

Food Miles – the international debate and implications for New Zealand exporters

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Discussion about food miles is increasing and causing concern for the business community. This briefing explains the origins of the food miles issue and its implications for New Zealand exporters in the context of international trade. It discusses the positions being adopted by the various interest groups and practical actions that could be implemented along the supply chain.

Food miles – the big picture

Global trade has resulted in more and more products travelling ever-increasing distances from production to final consumption and disposal. A new debate has emerged around the environmental and social impacts that growing trade and consumption in products and services generates. The debate has been better articulated for food products, due to the wider environmental and social issues associated with food production and trade, and the volume of worldwide freight transport taken up by food.

Between 1968 and 1998, world food production increased by 84%, population by 91%, and trade in food by 184%¹.

While 'food miles' simplistically means the distance food travels from farm to consumer, the term implies the complex impacts underlying the food system, such as energy use and contribution to climate change, dependence on fossil fuels, traffic congestion as well as social and economic impacts on rural communities and developing countries. The concept is also applied to other products such as flowers and clothing. In Japan, a specific Wood Mileage CO₂ Certification System² is being applied to wood for housing.

In Europe and North America, campaigners have found the food miles concept to be a useful vehicle for engaging the general public in taking action on environmental issues. European consumers are increasingly concerned about climate change and, for many, supporting local communities and opposing globalisation is part of being 'green'. Food miles is a simple concept, a large proportion of the population purchases food and avoiding unwanted food miles is an easy action to promote. The issue is now firmly on the agenda for some major retailers³ and governments. Elsewhere, the concept has gained traction with better understanding of the implications of climate change, oil depletion, energy security and transport costs.

New Zealand food products have often been targeted by overseas campaigns for low food miles to illustrate the long distance products travel to export markets such as Europe, North America or Japan. It is unclear whether this attention impacts on the sales of New Zealand products in those markets. This attention poses a potential risk to New Zealand exports of food and beverage to these markets, although to date there does not appear to have been any marked change in demand. Government officials are aware of the food miles debate, and are maintaining regular contact with food and beverage industry representatives on the matter.

The impacts of the food supply chain

There is a significant body of research exploring the links between food production, transport, energy use and emissions. Many studies underline the worldwide trend of increasing volumes of food being transported longer distances, with obvious consequences in increased energy use and emissions (particularly CO₂) and higher vulnerability of the food-supply chain. The intrinsic dependence of food production and supply on fossil fuels is highlighted in numerous studies. There seems to be consensus about the link between distance travelled and the degree of food-processing – the longer the distance, the higher the level of food-processing required – implying that long-distance transport of food is responsible for additional emissions due to increased food-processing and packaging.

1 Jones A (2001). Eating oil – Food in a changing climate. London, Sustain and Elm Farm Research Centre.

2 Japan for Sustainability (2005). Wood Mileage CO₂ Certification System Promotes Local Wood Use. www.japanfs.org/db/database_gi?cmd=dp&num=1346&dp=data_e.html (accessed 28/05/06).

3 Environmental Resources Management (ERM) (2002). Corporate Environmental and CSR Issues Management. London, ERM. [http://www.erm.com/ERM/news.nsf/0/2920c6b4df70ff1680256d26002db917/\\$FILE/Issues%20Management%20Survey%20page.pdf](http://www.erm.com/ERM/news.nsf/0/2920c6b4df70ff1680256d26002db917/$FILE/Issues%20Management%20Survey%20page.pdf).

Opinions differ when it comes to determining how significant the transport-related energy use and CO₂ emissions are in relation to the life cycle of certain products. Proponents of low food miles advocate that sourcing food locally or regionally will bring environmental benefits (i.e. emissions reduction) and will also help local producers and strengthen local economies. Large retailers and manufacturers argue that long supply chains have high levels of energy efficiency in their distribution systems that local supply chains cannot always achieve. They also meet consumer demands for year-round availability of food products and low prices, and support developing countries' economies by importing their products. One must consider all the arguments surrounding food miles and examine trade-offs before deciding which measures increase overall sustainability of the food system and reduce its energy intensity.

United Kingdom

One of the first reports to outline concerns about the distance food travels was produced by Safe Alliance⁴ in 1994 triggering widespread debate in the United Kingdom (UK). The follow-up report⁵ in 1999 showed a continuing trend in the UK for food to travel further between farm and final consumers (average distance per tonne increased 9.6% over five years). This second report highlighted the impacts: more pollution from transport, increased packaging, loss of land and agricultural biodiversity, and greater use of chemicals required in food transit and storage. It attributed the closure of many small country shops and failure of small-scale farms to the activities of a small number of powerful retailers able to source lower-priced food from overseas. A study published last year by Essex and City of London universities⁶ suggests that food in the UK travels 65% further than it did two decades ago and that £2.3 billion per year could be saved in environmental and congestion costs if food was sourced from within 20 km of consumers. The report argues that buying local is more important than buying 'green' on the basis that only £1.1 billion per year would be saved if all UK farms became organic. As the UK organic market is largely dependent on imports that travel long distances, the environmental impacts of transport may override the benefits of organic production practices. In a 2005 study⁷ commissioned by the UK government about the possible use of food miles as an indicator for sustainable development, the direct costs of food transport were estimated to be over £9 billion and congestion on UK roads was considered a dominating factor.

Current estimates show that food transport is responsible for 3.4% of the UK-generated CO₂ emissions (total 551 Mt), of which food transport by road is responsible for 1.8%⁷.

United States of America

In the United States of America (USA), a study by the Leopold Center for Sustainable Agriculture showed a 22% increase in the average distance travelled by food products arriving in Chicago by truck (up to 10 times more energy intensive than rail or ship) between 1981 and 1998⁸ (average of 1518 km in 1998). During that time, the volume of products arriving by truck also increased from 12.5% to 21.5%. The Center for Sustainable Systems in Michigan estimates that 10% of total energy use in the USA goes into food production and distribution where transport of food is responsible for about 14% of that energy use⁹. High dependence on fossil fuels, increasing conversion of agricultural land, reduced income from farming, and increased consolidation of the food industry are all indicators that reflect the lack of sustainability in the USA food system. The research called for a life cycle approach to evaluating the food system to reconnect consumption behaviour to production practices, food transport and distribution.

4 Paxton A (1994). The Food Miles Report: the dangers of long distance food transport. London, Safe Alliance (now Sustain).

5 Hird V *et al* (1999). Food miles—still on the road to ruin? London, Sustain.

6 Pretty JN *et al* (2005). Farm costs and food miles: An assessment of the full cost of the UK weekly basket, Science Direct, Food Policy 30, 1–19.

7 Smith A *et al* (2005). The validity of food miles as an indicator of sustainable development: final report produced for DEFRA. Report number ED50254, Issue 7. Didcot, Oxfordshire, AEA Technology.

8 Pirog R *et al* (2001). Food, Fuel and Freeways: An Iowa perspective on how far food travels, fuel usage and greenhouse gas emissions. Ames, Iowa: Leopold Center for Sustainable Agriculture.

9 Heller MC, Keoleian GA (2000). Life Cycle-Based Sustainability Indicators for Assessment of the U.S. Food System. Centre for Sustainable Systems, University of Michigan, Ann Arbor.

New Zealand

Specific reports looking at the issue of food miles are not available in New Zealand. A German paper¹⁰ published in 2004 compared the embodied energy in frozen lamb from New Zealand and Germany using a life cycle approach. The paper challenged general thinking that regional food production and distribution systems are less energy intensive than global systems, and argued that “ecological quality is mainly influenced by operational efficiency and not by the marketing distance itself”. While the paper had good resonance in the media, inviting German consumers not to worry about food miles and to continue ‘feasting’ on lamb from New Zealand, its methodology and results were criticised by some life cycle assessment experts¹¹. Few full life cycle assessments have been undertaken on New Zealand food products and none for the New Zealand food system as a whole. However, comparative life cycle assessment is difficult and costly, and requires peer-review in order to ensure the credibility of the results.

The food supply chain and global trade

Emissions from transport of goods to overseas consumer markets is a direct and indisputable contribution of world trade to environmental degradation and climate change. Trade liberalisation has enabled a large number of countries to become involved in world markets, with the consequence that more (food) products are being traded and transported. However, emissions from international freight have been excluded from Kyoto Protocol negotiations and no emission reduction targets are set for international air and sea transport. This is considered by many as a shortcoming, because current trends show the growing importance of emissions from international transport, particularly for freight goods, where food trade is a significant proportion.

A 1997 OECD report¹² estimates that global transport (rail, road, air, maritime) contributes about 20–25% of the carbon emissions from energy use. Transport of internationally traded goods is expected to increase at a higher rate than the volume of trade and production, with traded goods travelling longer distances. In recent years large food manufacturers have tended to set up processing facilities in countries with low wages and low input costs¹³ leading to longer supply chains and more food miles.

A 1993 Wuppertal Institute transport analysis of strawberry yogurt produced at a factory in southern Germany revealed the high transport intensity of a relatively simple and locally manufactured product. Materials and ingredients for the manufacturing and packaging of strawberry yoghurt were sourced from Germany and other countries, every tonne of yogurt being finally responsible for 600 km of truck movement.

Movement for local food

Many food miles initiatives focus on promoting localism or regionalism in food-sourcing and more sustainable agricultural and transport practices – with the potential to minimise greenhouse gas emissions. Formal policies to source food locally are difficult for governments to promote as they are potentially in conflict with free trade objectives. Consumers’ taste and concerns are therefore the ultimate drivers, and food miles campaigners have worked hard to educate consumers about the ‘invisible’ impacts of imported food.

Major food scares of the past decade (foot and mouth, mad cow disease, genetically modified food) and concerns about the impact of transport on climate have triggered consumer interest in the origin and traceability of food, including a preference for local food. European and North American campaigns for buying local food have singled out products from New Zealand, Australia and South Africa as high in food miles. The UK Organic Action Plan stipulates that 70% of in-season organic food should be sourced from within the UK by 2010; the Italian Government has passed legislation for local authorities to include organic and local food in school catering; and funding from the European Union has been used to support local food initiatives to develop farmers’ markets and local food brands. Environmental groups and local food movements have been lobbying for farm assurance schemes and organic certification bodies to introduce food miles into certification.

10 Schlich E, Fleissner U (2005). The Ecology of Scale: Assessment of Regional Energy Turnover and Comparison with Global Food. The International Journal of Life Cycle Assessment 10(3), 213–223.

11 Jungbluth N, Demmeler M (2005). The Ecology of Scale: Assessment of Regional Energy Turnover and Comparison with Global Food. Letter to the Editor. The International Journal of Life Cycle Assessment 10(3), 168–170.

12 Organisation for Economic Cooperation and Development (1997). Freight and the environment: effects of trade liberalisation and transport sector reforms. Paris, OECD.

13 Garnett T (2003). Wise Moves: Exploring the relationship between food, transport and CO₂. London, Transport 2000 Trust.

Recently, the UK Soil Association announced that food miles might be considered in guidance for ethically concerned consumers. This could be a turning point in organic labelling and result in decertification of previously approved products. Development of an eco-label based on the principle of local sourcing and environmental impact of transportation has also been explored in the State of Iowa in the USA. Country-of-origin labelling rules are already in place in the USA and the organic certifier Bio-Swiss requires the source of the product (imported or national) to be specified on its labels. Specifying the country of origin in New Zealand is not obligatory, although supermarkets do so for some products. Although consumer demand for more locally sourced food might eventually lead to shorter supply chains and a reduction in international trade for certain products, it is more likely that local and global food chains will develop in parallel¹⁴.

The business case for responding to food miles

Managing risks

Consolidation of food supply chains and concentration of sales in supermarkets are primary drivers for food miles. The USA giant supermarket Wal-Mart has 2% of the global food market, five supermarket groups now control 28.3% of the European food market, and 85% of the UK food market is shared among four or five top retailers. There is increasing evidence that many large food retailers and supermarkets consider sustainability as a standard performance issue, and adaptation to climate change is part of their long-term strategic planning. There is a compelling business case for the food industry as a whole to improve energy efficiency and reduce dependence on fossil fuel and its corresponding emissions. These strategies create the opportunity to tap into markets for products with higher environmental and social added value such as organic products or fair trade – markets that have been growing at a higher rate than conventional markets.

The UK Carbon Trust¹⁵ has investigated the risks to brands in the UK from climate change – after airlines, the food and beverage sector was found to have the second highest intangible value at risk (10% of its market value). Tackling climate change and emissions reduction is considered both a reputation and competitiveness issue. In a survey published in 2005, the Carbon Disclosure Project showed that although the food and beverage industry has a high level of strategic awareness of climate risks, there is still limited recognition of climate-related opportunities¹⁶.

The food industry could use carbon offsetting to go beyond reducing greenhouse gas emissions especially where internal emissions reduction options are more expensive. Low-carbon or carbon neutral food products have existed for a decade, the first being Whole Earth (UK) wholegrain cornflakes in 1996. More recently car rentals, bank loans and other products such as flowers and carpets are being offered as carbon neutral.

Mainstream carbon neutral trademarks used overseas include Carbon Neutral, Climate Cool and Climate Care. At the beginning of 2006, the USA retailer Whole Foods Market® purchased renewable energy credits to offset the company's total electricity use, significantly reducing the company's energy footprint even though it has not yet addressed supply chain food miles.

¹⁴ Garnett T (2003). *Wise Moves: Exploring the relationship between food, transport and CO₂*. London, Transport 2000 Trust.

¹⁵ The Carbon Trust (2005). *Is your brand at risk from climate change?* London, The Carbon Trust.

¹⁶ The Carbon Disclosure Project (2005). *Project Report 3*. London, The Carbon Disclosure Project.

Managing the supply chain

Some European retailers have quantified the impact of their supply chain and designed transport- and energy-efficiency measures for their entire supply chain. Marks & Spencer uses a system that breaks the ISO 14001 environmental management standard into different stages that suppliers need to achieve depending on their energy intensity and environmental impact. J Sainsbury has annual targets for emissions reduction, and has increased (as part of its low-food miles strategy) the proportion of products sourced domestically to 90% for food that can be grown in the UK. Another retailer, Sainsbury UK, has developed an efficient distribution system, introducing measures to reduce its food miles and the energy consumption of its fleet by increasing the use of rail freight. In the recently published Food Industry Sustainability Strategy, the UK government has proposed key performance indicators for food transportation that include road distance travelled, emissions from traffic and air transport¹⁷. Towards the end of 2005, Wal-Mart announced plans to boost energy efficiency, increase organic food sales, and reduce waste and greenhouse gas emissions (20% reduction in emissions by 2012). In partnership with the World Wide Fund for Nature, Wal-Mart has launched an initiative to develop ethical sourcing policies for its seafood products and to work with its supply chain to improve management practices. The implications are significant for Wal-Mart's global chain of suppliers and the initiative sets an unprecedented example for other multinational companies.

Implications for New Zealand business

New Zealand producers and exporters are potentially vulnerable to demands for low food miles products in their export markets. From a climate change perspective, reduction in food miles is appropriate as long as it leads to reduced emissions for the entire life cycle of the food product. Localism, which may seem a threatening concept for New Zealand exporters of food and agricultural products, is not always the most environmentally sound solution if more emissions are generated at other stages of the product life cycle than during transport. Recognising the challenge to determine the least environmental harmful options, the 2006 UK Food Industry Sustainability Strategy encourages the food industry to increase the use of life cycle assessments to identify the most important product impacts and whether they occur in UK or overseas. With environmentally responsible production practices and offsetting, products shipped from New Zealand by sea may have significantly lower environmental impacts than those travelling shorter distances by road in Europe.

Although there is no data available on overseas transport emissions, energy use and related CO₂ emissions have been investigated for dairy farming, one of New Zealand's most important export commodities. The 2001 report¹⁸ commissioned by the Ministry of Agriculture and Food (MAF) found that New Zealand dairy production was on average less energy intensive than in North America or Europe even though on-farm primary energy input had doubled in 20 years and energy ratio (outputs vs inputs) had increased by 10%. However, energy use varied between farms and regions such as Canterbury which is more energy intensive due to high irrigation demand.

Some New Zealand producers and exporters have already applied responsible farming and production practices, including energy efficiency, that have increased the environmental credentials of their products. New Zealand also enjoys a good reputation for product labelling and traceability (including safety) – important consumer demands in all developed world markets. To ensure that New Zealand food products are recognised for their low-impacts, the food industry (producers and exporters) needs to be able to demonstrate the low environmental impacts and carbon intensity of their products by undertaking life cycle assessments. Such analysis must consider energy consumption and corresponding emissions associated with producing and shipping the product to the export market to determine if more energy efficient production practices can compensate for food miles. Since life cycle assessments look at all the impacts of a product, they can be both resource and time intensive. The type of products assessed should therefore be carefully selected by the industry, focusing first on representative products for New Zealand food and beverage industry.

¹⁷ Department for the Environment Food and Rural Affairs (2006). Food Industry Sustainability Strategy. London, DEFRA.

¹⁸ Wells C (2001). Total energy indicators of agricultural sustainability: dairy farming case study final report. Prepared for Ministry of Agriculture and Forestry by University of Otago, Dunedin.

Offsetting emissions is potentially a key risk management strategy for companies that want to counter overseas claims about food miles and differentiate their products in export markets. The methodology is less demanding than life cycle assessment as it focuses only on the fossil fuel emission components of the supply chain. In New Zealand, CarboNZero® is available as a brand that certifies products as carbon neutral, where emissions have been reduced and remaining unavoidable emissions have been offset by purchasing carbon credits. In Europe, where an emission trading system is in place, carbon credits are traded at a higher price than in New Zealand. The cheaper offsets currently available in New Zealand provide companies with a competitive advantage although it may be considerably more costly to adopt these measures in the future. Marketing has yet to play a role in promoting low-carbon intensity products as a way for New Zealand producers to tackle food miles exposure.

The long distances that food and agricultural products travel from New Zealand to export markets calls for particular attention to be given to the efficiency of the food distribution system, including refrigeration, from the farm to the distribution centre and overseas destinations. Data from the New Zealand Ministry of Transport show that transport is responsible for 42% of total CO₂ emissions and road freight makes up 80% of all freight transport. While these data are not specific to food and agricultural products, they do suggest the importance of exploring new solutions for low-carbon transport systems, above and beyond fuel efficiency. Declining oil availability and its potential impact on future transport and transport-dependent activities such as food production and export, provide additional incentives for reducing food miles.

Vehicle-kilometres travelled by freight vehicles increased by 34% for light goods vehicles and 19% for heavy goods vehicles between 1996 and 2001.

The debate around food miles and CO₂ emissions is most heated in developed world markets, being linked to both climate change and sustainability of the food production and distribution systems. New Zealand exporters have seen limited growth in these (North American and European) markets and they concentrate on the Asian market due to future growth opportunities. At present, the food miles debate is not an issue for food and beverage exports to developing countries; however, consolidation in global supply chains and a stronger presence of European and North American brands in Asia might bring to that market the same drive for energy efficiency and emissions management that can now be observed in developed countries.

New Zealand producers and exporters have invested in reducing the energy intensity and environmental impacts of their products; however, this alone is not sufficient to counter overseas claims about New Zealand goods. More life cycle assessments for product groups and supply chains are needed in order to document the true impacts of production and distribution. Transport data collection should be more specific to differentiate sectors so that trends in food transport in relation to overall freight can be determined, and corresponding emissions quantified. Integrated indicators based on food production, trade and transport-related statistics need to be developed and aligned with those commonly used overseas.

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