UK Food Supply in the 21st Century: The New Dynamic

The Chatham House food supply project is concerned with the effects of global trends on the realities of everyday life. Examining in detail the networks that supply two staples, milk and wheat, to the United Kingdom market, the study will map the patterns likely to emerge over the next 20 years. This Briefing Paper provides the baseline considerations from which the work will be taken forward.

Summary

- Modern food supply networks are complex.
- In the years ahead, the interdependent mechanisms and resources that support them – including land, energy and people – will be influenced increasingly by global uncertainties and their effects.
- As a result, existing supply arrangements and policies are likely to undergo significant structural change.
- Managing the transition between what is in place now and what is to come will need to be a key focus of attention.
Introduction

Many commentators and researchers agree that today’s food supply networks have emerged from a period of remarkable change, one that has reconfigured what happens both within the food system and in its wider relationships with government(s), society and other economic actors. Food supply in the UK is bold and businesslike. Its characteristics include:

• a broad determination by governments to be more ‘hands-off’ in relation to food markets than in the past1 (except for contingency planning for certain kinds of crisis);
• a regulatory framework that is mainly concerned with issues of standards and safety;
• activity that is guided by risk-averse consumer demand and sustained by the idea that anything is possible at a price;
• a 10–20% reduction from 1990s levels2 in lead times for production, processing and retailing;
• a rationalized supply network with high levels of market concentration in the retail and processing sectors, and with any centralized control maintained through tightly defined product and logistics/delivery specifications;
• farm-based productivity that has increased 20% since the 1980s through the continued roll-out of industrialized techniques;3
• nutrition and diet as issues of individual education and discipline.

Today’s consumer shops with high expectations. Year-round choice, historically low prices, assured availability, a-seasonality, and unprecedented quality have become the norm. Britain has a large and important agricultural sector of its own. Nonetheless, it is its access to the ‘open’, global market that has helped to shape current food consumption patterns and that now provides, some would argue, the only realistic means of sustaining them.4 In an arena in which operations driven by commercial considerations are required ultimately to support the public good, the supply chain dynamic is becoming more susceptible to the effects of a range of global influences. The new focus on these wider uncertainties has in part been driven by the growing debate on climate change, and most recently by the Stern Review which highlights the importance to be placed on ‘the economics of risk and uncertainty’.5

Focusing on the arrangements for supplying milk and wheat to the UK, this Chatham House project will develop and test a range of supply scenarios. The aim will be to look forward 20 years to:

• identify the UK’s future sources of food;
• assess the geopolitical implications of change;
• consider the effects on home markets including domestic producers;
• chart the balance required between sustainable supply and the consumer requirement.

Grounds for uncertainty

Modern supply rests on a complex network of interrelated socio/politico/economic environments that span countries and continents.6 The UK’s agri-food networks operate in an intensively price-competitive market and have many interdependent components:

• product, money and information flows;
• physical infrastructure;
• distribution and packaging networks;
• transport networks;
• processes, control and governance mechanisms including regulatory frameworks;
• individual companies that together make up an industry;
• relationship-based factors including trust, coordination and collaboration.

The rise in low-probability, high-impact disruptions – BSE, foot-and-mouth disease (FMD) and the fuel price protests7 – has served to underline this interconnected nature and how a disturbance in one seemingly unrelated area can ripple through to cause serious disruption across the wider network. But those challenges are essentially measurable. The key issue for the future will be to determine how food supply can remain assured over the longer term against more complex uncertainties and their effects (see Table 1).
Table 1: The UK’s milk and wheat supply networks: wider uncertainties and their effects

<table>
<thead>
<tr>
<th>Network dependency</th>
<th>Wider uncertainty</th>
<th>Potential effects</th>
<th>Possible policy responses</th>
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<td>Water</td>
<td>The availability of water.</td>
<td>Competing demands (e.g. between domestic use and irrigation).                     * Pricing changes? * Rationing (hose-pipe bans and beyond)?</td>
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<td>Weather</td>
<td>The extent of compliance with Kyoto-type agreements and the resulting effects.</td>
<td>(i) Changes in land usage (e.g. following increased flooding).                     * Evolving criteria for planning applications?</td>
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<td></td>
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<td>(ii) Changes in crops and/or patterns of production in the UK and overseas.        * Adjustments in foreign policy as new growing regions gain in importance?</td>
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<td>Energy (the total supply chain requirement)</td>
<td>(i) Increasing global competition for energy as the UK becomes more reliant on imports.</td>
<td>(i) Rising energy costs and/or restriction in energy use.                         * Energy-driven foreign policy?</td>
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<td>(ii) Pressure to reduce carbon dioxide emissions.                                 * New market pricing to influence sustainable behaviours?</td>
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<td>Transport</td>
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<td>(ii) Food miles.</td>
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<td>Labour</td>
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<td>Shortage of multi-skilled labour, particularly in the agricultural sector.         * Immigration and its social impacts?</td>
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<td>(ii) Changes in skill availability.</td>
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<td>Livestock</td>
<td>(i) Consumption patterns of dairy/meat.</td>
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<td>(ii) Major changes in farming practices.                                          *Measures to influence sustainable farming practices?</td>
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<td>Application of science to increase productivity</td>
<td>(i) Ecological changes.</td>
<td>(i) Threats to biodiversity.                                                      * Health? * Policies to deliver a different public view of risk/safety?</td>
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<td></td>
<td>(ii) Developments in bio/nano-technologies.</td>
<td>(ii) New food production techniques.</td>
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</table>
Likely pressures on food production

A number of the issues raised in Table 1 deserve further comment.

Politics and trade

By its nature, the UK’s globalized food supply is also affected by the impact on markets of emerging economic powers, notably China and India, and by the changing patterns of world trade. In the latter case, the future development of the Common Agricultural Policy and the Common Fisheries Policy will be particularly important.

Agricultural land usage

The Barker Review heralds the re-emergence of a core national debate about the value of land in the UK and its usage. Competing demands include:

- food production, with a balance to be struck between human food and animal feed;
- the need for more sustainable energy: the European Union has set a target of 5.75% by 2010 for the use of fuel from bio sources;
- carbon sinks: the use of land to ‘lock in’ gases which otherwise would contribute to global warming;
- housing and amenities;
- biodiversity: maintaining genetic diversity and inter-species ecological reliance and relationships;
- public space;
- cultural identity: the British identification with, and preparedness to pay for, landscape and views.

Some industry commentators believe that the combination of food, feed and bio-fuel production pressures alone could result in developed countries’ wheat surpluses becoming fully consumed by their...
domestic markets and their export capacities being eliminated altogether.\textsuperscript{16} That process, affecting among others the UK and the United States, could happen over a period of relatively few years.

**Climate change**

Described by the Stern Review as ‘the greatest and widest ranging market failure ever seen’,\textsuperscript{17} climate change is an issue of central importance. The impact of global warming is likely to include:\textsuperscript{18}

- Regional yield increases and decreases. UK Meteorological Office studies indicate that small increases in cereal yields in high- and mid-latitude areas including Canada, China, Argentina and much of Europe will be more than offset by decreasing yields in Africa, the Middle East and India.
- An increase in crop failure together with higher energy requirements as demand for electricity-based cooling increases. Against that, an increase in minimum temperatures and fewer cold and frosty days in some growing regions could reduce their risk of crop failure.
- Changing precipitation patterns. Average global precipitation is expected to increase in volume and intensity though, once again, regional changes are likely to vary. Possible effects include soil erosion and flooding. Regions of production are likely either to shift gradually, or to remain as at present but with new strains placed on water, energy and other resources.
- Regional increases in tropical storm intensity. Peak wind and precipitation are likely to raise the number of tropical cyclones with an increased risk of Hurricane Katrina-type disasters. Damage and disruption to supply chain infrastructure are possible, along with potential labour disruption due to disease and displacement.

**UK food production: emissions**

The UK’s carbon dioxide (CO\textsubscript{2}) output – the country’s footprint – is much in discussion; and food production and consumption activities overall account for 13\% of the UK’s emissions. ‘Food miles’ is one element of that, but no more than a quarter of the total.\textsuperscript{19} The methane produced by livestock and the nitrous oxide created by manure and crop fertilizers are, however, intrinsically more damaging than CO\textsubscript{2} in their greenhouse effects.\textsuperscript{20} Underlining the point, a recent FAO report identifies the improved management of methane and nitrogen output as a potentially major means of avoiding the worst impacts of climate change.\textsuperscript{21} A move towards the emissions-based economy envisaged would almost certainly require changes in farming practices and would have a clear impact on the UK’s dairy and wheat supply networks, the farming elements of which currently account for 36\% and 66\% respectively of the UK’s methane and nitrous oxide totals.\textsuperscript{22}

**Planning for change**

The UK’s food supply network continues to function essentially as a response to a package of consumer-led expectations including assured delivery to the table, cheapness, convenience, unparalleled choice and market responsiveness. Continuing the process of change seen over the last 60 years (see Table 2),

| Table 2: A preliminary medium to long view of consumers’ food culture, supply chain drivers and policy frameworks |
|---|---|---|---|
| **Decade** | **Consumer culture characterized by** | **Shaped by experience of** | **Food supply chain drivers** | **Policy framework shaped by** |
| 1940s/1950s | Acceptance. | Rationing; price; availability; health. | Reconstruction; shortage of materials; labour difficulties; transport; focus on volume of food produced. | Under-supply; post-war reconstruction; focus on agriculture and increasing production; lowering prices. |
| 1960s/1970s | Aspiration (rising expectations). | Pleasure and convenience; choice. | Europeanization; new products; the move from local to supermarket shopping and the emergence of large retailer power; price cutting. | Technology; product/process innovation; focus on manufacturing; concerns about over-production. |
| 1980s/1990s | Contentment, but with worries. | Information deficit; time pressure; choice extension; also health, safety, genetic modification. | Expansion of supermarkets; information technology; retailer-driven choice; price competition and concentration of power. | Supply chain efficiency; EU single market; global trade barrier reduction; ‘informed choice’. |
| 2000 to present | Personal choice alongside increasing ethical concerns. | Technology; obesity and health; ethics; food miles; sustainability. | Low cost vs ethical and healthy eating concerns; the rise of corporate social responsibility. | Over-supply alongside scarcities; global sourcing; tensions between public and corporate governance; health; fuel; water. |
elements of that package will have to be re-examined in the light of emerging challenges and their effects.

For the first half of the 20th century, food was regarded in the UK as a strategic asset and one of great political significance, especially in times of national crisis. Something of that recognition may need to return to the policy arena over the next 20 years as consumers are increasingly forced to consider as part of their daily lives such currently remote concerns as access to land for food production, the availability of water, and competition in the use of fuel for agricultural and household purposes. The effects of some of these emerging uncertainties are at present unknown and do not appear to be being monitored.

For cross-sector policy-makers in particular, forecasting the scale and impact of change will help in managing the transition to a supply network and governance systems better able to cope with the new requirements presented. The new institutions, new laws, new risk management systems and new quality assurance schemes that have been put in place in recent decades have responded mainly to concerns about food safety and consumer trust. To adapt successfully, the current three-way governance model – regulation by public authorities, self-regulation by companies and consumer self-protection – will need to incorporate processes and mechanisms that embrace broader concepts of risk and uncertainty.

As a first step, answers are now needed to a number of pertinent questions facing the UK:

- Given strategic uncertainties, how will current supply dependencies and assumptions change?
- Over the next 20 years, what are the political, economic and social choices that society will need to make in terms of the food it eats?
- What are the ‘carrots and sticks’ that could influence the choices made? And what will be the capacity and role of domestic food production in supporting those choices?
- What is the role of communications in the new environment? And how best may consumer opinion be influenced, understanding advanced, and trust maintained?

Consulting a wider range of stakeholder interests throughout, the next phase of this two-year research programme will run from January 2007 to March 2008 and will be concerned with the development of assumptions, scenario play and analysis:

- the collection and collation of qualitative data;
- the preparation of models of the UK’s milk and wheat supply networks, their key assets, dependencies and resource utilization;
- the development of key assumptions on (i) internal supply uncertainties; (ii) strategic trends and uncertainties; and (iii) the likely policy responses;
- the conduct of feasibility studies to identify appropriate quantitative modelling techniques;
- the selection and working through of six scenarios;
- the assessment of the impact on the focal supply networks in each of the circumstances selected;
- the development of recommendations on (i) food supply policy; and (ii) supply governance arrangements.
Endnotes


4 In a market worth £76bn in 2004 (Mintel, UK Retail Briefing – Food and Drink Focus. Mintel International Group Limited, 2006), the UK’s agri-food industry represents some 8% of GDP and 12.5% of total employment (Department for Environment, Food and Rural Affairs, Farming and Food’s Contribution to Sustainable Development: Economic and Statistical Analysis. UK: Crown Copyright, 2002). In volume terms, in a production environment still dependent on subsidies, the UK can produce more than two-thirds of its total food requirement. In practice, up to 44% of what it consumes, at least in the primary products (cereal, potatoes, vegetables, cattle, poultry, milk products, pigs/pig meat and fruit) is imported, the bulk from EU countries (European Commission, The Common Agricultural Policy Explained. Brussels: European Communities, 2004). Imports of food are considered important to ensure year-round choice and nutritional standards.


10 Ibid.


16 G. Lean, ‘As stocks run out and harvests fail, the world faces its worst crisis for 30 years’, Independent on Sunday, 3 September 2006.


19 I. Herbert and J. Brown, ‘Study calculates precise damage Britons cause to the environment’, The Independent, 9 December 2006. See also http://www.carbontrust.co.uk/about/presscentre/061206_Carbonfootprint.htm.

20 Methane is calculated to be 23 times more potent, while nitrous oxide is 296 times more potent. Source: FAO report (see note 21 below).


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http://www.agindustries.org.uk/content.template/30/30/Home/Home/Home.mspx

**Aon United Kingdom**
http://www.aon.com/uk/en/industry_specialisations/food/serving_our_clients.jsp

**Cardiff Business School**
http://www.cf.ac.uk/carbs/research/fpiu/

**City University**
http://www.city.ac.uk/ihs/hmfp/foodpolicy/index.htm

**The Milk Development Council (MDC)**
http://www.mdc.org.uk/

**Monsanto UK**
http://www.monsanto.co.uk/monsantouk/monsantouk.html

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