear trait that emerges from the literature is that a large number of 'green' food consumers are not motivated by environmental concerns, rather they are motivated by product attributes such as taste, nutrition and perceived health benefits (Chinnici, D'Amico, & Pecorino, 2002; FAS, 2001; Lohr, 2001). It follows that producers of 'green' agricultural commodities need to maintain a focus on quality, and not just the greenness, of their produce in order to receive any price premium that may be available (Campbell & Fairweather, 1998).

Thus there is growing importance for compliance with quality and environmental schemes, beyond what is required for access to the EU. EurepGap is such an example, where further compliance to what is required by EU official standards, is essential for gaining access onto the shelves of retail chains.

4. CONCLUSION

This paper has reviewed the development of NZ agriculture and scoped some of the factors affecting it currently and into the future.

NZ is unique in the developed world in its reliance on agricultural exports for external income; it is also unusual in the developed world in that it has an unsubsidised agricultural sector which has to compete with subsidised sectors around the world. This has led to a number of issues for NZ, not least competing with countries which not only subsidize their agriculture but also provide export subsidies and compete in potential markets for NZ.

The other issues facing NZ is of course the low or even negative income elasticity of demand for primary commodities and thus as incomes around the world have risen NZ has failed to keep pace and has fallen down the OECD rankings. The NZ agricultural sector has already responded in various ways to falling real incomes. These include reducing the cost of production through economies of scale and increasing efficiency through different management and production techniques. In addition the agricultural sector has diversified into alternative crops and animal products, such as kiwifruit and deer.

Thus to raise NZ incomes relative to other countries it is important that the export markets with positive and high income elasticities of demand are targeted. These high income elasticities generally are related to food attributes and include the way the food is produced as well as quality and safety attributes. NZ agriculture already meets some of these demands. These include the adoption of Integrated Pest Management (IPM) in apples and kiwifruit production, adoption of schemes such as EurepGAP, and Organic certification schemes. This not only enables a premium to be paid within a market but also access into high value markets such as certain UK supermarket chains.

In addition to the above the developments in European Union agriculture and environmental policy have both direct and indirect implications for New Zealand. While the importance of the EU as a market for NZ produce has diminished it is still significant, especially the influence the EU has on the outcome of WTO negotiations, particularly in relation to agriculture. Also policy and market changes in the EU affect NZ indirectly by impacting on other potential export markets. Of equal importance though is the change in EU (and other key developed countries) policy from both internal and WTO pressures away from market support to payments for other attributes such as environmental quality. As the billions of dollars of expenditure on agriculture becomes diverted to these direct payments for environmental quality (among other factors), the compliance costs of those producers for meeting any market requirements for accountability, traceability and/or environmental compliance, will be lower. This of course is of importance to NZ who has to compete without the direct payments to help meet any market access requirements such as those under EurepGAP.

Concern does exist regarding the applicability of some of the market access requirements to NZ as they tend to reflect the conditions in the export market country, not NZ conditions. Moreover relatively little is known in detail about the different cost structures of different types of farming and how these impact on the environment or connect to social variables. To assess both this and the potential benefits and costs to NZ of adopting market driven environmental and product schemes the ARGOS (Agriculture Research Group on Sustainability) has been established.

ARGOS is a 6 year quasi-experimental research project with the aim to model the economic, environmental, and social differences between organic, environmentally

friendly and conventional systems of production. The aim is to detail the impact of these systems and develop indicators which reflect the interactions across the social, economic and environmental factors.

The ARGOS Programme also assesses market developments overseas and how these are likely to affect and be implemented in NZ. The costs of implementation and potential benefits of these will be further assessed using the LTEM (the Lincoln Trade and Environment Model). This enables the impact of various scenarios relating to the level of production and consumption, premiums and production costs to be assessed both for NZ and other countries.

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