Eating Oil – Food in a Changing Climate

A Sustain/Elm Farm Research Centre Report

December 2001

Summary

Many of the high-profile social, environmental and public health problems within the food system are symptoms of flaws within the farming and food system. One of the most damaging aspects of the contemporary food system is the extent to which the supply of even the most basic foods has become dependent on petroleum.

Fuelling the food system

- Transporting food long distances is energy inefficient. We put in more energy (in the form of non-renewable fossil fuels) than we get out (in the form of food calories). For every calorie of iceberg lettuce, flown in from Los Angeles, we use 127 calories of fuel.

- Long distance transport also emits carbon dioxide (CO2), a greenhouse gas. One sample basket of imported organic produce could release as much CO2 into the atmosphere as an average four bedroom household does through cooking meals for eight months. The 26 products, collectively, travelled a distance equivalent to six times round the equator (241,000 kilometres).

- The same basket of non-organic imported produce would do the same damage. However, on top of this, non-organic food uses more energy in the production process.[1] Non-organic milk, for example, needs five times more energy per cow than organic milk.[2]

- Food packaging also uses energy and creates pollution. Most of the 80 million food and drinks cans we use each day are not recycled but buried, in increasingly scarce landfill sites.[3]

- International food trade is increasing faster than the world's population and food production. Between 1968 and 1998, world food production increased by 84%, population by 91% and food trade by 184%.[4]

- UK imports and exports of many food products have increased in recent decades. The situation for certain food categories is now critical. For example, even if all UK fruit production went to UK consumption, out of 100 purchases, on average only 5 will have been grown in the UK.

- Rather than importing what they cannot produce themselves, many countries appear to be simply 'swapping food'. In 1997, the UK imported 126 million litres of milk and exported 270 million litres.[5]

- The organic sector seems to be repeating these trends, with UK imports of meat growing from 5% of the market in 1998/9 to 30% in 1999/2000.[6] Of all organic food consumed in the UK, three-quarters is imported. This is because UK farmers, like their conventional counterparts, cannot supply large volumes of standard produce all year round, to the major retailers who dominate the distribution system.

- One study has estimated that UK imports of food products and animal feed involved transportation by sea, air and road amounting to over 83 billion tonne-kilometres, using 1.6 billion litres of fuel and, resulting in 4.1 million tonnes of carbon dioxide emissions.[7]

- Some types of food will always have to be imported, but some forms of freight transport are much less environmentally damaging than others. Shipping is one of the best options, since road transport generates six times more CO2 and airfreight 50 times more.[8]

- Unfortunately, between 1989 and 1999 there was a 90% increase in road freight movements of agricultural and food products between the UK and Europe.[9] Worse still, total UK airfreight doubled over the same period, and is predicted to increase at 7.5% each year until 2010.[10]

- Despite aviation causing more environmental damage than road transport, there is no tax on aviation fuel. In November 2000 a motorist paid 80p for a litre of unleaded petrol, and airlines paid 18p for a litre of fuel.[11]

- Once inside the UK, food continues to clock up food miles. Between 1978 and 1999 we consumed 9% more food, feed and drink, but transported 16% more and over distances that were 50% longer. The food system accounts for up to 40 per cent of all UK road freight.[12]

- We are driving further to shop, and more frequently, including for our food. Between 1985/6 and 1996/8 average distances increased 57% (from 14 to 22 Kilometres) and frequency from 1.68 to 2.42 times a week.[13]

Why do we have a problem?

- OPEC Petroleum Exporting Countries, mainly in the Middle East, account for some 40% of world oil production, and almost two-thirds of oil reserves are in the Middle East. The political and economic conditions, which led to the first oil crisis of 1973, remain largely the same.

- If consumption remains constant, oil reserves could be exhausted by 2040.[14] However, consumption is not constant. In 1985, Asia consumed 18% of the world's oil. By 1997, this increased to 26.4%.[15] Consumption in developed countries continues to be significant.

- Even if new oil reserves are found, the climate change consequences of using them could be catastrophic. The 1990s was the warmest decade, globally, since instrument records began in 1861. Droughts, floods, rising sea levels and ecological disasters are predicted to increase in frequency and spread. Food security in the world's poorest regions is at particular risk from climate change.[16]

- The Intergovernmental Panel on Climate change (IPCC), an international group of 2,500 of the world's experts in this area, has recommended cuts of 60-80% of greenhouse gasses just to stabilise the situation.[17]

- The Kyoto protocol, the international agreement to cut greenhouse gasses, does not include emissions from international sea and airfreight, so there is currently no incentive to reduce them.

- The food system is a significant contributor to climate change. A typical UK family of four would, each year, emit 4.2 tonnes of CO2 from their house, 4.4 tonnes from their car, and 8 tonnes from the production, processing, packaging and distribution of the food they eat.

- As well as climate change, road transport also contributes to ill health (through accidents and air pollution). Government experts reported, in 1998, that between 12,000 and 24,000 people might die prematurely each year from air pollution.[18] Vehicle manufacture and transport infrastructure, such as roads, ports and airports, further contribute to CO2 emissions and environmental damage.

- Oil spills from tankers sporadically devastate marine life and sea birds. The world's largest spill - from the Amoco Cadiz in 1978 - oiled 25,000 birds in Brittany.[19]

- Some studies show that, specialisation and standardisation, coupled with long distance transport is diluting the nutritional potency of our food. Some nutrient losses, in particular vitamin C, vitamin A, riboflavin and vitamin E, will occur even with excellent storage conditions.[20] [21]

- Growing crops for export - through the same process of specialisation and standardisation - is threatening the genetic diversity of plants and animals. More than 700 breeds of farm animals are already extinct. In the Philippines, where thousands of traditional rice varieties were once cultivated by small farmers, just two varieties accounted for 98 per cent of all rice production in the mid-1980s.[22]

- In 1998, 12.3 million pigs, cattle and sheep were traded, live, within the EU.[23] Despite animal welfare legislation, many animals die on route while others are in a pitiful state when they arrive at their destination, after hours in miserable conditions.

- Transporting live animals and meat products increases the risk of spreading disease, which threatens livelihoods as well as human and animal health. One estimate of losses due to Foot and Mouth disease was put at £9 billion, and some four million animals have been slaughtered.

- Food trade is said to help poor countries to develop their economies and break out of poverty. However, a recent UN report on the world's 48 poorest countries showed that although they had opened their economies to imports and exports, poverty had deepened.[24] In addition, once a producer grows for export, considerable and growing levels of external inputs are required to compete effectively.

- Over a period when Kenyan fruit exports almost doubled, domestic consumption declined from 30.5 to 26.5 kilograms of fruit per person per year.[25] In addition, as a result of pressure for fresh produce, 93 per cent of Kenya's fresh horticultural exports to the UK are airfreighted.[26]

- Competition between horticultural producers in developing countries compounds market uncertainty and means that they are in a similar, vulnerable situation to the producers of more traditional cash crops like coffee.

- The poor human rights record of many oil producing countries also hinders development. An estimated 10,000 families, from each of the six major oil producing regions in Nigeria, have lost their farmlands to oil production and transport alone.[27]

Creating a more sustainable food supply

- The current food system is linear in design, treating inputs such as energy and raw materials as infinitely available (which they are not), and the environment as infinitely capable of absorbing waste (which it is not). We need to move away from these unsustainable linear systems towards more sustainable circular approaches.

- Organic production systems are an example of the sustainable, circular methods of food production, and sales of organic food more than doubled from £260 million in 1997/8 to £605 million in 1999/2000. Unfortunately, the sustainable system is fractured by organic imports, sucked in to fill the gap between domestic demand and supply.

- The transport involved in importing organic products consumes more energy than is saved through organic production. For instance, when organic produce is imported by plane from New Zealand, the transport energy consumption is 235 times greater than the energy savings of organic production.

- The loop could be closed by increasing organic production in the UK (via targets for organic production and an action plan to meet them), diversifying production and encouraging consumers to chose more sustainable options which minimise food miles such as farmers markets, box schemes, farm shops and community food growing schemes .

- The proximity principle suggests that production should be located as close as possible to the consumer. If, for example, locally grown spring onions were brought through a home delivery box scheme, there would be 300 times less CO2 emissions than if they were flown in from Mexico and brought from a supermarket in a shopping trip by car.

- Local food systems also generate jobs, as citizens as far apart as Cornwall and Austria are discovering through their own schemes.

- Some foods will always be supplied from outside the UK, simply because they cannot be produced in temperate climates. Much of this is already transported by ship - the least environmentally damaging option - but still more benefits can be gained through fair trade, where suppliers receive a reasonable and secure income.

Conclusions and recommendations

- Government currently appears to hold two mutually incompatible positions: first, that it is committed to a sustainable farming and food system, second that it cannot introduce policies to promote such a system due to the constrains of globalisation and the need to be internationally competitive.

- Of the three complimentary approaches we have identified to help relocalise food systems, one requires no Government action. The farming and food sector could voluntarily opt to steadily increase the proportion of local produce they buy and sell. Imaginative, voluntary labelling schemes could highlight the environmental benefits of buying local.

- The other two approaches need leadership, and action by government. Environmental taxes, for example, are one way to show the real cost of using oil and its products, which are not currently reflected in the price of petrol and, particularly, aviation fuel.

- Other fiscal measures, for example, subsidies for local food production may be more politically acceptable than taxes but would need to be set in the context of a comprehensive action plan, with targets, for sustainable food production systems.

The report makes comprehensive recommendations for action by individuals, industry, local and national government and the public interest sector. The primary recommendations are:

1. **Developing a sustainable food system should become a major government policy based on setting targets for sustainable food production, import substitution, fair trade and local sourcing of food to be achieved over a specific period.**

2. **Measures should be introduced to internalise the external environmental and social costs of transportation to minimise the damaging effects of international and national food freight transport by air and road and shopping by car.**

3. **Agricultural support policies should be redirected specifically to promote sustainable food production and localised food sourcing and processing.**

4. **Fiscal measures such as tax incentives should be introduced to encourage businesses and public sector bodies to buy food from local or regional suppliers.**

5. **Labelling on all food products should be introduced to indicate the environmental impact of distribution. Organic and other assurance schemes should take the lead by introducing the proximity principle into certification.**

6. **More research is urgently required into the obstacles to and benefits from changing to a localised food system.**

Contact:

Andy Jones (Food and Fuel Project Officer) or Vicki Hird (Policy Director)
Sustain: the alliance for better food and farming
94 White Lion Street
London N1 9PF
T: 020 7837 1228
F: 020 7837 1141
Email: andy@sustainweb.org or vh@sustainweb.org
Web: www.sustainweb.org

References

[1] Steven Shrybman, Trade, agriculture and climate change. Institute of Agriculture and Trade Policy, November 2000.
[2] MAFF, 2001. Energy use in organic farming systems. ADAS Consulting for MAFF, Project OF0182, DEFRA, London.
[3] Waste Watch, 2001. Recycling for householders. Waste Watch at www.wastewatch.org.uk
[4] Based on data from - FAO Food Balance Sheet Database, 2001, at www.fao.org
[5] FAO Food Balance Sheet Database, 2001, at www.fao.org
[6] The Soil Association, 2001. The organic food and farming report 2000. The Soil Association, Bristol
[7] Cowell, S., and R. Clift., 1996. Farming for the future: an environmental perspective. Paper presented at the Royal Agricultural Society of the Commonwealth, July 1996, RASC.
[8] Data for shipping and airfreight from Guidelines for company reporting on greenhouse gas emissions. Department of the Environment, Transport and the Regions: London, March 2001. Data for trucks is based on Whitelegg, J. (1993) Transport for a sustainable future: the case for Europe. Belhaven Press, London and Gover, M. P. (1994) UK petrol and diesel demand: energy and emission effects of a switch to diesel. Report for the Department of Trade and Industry, HMSO, London.
[9] DETR, 2000. Focus on Ports. Department of the Environment Transport and the Regions, HMSO, London
[10] DETR, 2000 The Future of aviation: the Government's consultation document on air transport policy. Department of Environment, Transport and the Regions, London.
[11] Brendon Sewill, 2000. Tax free aviation. Aviation Environment Federation, December 2000
[12] Jones, J. A., 1999. The environmental impacts of distributing consumer goods: a case study on dessert apples. PhD Thesis (unpublished). Centre for Environmental Strategy, University of Surrey, Guildford, Surrey, UK.
[13] DETR, 1999. Transport statistics Great Britain. Department of the Environment Transport and the Regions, HMSO, London
[14] Medea – European Agency for international information,2001. Oil Reserves. at - http://www.medea.be/en/
[15] Joe Quinlan, 1997. Oil: Asia and Oil - Three Numbers for Investors to Contemplate. Morgan Stanley, New York, 13 June 1997 at www.morganstanley.com
[16] DETR, 2001. The draft UK climate change programme. HMSO, London
[17] RCEP, 2000. Energy – the changing climate. 22nd Report of the Royal Commission of Environmental Pollution, The Stationery Office, London
[18] Committee on the Medical Effects of Air Pollutants, 1998. Quantification of the Medical Effects of Air Pollution in the United Kingdom. HMSO, London
[19] British Marine Life Study Society, 2001. Oil Tanker Disasters: Oiled Bird Count. at http://ourworld.compuserve.com
[20] Bender and Bender, 1997. Nutrition Reference Handbook. Oxford University Press
[21] MAFF, 1996. Manual of Nutrition. 10th Edition. The Stationery Office, London
[22] RAFI, 1997. Human Nature: Agricultural biodiversity and farm-based food security. Rural Advancement Foundation International for the FAO. Ottawa, Canada
[23] Eurostat, Statistical Office of the European Community
[24] UNCTAD, 2000. Least developed countries report 2000. United Nations Commission on Trade and Development, New York and Geneva
[25] FAO Food Balance Sheet Database, 2001
[26] H. Barrett et. al., 1999. Globalisation and the changing networks of food supply: the importation of fresh horticultural produce from Kenya into the UK. Transactions of the Institute of British Geographers. Vol 24 p159-174
[27] Human Rights Watch, 1999. The Price of Oil, Human Rights Watch, New York