



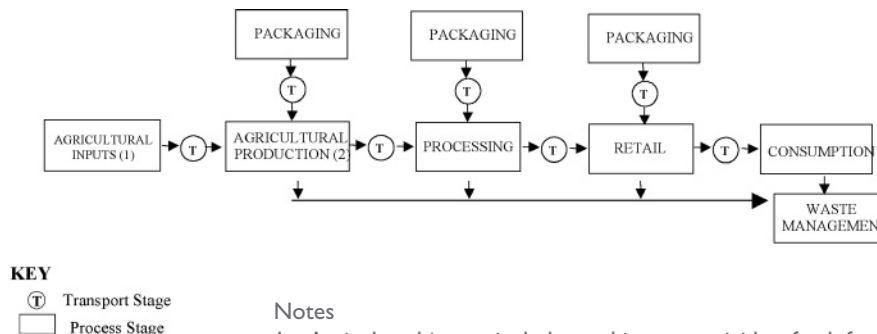
Taking Stock Fact sheet 3: Food



Introduction

The UK food system has changed significantly during the last fifty years based on the assumption that people want cheaper food, greater variety and non-seasonal food all year round. Farms have become highly mechanised, larger and more specialised and the distance between food producer and consumer has increased as food supply chains have become more complicated and transport-intensive. Food retailing has become concentrated within a small number of multiple retailers, with many of their stores located away from the traditional high street, now accounting for over three-quarters of UK food sales. Take-away food and ready to eat meals have been introduced and are extremely successful. These changes have influenced the resource consumption and environmental impacts of food supply. Figure 1 below provides a simplified version of the food supply chain, in practice there will be considerably more processes and transport stages.

Figure 1:
Food supply chain



Notes

- 1 - Agricultural inputs include machinery, pesticides, feed, fertiliser, seed and packaging.
- 2 - There are many variables associated with agricultural production, including: whether crops or livestock are produced, the degree of specialisation, field and holding size, machinery use, dependency on external inputs.

During each stage, energy and resources are consumed which results in solid waste and liquid and gaseous emissions. The environmental impacts associated with the food system are, therefore, diverse and include:

- water pollution;
- habitat loss;
- soil erosion as a result of agricultural production;
- greenhouse gas and air pollutant emissions from energy used for food packaging, processing and distribution; and
- solid waste in the form of food and packaging during each stage in the supply chain.

Key facts

Detailed import export data for specific food items is not available for the region, however based on UK information we know that over 31% of food (by weight) is imported from overseas, of which 99% arrives by ship. Imports of agricultural raw materials have doubled each decade from 1970. The UK average crop yield for all cultivated land is 6.6 tonnes per hectare, over twice the world average of 2.7 tonnes/ha. The average input of chemical fertilizer is 0.35 tonnes/ha.

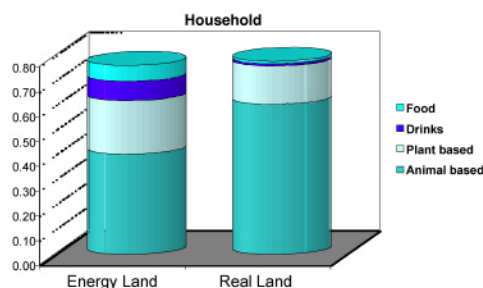
The South East contains 13% of English productive land area under cultivation, or 1.16 million hectares. The region produces 2.7 million tonnes of wheat, which is 23% of UK production, and contains 5% of all cattle and 7% of all pigs in the UK. Based on the UK average, the input of chemical fertilizer in the South East would be 600,000 tonnes, mainly in the form of nitrogen and phosphorus compounds.

Five million tonnes of food was consumed in households in the South East region in 2000, equivalent to around 620 kg per person per year or 1.7 kg per person per day. The weight of packaging used to supply this was 660,000 tonnes, or 81 kg per person per year. About 0.9 million tonnes of food was consumed in commercial and public catering in the region, equating to 111 kg per person (This is defined as Direct Material Consumption). Over 1 million tonnes of food and drink per year, or 124 kg per person, goes directly to waste. This includes around 43% of food supplied for catering and 14% of household food and 88% of it ends up in landfill sites.

The total amount of materials involved in food consumption in South East households in 2000, taking into account all the stages in Figure 1, is 25 million tonnes, equivalent to 3 tonnes per person per year or 8 kg per person per day. (This is defined as Total Material Consumption) The corresponding figure for commercial and public catering is 2 million tonnes, or 250 kg per person per year. Total materials involved in packaging of food, including indirect or "hidden" materials is 4.14 million tonnes, around 500 kg per person per year.

The Ecological Footprint (EF) of food and drink consumption in the South East is 1.69 gha (global hectares) per capita equivalent to over a quarter (25%) of the total EF from all activities. Breaking this down household consumption constitutes 1.47 gha, catering consumption 0.15 gha, and packaging 0.07 gha, all per person per year. In contrast to other sectors the 'energy land' (notional land needed to take up energy and emissions),

Figure 2: Ecological Footprint for household food



is of a very similar size to the 'real land' (actual land used in food production), each being around 0.8 gha per capita for household food (see Figure 2).

In terms of the breakdown of food types, including both household and catering:

- Meat and dairy product consumption accounted for two thirds (66%) of the total food and drink EF.
- Cereals and other plant based food accounted for 23% of the total.
- Drinks of all varieties accounted for 6% of the total.
- Packaging for food and drink products accounted for 4.5% of the total.

Policy background

The South East region has a large and productive farming sector in some areas, and also very intense competition between urban and rural land uses. Much of the region (19%) is subject to Green Belt policy which constrains development and helps maintain agricultural land, but there is increasing pressure on this land. Food and agriculture is a complex policy area, mostly taking place at national and international level. Key current issues include reform of the EU Common Agricultural Policy and the application of environmental criteria, set aside and production quotas, and the ongoing UK government work on sustainable food and farming policy.

These policy and market trends are expected to lead to significant changes in the structure of agricultural production in the UK, for instance:

- Consolidation into larger units of production, to be competitive with EU and world markets.
- New forms of agri-industrial products including pharmaceuticals and specialist chemicals.
- New forms of niche food/drink products, such as local cheeses, fruits or wines.
- A shift towards diversification of agriculture and forestry land use, with environmental and amenity objectives to the fore.

Possible future scenarios

In the full Taking Stock Project Report we consider four scenarios for each sector, ranging from high growth (Factor 0) through business as usual (Factor 1) to low growth (Factor 2) and finally a 'Factor Four' scenario which represents a more sustainable alternative involving more efficient use of resources and a reduced ecological footprint. The Factor Four scenarios are designed to achieve a 40% reduction in EF by 2020, and a 75% reduction by 2050, in line with the 'halving resource use – doubling efficiency' targets first set out in the book Factor Four published in 1997.

Key scenario indicators for food, many of which are also representative of driving forces, are as follows:

- Imported %: The trend towards greater imported (from overseas) foodstuffs is set to continue.
- Vegetarian %: This affects the balance between meat-based food (generally energy intensive) and others (less intensive). The current levels are 32% meat-based, 47% vegetable-based, and the remainder in drinks. Optimistic projections show vegetarian diets increasing and fewer meat products.
- Organic production %: Has been rising by 15% per year over the past decade, still only 0.6% of food by weight. There are different opinions on whether this trend will continue or level off.
- Chemical intensity: The inputs by weight of chemical fertilizers and pesticides have increased dramatically in the last 50 years, but this is likely to decrease as a result of precision agriculture. Can be taken as a proxy for the overall energy intensity of production and hence the EF.
- Packaging % (by weight): Food packaging by weight has increased slowly, but more rapid is the shift from low-energy (brown paper) packaging, to higher energy materials (plastic based).
- Composting of food waste % (by weight): There is limited re-use of food for animal feed from institutional catering. The current levels of composting of food waste are a fraction of 1%. However the regional waste strategy contains objectives to increase this.

High growth scenario (F-0)

With rapid economic growth food supply follows a free market model, with falling subsidies, rising imports and chemical use and more pre-cooked convenience foods. Farming in the South East shifts towards niche and leisure uses, and the effect of such trends is to increase the total EF for food and drink by 2.25% per annum or 50% by 2020.

Business as usual scenario (F-1)

Based on a continuation of current trends, i.e a rise in packaging, processing and imports, alongside a compensating rise in vegetarian production, organic production and food waste composting. This would increase the total food and drink EF by 1% per year, equivalent to 18% by 2020 and 64% by 2050.

Low growth scenario (F-2)

In a scenario of market failure and environmental hazards, the current consumption levels of the affluent SE cannot be taken for granted. Prices rise steeply and food hazards affect spending choices, resulting in a move back towards localized production much of it by householders or hobby farmers. There is a parallel rise in demand for cheap 'industrial' food in urban centres. In terms of the scenario indicators, local food sources and composting of food waste increase, but so do the chemical intensity and the packaging of industrial food.

Factor Four scenario (F-4)

This scenario represents a gradual adjustment towards a more sustainable, low impact food system. Imports decrease, with more regional and organic production and greater diversity involving more farm employment. Plant based diets increase, accelerated by further food scares, to a point where 75% of the population is mainly vegetarian. Packaging switches to re-usable and recyclable containers and composting of food waste increases rapidly. EF for food and drink reduces by 40% by 2020 and 75% by 2050.

Policy implications

The challenging task of devising a constructive set of policies aiming towards a more sustainable food system would need to take account of a range of factors, including:

- Consumer demand and preference.
- Food technology and supply chains.
- Food markets and subsidies.
- Global trade and international development.
- Agricultural land markets and management.
- Food waste management.

Regional policy has had little engagement with food issues since World War II, when basic production became an overriding priority. This is now changing, with further rapid developments likely, and a range of factors are involved:

- Regional image and marketing - The Countryside Agency programme 'Eat the view' is a forerunner of more regional based food activity, already well established in many EU countries.
- Food and drink production as a priority sector for economic development: the industry is often low skill with high environmental impact, and is seen as an essential part of many regional strategies.
- Regional countryside policy - this may prioritize farm or land-related employment and intermediate labour market activity.
- Regional housing policy - may seek to encourage new forms of low impact rural housing, in order to maintain populations and landscape quality, while avoiding the spread of commuter settlements.
- Regional landscape policy - in most areas the social or visual amenity is closely linked to the maintenance of a populated agricultural landscape, therefore there is a strong case for encouraging the diversification and continuing production from the regional landscape.
- Regional climate change policy - the extra pressures put on the landscape and habitats by climate change and extreme events (storms, floods, droughts, soil erosion, stress on species) may be ameliorated and adapted by a diversified and productive countryside. Indeed a changing climate is likely to bring new opportunities for crops and crops/livestock management, as well as changing consumer demand for food types.

For further details of our findings on food see the full Project Report at www.takingstock.org.uk

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