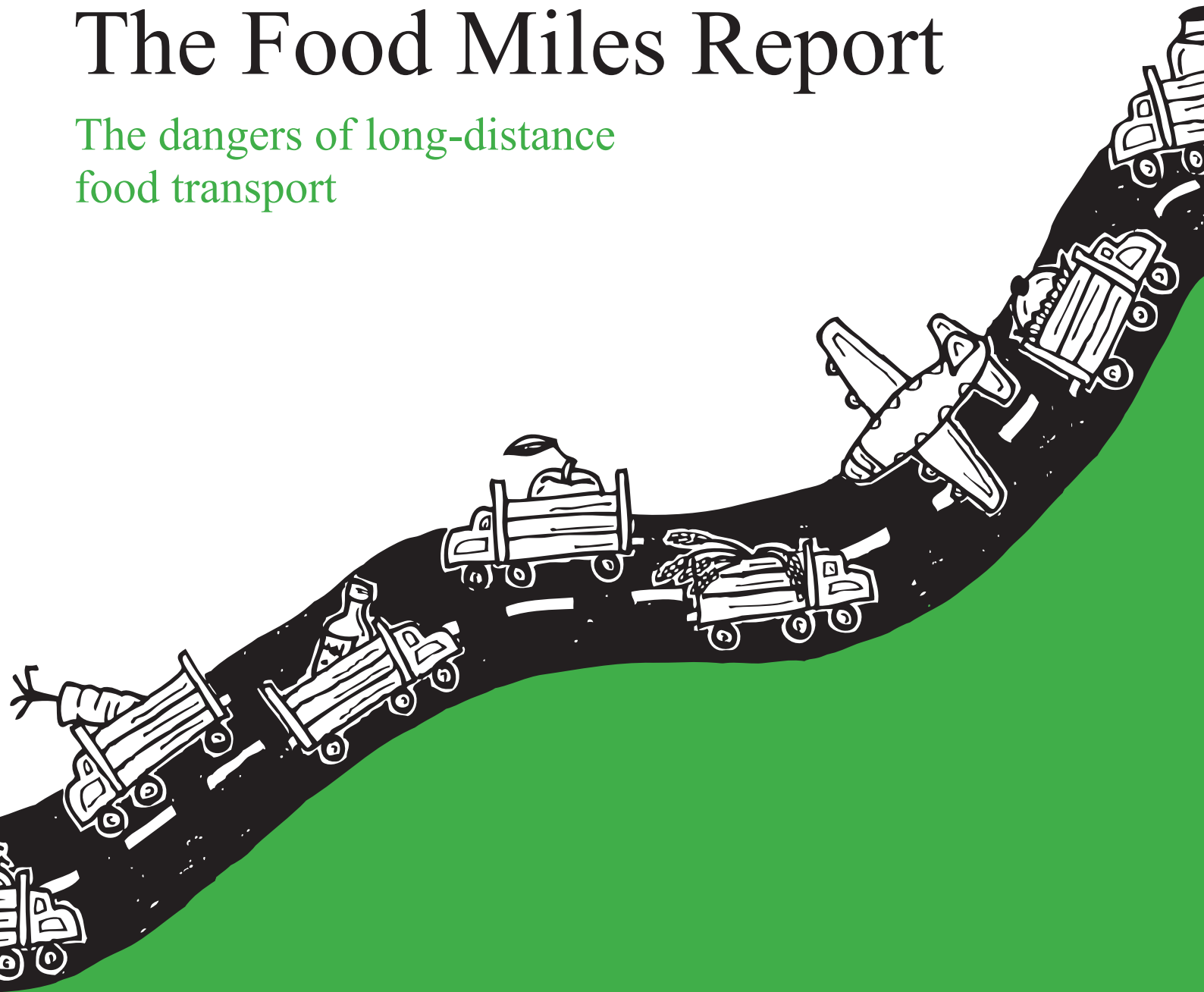


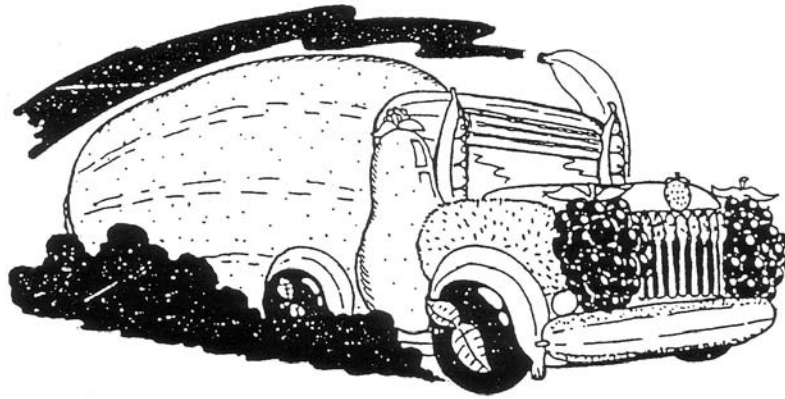
The Food Miles Report

The dangers of long-distance
food transport



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The dangers of long-distance food transport



by Angela Paxton



Originally published in 1994 by the Sustainable Agriculture,
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The Food Miles Report: The dangers of long-distance food transport

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About the SAFE and Sustain alliances

In 1994, the Sustainable Agriculture, Food and Environment (S.A.F.E.) Alliance was a coalition of groups working together to research and promote sustainable agriculture. It included farming, organic sector, environmental and conservation, third world development, animal welfare and consumer organisations. The Alliance had established itself as a major voice in the debate on agriculture and food policy, and worked with a network of similar alliances across Europe.
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Sustain: The alliance for better food and farming was launched at the UNED-UK hosted Healthy Planet Forum on 17 June 1999. It was formed by merging The National Food Alliance and the Sustainable Agriculture Food and Environment (SAFE) Alliance, both of which had been established for over 10 years. The alliance is a registered charity (no. 1018643) and company limited by guarantee (no. 02673194).

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This re-issued edition of The Food Miles Report is dedicated to the memory of Andy Jones, who died tragically in November 2010. Andy was the author of, among other things, *Eating Oil: Food Supply in a Changing Climate*, which won the 2002 Guild of Food Writers Award for Investigative Journalism. He will be sadly missed.

Foreword to the 2011 reprint of the Food Miles Report

Some 16 years have passed since the first report on ‘food miles’ – this one – was published. Both of us were mentioned in the acknowledgements and, at that time, we were each associated with separate, but linked alliances. Neither of us could have imagined that the phrase “food miles” would become common parlance – part of the way we talk about what is wrong with our food and farming system.



Encouragingly, that’s not the only result of the report. Many more reports, from a range of sources, have followed and – most important – local food initiatives have sprung up everywhere. Farmers markets, ethical restaurants, food co-ops, grow-your-own schemes...the number and variety continue to increase. People have “got it” and are keen to right the wrong. Citizens don’t want the same food pointlessly criss-crossing the globe, wasting precious energy, causing pollution, trading unfairly, and leaching jobs from the countryside.

Less positively, 16 years on it is still not possible to see, at a glance, where or even how most of what we are buying was produced. Major retailers – who market dominance continues to grow - will occasionally have some local “window-dressing” produce, but the vast majority of what they sell is bought from wherever in the world is cheapest. The fuel for air-freight remains untaxed (and even domestic fuel tax does not discourage road haulage). Companies still largely get away with poor working conditions and environmental damage, both here and abroad. EU procurement law still forbids public bodies from specifying local produce in their contracts and the barriers to buying more sustainable produce, including lack of funds and knowledge, are considerable.

Even the phrase ‘food miles’ has been abused. Too often it describes only the greenhouse gases emitted from the transport, not the full damage of long distance food. This gives those who want to avoid taking action an excuse simply to tinker round the edges of the serious problems in our farming and food system.

At the same time, there is a renewed focus on food “security” – on where our food will come from, if we don’t produce it ourselves. No-one – least of all our organisations – is arguing for a siege economy, where we aim for self-sufficiency and nothing is traded. Fair trade – along with organic food – has been another welcome success story in the years since *The Food Miles Report* was first published. But even governments in rich countries were shocked out of their complacency by the food price spikes in 2008.

Alongside the tragic deaths and food riots in poor countries, many countries stopped exporting their wheat, rice or other food commodities for a period. Accustomed to buying whatever we wanted, whenever we wanted it – and cheaply – on the world market, rich countries were suddenly reminded of their vulnerability. Most commentators agree that this is not likely to be an isolated incident, if current global trends continue.

So when will “food miles” stop being an issue? Only when we have a truly sustainable food and farming system here and across the globe and that, unfortunately, is still a long way off.

Vicki Hird

**Then at the Sustainable Agriculture Food and Environment Alliance
Now Friends of the Earth**

Jeanette Longfield

**Then at the National Food Alliance
Now Sustain: the alliance for better food and farming**

Foreword to the original 1994 Food Miles Report



Two major determinants of a country's environmental impact are the nature of its food economy, and its systems of transport. Though they are not usually bracketed together, they are becoming closer and closer intertwined. Food production is highly dependent on external inputs – which have to be transported. Eating has never been so transport-intensive – as a sector of the UK economy, food accounts for a hugely disproportionate part of freight demand. Food is becoming *the* issue in the transport debate.

This report represents the start of a new campaign on the food we eat, where it originates and how it reaches us. Action is needed to address the great challenges of climate change, international equity, threats to biological diversity, irreversible pollution and the erosion of natural resources – as debated by world leaders at the Rio Earth Summit in 1992. The S.A.F.E. Alliance intends this campaign to be an important element of the move towards more sustainable systems of food production and distribution.

This report urges action from individuals, farmers and growers, retailers, local authorities, governments and international institutions. Each has a part to play in tackling the menace of Food Miles.

Hugh Raven
Coordinator – The S.A.F.E. Alliance
September 1994

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Summary of the Food Miles Report

Introduction

Food is being transported longer and longer distances – ‘food miles’ – from producer to consumer. In the UK, comparatively little of the food we consume comes from local producers; and much will have been transported over great distances – such as apples 14,000 miles from the New Zealand, and green beans 4,000 miles from Kenya. Cheap non-renewable fossil fuel energy makes intensive agriculture and long-distance transportation economically viable, and has allowed food production and distribution to become global industries. Prices in shops do not reflect the full cradle-to-grave environmental and social costs.

But the concept of food miles isn't just about distances. This report explores some of the wider social and ecological implications of international food trade, and suggests how to reduce excessive, unnecessary food miles.

The food miles food chain

Food miles build up all along the food chain – from transport of food from the country of origin to distribution to shops around the country.

Producers: Long distance trade in foodstuffs leads to specialisation in agriculture and the allocation of resources to production for export rather than to local needs and self sufficiency. For example, in Bangladesh shrimps rank as the country's third largest export earner. Yet the country is unable to feed its own population – a clear conflict over the use of land for local food needs, as opposed to export production.²

Preservers, packagers and processors: Pesticides are used in storage and transport. Methyl bromide, a toxic pesticide widely used as a fumigant on food before transport, is also a significant contributor to ozone depletion.³ Oranges on sale in the UK are bathed in chlorinated water, washed with detergent; sprayed with a post-harvest fungicide and finally coated with wax to make them shiny. To protect food in transit it is either heavily processed, packaged and preserved. Almost three quarters of the food purchased in the UK has been processed in some way,⁴ using up to ten times the energy to grow the crop.⁵ This can mean paying over £2.00 per pound of potatoes as crisps.⁶

Transport: Transport is both energy-intensive and polluting. Importing food by air is particularly serious, consuming 37 times more fuel than shipping. Road freight uses four times the amount of energy per tonne– kilometre as rail, yet in the UK carries 81% goods.⁷ Road traffic is the fastest growing source of carbon dioxide, accounting for 19% of the UK's total CO₂ emissions in 1991.⁸ The *distance* foods are being transported within the UK has increased by over 50% since 1978⁹ – partly as a result of centralised distribution and delivery systems. Over a third of the growth in road freight in the UK over the same period is attributable to food, drink and tobacco – more than for any other major commodity group.¹⁰ Road transport leads to many environmental and social hazards, such as increased air pollution (see Strawberry Yoghurt Case Study).

Trade-offs: In terms of energy use, to some extent there is a trade-off between energy use in agricultural production and that used in transport. For example, it is usually more energy efficient to grow products in their natural climatic conditions and ship them to the country of destination, rather than using intensive agricultural methods to grow them in inappropriate climates.

Food Miles: Issues and implications

The environment: Air pollutants and climate change gases are released as fossil fuels are used for production, transport and packaging (see Orange Juice Case Study). Industrial agriculture supplying international trade involves overuse of pesticides, land erosion, loss of wildlife sites and reduced biodiversity in wild and cultivated species. For instance, three varieties of winter wheat in the UK account

for over 50% of the crops sown (also see Apples Case Study). Worldwide this trend poses a serious threat to food security, as the genetic base of our food crops is narrower than at any time in history.

Implications for the South of producing food for distant markets in industrialised countries include: the allocation of human, environmental and economic resources to export production rather than for local needs and self sufficiency (see Luxury Lines Case Study); vulnerability from dependence on export sales; health and safety risks to farmers and farm workers; and environmental and resource damage, resulting from the application of inappropriate industrial agricultural methods. Regional trade suffers as countries export foodstuffs to the North, whilst neighbouring states may be in famine.

Small producers: Industrial specialised agriculture favours large producers, and replaces human labour with energy-intensive mechanisation. In the UK 12,000 farmers left farming in 1991.¹¹ It is estimated that over the next 5-10 years a further 100,000 will go and 25,000 rural jobs in farming-related industries will be lost.¹²

Animal welfare is severely compromised as demand for cheap, standardised products encourage factory farming (see Meat Miles Case Study). This is also inefficient in terms of land use and energy conversion – in general, for the production of one calorie of meat, up to ten times as much land is required as for the production of one calorie of cereals.¹³

Public health: Over-processed, over-preserved and over-packaged produce can mean that consumers buy foods of lower nutritional value. For instance even after only 24 hours, spinach and asparagus, stored at room temperature, lose 50% of their vitamin C content.¹⁴ Pesticide residues on foods and pollution from transport pose additional risks (see Chocolate Habits Case Study).

Forces behind Food Miles

The forces behind food miles are complex. One of the key areas is the low cost of fuel, which does not reflect the full environmental and social costs of its use. Altogether it is estimated that air pollution from road transport in the UK costs £2.8 billion annually.¹⁵

The much criticised Common Agricultural Policy in Europe has resulted in a heavily subsidised agriculture leading to food surpluses, farmers being paid to set aside land, and prairie-style farming. Yet Europe remains one of the largest importers of food in the world.

The large retailers wield enormous power through their huge market share. Producers bear the cost of wastage in the supermarket's desire for 'perfect produce'. Retailers import products to fill seasonal gaps, or encourage domestic growers artificially to extend the natural growing seasons, and even import fresh produce when it is in season in this country (see Salad Days Over and Milk Case Studies).

The largest retailers have centralised distribution, resulting in enormous mileages being covered between producer, packager, distributor and ultimate retail outlet (see Bread Line Case Study). Lorries often travel around less than half full to supply food at short notice to supermarkets, and more journeys are made to transport the same amount of goods.

Who reaps the profits?

Cheap transportation and low prices on the world commodities market have contributed to the profitability of trade in food over huge distances. Transnational corporations (TNCs) exploit land, labour and resources in developing countries for the production of raw commodities to which they add considerable mark-ups before sale in the North. Almost all primary commodities are each now marketed by fewer than six multi-commodity traders.¹⁶ For instance, three TNCs control 80% of world banana trade. Less than 2% of the price of a banana will go to the field worker, while 5% goes to the farmer. 88% of the price goes to the intermediaries in the food chain – the importers, wholesalers, retailers, and freight companies.¹⁷

International finance: Only relatively small amounts of overseas development aid goes to the poorest of countries or to projects that benefit mainly the poorest people. Much aid is tied to the purchase of donor country services and goods. Debt contributes to food miles by encouraging production for export in heavily indebted countries to service debt repayments. The total debt burden for sub-Saharan Africa reached over \$183bn in 1992.¹⁸

Structural adjustment programmes arranged by the IMF for indebted nations also demand high earning exports and reduced internal spending. This exploits their so-called ‘comparative advantages’ of cheap labour and resources and lax environmental protection. African countries now export some 50% more cocoa than in the mid-1980s, but the resulting over-supply on world markets forced prices down recently to the point where they receive less revenue.¹⁹ The General Agreement on Tariffs and Trade (GATT) will tend to increase the international food trade.

Customers: Food corporations argue that consumers drive the food industry. Yet consumers are not fully informed of the effects of the food they are buying; and that the full costs of production and transportation are not reflected in the shop price. If they were, people might prefer to choose local, seasonal, low impact produce.

Reducing Food Miles

Food miles from a complex problem – and there is no single solution. The SAFE Alliance believes that the answers lie in long term cultural changes for consumers, retailers, and policy makers.

Recommendations

Action by individuals: When buying food that cannot be grown in the region, such as tea or bananas, individuals should buy **fair trade** products whenever available. When buying food that can be grown in the region, i.e. Europe, individuals should follow a hierarchy of purchasing priorities: **locally, nationally and regionally**. They should buy locally produced, seasonal fresh produce whenever available, from small, local shops or through direct producer consumer links. Consumers should also reduce consumption of meat and dairy products and avoid processed and preserved food.

Individuals could investigate setting up their own local produce marketing scheme, join an existing one or grow their own food, in gardens or allotments. Groups of six individuals can petition their local authority to provide sufficient allotment space if it isn't already available. Individuals should write to their MP and MEP, to MAFF, and to supermarkets and food manufacturers, demanding a clear labelling system showing the distance food has travelled and its country/countries of origin.

Action by farmers and growers: They should examine the potential to market produce locally, diversify production for local consumption, and introduce more value-adding of foods on-farm.

Action by food retailers and processors: Retailers and manufacturers should give priority to sourcing locally and stocking fair trade products wherever possible. Retailers should introduce national labelling schemes showing food miles and/or itemised till receipts to show country/countries of origin of foods, and introduce reusable packaging schemes for local goods.

Action by local authorities: They should use existing powers (Planning Policy Guidelines 6 and 13, for example) to encourage and revitalise small, local and/or high street shops, decentralised facilities and local markets and influence the siting of supermarkets in sites accessible by non-motorists, and centralised distribution facilities; and encourage local farmers' markets.

Action by national governments: Measures should be introduced to reduce long distance transport of goods – such as increased fuel taxes. Products could be required to carry information to consumers to show the distance fresh food has been transported, and the mode of transportation used. Assistance should be given to direct marketing schemes and Food From Britain transformed so that its emphasis is on import substitution, i.e. replacing imports with home-grown produce.

Aid and debt relief for Southern countries should be linked to sustainable development initiatives including diversification and sustainable agricultural production. International agencies such as the IMF should be lobbied to promote multilateral debt-relief. Within the GATT, pressure should be applied for multilateral adoption of minimum standards for working conditions and environmental protection in agriculture.

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The Food Miles Report: Introduction

Food is being transported over long distances from producer to consumer. In the UK, comparatively little of the food we consume comes from local producers, and most of it will have been transported over great distances to reach us. Apples 5,000 miles from South Africa, shrimps 13,000 miles from Bangladesh, and green beans 4,000 miles from Kenya,¹ are all brought to our local supermarket where we can pick and choose from the world's food store. Farmers and growers the world over specialise production to compete for markets hundreds or thousands of miles away.

This report explores some of the wider social and ecological implications of this food trade and makes wide-ranging suggestions for what can be done to reduce the distances food travels from producers to our plates, and otherwise tackle problems arising from unnecessary food miles.

Although the global food system results in a vast choice of food and drink products, this choice is only available to privileged minority of rich consumers in industrialised countries such as the UK, and is dependant upon cheap commodities from the South. For instance, vast tracts of land in countries such as Brazil are taken up just to produce feed supplements for livestock production in the rich European Union (EU).

In many cases those farmers and farm workers, particularly in southern countries, who produce the foods we consume have limited choice and quantity of food. This is not as a result of food shortages, but because the poorest people lack money, land, or the means to produce food. Comparisons between over-fed consumers in rich countries and undernourished producers in the poorer ones can be stark.

The distances which separate consumer from producer contribute to the consumer's ignorance of how food is produced. The distance food travels to its market determines to a great extent how it is produced, and the treatment it receives during production and post-harvest. This means many foods available to us are those which travel and store well, or that have been preserved or processed in some way. Were individuals aware of the working conditions of southern producers or the amount of pesticides applied to their food, perhaps they would choose to purchase a different product, or to get involved in bringing about more equitable, sustainable production methods.

❖ *Dependence*

Specialising production for sale to distant markets breeds dependency and vulnerability. Southern countries are particularly susceptible to external forces and events because they generally produce a limited range of agricultural exports for consumption in industrialised countries such as the UK.

❖ *Balance of power*

The agricultural and trading policy framework for global food production and trade are, in the main, determined by powerful nations or superblocs in the industrialised world, particularly the US and Europe. These countries support their own agriculture whilst limiting the power of developing countries to do the same, resulting in a build-up of food surpluses in the EU and US, which are dumped on world markets or poorer countries. Subsidised imports 'dumped' in the South lowers world prices and renders the commodities produced by poor countries uncompetitive, undermining their agriculture and leaving them without any income in the short term.

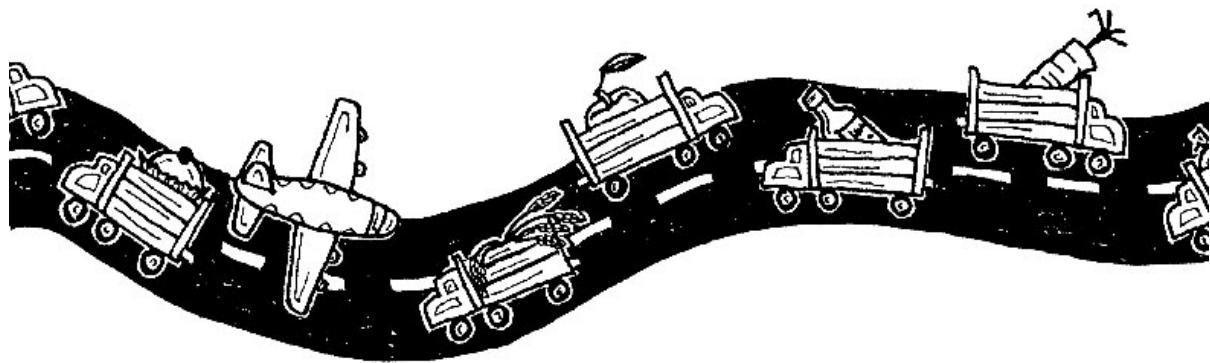
A number of international agreements and actions have implications for the food industry worldwide, most notably the General Agreement on Tariffs and Trade (GATT) and Agenda 21. The GATT is a trade agreement provisionally signed in April 1994, to be ratified in 1995, and is likely to exacerbate inequalities between rich and poor nations, particularly through its requirements to expose vulnerable markets in countries in the South to the competitive international trading environment. Increasing trade means increasing food miles. Agenda 21 is the programme of action agreed by nations at the Earth Summit in Rio in 1992, which sets out the sustainable way forward for the 21st Century. Essentially the basic aims promoted by GATT and Agenda 21 represent opposing objectives: freeing up of international trade and sustainable development cannot be pursued effectively at the same time.

International trade in foods is controlled by a relatively small number of intermediaries, mainly transnational corporations, for the most part based in industrialised countries. These giant companies, which can include wholesale, freight, packing and retail of foodstuffs in their operations, put high mark-ups on food sold to consumers whilst paying producers low prices for the raw commodities, with the justification of 'added value' due to processing or convenience.

❖ *The full costs of food miles*

Cheap fossil fuel energy makes intensive agriculture and long-distance transportation economically viable and has allowed food production and distribution to become global industries. Prices in shops do not reflect the full costs to people and the environment of producing and transporting goods. For example, an apple which has been grown intensively in Chile, being treated with agrochemicals, and then shipped 9,000 km to the UK, is likely to be cheaper here than domestically grown organic apples.

Yet the environmental and social costs in terms of soil, water and air pollution in Chile, occupational exposure to hazardous pesticides and environmental damage from the use of fossil fuel, are not accounted for in the price of the apple. These costs are paid by people in Chile and by the environment in general. This report will argue that the market system, which is supposed to ensure an efficient allocation of resources, has manifestly failed to do so because the environment and certain social groups are bearing the real costs of food trade and transport.



1. Food Miles case studies

Case study 1: rotten apples

English apples are available most of the year round, but only 25 per cent of dessert apples consumed in the UK are grown here, whereas in France 90 per cent of those sold in supermarkets are French.² At the same time as orchards in the UK are being grubbed up – since 1950 the cropped area of dessert apples has fallen by almost half and that of culinary apples by two thirds– apples are being imported from Europe, New Zealand, Chile, the US and South Africa.³ We could produce many more of our own apples, which would benefit our rural communities and save energy on packaging, storage and transport.

❖ *Biodiversity*

As a consequence of pressure to intensify and specialise production only a small number of apple varieties are now grown in the UK. There are 2,000 varieties of apple in the National Collection of the UK⁴ but today just nine dominate in our commercial orchards.⁵ At one time over 200 varieties could be found growing in a single orchards. Today, old orchards and varieties of fruit are in decline.⁶

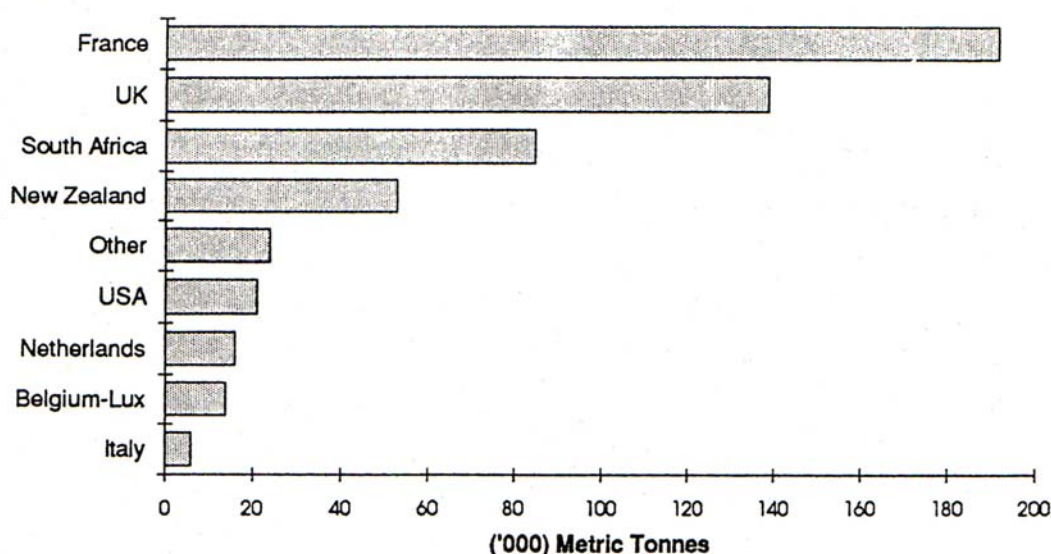
❖ *Buyer concentration*

Major supermarkets in this country have considerably increased their share of the fruit and vegetable market in recent years, largely at the expense of specialist greengrocer shops. In 1991 the largest supermarkets took 48 per cent of fresh fruit and vegetable sales in the UK,⁷ giving them enormous buying power. Food retailers insist on the ‘standardisation’ of fruits and vegetables, which means the fruit should be blemish-free, travel and store well, and be of a uniform size and shape so that it is visually appealing on the shelf. To produce such apples, intensive farming techniques need to be adopted, growing a limited number of varieties, and using large amounts of pesticides and other agrochemicals to keep the fruit free from imperfections.

❖ *Wastage*

There is considerable wastage of fruit which does not meet these standards. For 1993, the out– grading for UK apples amounted to roughly 12 per cent of gross production.⁸ Due to periodic gluts in apple supplies, food giants can afford to be, and indeed are, choosy.

Figure 1. Countries of origin for dessert apples consumed in UK in 1993



❖ *Rural communities*

Commercial orchards tend to rely on mechanical harvesting and ‘synchronized ripening’, leading to both social and aesthetic losses to rural communities as workers are laid off and old, established orchards are replaced by fruit plantations or monotonous landscapes of identical crops. As Figure 1

shows, the largest source of apples consumed in the UK in 1993 was France, with 35 per cent of the market, with another 15 per cent coming 5,200 miles from South Africa, 10 per cent 14,000 miles from New Zealand and 4 per cent 3,300 miles from the United States.^{9 10} UK consumption of apples is increasing and the fresh apple market is expected to grow slowly in the future. However, most of this market growth is likely to be filled by imports, primarily from New Zealand and South Africa,¹¹ while the EU is providing a grubbing grant for fruit growers in Europe to remove surplus capacity!¹²

Case study 2: oranges are not the only fruit

Over 90 per cent of the 55 million metric tonnes of orange juice consumed world-wide goes on the account of the northern industrialized nations: the USA, Europe and Japan. More than 80 per cent of the orange juice consumed by Europeans originates from Brazil, the largest orange juice producing country world-wide.

A study at the Wuppertal Institute in Germany showed that for each tonne of Brazilian orange juice consumed, at least 25 tonnes of materials were also used, including 22 tonnes of water and 0.1 tonne of fuel. Altogether, annual Western German orange juice consumption occupies approximately 370,000 acres (150,000 ha) of land (see Figure 2). This is three times the domestic Western German fruit growing area in 1991 (119,000 acres). If this German level of orange juice consumption were adopted by all world citizens, 32 million acres (130,000 km²) of land would be needed just to produce oranges!

The Wuppertal study found that locally produced blackcurrant juice contained as many vitamins as the imported orange juice but was far less resource intensive, since it is produced with no or little pesticides or irrigation water, and requires little transport. 50 per cent of local German blackcurrant production is used for own consumption juice.¹³

Case study 3: luxury lines in fresh produce

Many developing countries are now beginning to diversify their cash crop production into fresh fruit and vegetables for industrialised markets. This is due to a combination of factors, including the relaxation of import restrictions into the EU, the development of competitive long-haul refrigerated air transport and a growing demand for fresh out-of-season or exotic produce by European consumers. Sub-Saharan African countries in particular have been keen to diversify their export base in order to meet debt repayments and to compensate for a dramatic reduction during the 1980s and 1990s in the world market price for their traditional agricultural exports such as cocoa, coffee, cotton and tea.¹⁴ Similarly, there has been a huge growth in the export of vegetables from Latin America to the US in the last ten years.

However, the international market demands fruit and vegetables with no blemishes, hence farmers have to use large amounts of pesticides on their crops to achieve such 'standardisation'.¹⁵ Environmental impacts of horticultural production in the South include declining water tables, soil and groundwater pollution from agrochemicals, and saline intrusion. As much of this produce is flown to its destination, the environmental impact of air transport must also be considered – particularly in view of the pollutants emitted being far in excess of other modes of transport.

In Kenya, for example, the production of luxury vegetables and flowers has overtaken coffee to become the second most important export sector after tea, with produce going to 30 countries, the largest market being the UK with 40% of market share.¹⁶ All over the country, farmers have switched from growing potatoes, carrots, maize and cabbages, for local consumption, to producing luxury vegetables such as French beans or flowers, to be flown to Europe. Exports of horticultural products have grown from less than 1,500 tonnes in 1967 to 64,000 tonnes in 1993. The aim of this horticultural production is to cover the country's US\$250 million trade deficit, caused by plummeting prices for its traditional export crops.

There are drawbacks to this booming export business.¹⁷ On the slopes of Mount Kenya, land clearance for "new farmers" growing horticulture crops has damaged the catchment areas of rivers in the district.

Traditional farmers below are being deprived of water for their crops, leading to steep food prices rises. Europe is now attempting to regulate imports that have high pesticide residue levels, and according to the United Nations Environment Programme (UNEP), Kenyan producers are major culprits.

Case study 4: salad days over for UK producers

Many UK salad growers are currently facing ruin because of competition from cheap imports as a result of oversupply within the EU. In the last ten years, imports to the UK of lettuces have tripled, while self sufficiency has fallen from 89 per cent to 74 per cent.¹⁸ Lettuces, tomatoes and cucumbers are being sold in the UK at prices far below those which could reasonably be set for home-produced items. Spring prices of cucumbers for example, were down 40 per cent in 1994 from 1993.¹⁹ Imports of Spanish Iceberg lettuces alone have more than doubled since 1988, pushing home-grown produce off retail shelves across the country.²⁰ The UK's answer to this is to encourage producers to export their salad vegetables to the continent,²¹ resulting in needless increased freight transport, and further insecurity for farmers.

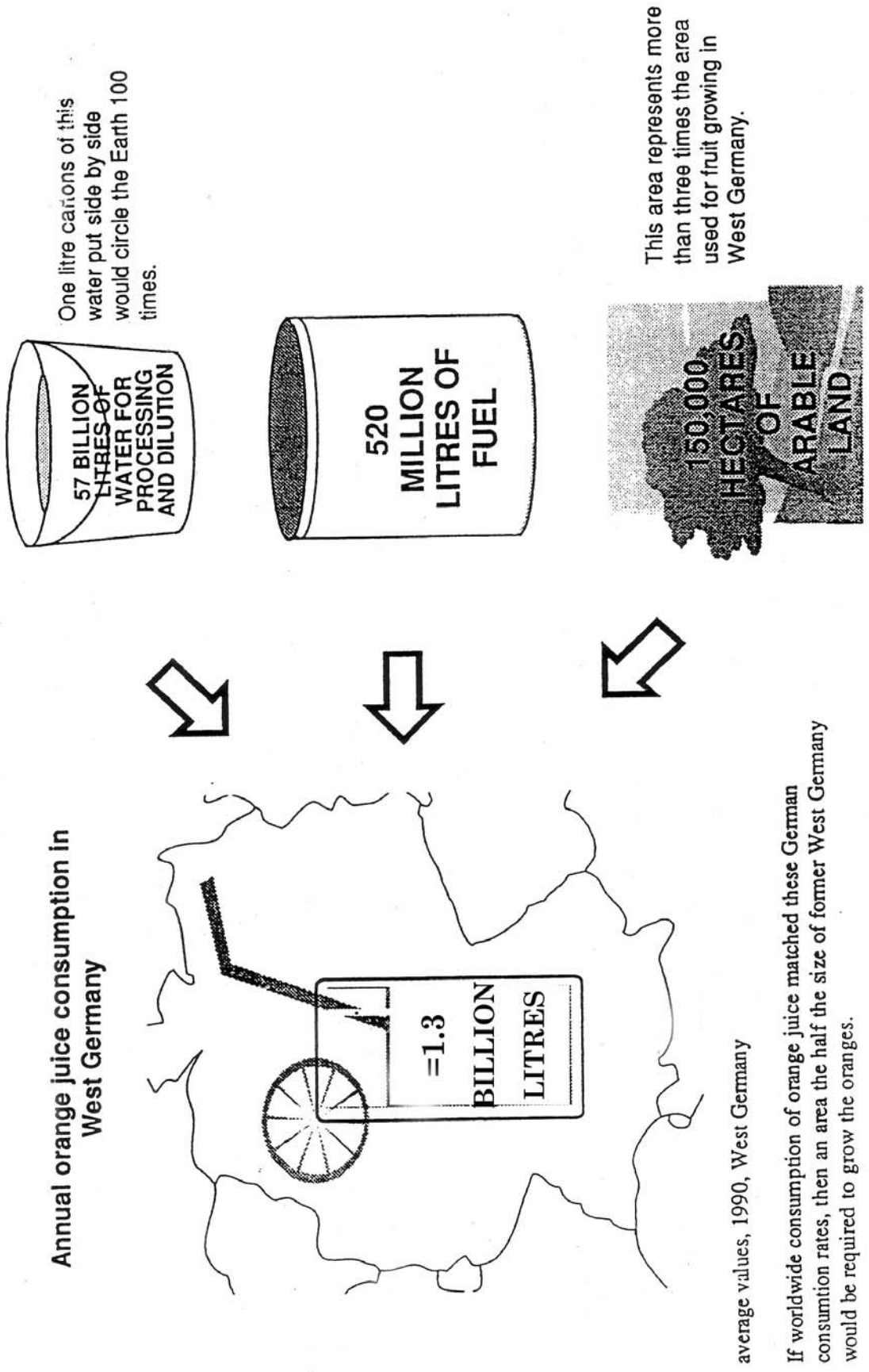
Small farms in Spain have also suffered as a result of the introduction of industrial, export-oriented food production, which has benefited from EU funds. In the face of competition from intensive agriculture in other European countries, Spain is losing its small-scale, sustainable, agricultural production; its farming population is being forced off the land, rural communities are disintegrating, and the environment is under threat.²²

Case study 5: milk – the demise of door-step deliveries

In 1972, 90% of the total volume of milk sold was supplied via door to door deliveries. By 1993 this has fallen to 56%, with 26% being sold through supermarkets, in comparison with 8% for all shops in 1972.²³ Despite being an emergency and resources efficient distribution system, with bottles being returned on average 12 times²⁴, door to door deliveries are now more expensive per pint than milk from the large retailers. This is because rival supermarket chains and discounters have sought to undercut each other on staples such as milk, often making no profit on these lines, whilst recouping the shortfall through other sales.²⁵ In March 1994, retail milk prices were driven down to a 20p pint.²⁶ Local milk deliveries, unable to compete with such low prices, are in steep decline.

The scrapping of the UK milk marketing boards in November 1994 will leave farmers free to sell their milk to the highest bidders instead of having to supply the boards.²⁷ This is expected to lead to higher prices for milk, and if sources are unavailable at the right price in Britain, superstores may look to Europe for supplies – sucking in imports.²⁸ Additional fears have been expressed that the end of the boards could lead to the extinction of some of the home-produced, small-volume territorial cheeses and bulk cheddar sources, which could suffer problems of price and milk supply.

Figure 2. Water, fuel and land required for annual West German orange juice consumption



Case study 6: meat miles

❖ *Imported feeds*

Intensive livestock rearing in the EU largely depends on imports of protein-rich feedstuffs and cereal substitutes. Approximately half of EU animal feed requirements are met from grassland and bulky fodder crops – the remainder coming from compound feeds, protein concentrates, straights, additives and supplements. Imports of non-cereal feed ingredients into Europe for livestock production constitute a major input of nutrients and energy to our agricultural system, amounting to approximately 30 per cent of all feed, 40 per cent of which is soya.²⁹

Animal feed is allowed into the EU without the usual application of tariffs, which results in EU-grown wheat, which would otherwise be used as animal feed, instead being displaced and having to be exported with an added subsidy. Thus EU taxpayers pay twice for these imports.

Soils in developing countries are depleted of their nutrients through intensive growing of these feeds for export, while the feed importing countries end up with an excess of nutrients, disrupting their nutrient cycle – like the 40 million tonne mountain of manure in the Netherlands, which is now major environmental hazard.³⁰ The possibility of exporting some of this manure to developing countries such as India and Thailand is currently being entertained.³¹

The US is the most important source of feedstuff imports into the EU, compromising about 40 per cent of total imports, including soya-cake, corn-gluten feed, corn-germ-cake, citrus pulp, beet pulp and brewery waste. Developing countries such as Brazil and Thailand provide about 55 per cent of total compound feedstuffs.³² The reasons for and implications of producing feed for export by these two countries vary considerably, and different cases will require different solutions.

Brazilian soya

In 1989, 77% of Brazil's soya bean exports and 68% of its soya flour exports went to the EU. Europe is a major importer of soya from Brazil, much of which is used as animal feed. Soya meal or cake contains up to five times more protein than cereals, and so makes a good feed supplement.³³

Large scale mechanised soya monoculture in Brazil has contributed to the devastation of the ecosystem of the Cerrados plateau. The area under soya has grown from 800,000 acres in 1975 to 12 million acres in 1989. Four fifths of this soya is exported. A quarter of Cerrados' forest, with many potentially valuable species has gone. Annual soil loss in areas of native vegetation is 0.04 tonnes per acre, while in areas under soya it is 3.2 tonnes per acre. The increased farming of unsuitable land leads to worsening erosion as demonstrated by gigantic gullies. Fertilisers, pesticides and lime have contaminated water, decreased pollination, and led to the growth of disease and pests. For example, the boom in soya bean cultivation has been blamed for a big increase in the whitefly pest, which has seriously affected traditional bean-growing areas.

In 1970 Brazil grew soya beans on 3.5 million acres of land; by 1988 the crop covered 26 million acres.³⁴ The food security of indigenous Indian peoples, and of small-scale settler farmers, has been undermined. Consumption of beans by Brazilians is today little more than half its 1981 average of 28kg per person.

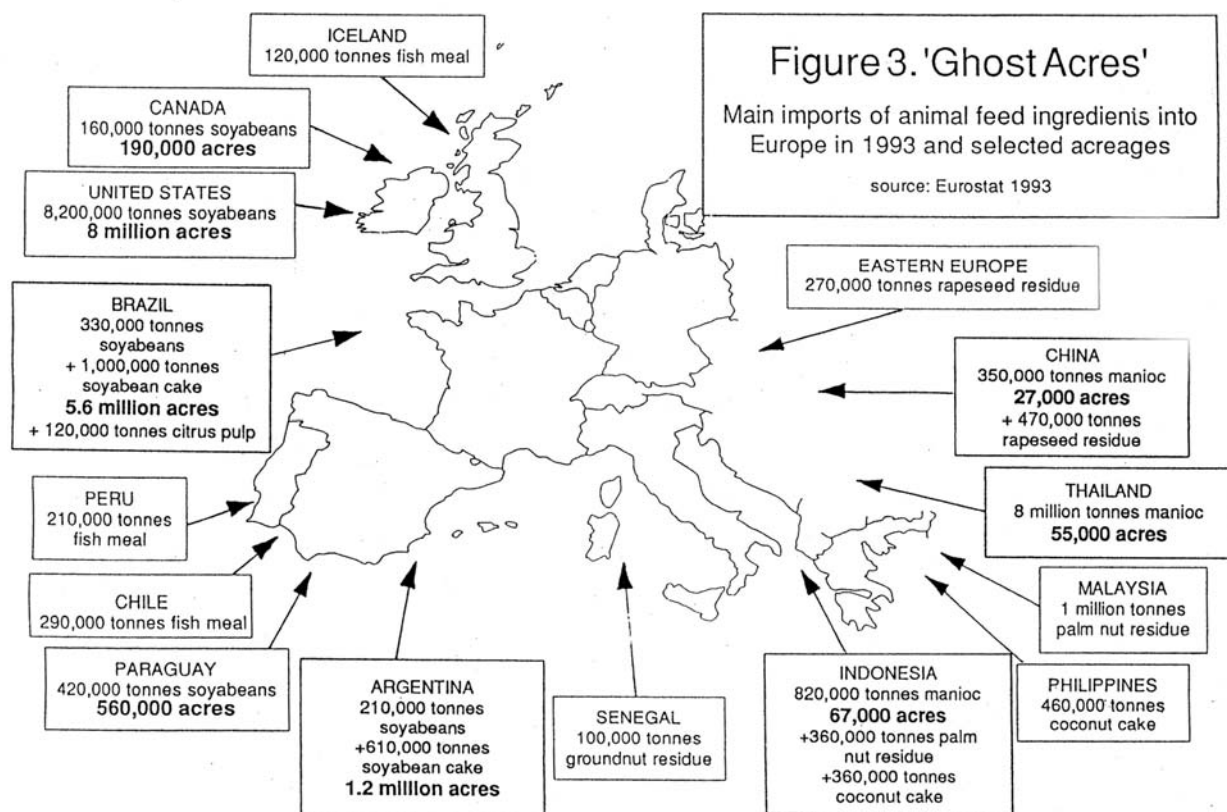
An 'ecological shadow' is cast over the blighted areas of third world soya production as 'ghost acres' are farmed to satisfy our demand for meat and meat products. The UK farms two of these ghosts abroad for every one farmed at home.³⁵ Figure 3 shows the main imports of animal feed ingredients into the European Union in 1992.

Thai cassava

Tapioca, a raw material used for animal feed in the EU, is made from cassava. In 1993, Europe imported eight million tonnes of cassava from Thailand, worth £790,000.³⁶ Exports of tapioca are Thailand's second most important agricultural export and so the trade is of great importance to the country.³⁷ An estimated five to six million people depend on income generated by its production,

processing and marketing. Organisations such as the Dutch Association for a New International Development Policy (NIO-Association) argue that tapioca is an indispensable source of income for small farmers in Thailand.

Some research has shown that no other crop could fulfil the important role of cassava, either outside of the EU nor within Thailand's own livestock sector.³⁸ According to this work, halting the cultivation of cassava could lead to greater risks to the environment in the form of more pressure on potential arable land, leading to further deforestation, and would cause a marked reduction in the sustainability of the agricultural ecosystem in the Northeast. For example, the planting of eucalyptus trees as an alternative to cassava cultivation would be disastrous, both from an environmental and social point of view. In addition, population growth precludes any return to food self sufficiency. However, cassava producers depend for the sale of their crops on import legislation decided thousands of miles away by European agricultural policy-makers, and thus remain vulnerable and dependent.



❖ *Export dumping*

Intensive livestock production in Europe has led to surpluses of meat and other animal products. These surpluses are either stored using taxpayers money, or dumped on developing countries' markets as frozen beef at lower, subsidised prices than meat from the locally reared animals. In 1992, the European Community (EC) exported 70,000 tonnes of mostly low-grade beef to West and Central Africa with the aid of huge export subsidies. European beef prices are often 40% lower than local fresh beef. The dumping of surpluses is ruining both local graziers and the environments, as rangeland is degrading under high stocking rates – and with beef prices so low more farmers are trying to crop fragile soils.^{39 40}

Meanwhile, the UK imported almost 140,000 tonnes of beef in 1993. The majority of these imports were from the EU, but we were also importing from Australia, Central America and Sub-Saharan Africa. One of the reasons for these imports is that beef prices in the EU are kept artificially high by the Common Agricultural Policy, so exporters receive a better price for their product than at home.

Table 1. Imports of beef to UK and distance transported in 1993⁴¹

Country of origin	amount imported (metric tonnes)	distance (nautical miles)
EU (France, Netherlands, Eire, Denmark, Italy, Germany)	99,500	-
Zimbabwe	9,700	7,100
Botswana	6,500	5,200
Namibia	4,300	5,200
Australia	5,800	11,200
Brazil	5,200	5,200
Uruguay	4,600	6,200
other	3,700	-
TOTAL	140,000	n/a

It would make more sense for the African countries exporting to the EU to instead supply neighbouring countries in their region, some of which may be in severe famine, whilst others are on the receiving end of the subsidised EU beef exports.

Case study 7: Chocolate habits

Research by the Women's Environmental Network has revealed that in 1992 some three billion pounds worth of chocolate were bought in the UK. On average, every man, woman and child ate an average of 8kg of chocolate, or five bars a week.⁴²

❖ Environment and health

Most consumers in the North today are entirely unaware of where chocolate originates and the process by which it is brought to our supermarkets and stores, being transported as far as 11,000 miles across the world.

At least 30 pesticides are known to be used in cocoa production including several listed among the Pesticide Action Network's 'Dirty Dozen' (the twelve most toxic and damaging pesticides), and residues have been found in the chocolate bars themselves. The effects of eating the pesticides in chocolate are still unknown, but their effects on the environment and on the lives of thousands of cocoa growers are better understood. Cocoa is largely grown on plantations and sprayed daily with an array of toxic chemicals which contaminate the soil and groundwater and endanger wildlife. The ill-protected and poorly paid pesticide sprayers commonly experience nosebleeds, breathing problems, headaches, nausea and skin rashes.

Malaysian cocoa production

Cocoa is the third most prolific cash crop in Malaysia, undergoing the biggest expansion of all crops throughout the 1980s. Around 55 per cent of Malaysia's cocoa is currently produced on plantations. Expansion of cash crop output has been facilitated by the Government's eagerness to follow the process of "opening up the land". Rainforest land is converted to plantations which then yield a consumable resource. Agro-conversion is the biggest cause of deforestation in Peninsula Malaysia where it has proceeded at a rapid rate since the turn of the century. Eight or nine plantation companies account for the majority of cash crop production in the country. However, world market prices dropped substantially in the late 1980s and early 1990 (until 1994 when they shot up) and these commodities became less profitable. Plantation companies then began to diversify into other areas of business such as manufacturing, oil, and property.

Undeterred by the unpredictable crop value, large areas of land have recently been converted to produce cocoa, as government, bent on economic development, is determined to compete for a stake in the world market. Most of Malaysian cocoa goes to feed the world surplus of the commodity.

The rationale that cash crop production will increase foreign exchange earnings and that people will benefit from having a cash income has motivated the government to move families into forest land, resulting in the resettlement of 26,000 families and the conversion of 300,000 hectares of land to cash crops in the five years to 1990. In total, over 700,000 people had been settled by the end of 1990.

Production has indeed increased, but communities have been accelerated into cash oriented economy and they have become dependent upon obtaining money from the crops they grow in order to eat. Formerly the forest supplied all their needs; in recent years emergency food supplies have had to be flown into such sites on several occasions.⁴³

❖ *Market concentration*

Producers and farm workers are subject to the uncertainties of the world market as cocoa prices rise and fall, and the traders and manufacturers hold onto the profits. World cocoa trade is controlled by three companies – as is the UK chocolate market. Cadbury Schweppes, at the top of the UK industry, made £208m in chocolate and food profits in 1993.⁴⁴

Case study 8: a fishy business

❖ *Industrial fishing*

In March 1993, the UN Food and Agriculture Organisation (FAO) warned that fish production from most of the world's fisheries have reached or exceeded the levels at which fish stocks can regenerate themselves. Fish stocks are falling as a result of over-fishing by commercial fleets based for the most part in the industrialised countries. Anxious to earn hard currency to service national debts, the governments of developing Southern coastal nations have been selling the right to fish in their waters to hi-tech, foreign factory fleets seeking better fishing in distant waters.⁴⁵

Only about two-thirds of global fish catch is actually consumed directly by humans; the remaining third is converted into fish meal to feed cattle, chickens, and ironically, pen-reared fish such as salmon, and into fertiliser and oil. Much of the fish which is being ground into animal feed and fertilizers could, instead, be eaten by hungry people.

As fish stocks are depleted, many small fishing communities in the developing world are being deprived of their primary source of dietary protein, and either starve or are forced into unsustainable methods of procuring food as a result.

Coastal over fishing in Kerala⁴⁶

The introduction of a modern trawler fleet into the fishing grounds of Kerala in South India has provoked the use of more intensive fishing techniques throughout the industry, resulting in overfishing. There has been a decline both in the catch per hour worked and in the size of the fish caught. As productivity has declined, the major economic brunt of over fishing has been borne by the local consumers – particularly the poorest among them.

The availability and quality of fish sold in the markets has deteriorated, and retail prices have increased faster than the general cost of other food items. Per capita availability of locally consumed fish has decreased from around 19 kilogrammes in 1971-72 to around nine kilograms in 1981-82.

❖ *Fish farming*

Many of the products of industrial over-fishing are, ironically, fed to intensively-reared farmed fish. Fish farming in developing countries has a number of social and environmental consequences which give cause for concern. Production of shrimps grew by 600 per cent in the 1980s in mainly Asian developing countries to serve export markets.⁴⁷ Research suggests that even semi-intensive cultivation is highly resource intensive, requiring 35-190 times the surface area of the farm to provide inputs.⁴⁸

In the Philippines, three quarters of the mangrove forests which line the coasts and serve as important breeding, feeding, and nursery grounds for fish have been cut down – primarily to make way for

fishponds devoted to prawn farming for export.⁴⁹ Similarly, in Bangladesh, shrimps are now big business, ranking as the country's third largest export earner. However, Bangladesh is unable to feed its own population, and again there is a clear conflict in the country over the use of land for local food needs, as opposed to export production.⁵⁰

Case study 9: the bread-line

Current methods of bread production are extremely energy intensive. Figure 4 shows an analysis of the fuels used to make a standard white loaf weighing 750g, revealing that 5.6kWh are used in total, which is 2.5 times larger than the food energy contained in the loaf.⁵¹ A quarter of the energy used goes on transport and packaging: 14 per cent of the energy is used in transport, and 10.5 per cent on packaging, particularly important in the transport of perishable foods.

❖ *Processing*

The milling of wheat into flour destroys many of the valuable nutrients in the original product. The more refined the flour, the more nutrients are destroyed. Certain vitamins are currently added by law to white bread in this country – although deregulation may remove this requirement. Bread made with wholemeal flour which is less processed saves energy and is healthier.⁵²

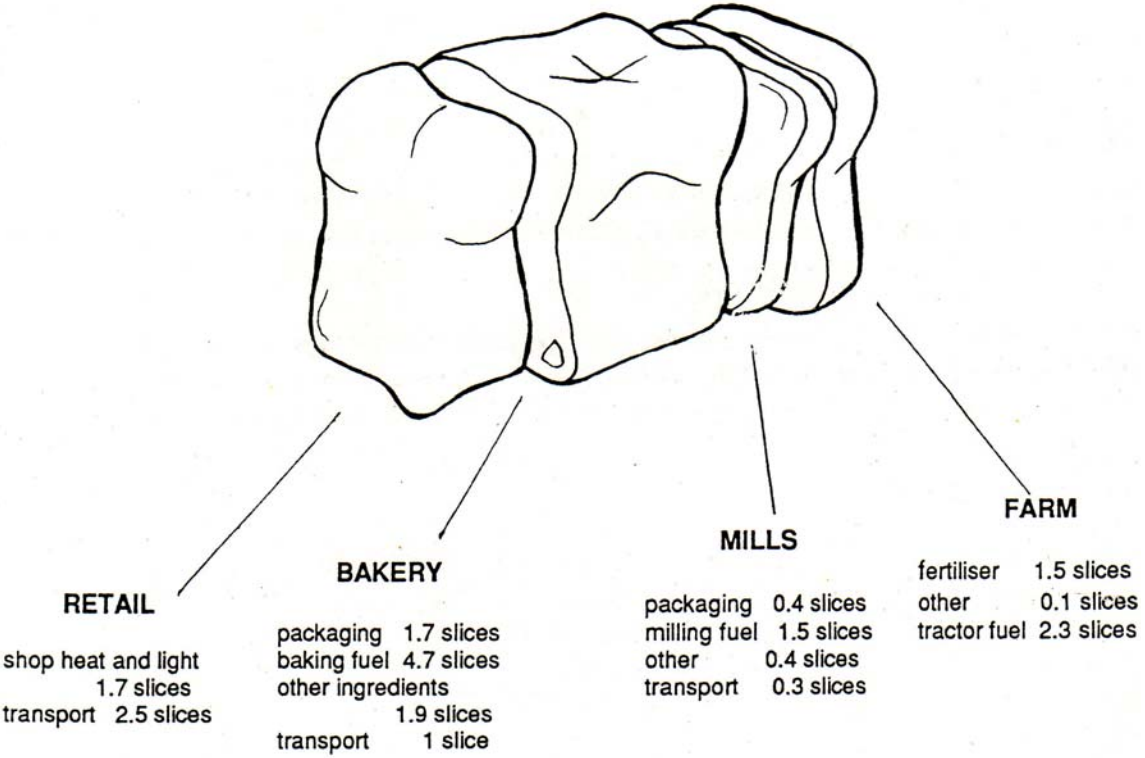


Figure 4. Contributions to the fuel costs of a standard (20 slice) white loaf of bread⁵³

❖ *Flour imports*

In recent years, Britain has produced around 14 million tonnes of wheat per annum of which around 3.3 million tonnes is used annually for bread production. Imported wheat is still used in UK bread production, the normal requirement being around 500,000 tonnes per annum sourced mainly from the EU and Canada.⁵⁴ We import bread-making flour made from hard wheats with high protein content to supplement soft wheats grown in this country.

❖ *Market concentration*

In the 1950s there were 12,500 master bakers, who would supply local markets with baked bread. By 1991 this number had dwindled to fewer than 4,000. The two largest bakers, Allied Bakeries and British Bakeries have dominated the market for plant-baked bread in recent years, accounting for 60 per cent of all bread production in 1992 between them. Both are owned by large UK food corporations

and are mainly supplied by grain milling operations within their groups. With fewer suppliers there is increased centralisation of distribution and consequently transportation.⁵⁵

❖ *Imports and exports*

The short shelf life of bread and morning goods has meant home production counts for a major proportion of domestic consumption. However, rapid transport systems and the introduction of part-baked products has resulted in an increase in imports and exports of bakery produce in recent years, particularly with close European partners.

Case study 10: the real cost of strawberry yoghurt

A study carried out at the German Wuppertal Institute worked out the environmental costs of transporting typical food products such as strawberry yoghurts to consumers.⁵⁶ To produce the yoghurt and get it to a distribution outlet in south Germany, strawberries were transported from Poland, yoghurt from north Germany, corn and wheat flour from the Netherlands, jam from west Germany and sugar beet from the east of the country. Packaging material also came from afar – the aluminium cover for the strawberry yoghurt jar was manufactured 300 km away from the yoghurt producer. Only the milk and the glass jar were produced locally.

In counting the yoghurt's environmental costs, the lorry emerged as the main culprit, contributing to noise, danger and pollution. The study found that to bring one truckload of 150g strawberry yoghurts to a distribution outlet in southern Germany, one "theoretical" truck must be moved a total of 1,005km. This would result in more than 400 litres of diesel being burned, emitting nitrogen oxides, sulphur dioxide and other toxic contaminants into the air.



2. The ‘Food Miles’ food chain

1. Agricultural production

❖ *Specialisation*

Long distance trade in foodstuffs leads to specialisation in agriculture and the allocation of resources to production for export rather than for local needs and self sufficiency. Agricultural production for distant consumption has a number of implications. Specialising food production means the farmer employs intensive agricultural methods growing a limited range of crops, using agrochemicals to increase yields and kill the pests and diseases which thrive in monocultural conditions, and replacing farm workers with machinery. (See case study 7: chocolate)

❖ *Separation of production and consumption*

Once consumers are geographically separated from food production, they are rendered ignorant of many abuses of the environment, farm workers and farm animals which might not be tolerated if they were occurring in the neighbouring field. For example, many pesticides are used in the South on crops destined for industrialised countries which are banned in the latter because of effects on the environment or human health.⁵⁷

Agriculture is seen as an industry, no different from any other. When agriculture replaces farm workers with machinery to cut costs, uses agrochemicals to increase yields and reduce imperfections, and is powered by enormous ‘hidden’ quantities of fossil fuel, this is seen as a necessary evil to increase ‘efficiency’ and stay competitive in face of national and international competition.

2. Processing, packaging and preservation

Transported food is preserved to prevent spoilage and contamination, and packaged to ensure a long life during transit, storage and on the supermarket shelf. Sometimes preservation itself leads to foods being needlessly transported across the country. One supermarket in the UK for example, although sourcing fish in Scotland, hauls it down to Cornwall to be smoked, then back up again for sale in Scottish stores.

❖ *Processing*

Almost three quarters of the food consumers purchase in the UK has been industrially processed or manufactured in some way.⁵⁸ Manufacture of processed foods from raw ingredients is an energy intensive procedure using up to ten times the energy necessary to grow the crop in the first place.⁵⁹ Processing also reaps enormous profits for the companies involved in return for ‘added value’, which can mean paying over £2 per pound of potatoes after processing into crisps.⁶⁰ For example in the UK there is generally a 40 per cent mark-up by food manufacturers on bread, biscuits and flour confectionery, and a 28 per cent mark-up on processed fruit and veg.⁶¹ (See case study 9: the bread-line)

The end product is almost certainly of lower nutritional value than less processed foods as a result of added flavourings, preservatives, fillers etc, and the loss of nutrients in storage and processing. A large proportion of the ingredients in processed foods, such as saturated fats and refined sugars and carbohydrates are unhealthy, but satisfying because they are high in calories and fulfil cravings for sugary, fatty foods. Cheap ingredients are transformed with the aid of additives and manufacturing into desirable snacks and convenience foods. So consumers are paying more to receive less. Since the basic components of most varieties of everyday processed foods such as cakes or biscuits are the same, the taste varies little, so the apparent choice and variety is illusory. Many goods are travelling the globe not to fulfil genuine need, but rather to provide yet another minor variation on an existing product – such as flavoured bottled water from Canada on European supermarket shelves. Likewise, bottled Perrier water from France is popular in the United States.

❖ *Packaging*

The trade and transport of food and drink over long distances makes reducing and reusing packaging much more difficult, whilst packaging itself enables foods to be transported far from where it is

produced, to distant points of consumption. According to industry, up to two-thirds of packaging is used to protect food and drink.⁶² Spent packaging now constitutes a quarter of household waste by weight.⁶³ One purpose of packaging is to preserve the product during transport, storage and whilst it is sitting on the supermarket shelf. At the same time packaging serves to glamourise the contents, enticing consumers to buy one product rather than another which may be virtually identical in content.

Reducing the amount of packaging used is the most effective option. However, long distance distribution chains mean that in many cases this is impractical, since goods need to be protected and/or preserved in transit and storage. The next best options are to reuse packaging, or recycle it. Reuse is preferable to recycling because less energy is consumed in sterilising containers than in recycling. According to British Glass, returnable bottles are “a very efficient way of reducing energy consumption”, typically using one quarter of the energy of any single trip package.⁶⁴ (See case study 5: milk). But reusable containers are best suited for a local distribution system, and recyclable containers for a wider-based system. When goods are transported over long distances, heavy re-usables are at a disadvantage in comparison with lighter recyclable containers. However, only a small proportion of plastic bottles – 2.5 per cent in Europe in 1992 – are even recycled, most being used only once before being discarded.⁶⁵

The reuse of containers favours local trade, as in the case of a bottle refilling scheme in Bavaria for mineral water.⁶⁶ Not surprisingly, re-usables are seen as a threat by large bottle manufacturers and a ‘barrier to trade’ by large food and drink companies; attempts to (re)introduce such schemes are hotly contested, as demonstrated by the corporate challenge in the European Court of Justice (ECJ) to Denmark’s 1981 law requiring all beers and soft drinks to be sold in refillable bottles.⁶⁷ The EJC largely upheld Denmark’s position on environmental grounds.

Some methods of preservation are more energy consuming than others. The results of a study carried out by the University of Wageningen are shown below in Table 2. The study found that the most energy intensive method of supplying and/or packaging peas was aluminium cans using 40 MJ/kg. Fresh produce uses the least amount of energy in total as long as it is produced locally and seasonally. When out-of-season produce is imported, however, this was found to be the second most energy intensive method of food supply, using 25 MJ/kg.

Table 2. Energy used for different product/packaging combinations for peas⁶⁸

	Steel can 420 cm ³	Alum. can 220cm ³	Glass 1-way 360 cm ³	Multi-layer Pouch 600 cm ³	Frozen carton	Fresh Local	Fresh imported
Total energy used in MJ/kg	18.0	40.0	20.0	16.0	24.0	9.0	25.0

❖ *Pesticides*

Pesticides are used not only when crops are growing but also after harvest on fruit and vegetables to extend storage life and prevent damage in transport.⁶⁹ Methyl bromide is a toxic pesticide widely used as a fumigant on food before transport, to prevent pests such as the colorado beetle entering the UK. It is also a significant contributor to ozone depletion, and may cause more than 16 per cent of ozone losses by the year 2000.^{70 71}

Another example of post-harvest treatments is oranges on sale in the UK. These may have been bathed in chlorinated water, to remove fungal spores; washed with detergent, to remove dirt; and then sprayed with post-harvest fungicide, to reduce the risk of rotting. Finally, they are coated with wax to make them shiny: the most commonly-used wax is shellac, made from the excreta of the Asian lac beetle. Beeswax and sperm oil from whales are also permitted, but many overseas fruit producers use polythene, a spray banned here but accepted in some other European countries.⁷²

Consumer and environmental groups are becoming alarmed at the use of these processes on supposedly fresh fruit, although growers and retailers say the processes are safe, and essential if the fruit offered is to look good and be of good quality.

3. Transport

Long-distance transport of food takes two main forms. First, the producer and consumer may be physically far from each other, as in the case of New Zealand lamb being shipped to the UK. Second, foodstuffs pass through the hands of many intermediaries along the food chain, such as processors, packers, wholesalers, distributors, and retailers, and along centralised systems of distribution. The UK food industry has particularly highly-centralised systems of distribution, which can lead to instances of foodstuffs being transported hundreds of miles just to be polythene wrapped before being returned to be sold within a few miles of their place of origin.

Different modes of transport have widely-varying performance in terms of energy use and pollution, as illustrated below in Table 3. Flying is the most energy consuming form of freight transport, consuming 37 times more fuel per tonne-kilometre than shipping – which is the most energy efficient. Pollutants emitted by air freight are mainly at high altitudes, where they do more damage in terms of ozone depletion and global warming.

Table 3. Energy use and emissions for different modes of freight transport⁷³

	Rail	Water Transport	Road	Air
Primary Energy Consumption KJ/Tonne-km	677	423	2,890	15,839
Specific total emissions g/Tonne-km				
Carbon dioxide	41	30	207	1,206
Hydrocarbons	0.06	0.04	0.3	2.0
VOC⁷⁴	0.08	0.1	1.1	3.0
Nitrogen oxides	0.2	0.4	3.6	5.5
Carbon monoxide	0.05	0.12	2.4	1.4

❖ Road freight

Road freight uses four times the amount of energy per tonne-kilometre as rail. However, only 6% of goods in the UK are transported by rail, whilst road freight carries 81% of goods and has been forecast to increase dramatically.⁷⁵ Figure 5 shows how, while the amount of food being transported within and around the UK by road freight has remained largely static since 1978 – from 290 million tonnes to 300 million tonnes in 1993 – the distance foods are being transported has increased by 50 per cent, from 24 billion tonne-km in 1978 to 36 billion tonne-km in 1993.⁷⁶ The same amount of foodstuffs is being hauled over long distances, and the main beneficiaries are intermediaries in the food chain, such as freight companies, the major supermarkets and food manufacturers.

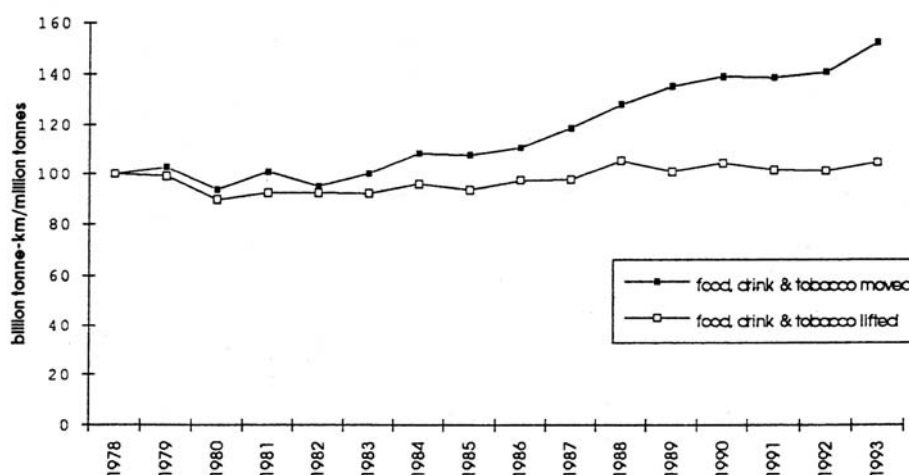


Figure 5. Food, drink and tobacco lifted and moved by heavy goods vehicles in UK, 1978 to 1993, using 1978 as a base year

Over a third of the growth in overall tonne-km travelled by road freight in the UK over the past fifteen years is attributable to the increase in transport of food, drink and tobacco⁷⁷, which accounts for only 8.5 per cent of GDP.⁷⁸ The sector accounted for more of the increase in tonne-km than for any other major commodity group.⁷⁹

Road transport leads to many environmental and social hazards, including air and noise pollution, acid rain, loss of countryside and wildlife sites for new roads, congestion, severance of communities, restricted freedom for children, health effects, and road accidents. Road freight in particular contributes far more than its fair share of costs on the wider environment and society than it pays in taxes and duties.⁸⁰

Road traffic is the fastest growing source of carbon dioxide, the main greenhouse gas, accounting for 19 per cent of the UK's total CO₂ emissions in 1991.⁸¹ The Government is committed to stabilising carbon dioxide emissions at 1990 levels by 2000, yet the UK's Department of Transport has been assuming, and planning roads for, a 30-50 per cent increase in traffic through its National Roads Programme over the same period.⁸²

A study by Friends of the Earth suggests that the British motor way system will be heavily congested in 2025 despite the planned National Roads Programme.⁸³ Rather than attempting to accommodate increased traffic through building more roads, decreasing demand for capacity would seem to be the only viable way of reducing road traffic.⁸⁴ The most effective way to reduce vehicle emissions from freight would be to reduce the need to transport goods such as food over great distances in the first place.⁸⁵

❖ *Trans-European Road Network*

The EU is planning its largest ever spending programme on road building, the Trans-European Road Network (TERN).⁸⁶ The TERN, specifically intended for lorry traffic, paves the way for the construction of over 50,000km of new roads in Europe, including 12,000km of new motorways, guaranteed to bring soaring traffic levels and pollution.⁸⁷

The removal of trade barriers in 1992 has been predicted to encourage Europe-wide operations, and companies in the food industry such as supermarkets are expected to increase their geographical coverage and use of freight transport.⁸⁸ In recent years, from 1986 to 1991, for Europe as a whole, the kilometres foodstuffs are transported nationally has increased by 19 per cent, while the amount being moved has only increased by eight percent.⁸⁹ Goods transport in the EU is forecast to rise by 90 per cent by the year 2010.⁹⁰

❖ *Air freight*

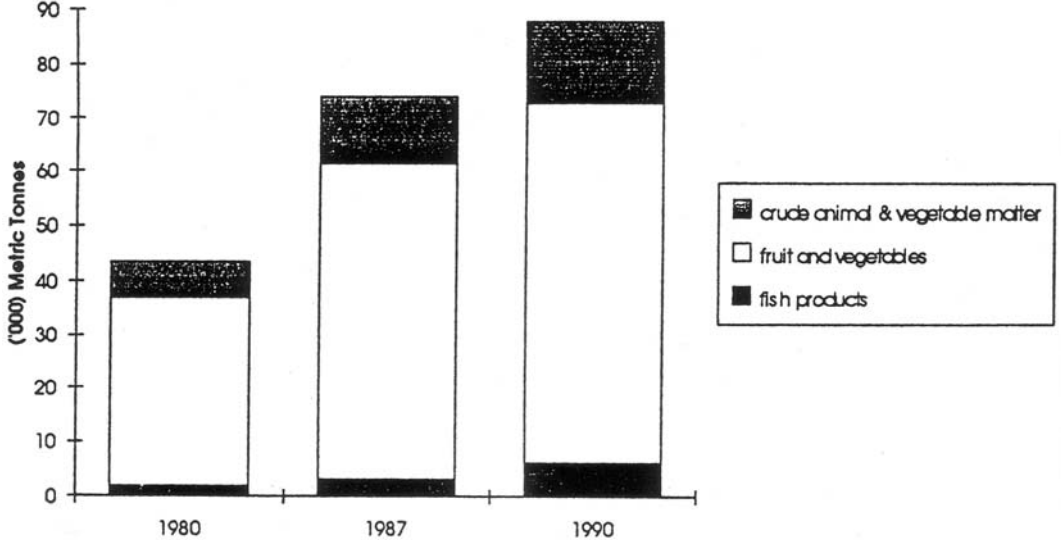


Figure 6. Imports of airfreighted foodstuffs to the UK, 1980 to 1990

Most of the UK's overseas trade is carried by sea: over 90 per cent by weight and 75 per cent by value. The rest of the freight is transported by plane.⁹¹ Figure 6 shows how there has been an increase in the amount of all food groups air-freighted into the UK during the 1980s.⁹² After falling in the recession, imports of air-freighted foodstuffs were up 15 per cent in the first half of 1994 on the same period last year. Projecting forward to the end of the year, Britain is set to fly in 11 per cent more food than in 1990 when the recession began.⁹³ So far this year, the UK has imported more than 36,000 tonnes of air freighted fruit and vegetables, 7,200 tonnes of which came 4,000 miles from Kenya, and 6,300 tonnes 9,000 miles from the USA.⁹⁴ (See case study 3: luxury lines)

Most flown fresh produce is 'piggy-backed' on tourist flights. Produce importers such as Geest claim airlines actively encourage them to look at the fruit and vegetable import potential of routes they operate.⁹⁵ It is argued that this has not increased the volume of air traffic, since many of these air-freighted imports come in the baggage holds of passenger planes. However, this practice encourages air transport both by increasing the profits for such long-haul flights, and by creating new demand for long-haul fresh produce. Aviation is widely acknowledged to be a growth industry – the amount of imports flown to the UK has more than doubled over the past ten years, and is forecast to continue increasing over the next couples of decades. It is in the interests of freight and passenger transport companies to encourage increased long-distance trade in foodstuffs such as horticultural produce from Africa or Asia to increase profits on the route they operate. As a result of this and other factors, emissions from transport are predicted to increase substantially into the foreseeable future.

4. Energy use in the food chain

❖ *Energy trade-off between transport and production*

To some extent there is a trade off between energy use for different foods in terms of agricultural production and transport. For example, in terms of energy use, it is often best grow tropical products such as fruit in tropical climates, and sub-tropical foods in sub-tropical climates, and then ship them to the country of destination, rather than using intensive agricultural methods to grow them in inappropriate temperate climates, which would require substantial inputs of energy. However, as the next section discusses, this is not always in the best interests of producers in poor countries, while production and preservation may still involve the use of harmful processes such as pesticide spraying.

❖ *Energy use in the UK food system*

Table 4 shows the results of a 1977 study which found that the distribution and processing stages of the UK's food system use roughly 12 per cent of total UK energy use – more than growing the food, which used five per cent. This figure will almost certainly have increased since the study was carried out, as manufacturers and retailers have further centralised their distribution, increasing the distances over which foodstuffs, and other inputs such as packaging materials, are transported.

Table 4. Energy used per year by UK food-related industries⁹⁶

	Energy Use (10J)	Percentage of UK total energy use
Agriculture	360	
Imports of animal feed	60	5.0
Food processing	527	6.3
Food distribution	451	5.3
Import of human food	208	2.5
Home cooking	728	
Waste disposal	26	8.9
Total		28.0



3. Food Miles: Issues and implications

Environmental effects

❖ *Agriculture*

Intensive industrial farming can have widespread environmental impacts, including the loss of wildlife sites, soil compaction and erosion, and the contamination of ground and surface-waters.⁹⁷

Agrochemicals such as pesticides also get into the air and travel long distances, and can fall in rain and snow. Other agricultural pollutants affect climate and/or the ozone layer, such as nitrous oxide and methyl bromide. Consumers, environmentalists and farmers are all becoming increasingly concerned about the costs of trying to produce more and more per hectare, at the expense of the long-term health of the soil, the quality of our drinking water, the wider environment, and biological diversity.

❖ *Biodiversity*

Biodiversity in food production is decreasing because of agricultural specialisation and the demand for standardised produce. Farmers and growers supplying supermarkets, for example, have to concentrate on appearance, uniformity and qualities related to travel and storage, especially long shelf life in production. (See also case study 1: apples) New techniques of genetic engineering are employed by seed companies to produce the requisite characteristics, frequently to the detriment of factors such as taste and nutritional value. These varieties will then be mono-cropped in fields or plantations – with the result that large tracts of land in Europe and further afield are turned over to single varieties. Local crop varieties adapted to the regional climate and conditions are no longer cultivated, being replaced by a few commercial varieties. The genetic concentration of eight field crops in the UK are shown in Table 5.

Table 5. Percentage of crop hectares sown to leading varieties in the UK 1992.⁹⁸

Crop	Top variety	Top two	Top three
winter wheat	22%	33%	51%
spring wheat	38%	72%	86%
spring barley	21%	39%	51%
winter barley	21%	40%	53%
oats	43%	60%	77%
rye	25%	45%	56%
sugar beet	24%	44%	61%
oilseed rape	22%	42%	55%

The reduction of agricultural biodiversity makes crops more vulnerable to pests and diseases which thrive in these unnatural conditions. Increased applications of agrochemicals are needed to fend off these pests and diseases, which in turn become resistant quickly to new insecticides and herbicides, setting the farmer on a chemical treadmill. On a global scale, reduced biodiversity poses a serious threat to food security as the genetic basis of crops is now narrower and more fragile than it has ever been.⁹⁹ We should aim for biological diversity in our food and farming systems, growing more varieties of crops, growing different crops together and using different crops in rotation. This would reduce the need for applications of agrochemicals, and provide biological stability and thereby increased food security.

❖ *Climate change*

The International Panel on Climate Change (IPCC), a body of 300 expert scientists convened by the UN, currently predicts that the expected rise in concentrations of ‘greenhouse gases’ will result in an increase in global average temperature of 1°C by the year 2030 and nearly 3°C by the year 2100.¹⁰⁰ Such temperature changes would have significant impacts on sea levels, rainfall patterns, wind speeds, frequency of storms and extreme weather events. These would in turn impact upon most aspects of human economic activity including human settlement patterns, agriculture and food supplies.

Historically and presently, the large majority of carbon dioxide emissions, about 73 per cent, originate in industrialised nations.¹⁰¹ The precautionary approach, on which the UK government claims to have based its climate change programme, requires concerted action to be taken to reduce emissions of greenhouse gases. However, the UK has only committed itself to taking measures to return emissions of greenhouse gases to 1990 levels by the year 2000, which is widely considered to be inadequate to prevent global warming – the IPCC suggests that 60-80 per cent cuts in carbon dioxide from 1990 levels will eventually be needed to stabilise the climate.

Transportation, intensive agricultural production methods and different forms of foodstuffs preservation all burn substantial amounts of fossil fuel energy. For example, if current trends continue, transport in Europe, particularly by road, will undermine any attempts to reduce carbon dioxide emissions.¹⁰² Land use changes and the rearing of livestock in agriculture also emit air pollutants such as carbon dioxide and methane, which are significant greenhouse gases.

❖ *Implications for the South*

Many of the everyday foods which we take for granted come from developing countries where the people producing the commodities are often poor and working for low returns in difficult conditions.

Eking out a living is frequently made more difficult as a result of uncontrollable external forces, generally originating in the industrialised North: small-holder farmers may find their profit margins squeezed by declining prices for their products on the world market and increasing input costs for fertiliser or seeds, sold by northern multinational companies; while farmers in poor countries such as Burkina Faso have found their livelihoods undermined by subsidised imports of food staples from Europe and the US. (See case study 6: meat miles)

According to free trade theory, countries and regions should produce those goods in which they have ‘comparative advantages’. For developing countries this frequently depends on or is a result of poor working conditions or lax environmental standards (superficial comparative advantage), which can lead to the exploitation of farm workers and ecologically damaging agricultural production.

❖ *Food security*

In developing countries, food security has become a central element of food and agricultural policy. A World Bank definition is “*access by all people at all times to enough food for an active healthy life.*” A more comprehensive view is given in a Non-Governmental Organisation (NGO) declaration written during the NGO conference in Rio:

“Food security is having the means as an individual, family, community, region or country to adequately meet nutritional needs on a daily basis. It includes freedom from both famine and chronic malnutrition. Food security is best assured when food is locally produced, processed, stored and distributed, and is available on a continuous basis regardless of the climate and other variations.” (authors’ emphasis)¹⁰³

However, as stated earlier, the food security of developing countries is under threat where agricultural land is used for the production of cash crops for export, usually to developed countries, in order to pay off debts and purchase imports. Brazil for example is the third largest agro-exporter in the world, while two out of three Brazilians do not have enough to eat.¹⁰⁴

Ecological footprints

Worldwide there is an average of 0.28 hectares of arable land available per inhabitant.¹⁰⁵ According to information from the UN Food and Agriculture Organisation, 0.19 hectares are needed for a healthy diet, if sustainable production systems are used.¹⁰⁶ Rich countries tend to use far more than this to feed themselves, in addition to their use of land and resources for fuel and additional agricultural products such as tobacco and textiles.

In the Netherlands, for example, each person uses up to 0.45 hectares of land at home and abroad for food production, this being particularly high as a result of the amount of cattle fodder imported to support the high consumption of meat in the country.¹⁰⁷ Similarly in Canada, the population of one valley “imports” as least 20 times as much land for food and fossil fuel demands than it actually occupies.¹⁰⁸ These figures confirm that people elsewhere in the world, principally those in poorer nations exporting agricultural products to more affluent countries, must be left with less than is necessary for their own needs.

❖ *Export dumping*

Intensive agricultural production in the European Union has led to surpluses of products such as meat and cereals. These food surpluses are either stored using taxpayers money, or ‘dumped’ on developing countries’ markets at subsidised prices, undermining indigenous agriculture and creating demand amongst affluent urban consumers for food imports. This damages the food security and household incomes of the vast majority of rural producers, and impairs national food self sufficiency. (See case study 6: meat miles)

❖ *Working conditions*

Less stringent safety and environmental standards in the South mean that the adoption of industrial farming methods in these countries presents a further danger to people working on the land, and to the long term sustainability of production itself.¹⁰⁹ For example, the increasing use of toxic agrochemicals is a prominent feature of the move to intensive farming. Many of the chemicals used on food crops have never been tested to see what long-term effects they have on the environment or people.

Chemicals such as artificial fertilisers and pesticides are often made in Europe and North America for export to developing countries. There they may be used by illiterate farmers or farm workers who do not realise the potential dangers, or are not supplied with protective clothing, regarded as an unnecessary expense by many employers. According to the United Nations Environment Programme at least 40,000 people are killed each year by misuse of pesticides and up to one million are made ill or permanently damaged, mostly in Southern countries.¹¹⁰ (See case study 7: chocolate)

❖ *Regional trade*

Trade between poor countries has been declining in recent years: only 7 per cent of Africa’s trade is carried out within the continent, while over half was with the EU¹¹¹ – a country may be exporting foodstuffs to rich countries in the North at the same time as a neighbouring African state is in famine. Although trade between developing countries is desirable, this is very difficult to implement at present, as countries frequently produce similar goods.

Small farms and rural communities

❖ *Flight from the land*

Industrial specialised agriculture favours large producers, and replaces human labour with fossil fuel powered machines, forcing small farmers and farm workers off the land in Northern and Southern countries alike. In the UK 12,000 farmers left farming in 1991.¹¹² It is estimated that over the next 5 to 10 years a further 100,000 will go and 25,000 rural jobs in farming-related industries will be lost.¹¹³ Declining farm employment undermines rural communities and services, threatening the viability of village shops, schools, and public transport. This puts extra pressure on urban areas, as people leave the land to look for jobs and housing in towns.

Only one in ten people in the world lived in cities at the beginning of this century, a figure set to rise to over 50 per cent by the year 2000.¹¹⁴ It is considerably more difficult to live sustainability in an urban environment than it is in a rural one. Long distribution chains make the reuse of packaging and recycling of organic wastes much more difficult, for example. Where cities are unpleasant environments, this leads to urban sprawl, development on green belts and increased transport.¹¹⁵ It is therefore desirable that the flight from the land in both developed and developing countries is brought to an end, or better still, reversed. This should include a return to more labour intensive and environmentally beneficial farming methods.

Animal welfare

❖ *Factory farming*

Intensive agricultural methods are not only applied to crops in the field – they are also used in animal production. Access to cheap imported feed ingredients, combined with demand for cheap, standardised meat and dairy products, causes many animals to be subjected to industrialised production techniques, or ‘factory farming’, as typified by intensive broiler production.

In the past, animals were used to convert plant nutrients which were inedible to humans, such as grass, into edible animal proteins. Today, livestock are often reared on compound feeds using imported high-protein ingredients (see case study 6) to ensure maximum growth rates, and are kept in cramped, unnatural living conditions. As well as causing immense suffering to animals, intensive animal production is also inefficient in terms of land use and energy conversion – in general, for the production of one calorie of meat, up to ten times as much land is required as for the production of one calorie of cereals.¹¹⁶

❖ *Misery miles*

Until recently UK-raised livestock were often sold overseas, with many being exported live. In 1993, for example, the UK exported 2 million sheep and lambs and 450,000 calves to Europe,¹¹⁷ whilst simultaneously importing lamb from New Zealand and beef from Latin America. Animals exported live often suffer in appalling conditions during transit and slaughter.¹¹⁸ In addition, calves are exported live to be fattened in the veal crate system, which is banned in the UK. Other effects of live exports include a reduction in the availability of UK-reared meat in this country, and abattoirs in the UK being deprived of much-needed business, robbing the industry of the opportunity to handle inedible by-products.

Largely as a result of public pressure, the three major cross-channel ferry companies P&O, Stena Sealink and Brittany have announced in the months up to September 1994 that they will no longer carry live animals to Europe for slaughter, although the latter will continue to carry animals for fattening.¹¹⁹ The companies have pledged to continue their ban unless properly enforceable EU legislation is introduced which will ensure proper safeguards for animals.¹²⁰ This effectively cuts off the main route to the continent and may be the beginning of the end for live exports.

Public health

❖ *Processing*

In general, the worst foods for health are those which are most processed, and which therefore are more likely to have travelled more food miles and consumed more energy. Additives allow the food industry to take basic, cheap ingredients, such as starch, sugar and fat, and with flavourings and colourings make it look like wholesome food! These types of products are usually high in fat or sugar, or both. Diet related diseases such as coronary heart disease, diabetes and appendicitis increase as societies move towards the Western diet, low in fruit and vegetables, and high in refined starches, fats and sugar.¹²¹ Eating more fresh, seasonal, unprocessed food would help prevent these diseases from occurring.

❖ *Additives*

Some food additives are known or suspected to be health hazards. For example, sulphite preservatives are used in jam, lemon curd, fruit desserts, dried fruit, turkey burgers, sausages, beef burgers, salad cream, sauces, soft drinks, savoury rice and packet mixes. Sulphites are known to provoke asthma attacks in five to ten per cent of sufferers, whilst in the US at least a dozen fatalities have been linked to their consumption.¹²² In addition, the preservative can, in susceptible people, cause itching and flushing of the face and other parts of the body.

❖ *Lost nutrients*

Food labelled ‘fresh’ can be several weeks old, because of the time taken to transport the food from the field to its distant destination. Fruit and vegetables lose valuable nutrients in storage and transport. Spinach, green beans and asparagus stored at room temperature lose 50 per cent of their vitamin C

content after 24 hours.¹²³ Over-processing of food also reduces the nutritional value of what is ultimately consumed.

The irradiation of food, which has been legalised by the government, although hardly used, extends the shelf-life of food, enabling its transport to anywhere in the world.¹²⁴ The products for which irradiation is most appropriate are not necessities, being either luxuries or techniques which might benefit the manufacturer with no clear benefit for the consumer. There have been a number of major scandals in the UK and abroad in the past involving the use of irradiation to cover up contamination of unsaleable foods. The process generates a number of chemical changes in foods, some of which are known to be harmful, being mutagenic (altering genetic structures) and/or carcinogenic (causing cancers). Irradiating food causes damage to many important vitamins – losses of 20-80 per cent are common – while fats tend to develop rancid flavours and odours.

❖ *Pesticide use*

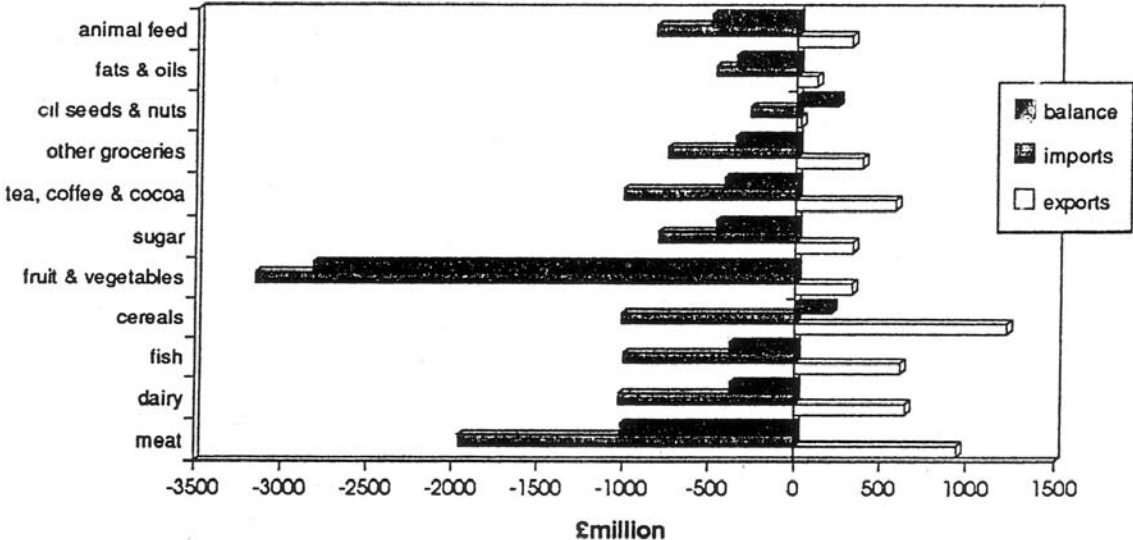
Agrochemical residues in and on food pose another health hazard. Government figures show detectable pesticide residues in a wide range of foods.¹²⁵ Residues sometimes exceed the legal or recommended limits. These are potential danger to the consumer but, as indicated earlier, those applying the pesticides are at even greater risk, especially in developing countries. Even in the UK, however, thousands of farmers and farm workers believe they have been poisoned by organophosphorous sheep dips, which are close pesticide cousins of nerve gas.

❖ *Environmental health effects*

The health of the human population cannot be looked at in isolation from the surrounding environment. Air, soil and water pollution resulting from ecologically damaging practices such as excessive transport and intensive agriculture pose additional health risks. Pesticide spraying has recently been linked to birth abnormalities in rural areas for example.¹²⁶ Air pollution is detrimental to health, especially to the respiratory system: research at the University of Lancaster for example, showed a clear and qualified link between traffic volumes and ill-health.¹²⁷

The effects of exposure to many different chemicals from anthropogenic activities such as fossil fuel emissions and the accumulation of pesticides in the environment – the so-called ‘cocktail effect’ – are unknown but the effect of all these put together may well turn out to be far more potent and dangerous than previously thought.

Figure 7. UK food trade balance in 1993



❖ *Food trade deficit*

Figure 7 show the UK's food trade balance in 1993 which amounted to £6.7 billion.¹²⁸ A large proportion of the food deficit, currently 70 per cent, is accounted for by trade with countries in the EU which have similar climates to the UK. Although we have modest surpluses in cereals and beverages, these are offset by large and increasing deficits in, for example, poultry meat, dairy products and processed potatoes.

The 1993 deficit in fruit and vegetables alone was £2.8 billion, which includes imports of over £80 million of apples, and £50 million of Dutch tomatoes.¹²⁹ Under the CAP, the Intervention Board for Agricultural Produce dumps British produce which is displaced by foreign foodstuffs. In 1992, for example, more than 30,000 tonnes of Brittany cauliflowers were brought into Britain and more than 8,000 tonnes of British-grown cauliflowers were then dumped. (See case studies 1 and 4)



4. Forces behind Food Miles

Subsidised transport

Motorised transport is currently heavily subsidised. Road transport in particular generates externalities in the form of pollution, noise and road traffic accidents, as well as the amount of land taken for roads and parking space, all of which is achieved without additional cost being charged to vehicle users. For example, vehicle emissions account for about one fifth of the UK's carbon dioxide emissions, half the emissions of nitrogen oxides, Volatile Organic Compounds (VOCs) and black smoke and almost all emissions of lead and carbon monoxide. Altogether, it is estimated that air pollution from road transport may account for £2.8 billion of damage annually in the UK.¹³⁰ The aggregate 'social costs' of road use in 1991 were estimated to be at least £22.9 – £25.7 billion,¹³¹ which was twice the revenue obtained from taxing road users. Air transport has similar "invisible" costs, particularly emissions contributing to global warming and ozone depletion.

Society and the environment bear these costs. Asthmatics experience increased attacks as a result of urban air pollution, children's freedom is restricted in traffic-congested towns and cities, wildlife sites are lost to road building and the atmosphere is the seemingly bottomless sink somehow expected to absorb all the emissions pumped into it. This social and ecological "subsidy" has enabled the growth of long-distance trade in goods. If users and consumers paid full costs of transport, it would be uneconomic to trade in foods which had travelled great distances.

Subsidised agriculture

❖ *The mad-CAP approach to farming*

Agriculture in the EU is dominated by the Common Agricultural Policy (CAP). It has been estimated that EU taxpayers are charged up to £200 per annum a head for the CAP overall,¹³² almost 50 per cent of which went in 1990 to dealing with surpluses.¹³³ The Policy's original intentions, when introduced in 1957, were to increase food production, stabilise markets and improve the living standards of the European farmer. The CAP has been one of the most influential driving forces towards intensive agriculture in Europe, through mechanisms such as price support which, because they are linked to volume of output, have disproportionately benefited large and intensive farmers.

The aim of ensuring security of food supplies by encouraging home production has succeeded to the point of embarrassment over surpluses. By 1982, for example, the then European Economic Community (EEC) as a whole was more than self sufficient in nearly all temperate agricultural commodities, with a significant surplus of some. The 1984 milk surplus reached such a level that a quota ceiling was imposed on milk production to restrict the amount farmers could produce without incurring a financial penalty. The UK then moved from being self sufficient in dairy products to importing a third of its butter and cheese in 1991.¹³⁴

As a result of surpluses of arable crops, farmers in the UK, as in the rest of Europe, are currently being paid to set-aside land to reduce agricultural surpluses. Set-aside is now Britain's second largest crop! However, despite this, Europe remains one of the largest importers of food in the world.

Since intensive farming leads directly to the geographic specialisation of agriculture (see below) and the build-up of surpluses which are frequently 'dumped' on vulnerable Third World markets, it is a major factor contributing to long-distance food transport.

❖ *Intensification*

Intensive, industrial agriculture favours specialisation in the production of a small number of outputs and the agglomeration of farms into fewer, larger holdings, encouraging more food miles. Small, less intensive farms tend to be less specialised. A large number of smaller farms is likely to have more diversity in output than a smaller number of large farms covering the same area. There is therefore less need to transport goods around.

Additionally, large farms tend to purchase greater quantities of inputs and sell greater volumes of output, leading to bulk buying and selling. This is often done over great distances, since transport costs are negligible in relation to the discounts saved by dealing in large quantities. Small farms do not always purchase or sell sufficient products to cover long-distance transport costs and this is another factor which leads to them doing more local business than larger farms.¹³⁵

Retail concentration

The UK has highly concentrated food retail sector. According to a recent report, the top five food retailers have over 50 per cent of market share in the sector.¹³⁶ As a consequence of competition from supermarkets, independent family-run grocery shops have been squeezed out of business – in 1950 they had 58 per cent of the UK grocery market in terms of sales; by 1991 this share had dropped to 12 per cent.¹³⁷ Consumers have little alternative but to buy from the major retailers, and farmers have little option but to sell their produce to them. However, supermarkets would rather buy from big growers who can ship/haul great quantities of fruit and vegetables all year-round – leaving small farmers with few outlets for their goods.

❖ *Perfect produce*

In 1991, the major supermarkets in the UK sold approximately 48 per cent of fresh fruit and vegetables in the UK, giving them enormous buying power.¹³⁸ Retailers insist on uniform, visually perfect fruit and vegetables for their selves, which entails a reduction in the variety of crops grown and the use of large inputs of pesticides, herbicides and fungicides. Food which does not come ‘up to spec’ is rejected, leading to huge amounts of wastage, which may be up to 20% for conventional or 50% for organic producers, the cost being borne by the producer.¹³⁹

❖ *Seasonality*

Supermarkets have fresh produce shelf space to fill all year-round. Consumers in turn have come to expect to be able to buy foods in all seasons. However, the majority of fruits and vegetables grown in the UK are only available at specific times of the year. For example, strawberries are only in season in this country from May to early August.¹⁴⁰ Retailers overcome these restrictions in the agricultural calendar by either importing products to fill seasonal gaps or encouraging domestic growers artificially to extend the natural growing season of their crop.

The resulting consumer choice is not benign luxury – intensive agriculture and long-distance transport of goods are environmentally expensive and socially undesirable, for reasons already discussed. Retailers also import fresh produce even when it is in season in this country – baby carrots from Kenya and apples from the US were to be found in UK supermarkets in September 1994, when both items were in season here.

❖ *Central distribution*

The centralisation of distribution has in effect allowed retailers to achieve substantial economies of scale due to the reduction in the number of warehouses required. However, this has been at the expense of increasing the transport costs as the number of kilometres travelled has risen. Central distribution is convenient for retailers because they generally pay the same price for their product regardless of how far it has come.

The highly organised central distribution systems of these retailers, together with the UK’s apparent “first-class” roads (sic) makes the domestic market relatively easy to penetrate from abroad.¹⁴¹ Domestic producers are undercut by cheaper bulk imports from countries where agriculture is more intensive and/or subsidised. Retailers have been known to reject produce which a farmer may transported hundreds of miles to the depot, because they no longer need it owing to oversupply.^{142 143} Retailers have the choice to accept the cheapest supplies which are frequently imports. UK farmers may be at a disadvantage in comparison with farmers who import into the country, because the imported produce is generally in bulk and is unlikely to be turned away at the depot.

❖ *Just in Time (JIT) deliveries*

Growers are made to deliver produce at short notice at frequent intervals, sometimes being given only two hours to compile the order, as a consequence of sales based ordering – the JIT system. This system constructs orders from computerised information which comes straight from the supermarkets till. All medium and large retailers in the UK have at least one store delivery per week day of fresh produce, while Tesco and William Low each have two.¹⁴⁴ Similarly, all major retailers have daily deliveries of fast moving grocery lines, chilled products and beers, wines and spirits.

A lorry on Just-in-Time business will make a journey whenever goods are needed – regardless of whether it can be filled or not. This means lorries are often only part loaded and many of the biggest travel around less than half full. More journeys are then made to transport the same amount of goods. Greater frequency of both store and supplier deliveries has serious implications for congestion, road damage, noise and air pollution.

❖ *Political influence*

The largest UK supermarkets are all members of the Freight Transport Association, one of the most influential wings of the British Roads Federation (BRF).¹⁴⁵ The BRF lobbies the government in support of its road building programme, of which the major retailers, with their highly centralised, road-based distribution networks are major beneficiaries – all courtesy of the domestic tax payer.

❖ *Catering for the car shopper*

The major retailers have increasingly been building out-of-town car-served outlets, generating traffic and undermining town-centres. In 1991, 17 per cent of all retail sales occurred out of town in comparison with under 5 per cent in 1980.¹⁴⁶ Studies from the 1970s up to the present day,¹⁴⁷ have consistently shown that customers at more centrally located stores use more public transport and other modes than for stores on peripheral sites.

Out- or edge-of-town shopping centres favour the more affluent members of society who can afford to run a car, and have sufficient weekly income to take advantage of lower prices and bulk buy their weekly or even fortnightly food requirements. Prices in inner-city supermarkets, catering for a captive, car-less market, are often higher than similar stores sited out of town.

❖ *Europe*

A UK study of retailing in relation to the opening of the European market in 1992¹⁴⁸ predicted lower transport costs, improved pan-European buying for retailers, and increased concentration in the retailing sector. This will almost certainly mean a significant growth in food transport.

Food manufacturers

Many large food companies such as Unilever and Procter and Gamble have pursued strategies of centralisation and specialisation within the single European market.¹⁴⁹ Factories now concentrate on producing single products for distribution all around Europe, whereas previously they would have produced a range of goods in each country for distribution within that country. When processed foods are produced a range of goods in each country for distribution within that country. When processed foods are produced in large factories to take advantage of economies of scale, this tends to lead directly to more food miles since the end-products will then have to be transported to outlets all over the country or region. This adds considerably to the number of lorries on the roads. (See case study 10: strawberry yoghurt)

The insanity of central distribution

In a field not far from Evesham organic crops are grown, some of which will be sold through two large supermarkets on the outskirts of the town. The distance is about one mile. But to get those crops into that supermarket they will go first to a vegetable co-op in Herefordshire, then to a pack-house in Dyfed, Wales, from there to two separate distribution depots, one just south of Manchester. Only from there will they be delivered to Evesham!¹⁵⁰

There are countless other examples of foodstuffs being transported hundreds of miles out of the way

along the various stages of the food chain:

- ❖ bananas sold by Geest, a fruit and vegetable distributor, are imported through Southampton, taken by road to Lancashire for ripening, sent back by road to Somerset warehouse and then distributed all over Britain;
- ❖ a UK supermarket buys KitKat chocolate bars from France and transports them by road to Britain because it is cheaper than buying them in this country;
- ❖ tomatoes sold in Dewhurst shops are brought by road from Pilling, Lancashire, to Lancaster, then by road to Blackpool, then to Yorkshire to a distribution depot before being sent by road, to all the shops in Britain owned by the supermarket chain;¹⁵¹
- ❖ one distribution depot in Warwickshire serves all Safeway stores in the country with dairy produce.¹⁵²

Who reaps the profits?

Cheap transport and low prices on the world commodities market have contributed to the profitability of trade in food from distant continents. Transnational corporations (TNCs) often exploit land, labour and resources in developing countries for the production of raw commodities to which they add considerable mark-ups before selling to consumers in the industrialised countries of the North and, together with the politically and economically powerful nations they originate from, they have engineered the global supermarket system to suit their interests.

TNCs can often squeeze out smaller competitors, to gain greater control of the food chain. According to UN figures, almost all primary commodities are each now marketed by fewer than six multi-commodity traders.¹⁵³ (See case study 7: chocolate) Table 6 shows the extent to which international trade in certain primary commodities is dominated by only a small number of transnational companies.

Table 6. Market share of transnational companies in world primary commodity trade¹⁵⁴

Commodity	No. of companies	Market share
bananas	3	80%
cereals	5	77%
cocoa	3	83%
tea	3	85%

Foreign agribusiness companies frequently employ workers in condition which would not be tolerated in their home country. For example, many local people are employed on banana plantations owned by multinationals in Costa Rica, a country where 250-300 cases of pesticide poisoning involving agricultural workers are reported each year.¹⁵⁵

Developing countries are prevented from exporting ‘added value’ processed goods through ‘tariff escalation’ by rich industrialised countries – import barriers which rise in proportion to the amount of processing. Rich countries do not wish developing nations to acquire the technology to process their own commodities because then they (rich countries) would lose access to the cheap raw commodities, and find their market for manufactured export to third world countries reduced. So poor countries may actually be prevented, through trade, from developing self sufficiency in manufactured products.

If a country is dependent on the export of primary commodities it is highly vulnerable to the dangers and uncertainties of competition on the international market. For example, with the advent of biotechnology, many of the agricultural commodities which developing countries have grown traditionally for export, such as sugar and oilseeds, are being replaced by substitutes produced in the factories of transnational companies in the rich countries.

Christian Aid has analysed where the money the consumer pays for a banana goes¹⁵⁶. As Figure 8 below illustrates, TNCs may control the processing, transport and marketing and sometimes the actual growing of the crop.

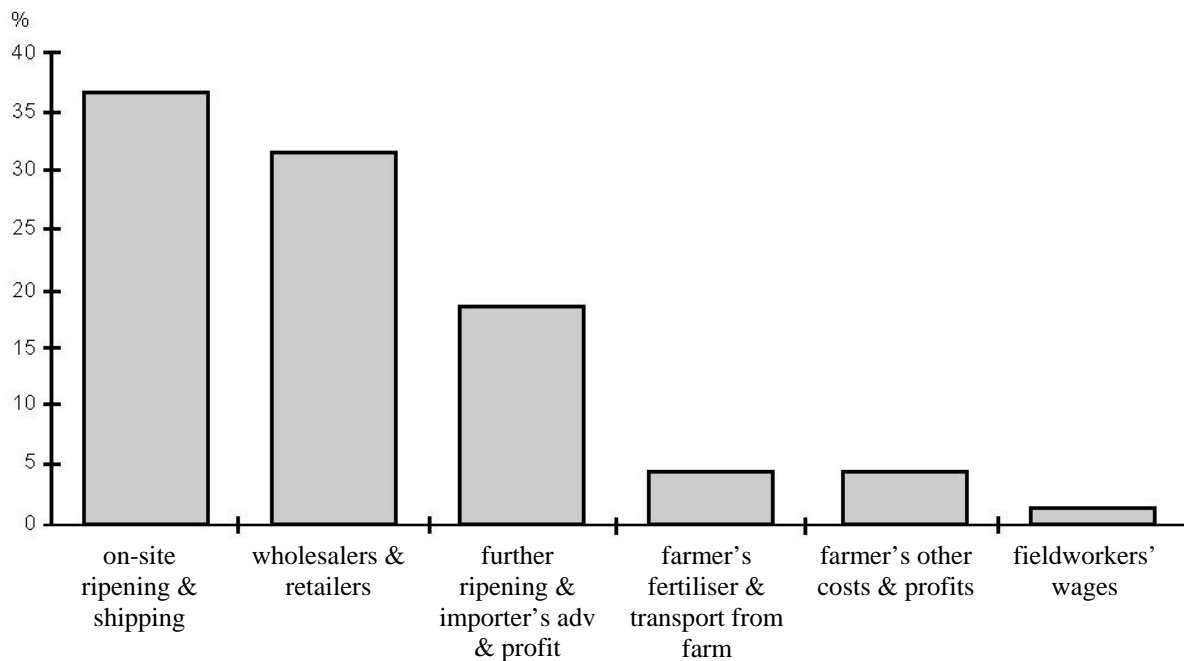


Figure 8. The cost of a banana – who gets what

Less than two per cent of the price consumer pay for their fruit goes to the fieldworkers' wages, while five per cent goes to the farmer. Eighty-eight per cent of the price goes to the intermediaries in the food chain – the importers, wholesalers, retailers and freight companies.

There is no intentional set of rules to govern the conduct of TNCs to ensure they protect the environment or behave ethically in countries where they operate. They use their influence to lobby internationally for further freeing up of trade and the lowering of environmental and social standards in food production, processing and retailing whilst at the same time making sure their monopolies are protected.¹⁵⁷

Aid, trade, debt and development

❖ Aid

The objectives of Britain's aid programme are to "promote sustainable economic and social development and good government to reduce poverty, suffering, deprivation and to improve the quality of life for poor people. Yet only relatively small amounts of overseas development aid goes to the poorest of countries or to projects that benefit mainly the poorest people – the richest 40 per cent of the developing world gets about twice as much aid per head as the poorest 40 per cent.¹⁵⁸ Much of overseas aid to developing countries is linked to trade, compelling the allocation of resources for export-oriented production. In 1992 for instance, 67 per cent of Britain's bilateral aid commitments (amounting to just over £1 billion) were tied, most of this to British goods and services. Moreover, of the further £1 billion of British aid committed to multilateral agencies, such as the EU or World Bank, every £1 is expected to yield £1.16 spent on British goods and services.

❖ Third world debt

Meanwhile the total debt stock of severely indebted low-income countries has tripled since 1980 to \$204 billion. World Bank tables show that in 1991, debtor nations paid out \$24 billion more in debt payments than they received from all new loans aid. The total debt burden for Sub-Saharan Africa, which contains three-quarters of the world's poorest countries, reached over \$183 billion in 1992, more than three times the level in 1980, draining the region of more than a quarter of its export earnings annually.¹⁵⁹ (See case study 3) Debt servicing is diverting resources from local needs on a massive scale, depriving communities of their right to adequate nutrition, health and education whilst contributing to food miles by increasing exports through Structural Adjustment Programmes (SAPs).

❖ *Sell more, earn less*

The International Monetary Fund (IMF) and/or World Bank have encouraged indebted southern nations, through SAPs, to adopt export-oriented policies, including the production of cash crops for sale to industrialised countries. Many developing countries have been drawn into the global market via these SAPs, which exploit their 'comparative advantages' of cheap labour, lax environmental protection and accessible resources. The programmes also involve reduced social spending on health, welfare and education. The foreign exchange earned from the sale of exported cash crops is used to pay off external debts and buy imports of food or manufactured goods, usually from Northern industrialised countries, although in many cases profits are creamed off by transnational corporations or wealthy elites.

Chile's economic miracle

Chile has been following export-orientated policies since 1973. The country is held up as an economic miracle, shown by its steady economic growth, low inflation and debt repayments of recent years. However, there have been considerable social and environmental costs resulting from this 'economic transformation'.¹⁶⁰

From 1973, the new military government in Chile adopted export-oriented policies more palatable to the free trade ideologies of the IMF and World Bank than previous policies which had encouraged import substitution. Three new export industries emerged – fishing, fruit, and forestry, which were providing Chile with 30 per cent of its foreign-exchange earnings in 1990.¹⁶¹

Despite these impressive economic statistics, living and working conditions in Chile have declined considerably amongst the poorer and more vulnerable sectors of society, while natural resources are steadily and unsustainably plundered, and the environment is polluted by intensive industrial and agricultural practices. For example, the calorific intake per person is estimated to have fallen by between 10 and 22 per cent since the beginning of the 1970s, while between 1978 and 1987 in two regions alone, 50,000 hectares, or nine per cent, of natural forest was cleared to be turned into plantations for export.¹⁶²

Whilst the IMF and the World Bank claim to tailor their loans and SAPs to fit each country, in practice the Bank has been criticised for its uncoordinated development policy which has resulted in indiscriminate expansion of the same products from countries which are in direct competition for the same commodity markets. For example, African countries now export some 50 per cent more cocoa than they did in the mid-/1980s, but resulting over supply on world markets forced prices down until recently to the point where they receive less revenue.¹⁶³ The World Bank's own figures show that while countries undergoing adjustment programmes have increased their exports, any benefit has been wiped out as a result of the deterioration in the terms of trade, that is, the relationship of the value of exports to cost of imports.¹⁶⁴

General Agreement on Tariffs and Trade (GATT)

The GATT promotes trade as an end in itself, regardless of social or environmental implications. The results of the GATT are difficult to predict precisely, but the Uruguay Round will, in general, centralise the control of resources, threaten food security and undoubtedly lead to more food miles. Among other things, GATT compels most developing countries¹⁶⁵ to open their domestic markets to a minimum of two per cent imports, rising to 3.33 per cent over the 10 year implementation period.¹⁶⁶ This requirement will cause severe problems in some countries. For example, a spokesman for the Indonesian Ministry of Agriculture stated: "To open our internal market by three per cent for rice means importing 1.5 million tonnes each year. At a time when debt servicing takes up 34 per cent of our export earnings, to devote extra foreign exchange to importing rice would weigh heavily on our balance of payments."¹⁶⁷

❖ *Benefits of trade*

There is no guarantee, and little likelihood, that increasing trade will be to the benefit of all parties involved, or the environment.¹⁶⁸ Trade can often be a 'zero-sum game' – for the benefit of some

parties and to the detriment of others. Gross inequalities between trading partners – as frequently exist in the food and agricultural sector, particularly between different countries – can allow a stronger partner largely to set the terms of the exchange. Exploitive working conditions or the seizure of assets which yield income opportunities, such as land for cash crops, can prevent weaker parties or countries from sharing benefits from trade.

GATT also requires all but the poorest developing countries to reduce support to their agricultural sectors. However, the direct income support payments made in the EU and US are exempted from reduction commitments, allowing these countries to cushion their farmers while continuing to export at low prices. Additionally, as a result of the criteria used by the UN to designate a country as “Least Developed”, many poor countries with large numbers of poor farmers who need state support are not exempted from the requirement to reduce support, including 13 Sub-Saharan countries are based on agricultural production for the domestic and export markets. It has been argued that agricultural subsidies in such countries play an import role in their development.

Increasing trade as a result of GATT inevitably means more food miles. On the other hand some consumer and development organisations are hoping that through the GATT it will be possible to introduce multilaterally enforceable minimum standards for workers’ rights and environmental protection. In reality this seems unlikely, since it is being resisted by a number of countries in the South which fear they will lose their comparative advantage; and by transnational corporations which do not wish to see their profits eroded by higher costs of production threatened by fair wages to workers or environmental protection.

Consumer choice and information

According to food corporations it is consumer choice which drives the food industry. Consumers demand variety at low prices, while supermarkets and food manufacturers accommodate these wishes to the best of their ability. However, it could also be argued that if consumers were aware of how far the foods have been transported, or effects of their choices on people, the environment and animal welfare, then they might make entirely different choices. They would certainly do so if the costs of food miles were reflected in the price of food. Individuals cannot make informed food purchases without clear, unbiased information on foodstuffs.

❖ Labelling

There is no legal obligation for manufacturers and retailers in the EU to indicate where food has come from if it was produced within the Union, only that it is ‘produce of the EU’. In addition, under the Trades Description Act, if a food imported into the UK is subsequently treated or processed such that it undergoes a “substantial change”, for example pork being processed into bacon or sausages, it may be labelled as produced in this country, with no requirement for the country of origin to be indicated. This clashes with the Food Labelling Regulation 1989 which requires that the country of origin should be made clear where the consumer may be misled “to a material degree.”¹⁷⁰ The ambiguity of this legislation permits abuse, as in the case of Norwegian salmon and Danish trout being passed off as Scottish salmon!¹⁷¹ In general, countries of origin are rarely given for manufactured products or ‘multi-packs’ of produce. Without a clear compulsory labelling system it is next to impossible to choose food which has been produced and transported in the most socially and environmentally beneficial manner.

❖ Advertising

Food companies spend £500 million a year on advertising.¹⁷² Although everyone like to think they choose, in practice consumers are bombarded with adverts persuading them to want to buy. Advertising campaigning tend to target impressionable, vulnerable groups such as children. Advertising of pre-sweetened cereals, confectionary, fast food, snacks and soft drinks, most of which involve extensive food miles, is heavily targeted at children. For example, confectionary, at £100 million a year, is the most heavily advertised food category – Mars Bars alone account for £4 million.¹⁷³ It is not surprising then that between 1985 and 1991 children’s consumption of convenience and snack foods rose while their consumption of fresh fruit and vegetables dropped by up to a third.¹⁷⁴

❖ *Media*

There is little coverage in the media of the wider consequences of free trade. The general consensus is that more trade is a good thing, and the possible consequences of this on, for example, people or the environment receive scant attention. An increase in consumer confidence and more consumption of goods and services, including food – the higher value and the more processed the better – is prescribed to save our flagging economy.

Food From Britain (FFB)

FFB was set up in 1983 by the government to promote home-produced food and drink, and previously had a role in promoting the consumption of products which could be produced in the UK, increasing trade worldwide, whereby it is assumed that all countries and individuals will be made better off through each producing a limited range of goods or services.

Thus, FFB aims to make the UK food industry more competitive and responsive to the demands of the world market. In April 1994, for example, the organisation berated UK producers for not exploiting potential export markets in the Far East, and is setting up consultancies in Tokyo and Hong Kong, as well as considering the setting up of a franchise operation based on one of them.¹⁷³ Unfortunately, such a strategy promotes dependence and vulnerability, as well as the many social and environmental costs arising from excessive food miles.



5. Reducing Food Miles

Agenda 21

Agenda 21 is the programme of action agreed by nations at the Earth Summit in Rio in 1992, and sets out the sustainable way forward for the 21st Century.

Sustainable development, as defined by the Brundtland Commission in 1987, is “*development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*” Food is a basic and essential need and the best way to ensure food needs are satisfied is, where possible, to have local production and consumption of food. Local consumption also addresses another key concept of sustainable development – that of limiting our actions in accordance with the biosphere’s ability to sustain human life. Reducing the need to transport goods such as food over long distances and implementing more environmentally sound food production are both essential to limit our impact on the environment and as such are vital elements of sustainability.

Equity is a vital element of sustainability, generally given scant attention by those in power because of ramifications for the affluent minorities who would stand to lose substantially in the event of fair redistributive measures. There are huge imbalances in the consumption of resources and energy between and within countries in the North and the South. The eradication of poverty and hunger, greater equity in income distribution and human resource development need to be addressed in order to achieve true sustainability. This must involve improved access to food supplies, particularly for people in poor southern nations, which is best achieved by better control over local resources, and integrated local food production and consumption.

New patterns of consumption

Consumers can reduce their own ‘food miles’ by changing their consumption patterns, and eating foods which reduce the need for long-distance transportation. Eating more local, fresh, preferably organic or low-input foods, reducing consumption of meat and dairy products from intensively reared animals, and avoiding processed, preserved foodstuffs will benefit people’s health as well as local producers and the environment. In addition, consumers can shop at local stores and markets, or buy food directly from farmers and growers (see below).

❖ *Less meat, more vegetables*

About 75 per cent of farmland within the EU is devoted to feeding animals,¹⁷⁵ while some 38 per cent of all the world’s grain is fed to livestock.¹⁷⁶ Growing high-protein crops such as soya for animal feed is a highly inefficient use of scarce resources. The high levels of meat consumption in industrialised countries, dependant on imports of protein rich animal feed supplements from the Third World, results in environmental devastation in those countries and a disruption of the nutrient cycle on European farms. In the UK, we consume 71kg of meat per person per year, whilst in Thailand it is only 8kg and in India it is as little as 2kg. The mistaken belief of many Europeans that they need to consume high quantities of meat protein is increasingly being questioned by experts for health reasons.

This inequitable system is in urgent need of rebalancing. Reducing our consumption of meat and dairy products from intensively raised animals in industrialised countries would enable those feed-exporting countries in the developing world to convert to food production for consumption by their own populations. Additional measures are needed to help developing countries to do this, and these are covered later in the section.

❖ *Seasonality*

If consumers were to eat more locally grown, in-season fresh produce then food miles would be automatically reduced. On the following pages is a diagram showing which fruits and vegetables are available at different times of the years in the UK.

Self sufficiency

If all nations were to live within their own regional 'carrying capacities', the result would be global sustainability. UK self sufficiency may not seem desirable for the majority of northern consumers, who don't wish to give up their access to the wares of the global breadbasket, but it is theoretically possible.

In 1993, the total area of agricultural land in the UK was 45.7 million acres (18.5 million hectares), roughly two thirds of which is suitable for growing food crops, and the rest for rough grazing.¹⁷⁷ In addition, there is space and land in urban areas which could also be used for food production. The population of the UK is 56 million,¹⁷⁸ so if we were to become totally self sufficient, this would mean each person could be allowed to consume the food grown on roughly 0.54 acres (0.22 hectares) of arable land, in addition to what could be produced from rough grazing and in urban areas. Since only 0.47 acres (0.19 hectares) of land per person are needed for a healthy diet, this implies that the food needs of the UK population could be met from its own land area. What would be needed is more efficient use of our resources, involving new consumption patterns – in particular eating less meat.

In the short term it would be neither possible nor equitable to switch immediately to self sufficiency, as many developing countries are dependant on foreign exchange from the sale of cash crops to us. However, in the long term, these countries too should be aiming for greater independence in food production, so it is relevant to examine our own potential for food self sufficiency.

Local produce buying schemes

UK organic farmers and growers have, in recent years, been developing alternative and novel methods of selling their produce directly to consumers, known as 'direct marketing' initiatives. There are a variety of reasons for embarking on such a course of action, primarily that the prevailing structure of the organic marketplace is not satisfying their needs, particularly of those farming or growing on small acreages. Some producers are not receiving the economic returns they need from the wholesale market to enable their holdings, or their distances from centralised wholesaling operation, makes the bulk marketing of their produce impractical. Furthermore, some farmers and growers are interested in developing more personal contact with their customers.¹⁷⁹

There are many kinds of direct links:

- farm shops;
- combined ordering systems, where consumer group places a combined order with a grower;
- standard ordering systems, where a box of produce is prepared for each member by the grower;
- subscription systems, where a grower prepares a budget and projected yield for the season and offers shares in advance, and sharers then receive a proportion of the season's produce.

Some schemes emphasise that payment is not for the food but to support the farm. The food produced is a consequence of this support. A motto for farmer/consumer links might be 'the means (community) assures the end (quality food)'. The aims of direct marketing are:

- to enable consumers to take responsibility for the food system which nourishes them;
- to encourage social responsibility towards the people involved and ecological responsibility towards the land;
- to grow food that is nutritionally complete;
- to retain as much diversity as possible on the farm in terms of crops, habitats and wildlife;
- to minimise transport, packaging and inputs;
- and to involve growers and eaters in decisions.

Jan and Tim Deane's box system

The Deans have a 31 acre holding in Devon where they grow vegetables to supply almost 200 customers a week with a boxed selection of fresh produce for a fixed price. The vegetables are chosen by Jan and Tim according to what is in season. All boxes have more or less the same number of vegetable varieties and are available in different box sizes. There is also a degree of flexibility if

customers have particular requirements. In most instances the contents are picked, packed and delivered within 24 hours with the exception of storage crops. The scheme cuts out the chore of shopping, bypasses intermediaries and guarantees freshness. It provides vegetables for the same price, if not cheaper, than conventional suppliers.

The scheme was initially seen as a supplement to wholesaling, but it has now taken over and utilises the entire harvest of eight acres of Soil Association certified organic field and polytunnel crops. At the same time the range of vegetables produced has widened from 12-15 varieties to over 50 – thus greatly increasing biodiversity.

Growing a greater variety of produce to satisfy local demand rather than growing one or two crops on a large scale for wholesaler/supermarkets has a number of advantages:

- the risk of crop failure is reduced, since even if one or two fail the farmer is not as dependent on it;
- biodiversity in the field is increased as more suitable local varieties are grown, appropriate to the land and climate, preserving existing genetic stocks and adding to food security. (Farmers producing food for a large national wholesaler or retailer usually have to specialise in growing a particular strain of fruit or vegetable which may not be as suitable to the area).

The Community Supported Agriculture (CSA) movement in Europe and the US is a community-based organisation of producers and consumers. The consumers agree to provide direct, up front support for the local growers who will produce their food. The growers agree to do their best to provide sufficient quantity and quality of food to meet the needs and expectations of the consumers.¹⁸⁰

Seikatsu Club

In Japan there are over 660 producer/consumer groups supplying over 11 million people with food.¹⁸¹ The largest of these is a co-operative known as the Seikatsu Club. Started in 1965, by a housewife concerned about rising food prices, it was officially founded as a co-operative in 1968. Within the 20 years to 1988 it has grown to represent 153,000 members, grouped into 25,000 “hans”, in ten prefectures.

The Seikatsu Club operates a unique system based on: a) advance orders; b) distribution and payment based on a “han” or group; and c) the concept of one product/one variety. Members form groups of six to thirteen families and put in a collective bulk order once a month. Milk is delivered twice a week; eggs, pork, processed foods and seasonings once a week; and other goods, including rice, once a month.

Although originally concerned with price, respect for the environment is now fundamental part of the Seikatsu Club, and no products are handled which are considered to be detrimental to the health of members or the environment.

The urban grower

There are particular difficulties for low income households trying to eat healthily. When money is tight, the cheapest way to get sufficient daily calories is often through purchasing sugary, fatty, processed foods which are not only deficient in many vital nutrients, but also contribute to the development of heart disease, some cancers, and a wide range of other conditions. One option for those on low incomes, and others, who wish to eat healthily, is to grow their own food.

Seasonal fruits and vegetables calendar

First part of the crop year Second part of the crop year

	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
DESSERT APPLES															
COOKING APPLES															
PEARS															
PLUMS															
CHERRIES															
STRAWBERRIES															
RASPBERRIES															
CARROTS															
ONIONS															
BRUSSEL SPROUTS															
SPRING CABBAGE															
CAULIFLOWER (WINTER)															
TOMATOES (OUTDOOR)															
LETTUCE (OUTDOOR)															
BROCCOLI															

Source: MAFF. Basic Horticultural statistics; HDRA.

Self sufficiency in Chinese cities

In China, 14 of the 15 largest cities have their own farm belts and are largely self sufficient in food. The bulk of the food required by major cities such as Beijing, Shanghai, Tianjin, Shenyang, Wuhan, and Guangzhou comes from their own agricultural suburbs, which is kept fertile by treated human waste. Cities are intentionally compact, so as to leave as much room as possible for the farm belt.

Only 20 to 49 per cent of the land belonging to these cities is actually built on. The rural adjunct, or *xian*, which falls under the administration of the city, supplies most of the vegetables, grain, fruit, and meat required by the city's inhabitants. Industry is deliberately kept separate in other areas of the city.¹⁸² In the last few years 'development' has been exerting pressure on this cycle, for example the practice of recycling sewage for use as fertiliser in agriculture has decreased, although the overall system still seems to be intact.¹⁸³

❖ *Allotments*

Allotments are cheaper option for those who wish to eat healthily, but are finding difficulties in buying fresh, organic fruit and vegetables from conventional outlets, or are finding it difficult to get involved in a direct link scheme. There are many additional benefits to be had from having an allotment, such as being able to choose which foods to grow, having control over the way they are produced, and the enjoyment of indulging in a healthy, outdoor leisure time activity. If there are no allotments available in an area, then local authorities (except inner London Boroughs) have a duty to provide a sufficient number of allotments, and if six residents write to the council requesting provision, the Council will have to take the request into consideration.¹⁸⁴

❖ *City farms*

There are over 64 city farms/community gardens in the UK which use previously derelict inner-city sites for food production. Horticulture is a large part of city farming and involves thousands of people in this country, of all abilities and ages.

Ashram Acres

In Birmingham, the inner-city area of Sparkbrook is host to an innovative urban land-use project and food-production scheme called Ashram Acres.¹⁸⁵ The project makes use of valuable local skills to utilize derelict gardens in the area, clearing them and making them productive. Another aim is to provide a meeting place for people who vary widely in age, race, and background. High unemployment in the mainly Asian and West Indian community led to an interest in and necessity for the cultivation of vegetable crops – among them specialist crops such as okra, karella, and coriander. Animals are also kept; goats providing milk and cheese.

Hundreds of people are now involved in the project and derive both therapeutic and economic value from being able to produce fruit and vegetables not normally grown in Britain. "Members" pay a nominal amount to work on the project, and are entitled to take produce home. The vegetables are grown organically in raised compost beds under cheaply made polythene greenhouses, avoiding soil contamination by air-borne lead. The huge success of the project has led Birmingham Council to make available to the community a larger one-hectare site.

Fair trade

The extent to which countries – particularly in the South – and their most vulnerable citizens benefit from exports depends not so much on the amount of trade, but more on the terms under which trade takes place. Fair trade aims to help producers receive a just price for their goods and labour. Arrangements are voluntary, often with development NGOs acting as intermediaries and supporters. They work within the market system, leaving it to consumers to choose to pay a premium for the product. All kinds of fairly traded foods are now available, including coffee, tea, chocolate, dried fruit, rice and spices.

The producers participating in fair trade schemes are often encouraged to use earnings from the scheme to aim for some degree of self reliance in the long term through converting to more sustainable means of agriculture and diversifying their food production. Since countries in the South are frequently locked into their trading relationships, such conversion must necessarily be gradual, and so support is needed over the short and medium term. Buying fair trade products is a way consumers can participate directly in this process. However, it is not always possible to convert more self reliant production in the case of, for example, a tea plantation where land is owned by a company, rather than small-holders.

Although fair trade addresses many of the inequities of world food trade, on its own it cannot solve the long term problems associated with excessive food miles. The foods still have to be transported across the world (although this is usually by ship which is the 'greenest' freight mode). Most importantly, the communities producing the fair trade goods remain dependent on the revenue earned from foreign sales and on sustained foreign goodwill to pay a higher price for the product.

Fair trade products are likely to remain a niche market as long as the majority of other foods are cheaper due to the full costs of production and transportation not being included in prices – fair trade coffee is on average 30-40 per cent more expensive than ordinary coffee, although a 1993 NOP poll found that 73 per cent of women were prepared to pay up to 29 per cent more for fairly traded products.

There are many other issues concerning fair trade which are beyond the scope of this paper. The growth of fair trade would be assisted by the adoption of certain minimum criteria in the production of all goods and services, relating to working conditions and environmental protection – as set out by the International Labour Organisation and the Fair trade Foundation, and as suggested for a 'green' round of GATT.

The price is right

Prices do not currently reflect the ecological or social costs of production and consumption – otherwise 'priceless' resources such as tropical rainforests in Brazil would not be cleared for quick profits from hardwoods, being replaced with tropical fruit plantations and cattle ranches of limited life-span. A study in America calculated that if priced according to its full costs for the environment, a hamburger from cattle on rainforest-cleared pasture could be \$200.¹⁸⁶ If costs were 'internalised' then prices would include the costs to society and the environment of polluting and wasteful activities. For instance, travelling by plane or consuming air-freighted food would have astronomical prices in line with the extreme environmental damage done by aeroplane emissions, placing such activities beyond the budget of most people.

❖ *Ecological tax reform (ETR)*

The objectives of ETR are that taxes should fall most heavily on those activities and materials that produce pollution and/or environmental damage.¹⁸⁷ The right price signals ensure that decisions involving expenditure for production and consumption of goods create a choice between a cheap, energy efficient, pollution free option, and an expensive, wasteful, damaging option. Flying, shipping, road and rail all use different quantities of fuel, emitting different amounts of pollutants. Users should be charged appropriately, according to their impacts on society and the environment. An additional bonus to ETR is that employment should be boosted: a study from Germany indicated that ecological tax reform would create up to half a million new jobs after ten years.¹⁸⁸ According to the results of this study, ETR does not have any negative effect on the economy as a whole if properly implemented.

❖ *Taxes to reduce road transport*

At the moment users of the road network in the UK pay only a fraction of the costs of their journeys. Heavy goods vehicles (HGVs) in particular should be charged more for their use of the roads in line with the high costs imposed on others which they do not bear themselves, such as road damage, noise, air pollution and accidents.

Vehicle users should be charged to discourage road use. Charging according to distance travelled

rather than ‘one-off’ charges such as Vehicle Excise Duty for HGVs – which are incentives to excessive road use once the initial payment is made – is particularly important. Thus, electronic road pricing, which charges vehicles per kilometre travelled would be appropriate. This could incorporate higher charges for HGVs in accordance with the level of environmental damage inflicted by road freight. Alternatively, HGVs could be fitted with odometers, as in New Zealand, Finland, Sweden and Norway, which are used to charge tax per kilometre according to vehicle weight and number of axles, and would ensure road hauliers were charged appropriately for the whole costs.¹⁸⁹

A tax on fossil fuel energy use would internalise other of the social and environmental costs of excessive and unnecessary food miles, and could also be applied to international transportation, such as air and shipping freight. Aviation fuel in particular should be heavily taxed in accordance with environmental effects of its emissions. Such a tax should be introduced gradually, to give the industries and individuals affected a chance to convert to less energy intensive technologies. Increasing the price of fuel to reflect the true cost of its use would, according to German study, be achieved by a 66 per cent increase in the price of a litre of fuel.¹⁹⁰

A combination of the above, applied to reflect the relative costs of different forms of transport, distance travelled, and energy use, would be passed on to consumers in the final price of goods. A carbon tax or fuel tax could also apply to agriculture, and when applied in conjunction with the other charges, would favour low input, locally grown produce over intensively cultivated foods from far away which are transported great distances to the final consumer. Other measures such as the phasing out of taxes on incomes and national insurance, and a phased in tax on land rental values, would also contribute to more small farms and increased rural employment.¹⁹¹

❖ *Use of revenue to protect the poor*

Tax reform along the lines above would mean that the prices of many foods would go up, which would disadvantage those on low incomes. Measures would be required to ensure that the poorer sections of society could afford to eat healthily, such as integrated social security policies so DSS-type payments are increased to cover the amount necessary for food. Revenue raised from taxes on renewable resources could be used to assist producers in industrial and developing countries to diversify into more self reliant and sustainable food production, bringing down the cost of local, healthy foods. This is covered further below.

Consumers need information

Consumers cannot practice “green purchasing” in relation to food miles without accurate, easy to understand information which will enable them to exercise an informed choice. Many goods are now being assessed in terms of their environmental impact from cradle to grave for an eco-labelling scheme in the UK and EU. Foodstuffs should be given the same attention. Ideally, producers and retailers would indicate clearly the source, distance and particular mode(s) of transport used for all items of food. However, any labelling scheme should also be relatively simple: further work is required to devise a food labelling scheme which fulfils these various requirements.

One labelling initiative¹⁹² which has great potential, if widely adopted, would involve growers being encouraged by the Ministry of Agriculture, Fisheries and Food to use “Grown By” labels on all packages, including pre-packs. This scheme has the advantages – among other things – of being simple to introduce and easy to understand, as well as indicating the source of the product. Such a scheme could also apply to imported foods, indicating whether the food was produced by a small-holder or on a plantation, and country of origin.

Processed, packaged foods present particular difficulties, in that ingredients and packaging materials may have been transported over long distances from many different sources, none of which are indicated on the food label. Manufacturers should be able to give their products a regional label, issued by a certification authority. Such a label could certify that the ingredients of a food are, for example, 80 per cent from within a specific region. With such a label the consumer could see the food miles s/he is buying.¹⁹³

The new “Food Quality” Regulations from the EU on the protection of geographical indications (PGI) and designations of origin (PDO), includes as part of the required criteria that most of the ingredients of the product are sourced within the stated geographical area.¹⁹⁴ The scheme goes some way towards preserving regional and specialist food products in the face of global uniformity, and enables consumers to make more informed choices and consciously support local, traditional producers.

The other issue of importance to consumers wishing to purchase ‘green’ products is, as indicated above, the mode of transportation for foods, since different modes have widely varying levels of fuel consumption and emissions. Consumers are entitled to know how their food was transported, particularly if it was flown, and this should be shown on either the packaging or the fresh produce shelf, in the same way as the ‘Grown By’ label.

The case for sustainable agriculture

❖ Common Agricultural Policy (CAP) reform

One of the major obstacles facing sustainable agriculture is that, particularly in industrialised countries, it is currently more difficult and expensive to produce food in an ecologically sound manner. The ‘environmentally expensive’ option of using intensive industrial farming methods is currently the least costly in monetary terms alone. Agriculture support policies within developed countries, most importantly in Europe and the US, must be changed to favour sustainable farming systems. In the European Union, the CAP needs to be reformed to support organic and low input, more sustainable agriculture. This should reduce surpluses and ‘dumping’, and be environmentally secure and beneficial.

❖ Developing countries

The majority of people in developing countries live on and from the land so the sustainable development of agriculture must be a priority. Unfortunately in the short term these countries are often dependent on the revenue from exports of agricultural products which cannot be curtailed straightaway. Poor countries must be given assistance to diversify away from export crops (see below). Vulnerable small-holder farmers in particular must be supported. In many countries land reform is needed to give people security of tenure which will encourage them to farm sustainably.

For a country with a deficit on its balance of payments to import food means that it is borrowing in order to eat, and the debt remains to be paid after the food had been eaten.¹⁹⁵ Raising rural peasant incomes in developing countries through agricultural improvements will not only tend to direct wealth to the poor majority, it will also provide a mass market for basic products like clothes, soap, and foods which involve some processing like cooking oil and tea. Rural-based processing of agricultural output is desirable to counter control by transnational corporations. It would also reduce the flow of people migrating from the land to the city. A strong, food-centred agricultural base has been a common element of success in countries ranging from communist China to capitalist South Korea which have had some success in meeting basic human needs and building up industry.¹⁹⁶

Diversification programmes cannot rely on supplying markets in rich countries. In the long term countries should transform their economies internally and regionally to foster appropriate forms of trade – forms that sustain natural resources, are integrated with other sectors of the economy, that help to mobilize resources and investment within the country, and that meets the needs of local people, above all in providing food.

❖ Consumer demand

According to a recent consumer survey 54 per cent of “housewives” (sic) would buy more organic foods if they were cheaper, while 22 per cent would if they were more widely available.¹⁹⁷ There is clearly untapped demand for organic food, if only it cost less and there was more of it. Currently, 60 per cent of organic produce is still imported into the UK.¹⁹⁸ If there was less discrimination against small organic farmers in agricultural support policies, we could supply more of this demand ourselves.

The Organic Aid Scheme in the UK is a welcome development, but is severely under-funded, with an average budget of less than £2 million per year. Its remit – only to assist conventional farmers converting to more environmentally sound agriculture – will penalise existing organic farmers.

Assistance to developing countries

As indicated previously, agriculture plays a major role in southern countries, culturally, economically and environmentally. In most cases developing countries' export-oriented agriculture has been encouraged by industrialised nations, transnational corporations or international institutions such as the IMF and World Bank.

Developed countries and international bodies, therefore, have a responsibility to reserve this process. Financial packages for developing countries making use of various measures including debt cancelling or relief, low interest loans and overseas development aid, need to be made available. These can be targeted to sustainable development schemes, particularly assistance for sustainable, peasant-based agriculture and diversified food production.

Concerted international action is needed to reduce substantially the burden of debt owed to official and commercial creditors by low and middle-income countries. In any case, many of the most heavily indebted countries are unlikely ever to be in a position to service their full debt. Debt reduction or cancellation could be linked to the commitment to pursue sustainable development policies – particularly sustainable, self reliant food production wherever possible.

Similarly overseas development aid could be targeted towards sustainable development measures, such as sustainable agriculture, instead of being tied to sales goods from donor countries or linked to damaging development projects.

Reducing the food deficit

❖ *Food From Britain (FFB)*

FFB's new role in aiming to reduce the UK's trade deficit in food and drink through increasing exports is severely one-sided. It would be better for our own struggling agricultural industry if the organisation were to abandon this role to instead concentrate on import substitution, producing for ourselves foods which we currently import. It would also help if FFB were better financed, in line with its counterparts in other European countries: the French food marketing organisation received more than four times as much money in 1993 from central government funds than FFB (£19 million compared with £4.7 million in 1993).¹⁹⁹

❖ *Strathclyde initiative*

The Strathclyde University Food Project is a research programme which is seeking ways of reducing the UK's large food trade gap through improving the competitiveness of the British food industry.²⁰⁰ The five northern European countries of the Netherlands, Denmark, Belgium, Ireland and Germany account for over half of the UK's food deficit. These countries export to the UK products like bacon, salad vegetables and fruit. It is this deficit in foods which could be produced in the UK, which the project is seeking to reverse, by sourcing food in this country rather than abroad.

This is a welcome initiatives and should be encouraged. Food processors, buyers from the major supermarkets, representatives of the catering sectors, and representatives from industry advisory bodies such as the National Farmers Union, ADAS and the Meat and Livestock Commission are all on the project's working parties. Since most of the food which gets eaten in the UK is affected by these organisations (about 75 per cent of food sales went to the major supermarkets in 1992²⁰¹) then the project has the potential to make a substantial difference in reducing unnecessary imports of food, from other EU countries in particular.

However, as discussed below, although the participants in the project wish to source more food in this country, which should reduce intra-European food miles, national food miles remain as a result of central distribution systems, Just-In-Time deliveries and out-of-town stores most easily accessible to car-borne shoppers.

Supermarkets and food processors

The food industry needs to reverse its current strategies aimed at increasing centralisation and agglomeration as warehouses and factories are served by ever lengthening transport links, causing pollution and unnecessary food miles. Supermarkets should aim for smaller stores, serving smaller hinterlands, revert to direct deliveries from local suppliers wherever possible, with local processing and/or packaging and site stores in town centres or areas easily accessible by pedestrians or public transport users.

Retailers and manufacturers could introduce labelling schemes which enable consumers to make informed purchases regarding food miles. Supermarkets could also introduce more detailed itemised till receipts which give product information such as the country of origin, in the same way as in Italy and Ireland. Stocking more organic and fair trade products is also desirable. Reducing the distance food travels will also mean that schemes to reuse packaging such bottles would be more viable.

Manufacturers of processed foods need to address the issue of ‘transport intensity.’ They should use local, low-input ingredients and packaging materials wherever possible, and work with retailers to introduce schemes to reuse packaging.



Conclusion

“The bulk of food should be grown near where people live, which would: reduce the need for transport, create useful home-based employment, enhance human health through contact with nature, and improve freshness and therefore quality of food, stimulate local area trading and cooperation and increase decentralised political autonomy.” (Peter Bane, Hawaiian permaculture activist)²⁰²

Reducing the distance food is transported is only a part of the conversion to a sustainable food production system. Agriculture itself needs to become more sustainable – reducing inputs of agrochemicals, for example. It would be possible to provide for a considerable part of our food needs nearer to home through diversification and altered consumption patterns. Shortening the food chain would reduce much of the unnecessary waste of energy and resources currently used in food transportation, specialised production and preservation.

In turn, reduced food miles would benefit the environment through reduced pollution and increased biodiversity. Developing countries would also benefit from more sustainable food production for sale in local markets, for example through improved employment and conditions of farm workers, and more secure food supplies. Small farms and rural communities in rich and poor countries would gain from stable rural employment and an assured market close by. Animal welfare should similarly improve as consumers choose meat and dairy products from animals reared nearby in humane non-intensive conditions. Finally, the consumption of more fresh, unprocessed food, free from additives and pesticides, and a healthier local environment as a result of less pollution from transport and industrial agriculture should all contribute to better public health.

To reduce the long-distance transportation of food, decentralised structures of distribution need to be established as alternatives to our increasingly centralised, globalised food system. Direct links between producers and consumers in an area is the best way of ensuring that food has not been transported over great distances. Direct link schemes also encourage more environmentally friendly agriculture, as people become interested in and aware of the way their food is produced. This should lead to consumers demanding improved animal welfare, reduced agrochemicals usage and increased biodiversity in the field as a greater variety of crops are grown in response to consumer demands.

To some extent there is a trade-off between different items. For example, in terms of energy use, individuals may compromise between eating locally grown food produced with a certain amount of energy intensive inputs and organic food which may have been transported over a long distance. This need only be a short term problem however. Groups of consumers in an area can support local farmers and growers by setting up a direct marketing scheme enabling him/her to convert to more sustainable agricultural production in order to supply them with organic food in the longer term.

Alternatively, consumers can be more environmentally friendly by shopping at markets and small local retailers which can be reached within easy walking distance, and requesting that more produce is available from suppliers in the surrounding area. Using decentralized, local facilities such as these supports the local economy, encourages the building-up of communities, and contributes towards the development of an environment worth living in.

Communities in developing countries which are dependent on export income from agricultural sales to industrialised countries must be assisted to become more self reliant. Assistance should include debt relief measures, increased overseas aid and low-interest loans to poor countries, which will enable them to pursue diversified, sustainable agriculture – and thus address the ecological as well as the development problems associated with commodity-dependence. For their part, individuals in developed countries can buy fair trade products whenever they are available.

However, there are no universal solutions available which can be applied to developing countries' food problems. In some cases producers have limited choice in what to grow because of environmental

constraints. Generally, production and consumption should be located as close as is possible and practicable. Only fair trade is acceptable, where producers receive a fair price for their goods, while in the long term it is desirable that a proportion of the income earned is used to increase self reliance.

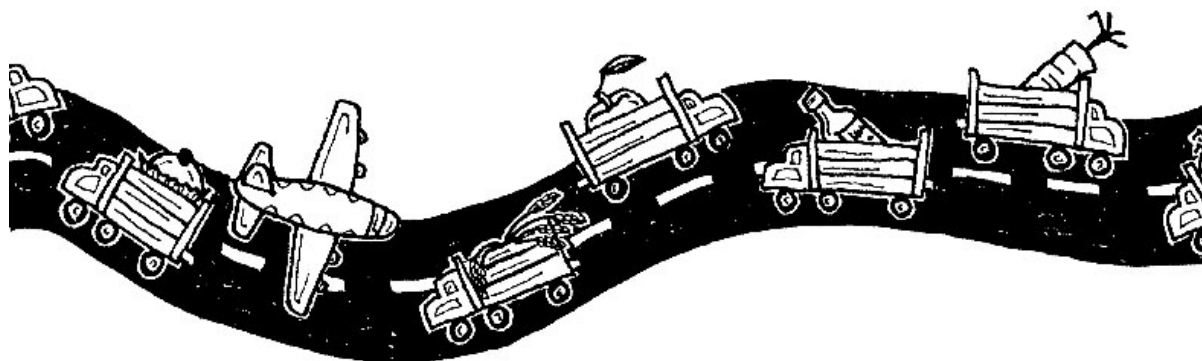
The scope for farmer and consumer projects in industrialised countries is undeniably modest in comparison to the volumes of foodstuffs moved through the conventional channels of the food industry. Big business will continue to steer the food system along their path unless confronted. Local projects could collaborate to lift themselves out of their marginal status: for example, farmers could graduate to producer wholesaling cooperatives capable of handling more food.

However, since most people do shop at supermarkets, supermarkets themselves should begin to take account of the issues raised in this paper relating to food miles. They can do this by stocking locally produced foods, delivering goods directly to stores (bypassing central distribution depots), deliveries of goods to customers, introducing comprehensible labelling schemes so that consumers can make informed choices about what they purchase and siting stores in town centres. Another important area where large retailers can make a contribution to social and environmental stability is by stocking more fair trade products, and encouraging the communities involved to become more self reliant in the long term. Supermarkets can also work with food manufacturers to introduce schemes to reuse packaging. Food manufacturers should source ingredients and packaging materials as locally as possible.

To enable all consumers, wherever they shop, to choose products which are as healthy – for themselves, others and the environment – as possible, information about food has to be improved upon. Work needs to be done to devise a food labelling system which would function as a food miles indicator. Manufactured foods are particularly harmful in their use of ingredients and resources, so manufacturers should be encouraged to give their products regional labels.

In general, the ‘polluter pays principle’ should be applied to both agriculture and the transportation industries. Measures such as including the true costs of freight movements into fuel and motor vehicle taxes are necessary to reduce the long-distance transportation of foods. This would mean that foods which used a lot of energy in production and/or transportation would be the most expensive, whilst sustainably grown, locally produced foods would be cheapest as well as best.

The UK government adopted Agenda 21 at the Earth Summit at Rio, and in doing so agreed to aim for sustainable development, which should include sustainable food production. Along with the majority of other countries in the North, the UK needs urgently to readdress its approach to agriculture and transport, away from the unbridled free trade policies of recent years, which are unsustainable and socially diverse, towards ecologically sound, equitable systems, of food production and distribution.



Recommendations

Action by individuals

1. When buying food that can be grown in the region, i.e. Europe, individuals could follow a hierarchy of purchasing priorities:
 - i. buy locally produced food (which should therefore be seasonal);
 - ii. buy nationally;
 - iii. buy from the region.
2. When buying food that cannot be grown in the region, such as tea, coffee, or chocolate, individuals should buy fair trade products where these are available.
3. Consumers should try to buy locally produced, seasonal fresh produce, when available, from small, local shops and markets, and request that produce be stocked from farms in the surrounding area.
4. Individuals could investigate setting up their own local produce marketing scheme or join an existing one (see Soil Association – address at end).
5. People could grow their own food, in gardens or allotments. Groups of six individuals can petition their local authority to provide sufficient allotment space.
6. Individuals could write to their MP and MEP, to MAFF, and to supermarkets and food manufacturers, demanding a clear labelling system showing the distance food has travelled and its country/countries of origin.

Action by farmers and growers

1. Examine the potential to market produce locally. (see Soil Association and Farm Shops and Pick Your Own Association (FSPA), address at end).
2. Diversify production for local consumption, and introduce more value-adding of foods on-farm.

Action by food retailers and processors

1. Retailers and manufacturers should give priority to sourcing locally and stocking or using fair trade products wherever possible.
2. Retailers and processors should introduce national labelling schemes showing food miles and the country/countries of origin, on fresh and processed products, and/or – in the case of retailers – itemised till receipts to show country/countries of origin of foods.
3. Reusable packaging schemes should be (re-)introduced (which is easier when products are sourced locally).
4. Multiple food retailers should site more stores in town centres where they are more accessible to non-motorists.

Action by local authorities

1. Use existing powers (Planning Policy Guidelines 6 and 13 for example) to encourage and revitalise small, local and/or high street shops, decentralised facilities and local markets.
2. Encourage local farmer's markets, as at Spitalfields and Portobello Road in London.
3. Use the land use planning system, through structure plans or unitary development plans to control the siting of supermarkets and centralised distribution facilities.

Action by national governments

1. Measures should be introduced to reduce the long distance transport of foods, particularly by air and road freight, such as taxing fossil fuels.
2. Products should be required to carry information to consumers to show the country/countries of origin for fresh and processed foods, the distance transported, and the mode of transportation used.
3. Assistance should be provided for direct marketing schemes, such as circulating information on how to set them up and cheap loans or grants.
4. Food From Britain should be transformed so that its emphasis is on import substitution.
5. Aid and debt relief should be linked to sustainable development initiatives such as diversification, sustainable agricultural production and environmental protection. Lobby international agencies such as the IMF for multilateral debt-relief and sustainable agriculture in the GATT.
6. The government should press for the multilateral adoption of minimum standards for working conditions and environmental protection in the production of goods and services as drawn up by the International Labour Organisation, and as suggested for a 'green' GATT, at both European and international levels.



Glossary

CAP	Common Agricultural Policy
EC	European Community
EEC	European Economic Community
ETP	Ecological Tax Reform
EU	European Union
FFB	Food From Britain
GATT	General Agreement on Tariffs and Trade
IPCC	Inter-governmental Panel on Climate Change
JIT	Just-In-Time (sales based ordering by retailer)
SAPs	Structural Adjustment Programmes
UN	United Nations
UNEP	United Environment Programme

Useful addresses

The contact details from the original 1994 Food Miles Report have been omitted, as many are now out of date. Contact details for the wide range of third sector organisations that work on sustainable food and farming can be found on the Sustain website at:

http://www.sustainweb.org/membership/sustain_members_list/

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The Food Miles Report

The dangers of long-distance food transport

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