

one planet
FOOD

Our Mutual Food



This report is based on research carried out by the One Planet Food project at Falkland Centre for Stewardship in Fife with the help of funding from the Esmée Fairbairn Foundation.

It is designed to bring the reader on a journey from the global impact of the food system to the possibilities of a particular region to develop a more sustainable alternative. While this report is focused on Fife we hope that the findings will have a wider relevance and applicability.

Falkland Centre for Stewardship is an environmental charity which is developing and promoting the practice of stewardship at local, regional and national level. For us 'food stewardship' spans these different scales, from eating with care to nurturing local food cultures to safeguarding food supplies in 2050.

The One Planet Food project was set up with help from Carnegie UK Trust to explore fairer and more sustainable alternatives to our current food system.

The project aims to:

- **Provide advice and encouragement to local food initiatives which involve communities in growing food themselves and sourcing it from local producers.**
- **Research and develop regional policies and projects promoting sustainable food systems.**
- **Influence national food policy, linking issues of food security and sustainable food production in Scotland with wider issues of environmental and social justice.**

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This report does not represent the views of Esmée Fairbairn Foundation or Carnegie UK Trust.



Our mutual food

Fast foreword

One Planet Food 2020

“The future is here. It’s just not widely distributed yet.” William Gibson

Eddie Stobart’s tangerine train pulls into Glasgow Central, bringing organic wine and oranges for the city’s 6 citizen food clubs. On the return journey it’s taking beef, lamb and whisky for the long-established community buying groups in Florence, Rome and Naples.

After Norway and Austria, whose governments provided start-up funding to the scheme, Scotland becomes the third bioregion to receive Terrestrial Stewardship Council accreditation, a multidimensional audit of governance, environmental sustainability, access and use of land, fair employment practices, animal welfare and fair supply chains. Products exported from TSC bioregions are identified and traceable as such.

The Niddrie Community Dairy Company has had to put on an extra course for community dairymen and maids. It has now paid off its slow money loan and is making profit on its liquid milk sales as well as Renewable Heat Incentive payments for its small scale anaerobic digestion plant, sales of digestate to gardeners, and sales of store beef calves from its Brown Swiss cross herd. It’s now looking at adding two more cows to its herd of 10, as long as it can negotiate grazing in Holyrood Park.

Four thousand people - half of them tourists - joined the Island drove walk this year and they converged at Oban before making their way with 1,500 cattle to Falkirk where the lowland cattle finishers arrived to pick up their stores. The new trail has created new permanent employment as well as a welcome annual boost to the hospitality industry along the route.

The Aberdeen city bread group has just won the UK’s coveted LOAF (local, organic, affordable and fairly traded) award for its sourdough. The bread group brings together seven Aberdeenshire organic wheat growers with two farm scale mills, twelve artisan bakers and almost five thousand households across the city. Unsold bread goes to the group’s small pig herd kept in the city hospital’s community garden.

The government’s new tax credit for low income families which tops up their credit union food payment by 40% has stimulated significant growth in the mutual food sector. “We’re seeing more families able to buy fresh seasonal organic fruit and vegetables as well as meat, eggs and milk through the mutual without worrying that they will run out of food before the end of the week” said the Minister for Food.

Local food online, the distribution mutual based in Stornoway but operating Scotland-wide, celebrated its 100,000th customer today one year after launching. The virtual market works with 350 local producers to fulfil orders using a routing algorithm derived from sheep foraging patterns.

These fragments from the future are intended to illustrate the possibilities of a more robust local food system in Scotland. While in global terms we can make only a small contribution to the pressing problems of food security and climate change, every little helps. A local food system which reconnects more of us with the seasons and the source of our food will help us as individuals and as communities to do better with food.

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Summary

The food we eat makes us part of a complex global system of food production, processing and distribution. This system - and the small number of giant companies which dominate it - affects both our health and the health of the planet.

This system has become much more powerful in the last 50 years. However, most of the world's population are still part of a much more diverse local food economy, with more direct connections between producers and consumers.

Meeting growing demand for food over the next forty years both fairly and sustainably is a key challenge for the world's governments, food companies, farmers and consumers.

This report describes the benefits of, and barriers to, strengthening the local food economy so we grow more of what we eat in Fife and eat more of what we grow, and sets out some practical next steps to build on what's already happening.

Fife produces more than enough staple food for its population and is a net exporter of cereals and potatoes. Yet despite a thriving farm shop sector, farmers' markets and a range of box schemes the local food system is marginal. Creating the supply chains, local processing capacity and predictable demand for local food will not happen by accident.

The key message in this report is:

We have to change what we eat, in parallel with changing how we farm. To connect producers and consumers better we need to develop mutual models for financing, producing and distributing food as a mainstream part of the food economy. For this to happen, government policy has to be enabling at all levels.

Introduction

The spike in global food prices in 2007, along with the financial crisis, jolted the UK out of complacency about where its next nine meals would come from. 'Leave it to Tesco' seemed a little incomplete as a food policy framework.

The rise in food prices inevitably hurt poorest households most - not just in developing countries where the number of hungry people went over one billion, but also in the UK where the poorest households spend proportionately three times as much of their household income in food as the most affluent ones.

At the same time, growing awareness of climate change drew attention to the environmental sustainability of our food system, now and over the next few decades as world population increases. At current production and consumption levels, a 'Western diet' for everyone would need two or three planets instead of one.

Despite a reducing average intake of calories, changes in diet away from vegetables, cereals and 'proper meals' towards snacks, fast foods and energy dense processed food mean that we have also been getting more obese as a population, increasing long term illness.

This combination of factors prompted governments and thinktanks to start looking at the food system as a whole rather than through separate windows of agricultural policy, food security, climate change, public health, biodiversity and so on.

In June 2009, after a process of public consultation and expert working groups, the Scottish Government launched the National Food and Drink Policy: Recipe for Success.¹

The public consultation generated widespread interest, with concerns expressed about climate change, animal welfare, wildlife and the environment, public health and food culture. However, the priority in the final report is to grow the food industry and boost Scottish food exports.

This poses a challenge to advocates of a more local and more sustainable food economy to demonstrate a viable alternative to business as usual.

In Scotland, local food economies all but disappeared in the face of supermarket dominance. In the last few years, some fragile green shoots have emerged - local producer co-operatives and food networks, farmers' markets, artisan bakers and cheesemakers, farm shops, city shops connecting directly with farmers and growers, the Fife Diet. While their combined share of the country's food spend is still tiny, they point to new possibilities.

Maybe there is a way of 'doing food' which does more good and less harm, which is culturally feasible, and which stacks up within the existing economic paradigm, albeit with more expensive oil and a price on carbon emissions.

A step change is needed - or local food will continue to operate at the margins of the food system, doing little or nothing to challenge mainstream thinking. The local food movement needs to raise its game.

1 The challenges for the global food system

Over the last fifty years, global food production has kept pace with global increases in population. We already have the technical capacity to continue this trend for the next forty years, by which time the human population will have peaked at around 9 billion.

So what's the problem?

The current food trading system is geared to making money rather than feeding people well, preserving biodiversity and soil health, or mitigating climate change. The perverse consequences are that a billion poor people go hungry while hundreds of millions have health problems caused by eating too much of the wrong sort of cheap food: that we continue to cut down forests rather than improve productivity on existing farmland; that we keep losing topsoil and using too much fresh water; that we burn a great deal of fossil fuel growing, storing, transporting, processing, packaging and cooling food; that the way we farm is driving thousands of species to extinction and damaging soil biodiversity; that most farmed animals lead wholly unnatural lives in concentrated animal feeding operations of a scale unimagined fifty years ago; that we have depleted fish stocks in many oceans; and that a small number of large transnational companies exert undue and unaccountable influence over what we grow and what we eat.

We have already pushed key ecosystems to the limit and 'business as usual' (BAU) risks locking us into a feedback loop of land degradation, biodiversity loss, deforestation and climate change where each trend reinforces the others.

This is market failure: there is no 'invisible hand' to guide food to where it is needed most, to prevent waste at every stage, to include the costs to the environment and to future generations in the price of food. Wheat goes to biofuel if the price is right; while the doors of grain stores stay closed to the millions of malnourished children.

There are competing narratives about the future of food in a fuller and probably warmer world. The BAU narrative is extending the Western 'plantation' model by increasing scale, specialization, monoculture and mechanisation in primary production along with increasing consolidation of processing, branding, distribution and retailing further up the food chain. Small farms, small herds, small enterprises are replaced by export-oriented businesses, while many more people become consumers rather than producers of food. Rural poverty is relieved primarily by movement to the cities as far fewer people are needed on the land.

More food is traded globally, with fewer crops and varieties of which more are genetically engineered. These food commodities are then re-engineered and

industrially flavoured to make an ever-changing range of value added products. More primary producers become franchisees of agribusiness companies, supplying labour and absorbing risk while losing almost all autonomy.

An alternative narrative is 'many to many' (M2M): maintaining and empowering a broad base of primary producers and processors to make good food - first for themselves and their families, then their communities, then for their regional markets, and then for global trade. This calls for different forms of support from government, different agronomy, a higher value on public goods and closer connections between producers and consumers of food.

Clearly, the first narrative is the default: the second narrative relies on co-ordinated long-term intervention by governments and civil society. The International Assessment of Agriculture Science and Technology for Development (IAASTD) - the result of 4 years work by 400 scientists whose 2009 report was widely endorsed by governments in both developing and developed countries - calls for investment in the hundreds of millions of small producers around the world.

IAASTD argues for valuing and building on existing farmer knowledge, greater farm diversification, adding value on farm, and linking small producers with the urban poor as well as export markets. Improving viability of small producers raises rural incomes and relieves poverty directly.

Food security

There is a broad consensus on projections of the world's population growth.

In the BAU story, more affluent populations increasingly adopt a 'Western diet' with more meat, dairy and energy-dense foods. Rising demand for meat means more grain is needed for animal feed as well as feeding humans directly. Some creative arithmetic and feeding the 9 billion is said to require a doubling of world food production in 40 years. Managing this will 'obviously' require doing what we do now faster and harder - genetic modification of plants and animals to increase yields, increased fertiliser and pesticide use, concentrated animal feed operations, moving inputs large distances to farms, and trucking food to centres of population from ever larger sheds and plantations. More and better agribusiness is the answer.

M2M also seeks to increase production, but defines production more widely. Useful labour is seen as a benefit, not just a cost: animal welfare is seen as an outcome in itself, not a production variable; sustaining and enhancing biodiversity and soil health is central to agriculture, not at the margin (of the field, and of attention). Farming is a social activity, with its primary purpose to feed local people well, and the production of commodities for export seen as secondary. More and better agriculture is the answer.

M2M methods reflect this wider definition of production. Co-operation between small enterprises rather than consolidation into large businesses: multiple linked enterprises on a farm rather than monoculture; learning from and working with nature rather than seeking to dominate and simplify the ecosystem; enabling small farmers through credit, routes to market and knowledge exchange; integrating livestock, trees and cropping; compost rather than chemicals; reducing inputs of fossil fuel.

Shifting some of the public research budget into smallholder-friendly science and technology could support further gains through selecting and breeding resilient, nutrient-use efficient varieties, improving tool design and techniques for cultivation, weed control, pest control, harvest, storage and processing.

An extraordinary array of 'climate-smart' techniques have been developed, many highly specific to particular eco-systems, others more widely applicable. For example, the System of Rice Intensification² (SRI) can generate higher yields and higher farm incomes with lower water, pesticide and fertilizer use in many different rice-growing environments. Farmers don't have to pay for any special seeds, chemicals or licenses (see the Hague conference on agriculture, food security and climate change for more examples).

The M2M narrative also disputes the numbers. A recent report published by the Soil Association asserts that the real increase in demand for food from 2006 -2050 even on present trends is 70%. In M2M, consumers in Western countries reduce meat consumption while meat consumption outside the West peaks at a lower level.

A Compassion in World Farming/Friends of the Earth study published in 2009 claims that we can feed the world by 2050 using free-range farm animal production systems and adopting a lower-meat diet in developed countries³.

BAU argues that it has already delivered cheap food to the benefit of the poor, and will keep doing so through market forces. M2M argues that these same market forces generate landlessness, malnutrition and obesity as well as other negative 'externalities' which should be included in the real cost of cheap food.

Livestock

The issue of livestock production is highly contentious, with advocates using whatever figures they can lay their hands on to plead their cause.

There are at least three dimensions to the argument:

- **The overall level of meat (and to some extent milk) consumption in the West and the developing world, and the impact of livestock on ecosystems.**

- **The role livestock play in different farming systems.**
- **The relative merits of beef and sheep versus pigs and poultry.**

Impact of livestock on the global ecosystem

Global meat consumption has increased steadily though unevenly over the last forty years. Meat (along with milk and eggs) provides valuable high quality protein, and in some parts of the world the population would benefit from access to more animal protein.

UK (and Fife) meat consumption is stable at about 85kg per person per year - or about half a pound of meat a day. We eat more chicken, followed by pork, then beef, then lamb. Our meat consumption is average for the 'developed' world, while people in developing countries eat about half as much on average. The world's two largest countries are outliers in the general trend for meat consumption to follow GDP. China is above the line, with per capita consumption of about 60kg per person, and India below the line at 3.3kg per person. India, with almost one-sixth of the world's population, eats less meat than the UK.

Both countries are self-sufficient in grain, milk and meat, although China, like Europe, is a major net importer of soya.

India is now the largest dairy producer in the world, albeit with a system where 80% of the cows and buffalo are in herds of 8 animals or less and dairying is a major source of employment (sources: FAOSTAT, FAO State of Food 2009).

Global growth in livestock in the last 20 years has been mainly pig and poultry, with cattle numbers up only 20% while pig numbers have gone up 90% and poultry has increased by 150%.

The impact of livestock production on climate change has been highlighted by many reports, for example 'Livestock's Long Shadow' by the FAO, which estimated that taking deforestation into account, livestock farming is responsible for 18% of global greenhouse gas emissions.

This figure itself has been challenged, most recently by Simon Fairlie⁴, but interestingly, the report has been used to argue both for reducing meat consumption and for intensifying beef production (on the grounds that fattening cattle on grain as quickly as possible and indoors if necessary means less methane per kilogram of beef than having cows wandering about eating grass and byproducts).

BAU is interested in technical fixes for methane production: improving genetics so cattle grow faster: fine-tuning the balance of nutrients in their feed mix; shifting towards more (intensively reared) pig and poultry meat; feed additives to change the gut composition so they make less methane - and even housing cattle in sealed sheds so the methane can be tapped off. All of these offer a market opportunity.

M2M argues instead for reducing meat consumption and reducing concentrated animal feeding operations - instead, using livestock to eat things we can't (particularly grass in the case of ruminants, but also by products and food waste) and integrating them into crop production.

(This used to happen in Western agriculture and still happens in most of the world - but is now seen as inefficient. Instead, we have huge animal feeding operations where food is brought in from miles away and where disposal of manure is a major problem. This then requires further investment in anaerobic digestion or 'waste' to energy plants which in turn requires the scale of production to be maintained or even increased).

The role of livestock in different farming systems

Livestock systems are diverse across the world, with small farmers in many parts of the world relying on one or two animals for draught power, insurance, collateral and manure as well as milk and meat - while poultry production in and for the UK is an industrial process with minimal connection to farming or soil. An estimated 1bn people in developing countries derive an income from livestock.

The relative merits of white and red meat

Choosing how much of which meat to eat means taking into consideration not just the direct impacts of the particular livestock system but also the opportunity costs of that particular system - so a complex mix of facts, values and opinions.

The major direct environmental impact of beef (and lamb) systems is the production of methane from animal digestion, and the release of nitrous oxide from manure handling. In grain-fed systems, cattle are killed at a younger age so in theory less methane is produced per kg of beef: but more carbon is released from cropland soils to grow the grain, more water may be used for irrigating the feedcrops and more nitrous oxide generated from cultivations and fertiliser application.

Some beef systems also feed soya to animals, contributing to deforestation as well as incurring a significant carbon footprint in transporting feed from Brazil to the UK.

Land use on farms can also sequester carbon in grassland and woodland, though again the potential for carbon sequestration in grassland is disputed. Until recently, the dominant view was that grasslands are in carbon equilibrium and should be excluded from calculations. The Soil Association's recent review⁵ of soil carbon sequestration research argues that UK grasslands managed organically (which increases biological soil activity) can lock up 670kgC/ha/yr - enough to offset half the methane emissions of the dairy cows and all the emission of the beef cattle chomping the grass above. Soussanna et al⁶ report from four European grassland sites a net sequestration of between 550kg and 1760kg ha/yr

after allowing for methane and nitrous oxide emissions. Studies also suggest that including clover in the sward reduces methane production.

Reviews of beef production in the Cairngorms National Park and in the Cambrian mountains both suggest that at farm scale grass-fed beef systems can be carbon-neutral or even carbon-positive.

The opportunity cost of beef systems - what could we have done with those resources instead? - also differs between systems. Since cows can convert grass which we can't digest into meat which we can, they can be efficient protein-makers. The ratio of human edible protein out to human edible protein in has been calculated at 1.2 in a USA feedlot system and 6.1 in an extensive ranching system, while the energy in/energy out ratios are 0.65 and 3.2 respectively⁷.

There is twice as much grazing land in the world as arable land. Ruminants graze land which is too poor, dry, rocky or steep to grow crops.

The opportunity cost of water is also significant in beef systems using irrigated maize, while in grass-fed beef systems in Scotland the water is just passing through anyway.

However, low carbon blueprints such as the Centre for Alternative Technology's Zero Carbon Britain 2030 report argue that the true opportunity cost is the carbon we could have locked up by converting grassland to forest. (Though some studies also show that silvopastoral systems combining trees with grassland lock up more carbon than forests.) Finally, it could be argued that by not eating beef ourselves we help to make more available for export from Scotland and/or help to reduce the UK's overall meat imports.

The direct impact of pig and poultry systems - although they convert grain to meat more efficiently than cattle - include the production of grain and the import of soya (which is currently an integral element of all intensive pig and poultry systems).

Europe imports around 38 million tonnes of soya - around 100kgs per person - each year, principally from the USA, Brazil and Argentina. Producing this crop requires some 15m hectares - about twice the area of Scotland. Soya production in Brazil is a major driver of deforestation, which globally is responsible for around 20% of greenhouse gas emissions.

Another direct impact is the lived experience of the animals who in the increasingly large concentrated animal feeding operations are treated simply as units of production rather than sentient creatures.

The opportunity cost of pig production also varies between systems, with the best systems getting out about half as much human edible protein as goes in. Obviously systems which include human food waste, woodland grazing and crop by-products in the pig's diet will do better on this indicator.

Two narratives

Business as Usual is comfortable with big. It's happy to see large scale solutions which rely on global carbon markets and the monetisation of ecosystem services. It likes hi-tech. These offer market opportunities. Business As Usual is good at lobbying, influencing the rules made by the World Trade Organisation. It likes either/or: nature here, production there.

More to More is more comfortable with locally relevant, locally managed low-tech solutions from farm-scale biogas and biochar to agroforestry and silvopasture. It likes engagement, dialogue, democracy - working with, not doing to.

On November 2009 the World Food Summit on Food Security took place in Rome. The main theme of the summit was to discuss how to feed nine billion people in 2050 in order to tackle what Jacques Diouf, Director-General of FAO, has called the "tragic achievement" of reaching the appalling figure of 1 billion hungry people. At the same time NGOs organised a parallel forum to the World Food Summit demanding that Food Sovereignty was "the real solution to the tragedy of hunger in our world" ⁸.

As argued by Patrick Mulvany (UK food group), the majority of the world's food "is grown, collected and harvested by more than a billion small-scale farmers, pastoralists and artisanal fisherfolk". However, farmers and consumers have little control of how food is produced because the food system and the rules that govern it are in the hands of a few agribusiness companies and international institutions and the speculative international market. There is a growing consensus among NGOs, farmers, pastoralists, indigenous people and other interest groups that a food sovereignty framework in policy-making could democratise the food system and at the same time contribute to the long term development goals of reducing world hunger and poverty.

The concept of Food Sovereignty was first developed by the organisation Via Campesina, an international movement of peasants, small- and medium-sized producers, landless, rural women, indigenous people, rural youth and agricultural workers. It has 148 organisational members from 69 countries in Asia, Africa, Europe and the Americas, including the Scottish Crofting Federation.

Food sovereignty framework

- **Food sovereignty is the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems.**
- **It puts those who produce, distribute and consume food at the heart of food systems and policies rather than the demands of markets and corporations.**
- **It defends the interests and inclusion of the next generation.**

- **It offers a strategy to resist and dismantle the current corporate trade and food regime, and directions for food, farming, pastoral and fisheries systems determined by local producers.**
- **Food sovereignty prioritises local and national economies and markets and empowers peasant and family farmer-driven agriculture, artisanal-fishing, pastoralist-led grazing, and food production, distribution and consumption based on environmental, social and economic sustainability.**
- **Food sovereignty promotes transparent trade that guarantees just income to all peoples and the rights of consumers to control their food and nutrition.**
- **It ensures that the rights to use and manage our lands, territories, waters, seeds, livestock and biodiversity are in the hands of those of us who produce food.**
- **Food sovereignty implies new social relations free of oppression and inequality between men and women, peoples, racial groups, social classes and generations.**

Extracted from Declaration of Nyéléni, World Forum for Food Sovereignty 2007.

While the language is not familiar, the basic claim is that the food system should serve people and not the other way round. The next section of the report starts to explore what that might mean in one local authority area.

2 Food in Fife

This section of the report looks at what can be done at the level of one local authority to develop a more sustainable food system locally and to contribute in a small way to a more sustainable food system globally.

In compiling this section of the report we were assisted by The Benarty Community Forum who undertook survey work and took part in interviews and focus groups.

About Fife

Fife is the third largest council in Scotland with 360,000 citizens, with a mix of urban and rural populations, rich and poor areas. Fife Council aims to be the leading green council in Scotland.

Fife's built up area constitutes 11% of the total land surface and it follows the trend of urbanization experienced in the rest of Scotland, with for example 1,403 hectares of agricultural land given over to roads, housing or industry in 2002-2003. Globally, 19.5m (about 200 times the area of Fife) hectares are lost each year to industrialization and urbanisation.

Fife's carbon footprint is about 16t CO₂e per person, compared to a global average of 6.4t.

Compared to much of the world, there is a high level of food import and export from Fife (and the UK). There are relatively few farmers in the population, and all farmers produce primarily for sale rather than for their family's consumption. As in the rest of the UK, the food industry in Fife has a major impact on Fife's economy, carbon footprint, on biodiversity, water quality and public health. The food industry employs over 10,000 people in Fife, with under 2,000 directly involved in farming. This report focuses on climate change and public health issues.

Food and climate change

The food system as a whole in the UK - based on what we consume rather than what we produce - is estimated to account for 18% of our total emissions⁹. (Other studies suggest a higher figure for the EU25 of 31% taking into account the impact of deforestation caused by the food system¹⁰). In Scotland, with a relatively larger agricultural sector, food and farming account for 25% of our total production emissions.

Of the emissions from food, about half come from agriculture itself ('pre farm gate') while the other half come from packaging, processing, transport and waste.

Of the emissions which come from agriculture to produce our food, about half (in CO₂ equivalent) comes from nitrous oxide emissions - mainly as a result of spreading chemical fertilizer and animal manures, but also through soil activity under different conditions.

Just under half of the emissions are from methane - primarily from ruminant animals, but also some from waterlogged agricultural soils and a small amount from production of the paddy rice we import.

Only 10-15% of pre-farm gate emissions come from fossil fuel use - fertilizer production, farm operations, grain drying etc.

The emissions in the rest of the food chain are mostly from fuel and electricity - processing, packaging, refrigeration, transport of food and animal feed, journeys to buy food, moving food waste and so on.

Decomposing food waste in landfill also releases methane and recent estimates by WRAP¹¹ suggest that greenhouse gas emissions from food waste equate to 20Mt CO₂ eq - comparable to 25% of the emissions from private cars.

Scotland has undertaken to achieve a reduction of 42% in its carbon footprint by 2020. This cannot be achieved without making a significant dent in the carbon footprint of the food we eat.

Public health

The recent increase in obesity is primarily a result of what we eat, when we eat it and how we eat it. The sugar drinks, confectionery and fast food which are available everywhere and anytime are cheap ways to get calories.

Around 25% of adults in Fife and 15% of children are obese. In 2003, of twelve OECD countries considered in an international comparison, Scotland had the second highest obesity rates, with the US at the top of the list,¹² and the highest death rates in Europe from cardiovascular diseases, which are highly associated with diet and physical activity¹³.

Furthermore the incidence of type 2 diabetes in the UK increased from 2.60/1000 person-years in 1996 to 4.31/1000 person-years in 2005¹⁴.

Food and drink companies have a well-rehearsed argument that there are no unhealthy foods, only unhealthy diets. However, what they spend promoting these unhealthy foods dwarfs what government spends promoting healthy food.

Could Fife feed itself?

Fife is a highly productive agricultural area. More than two thirds of its 94,000 agricultural hectares are arable land used for crops and intensive grazing. Food production is managed by a small workforce of around 1000 people supplemented by about 800 seasonal workers.

Excluding private gardens and allotments, Fife has 0.18ha of arable land per person, compared to about 0.1ha for the UK as a whole and 0.25ha globally.

The tables below are estimates of production and consumption based on available data. We have used typical yield figures for crops and livestock in Scotland and applied them to the land use data for Fife collected annually by government.

Consumption data for Fife comes from DEFRA's family food survey, which is based on a large sample of households recording what they spend on food. This does not allow for wastage (10-15%) and there is probably under-reporting of snacks and confectionery consumed. (For example, people report eating 113g confectionery per week, but industry sales data show an average of 250g being sold)¹⁵.

This data is presented to illustrate the match between what we produce in Fife, what we do eat and what we should eat according to current advice on healthy eating.

Estimation of food production for Fife Based on Scottish Government census data

	Yield (t/ha)	Area in hectares (2009 census)	Estimated production
Cereals			
Wheat	7.5	13,779	103,342
Barley	7	23,110	161,770
Oats	5.5	2,698	14,839
Total Cereals		39,587	279,951
Rape	3	2,135	6,405
Peas and beans	3	1,150	3,450
Potatoes (excl seed)	40	2,926	117,040
Veg	25	2,300	57,500
Fruit	13	230	2,990
Polytunnel/greenhouse	30	9.5	285
Livestock	Number animals	Yield/year	
Beef	13,000 cows	220kg meat	2,860 t
Mutton and Lamb	40,000 ewes	28.8kg meat	1,152 t
Pig meat	385 sows	1,200kg meat	462 t
Table birds	650,000	9.4kg meat	6,110 t
Milk	4,800 cows	6,800 l milk	32.6 m l
Eggs	870,000 hens	318	276.6 m

(1) The Scottish Government, National Statistics Publication, Scottish Agriculture – Output, Input and Income Statistics, Table 2 Quantities of Main Items of Scottish Agriculture Output 2008. April 2009

(1.2) Vegetables data from Food Affordability, Access and Security: Their Implications for Scotland's Food Policy - A Report by Work Stream 5 of the Scottish Government's Food Forum Table 7 The output in tonnes of fruit and vegetable production in Scotland in 2008

(2) The Scottish Government Agriculture and Fisheries Publications, Scottish Government Statistician Group
Scottish Agricultural Census Summary Sheets by Geographic Area: June 2009
March 2010

Meat yield may be higher or lower than average for individual animals. The yield does not represent individual carcass weight but reflects annual production of meat ie the annual weight of meat produced by several generations of individual animals in the case of poultry or a proportion of carcass weight in the case of cattle.

Fife annual consumption			Fife annual production	
Food consumption groups	Recommended dietary requirement in tonnes 1	Actual consumption in tonnes 2	Food Production	Tonnes
Fruit		22,546	Fruit	2,990
Vegetables	52,836	17,733	Veg	57,500
			Glasshouse and protected fruit and veg	285
Total fruit and veg	52,836	40,279		60,775
Brown/wholemeal bread	10,169	2,601	Cereals	279,951
White bread	10,169	12,721		
Breakfast cereals	4,487	2,337		
Potatoes 4	Minimum 6,604	15,959 (including chips and crisps)	Potatoes	117,040
Carbohydrates	31,429	33,618		396,991
Oily Fish	1,657	597		
Whitefish	2,008	1,415		
Total fish	3,665	2,012	Fish	*1,700
Red/processed meat	Maximum 11,870	21,134	Beef	2,860
Other meat	No recommendation		Mutton and lamb	1,152
			Pig meat	462
			Poultry	6,110
Total meat	Max red/processed 11,870	21,134		10,584
Milk and Dairy (as milk, butter, cheese etc)	No recommendation	37.4m l	Milk	32.6 m l
Eggs	No recommendation	37.6m eggs	Eggs	276.6 m eggs

Notes:

1. Wendy L Wrieden, Karen L Barton, Julie Armstrong, Geraldine McNeill, A Review Of Food Consumption And Nutrient Intakes From National Surveys In Scotland: Comparison To The Scottish Dietary Targets Commissioned By The Food Standards Agency Scotland September 2006

The Scottish Dietary Targets (SDTs) were established in the Scottish Diet Action Plan (SDAP) (Scottish Office, 1996). The dietary targets shown in the Table were reconfirmed in the recent strategic framework for Food and Health, (Scottish Executive, 2004).

Dietary targets are shown as annual quantities for Fife population (Fife Population - 361,890 in 2008. Fife.gov.uk) (See Appendix I)

2. Defra Family Food: A report on the 2007 Expenditure and food survey. Extract from table 3.2 Selected foods by country - Scotland.

Scottish Sea Fisheries statistics Map - Figure 1: Volume landed by district, 2008; Figure 2: Value landed by district, 2008

4. Quantities of fresh and processed potatoes purchased April 2005 to December 2007 were lowest in Scotland when compared with the rest of the UK. Family Food in 2007 A National Statistics Publication by Defra

5. Complex carbohydrates can include brown/wholemeal bread, some pasta, rice and breakfast cereals and potatoes.

Production in Fife is sufficient to meet the population's recommended dietary requirements for most of the major food groups. If Fife did become an economic island, we would have less fish than we need but more than enough chips to go with them. To fry the chips we grow over 6,000 tonnes of rape seed oil - 10 litres per person per year.

We grow enough veg to get our five a day though we would have a more limited range of fruit. Scotland and the UK import around 90% of the fruit we eat. We'd have more than enough cereals for our porage and bread and we could still make far more beer and whisky than we could drink (an acre of barley is enough for 2,500 bottles of single malt).

We would need far fewer hens than we've got to lay our eggs, but we'd still need about 30,000 tonnes of wheat a year for pigs and poultry - more than we'd be eating ourselves. We'd have to cut back a bit on milk, butter and cheese or make room for a few hundred more dairy cattle.

We would have to cut back on meat or rear a couple of thousand more sows - we produce about enough beef, lamb and chicken to match what we currently eat. Although we produce around 3,000 tonnes of peas and beans, we'd need a big increase in pea-growing and some clever nutritional work to meet protein requirements for the pigs and poultry. We currently import soya mostly from Brazil as this provides a more convenient protein source for pigs and chickens than home-grown legumes.

The other key external inputs to the food system are nitrogen fertiliser (the 8-9,000 tonnes of nitrogen fertiliser spread on the 66,000 hectares of arable land in Fife), imported phosphate and potassium fertiliser, and oil used for farm machinery including grain drying.

Although it is unlikely that the Kingdom of Fife will cease trading with the rest of the globe any time soon, the answer to the question ‘could Fife feed itself?’ is clearly ‘yes’.

The answer to the question ‘does Fife feed itself?’ is clearly no. Leaving aside, tea, coffee, wine, chocolate, spices, oranges and all those other exotic pleasures, there is little visible connection between what we grow and what we eat. Although we produce broadly enough of all the staple foods we need to eat, and despite the best efforts of the farm shops, farmers’ markets and Fife Diet, the local food system is marginal. Most of what most people eat in Fife cannot be readily linked to most of what people grow in Fife. Most farmers are producing commodities, not food. Wheat farmers don’t eat their own bread, and oat farmers don’t make their own porridge.

While we now think of this as normal, most of the world’s population still have a strong connection to local food production. Decisions made by governments and citizens in the next few years will determine whether our food system develops to be more like theirs, or theirs develops to be more like ours, or both systems develop to something new.

There are two main reasons for the lack of a local food system:

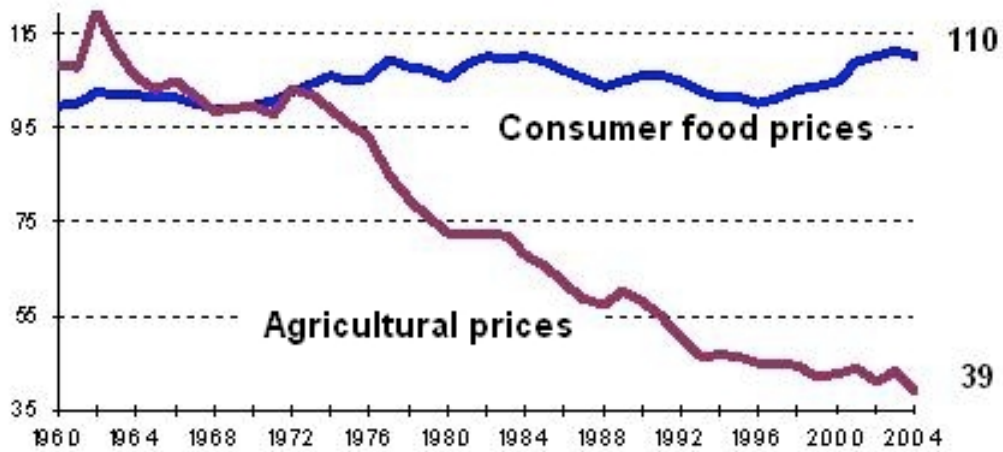
Dominance of supermarket chains in food retailing

The UK grocery sector is dominated by a few very large companies which source their produce from all over the world. While supermarkets are keen to pick up business by demonstrating their commitment to local suppliers, only the large and specialised producers can meet the demanding specifications directly. With meat, milk and cereal products, farmers tend to supply the supermarkets through large intermediary processors in other parts of Scotland and the UK and during this process the connection with the local area is lost.

Food processing data is not available for Fife, but it appears that no milk is pasteurized and bottled in Fife. Very little livestock is slaughtered and butchered within Fife. Some locally produced oats are processed into breakfast cereals in Cupar but these are then distributed throughout Scotland and Northern England. None of the bread sold in Fife is demonstrably made with even a proportion of locally milled flour. While intermediate technology for cleaning and milling cereals on a farm scale is commercially available, the system is geared to large centralised plant.

Anecdotal evidence suggests that even fruit and vegetables grown and packed in Fife travel to and from supermarket distribution hubs before being sold in Fife. Farmers are at the price-taking end of a chain where the price they get is determined by relative bargaining power (as with milk, where a small number of dairy companies control the industry) and by global commodity prices (as with wheat, where speculation on the commodity markets amplifies the effect of supply and demand which in turn is influenced not only by natural events such

as floods and droughts but also by the biofuels market). The proportion of the shopping basket price which goes back to farmers in the UK fell steadily from 47% in 1988 to 36% currently.



In Scotland, small dairy farms are dwindling every year: from 2,000 such farms in 1999 there are now only 1,300.

“With the big retailers paying farmers a current average of just 24p per litre for milk - less than the 27p cost of production - more and more are facing financial ruin” ...while more red tape is rarely the answer, we must find a way to expose and condemn this merciless squeezing of our dairy farmers” Struan Stevenson, MEP.¹⁶

Small dairies are now viable only if they can organise their own bottling and supply customers directly, or if they can add value on farm through cheese or ice cream.

Price cutting by supermarkets effectively put an end to doorstep deliveries in the UK.

Turnover for supermarkets and other shops in Fife 2009

Store	Number of stores	Annual Turnover £million
Supermarkets ¹		
Somerfield	1	6.7
M&S Food	2	14.2
Sainsbury	2	48.4
Tesco	6	124.3
ASDA	5	198.5
Aldi	6	21.4
Lidl	4	13.7
Morrisons	2	52.1
Co-op	3	21.2
Total supermarkets ¹		500.5
Town centre shops ¹		38.3
Other shops ¹		87.1
Farmers Markets ²	4 per month	0.5
Farm Shops ³	10	3
Total Estimated annual food turnover	629.4	

¹ Roderick MacLean Associates Ltd Fife Retail Capacity Study 2009 Estimated convenience turnover, 2009(In 2008 prices)

² SAC, Land Economy Working Paper Series Number 21. The Origins, Operation and Future of Farmers' Markets in Scotland 2006 Updated Estimated 2010 by Michael Macleod SAC

³ FARMA estimated approximate average turnover

It was not always this way. Most supermarkets in Fife are less than 20 years old. In 1960, small independent retailers in UK had a 60% share of the food retail market. By 2000, their share was reduced to 6% while the multiples' share increased to 88%.

While farmers' markets and farm shops are a welcome development, they remain marginal with around 0.5% of the market. Scottish Agricultural College (SAC) estimate the average turnover per farmers market stall to be £100 an hour. The Fife Farmers Market Association estimate this to be a little higher. The stall holder must grow/produce the food sold and cover all costs (e.g. seed, slaughter,

butchery, packaging, transport) as well as the labour to produce and sell the produce. Profit margins must inevitably be narrow and it is possible that many farmers may earn less than the minimum wage.

The case for farm shops appears slightly better with average turnover of £300,000 a year but they usually employ from 4 to 10 full time equivalent staff. Many farm shops attract 'top-up' spend from customers but are not providing their main source of food.

Without broader support for a local food system, these short cuts from producer to consumer will continue to be peripheral.

We eat food products, not food

From the farm gate onwards the UK (and Western) food system is dominated by a small number of large food and drink companies, and they, rather than local farmers, have the most influence on the food we eat in Fife.

We can only eat and drink so much (and in terms of calorie intake we appear to be eating less than before), and basic foodstuffs can be produced very cheaply at farm level, especially in the EU and US where production is directly or indirectly subsidised. So food and drink companies need to 'add value' to raw ingredients and create profitable food products and brands.

Great ingenuity goes into combining cheap calories into cheap but highly attractive and ubiquitous processed food from soft drinks and confectionery to breakfast bars and ready meals.

More and more we buy food products rather than food: and most of these food products can't be made in a kitchen. Ingredients such as soya lecithin and high fructose corn syrup, let alone the host of enzymes, emulsifiers and agents are not available at the farm gate.

Consumption of ready meals grew by 44% in the UK between 1998 and 2002, with the UK now consuming twice as many ready meals as France and six times as many as Spain¹⁷. Typically, the long list of ingredients and the scale of manufacturing means losing any connection between the meat or vegetables in a ready meal and a local farmer.

Many caterers rely on a single large supplier to source all their food, and much of what appears on the menu was made in a factory hundreds of miles away and simply reheated in the restaurant kitchen. This 'efficient' system allows caterers to reduce staffing levels and skills requirements, but removes the incentive to source local food.

Even bread, the most basic of products, cannot be made at home to resemble the ubiquitous white sliced loaf. The gummy texture, the refusal to go stale, and the sheer quantity of air and water folded into a factory made loaf with the help of

genetically modified enzymes is beyond the kitchen skills of even our best TV chef. With two companies - Rank Hovis and ADM - controlling more than 50% of the milling in the UK and large bakeries producing up to a million products a day, it is not surprising that we don't know if today's toast is from Lincolnshire or Kazakhstan. (While large plant bakeries supply over 80% of the UK market, craft bakers supply 90% of bread in Italy).

Half of the bread we eat is in sandwiches, and we have people make those for us too as part of a £3 billion industry.

Does any of this matter?

Supporters of the current food system argue that all this reflects progress, giving more choice to consumers and driving efficiency in primary production through competition. Local food, organic production systems and smallholders are seen as part of a nostalgic indulgence by rich Europeans but we just need to get with the programme.

Of course the real question is not could Fife feed itself, but 'could Fife feed itself better, and more sustainably, while also doing its bit to help the rest of the world do likewise?'

In Part 1 we argued that 'Business as Usual' at a global level would continue to drive climate change and damage the environment while failing to feed the world's poor.

BAU in Fife means negative environmental impacts both here and in other countries from the way we farm and the food we eat: and it means thousands of people in Fife dying before their time because of obesity and its consequences.

Local farmers' perceptions

Twenty farmers were interviewed by phone during January 2010. Interviewees were selected from a variety of farm types and sizes and include large-scale arable, mixed, dairy, egg producers and farms with direct sales via farm shops. Farmers were asked about the opportunities for and barriers to selling more local food. The majority of the interviewees were in favour of more local sales and were conscious of rising fuel prices and climate change.

Time, labour and skills

Many farms are running with only family labour or with just one additional worker. Many people said they didn't have the time beyond running the farm to explore processing and marketing their produce. Several interviewees also expressed a lack of confidence that they had the skills and experience to process and market their produce.

Status quo and "That's not what I do"

Two people said their job satisfaction came from farming and they did not see themselves as processors or retailers. Conversely those running farm shops and producing local cheese or running their own butchery expressed high job satisfaction and valued the chance to meet their customers but admitted to working very long hours. There was also a pride in selling Scotland to the world. A few people felt that Scottish farming was not about supplying local food and many farmers talked about the role of farming in export and strengthening the Scottish economy. Many farmers expressed fears for their future coupled with lack of confidence in making changes. There was a lot of nostalgia for mixed farming but a feeling that such systems could not be reintroduced.

Economics, monoculture, economies of scale

The time taken to process and market food locally was seen by many as uneconomic. An example given was lamb - transport to slaughterhouse, slaughter charge, butchery costs, marketing costs including labelling, time at farmers' market or on deliveries, etc. Many farmers involved in farm shops and farmers' markets earn less than minimum wage if all working hours are calculated. The investment in the necessary equipment and machinery was seen as very high for an individual farm - pasteurises, cold store, packaging, etc.

There was concern amongst farmers about climate change, but a sense of needing more information. People cared about climate change but expressed the reality that they must do 'what pays', for example producing barley for malting and export is seen as more profitable than growing vegetables for local consumption. There is also a need to look outward beyond Fife for markets. Most farms were producing a very small range of foods and many highlighted the difference with the traditional mixed farms of the previous generation. There was concern about the economic vulnerability of current monoculture and a variety of concerns were raised:

- Those farmers that contracted out land for vegetable growing spoke of the large machinery used, soil compaction and the damage to future soil fertility.
- Those selling cereals and vegetables spoke of the frustration of not being able to sell yields of less than 30 tonnes. This prevents some farmers using smaller areas or operating a rotation.
- The investment in storage, machinery, equipment and meeting regulations was also seen as a barrier to flexibility and ability to produce small local quantities.
- Lack of knowledge of where to go for help and advice, and frustration with the time taken for grants to be processed.
- One farm with its own shop grows over 70 varieties of fruit and vegetables. They can sell that produce directly to customers, but buying seed and harvesting is relatively expensive because of the small areas involved.

Supermarkets

Many complained about their treatment from supermarkets and bulk processors but did not feel ready or confident to take on the risk of moving away from that situation. Complaints included:

- **Precise specification, resulting in rejection and wastage of crops not meeting that specification. The supermarkets demand one size of swede or cabbage because farmers are told that is what the customer wants. Yet an account from a farm shop where a range of types and sizes are offered suggests that one size does not fit all.**
- **Tying in to several years contract and forcing farmers to invest in machinery/storage to meet that contract.**
- **Required pesticide and herbicide use.**
- **Food miles - the supermarkets claim to supply 'local' food which has in fact travelled to a processor or packer and then to a supermarket distribution hub before reaching the customer. This was a particular frustration for dairy farms where it has reduced prices below costs.**

Farmers' markets

- **Seen as a good way to raise awareness but not really a way forward.**
- **Cold and wet for stallholders and customers - this limits their popularity.**
- **Too small to deal with very much of Fife's food supply and demand.**

- Not providing sufficient continuity. When lamb prices are low farmers sell directly to consumers but when prices rise there is no lamb available in the farmers' markets and this affects customer and supplier loyalty.

Farm shops

- Those that sold through farm shops were very positive.
- Barriers include location and customer access. Not every farm is in the right place to attract customers. Their small number is seen as a barrier, and a more comprehensive network of farm shops and suppliers would be stronger.
- Many farmers referred to small independent high street shops as their access to local consumers in the past, but too few are left now.

Markets and Processing

- There are no livestock markets in Fife, and Perth Auction Market is now closed.
- Fife has just one commercial abattoir and there are frustrations with the lack of choice. Most farmers belong to producer groups and send stock to markets and slaughterhouses outside Fife.
- The few remaining dairy farmers all belong to supplier groups. There appear to be no local farm dairies pasteurising and bottling on-farm in Fife. There is one independent dairy, based in Glenrothes, collecting milk across Scotland and processing near Edinburgh. Glenrothes is just a depot for local deliveries. Most of the small independent dairies have been bought out by Grahams or Wiseman and only retained as doorstep delivery depots.
- Several farmers interviewed had given up dairy herds in the past five years. The remaining smaller herds are barely meeting costs and there are fears that the supermarkets are increasingly importing cheaper, poorer quality milk.

Positive Change in Fife

Those that had made the break to supplying local food were, in the main, very positive.

Fruit and Veg - farm shops are able to diversify, and although they work long hours they find direct customer feedback very satisfying. Networks to buy in from neighbouring farms are being established, and they are well supported by FARMA. Increasing numbers of shops helps establish a customer base.

Eggs - 'pressing on an open door' since restaurants and shops looking to buy local and free range. One supplier is exploring franchising out free range egg units to farms wanting to diversify.

Cheese - difficult to establish but with encouraging results.

Oats - there is a large-scale producer contract with Quaker - owned by PepsiCo who are committed to milling locally in Cupar and valuing and investing in local suppliers. The company is good at marketing the health benefits of the product.

Meat - one producer has established a butchery that now processes livestock from other farms. The product will have to remain at the top end of market because of high investment costs but many other farmers are interested in using this facility.

Community perceptions

For this report we surveyed 44 people in six separate locations throughout Fife, and members of the Benarty Community Forum helped with distributing and collecting questionnaires. These locations encompassed a mix of socioeconomic demographics, ranging over a rural township in a 'regeneration area', a small, affluent Burgh, a University town, a large town, and an industrial 'New Town'. This survey was conducted outside supermarkets, restaurants, and a small, organic farm shop and also in various workplaces. Participants ranged in age from teens to pensioners, with a high proportion of women (70%) taking part.

This is a small-scale survey focused on the Fife region, which does not claim to be statistically significant. For further reading in Local Food Trends in Scotland consult the Local Food Marketing Guide 2007 from SAC and TNS System Three Scottish Opinion Survey, April 2007.

Participants were asked to define 'local food', how important it was to them to have access to locally-grown produce, and what barriers (if any) existed to them being able to access local products. The majority (88%) of participants in this survey stated that they were interested in seeing more local products available, but 18% added the condition that the items should not be more expensive than comparable items in the supermarkets. 7% stated that the matter did not concern them, and 5% chose not to answer the question.

This trend is also explained by comments that respondents made when asked about barriers they had encountered to obtaining locally-grown produce. The main obstacle cited was cost (31%). The second most prevalent barrier was the availability of local produce in markets, with distance to local shops, farm shops, and farmers' markets (17%) following. Several respondents stated that they utilised public transportation and either did not drive, or did not want to drive. 16% said that more information on farm shops or other sources of local food needed to be made available to the general public. The same amount (16%) said they had no trouble accessing local food sources.

Those who shopped solely at supermarkets stated that lower prices, a greater selection of products, and consistent availability were determining factors in choosing to do so.

Summary of interviews and focus groups with community groups

The themes identified below emerged from our conversations with different age and social background groups, including community workers, young mothers, pensioners, and residents of a hostel for homeless people. These groups were located in the areas of Kelty, Lochgelly, Ballingry and Leven. Most of the issues raised in relation to access, cost, and availability confirm the results of our small-scale survey, but here we gain a better insight into the opportunities and barriers for Local and Sustainable Food. In general better food, more choice of food and better value food were of more concern to people than the carbon footprint of their food.

Access to local shops and farms

Most of the participants commented that it was unfortunate that in the past ten to fifteen years the numbers of local food shops had reduced and there was now very little choice of food shops within walking distance of home. Kelty was said to have no small local food shops. In the same period a large number of takeaway outlets had opened in the local area, mainly used by younger people who find the late opening and deliveries convenient. Several people commented that this was an expensive way to eat. Most people were critical of convenience stores in terms of cost, choice and package sizes - however, some people stated that it would be a good idea to supply more local produce through these stores.

People had a good knowledge of their local landscape and agricultural land, they could locate local farms on a map but rarely knew the name of the farm or the farmer. Most of the participants said they would like to visit local farms more often and buy produce directly from the farmer, but this was time-consuming and they were not sure if all farms were open to public visitors. Several participants, especially those in the older age groups, commented with nostalgia on the gradual disappearance of dairy farms; they could not understand why the UK is still importing milk from other countries and why there is a lack of manufacturing industry in Scotland. We discussed what it would take to get a doorstep delivery going again by setting up a partnership between the community and one or two local farmers. A town of about 5,000 people would need about 80 organic cows to keep it in liquid milk, and according to recent research would benefit from fewer childhood allergies as well as a much lower carbon footprint. The current system which trucks milk to large homogenization plants and back again to the supermarket takes nearly two thirds of the 70p cost of a litre of milk, and leaves 25p for the farmer.

Shopping preferences

Most participants did their shopping at a supermarket. The main reasons for shopping at a supermarket were:

- **Cost:** Most people in the younger age groups and from low-income families expressed the view that supermarkets offer families a cheaper alternative to High Street shops, especially through the “buy one get one free”. However, they were aware that buying offers sometimes leads to more food waste and purchasing poorer quality food.
- **Choice and range of foods:** Most of the people saw the supermarket as the only option to buy a good variety of food, including fresh food and ethical produce (e.g. organic, free-range, fair trade).
- **Convenience:** Supermarkets have car parks or are easily accessible on a bus route, although travelling by bus was seen as only practical if shopping for one because of the difficulties of carrying many bags. Some younger people living alone also commented on the convenience and affordability of online shopping when one is on a tight budget.
- **Quantities:** People living alone liked to be able to select small individual portions of loose fruit and vegetables rather than the pre-packed bags available at local convenience stores. On the contrary, families welcome the opportunity to buy big quantities and packs in the supermarkets.

Local food and provenance

The people interviewed said they did not know where most supermarket food was grown or produced but that it was probably not local. All participants appreciated the value of local food in generating local employment and they would like to see more affordable options available locally. Buying locally-produced food was not seen as a priority, but most people thought it would be good to support local producers. The arguments for this seemed to be economic rather than environmental or health.

People were more inclined to talk about meat than any other type of local food, and the exception to local shopping was butchers. Many people still went to a local butcher, some weekly, others occasionally. They believed that the quality of meat was better than at the supermarkets though more expensive. Several people commented on the social aspect of visiting the butchers - they knew the name of the butcher and expected the staff to recognise and remember them.

People interviewed were unsure if meat at the local butchers was locally produced or grass-fed, but thought it probably was. Interviewees seemed to have good background knowledge on buying meat and were confident of their ability to notice the taste of better quality meat. A high proportion of people had porage

for breakfast and it was thought that the oats were definitely Scottish. There was no discussion of where other breakfast cereals were produced.

Farmers' Markets were seen as places to get local and Scottish food in general and most people have visited one, although people pointed out that they were inaccessible without a car. Going to a farmers' market was seen as an outing rather than a regular part of the shopping, and the produce sold was seen as unusual and a treat rather than everyday food.

Purchasing organic and free-range products was seen by some as a luxury and some people were suspicious of the branding, since now most supermarkets seem to have their own organic brand. When looking at Fair Trade, most of the participants stated that they buy fair trade products occasionally and only when the price is reasonable.

Food culture, health and the environment

There were traditional gender divides among older participants. Older women spoke about cooking while men spoke more about eating. Many women believed it was important to teach their children and grandchildren cooking skills, and there was praise for the cookery classes in the schools and for the serving of fruit in primary schools. Older mothers stated that they always try to cook and avoid ready-to-go meals and food waste. People commented on the loss of a 'food culture' in Scotland and the need to recover food history and promote inter-generational activities in relation to food.

There was widespread belief that many young people no longer knew how to cook or did not have time to cook, and younger participants admitted to buying takeaway meals 2-3 times per week. Some participants said they were fussy about food and that this could lead them to choose unhealthy options. Young people and parents welcome the cooking classes organised by the council as a way of building their self-esteem and feeling confident to cook healthy and fresh meals for family and friends.

No direct mention was made of the possible health benefits of locally produced food. More discussion was needed to explore knowledge of health benefits of grass-fed meat and omega 3, fresh fruit and vegetables, etc. A few people commented that the Benarty Medical Centre sold small packs of vegetables from local farms on Wednesdays. Not many people seem to know about this, so perhaps the marketing has not been successful. Young people who often exercise and older people who regularly attend walking groups were more aware of the benefits of a healthy diet and many reported that they eat mainly fruits and vegetables, and meat only occasionally.

Most of the participants reported that they have access to their own garden or another family member's garden, and working in the garden was seen as a way to stay fit, have access to free and healthy food, and be more in control of what they produce and what they eat. There was a growing enthusiasm, especially among low-income families and people living in deprived areas, on initiatives that

promoted 'growing your own food' (allotments, community gardens, training and skills) and in Kelty, for example, they had a long waiting-list for allotments. People seemed to believe that these activities would contribute to 'building community' and would save money for income-deprived families, which normally spend a high proportion of their income on food especially in times of recession. There were some discussions about how to scale up models of community supported agriculture and growing, and the financial infrastructure needed to become sustainable.

3 Towards a stronger local food system in Fife

“At the global, regional, national and local levels, decision-makers must be acutely conscious of the fact that there are diverse challenges, multiple theoretical frameworks and development models and a wide range of options to meet development and sustainability goals. Our perception of the challenges and the choices we make at this juncture in our history will determine how we protect our planet and secure our future”¹⁸.

Fife does not set European agricultural policy or regulate global commodity speculation - but it can think globally and act locally. This section of the report sets out a coherent approach to improving food in Fife over time.

The global food system concentrates power in too few hands: fails to feed the hungry; drives climate change; reduces biodiversity and soil quality and compromises animal welfare. The current food system in Fife does all these on a smaller scale, both by the way we produce food and the way we consume food. Our system is simply part of a much bigger machine.

There are clearly helpful ‘changes within pattern’ which can be made without having to challenge the dominant worldview. More precision farming techniques reduce fuel and fertilizer use on farm. Smarter logistics and better engines allow supermarkets to move food around the country with less fuel.

We think we can do better than refine the existing system. There is an alternative. We recommend that Fife (and other regions) should implement a long-term, integrated policy to strengthen the local food system. This local food system will operate autonomously alongside the dominant food system, offering an increasingly credible alternative.

By local food system, we mean a network of producers (including very small scale producers in gardens and allotments) offering a wide range of produce, who see themselves as working together to provide good food for themselves and the local community: we mean short supply chains, economic and social co-operation between consumers and producers; we mean affordable food and fair prices, with a commitment to food quality, conserving resources and climate-smart farming.

We see the main benefits of a stronger local food system as:

- **Higher consumption across socio-economic groups of fresh, seasonal and minimally processed food leading to public health gains.**

- **Greater community cohesion through individual and community involvement in producing sourcing and preparing food.**
- **Improved health through significant expansion in grow your own.**
- **Increased employment in small to medium enterprises growing, processing and cooking food.**
- **As a result of diversification and short supply chains, increased viability of small farms and mixed farms, with benefits for rural communities.**
- **Greater efficiency through greater co-operation in local food production and delivery, maintaining affordable food prices.**
- **Stronger connections between consumers and producers supporting enhanced biodiversity and animal welfare.**
- **Some reduction in carbon footprint of the food system through increased organic production, climate-smart farming techniques, reduced food waste, increased nutrient recycling and reduced transport, packaging, processing and refrigeration.**
- **Greater public involvement in determining local food policy and land use.**

This policy requires joined-up action at a local level with the local authority, NHS, Scottish Enterprise, agricultural colleges, farmers' organisations, small businesses and civil society working together. While some changes can be made in the short term, a resilient and climate-smart local food system will take at least ten years to develop.

A local food system which accounted for 15-20% of food consumption in 2020 would be making a valuable contribution to public health, local economic development, community cohesion and the environment.

Moving towards a stronger local food system means many things changing in parallel - for example, consumers need to eat more unprocessed food while farmers need to diversify and collaborate to meet a greater demand for local food. Farming culture has to become more people-oriented, while communities have to become more aware of the realities of food production. Food - like health - is a public good, co-produced by farmers and consumers. Currently there is a chasm of language and perception between 'professional' farmers and grow your own gardeners. We envision greater mutual understanding and respect between food producers working at different scales and far more people involved in producing and/or processing some of their own food. We see a process of convergence over the next 10-20 years, towards a food system with a greater number of actors but a clearer shared purpose. This diagram on the next page illustrates the change.



Changing how we farm

Over the last fifty years, through a combination of breeding, management and nutrition, we have pushed pigs and chickens to grow at astonishing speed, and dairy cows to produce ever-increasing volumes of milk. A high-yielding dairy cow produces enough milk, butter, cheese and yoghurt for 60 people. One of the key elements has been feeding our animals a high protein diet. Much of this used to come from fish, and later from meat and bone meal. Since BSE, the use of meat and bone meal has been banned. Pigs used to be fed human food waste but this has been banned since foot and mouth disease.

As a result, Europe (and Scotland) import nearly 40 million tonnes of soya per year, mainly from the USA, Argentina and Brazil.

At a certain price for natural resources (water, forests, soil carbon, oil, land, biodiversity) our present system of food and farming will become increasingly non-viable. Importing animal feed and biodiesel feedstock from monoculture plantations across the world will become more expensive than the alternative. At the same time, pricing for ecosystem services will encourage farms here to produce more than food.

During the next ten years farming in Scotland must develop new ways to measure its triple bottom line of financial, environmental and social outputs, resulting in a shift towards more diversified and climate smart undertakings in many parts of the country. This new metric would help to change 'what pays'.

With stronger economic and social links between cities and family farms, farms would produce more than food - places for people to reconnect with food and nature, learn, walk, camp, eat together.

Near-city dairies could provide liquid milk for doorstep delivery (along with other online food orders) while more remote dairies produce cheese, butter and ice cream.

Concentrated animal feeding operations would become socially unacceptable, with a compensating investment in improved genetics for dual purpose cattle and hens. Beef would be predominantly grass-finished, with grazing integrated with forestry. Food waste would be fed to pigs as part of a regulated system.

There would be a significant increase in smallholder pig and poultry systems with effective extension support and quality standards. Continuing professional development would be offered to farmers, so they can consolidate and pass on their skills and knowledge.

Cream O’Galloway

David and Wilma Finlay run a 340 ha farm in Dumfries and Galloway. Their three enterprises are the farm (dairy, beef and sheep), manufacture and sale of organic and fair trade ice cream, and a visitor centre with nature trail and other amenities. They have also put up a community wind turbine on the farm.

They now have plans for a revolutionary change to their dairying system, leaving the calves with their mums until natural weaning at 11 months and milking the cows once a day. They are also changing the breed and feeding more grass and less concentrate. This will reduce milk production and milk taken off the cow in each lactation - but it will lead to longer productive lives for the cows, reducing the number of replacement heifers needed: will transform animal welfare; will increase beef production, and will reduce carbon footprint. The new herd will have 140 cows. A new AD (anaerobic digestion) plant will treat the slurry producing a more stable fertiliser as well as energy for use on the farm and to put in to the grid. The more social pattern of milking also makes the job more sustainable.

By contrast, most commercial dairies are now milking 1000 cows: keeping cows indoors all year round; using nitrogen fertiliser to increase grass yields, plus feeding high levels of soya-enriched concentrate; averaging 2-3 lactations per cow; and masking high incidence of stress, mastitis and lameness with antibiotics.

This is a pioneering example of a transition technology, providing sustainable milk and beef from relatively poor land which is largely unsuited to cropping.

Changing what we eat

The Fife Diet, Slow Food and other local eating experiments demonstrate growing public awareness of food choices, and support people to make changes as part of a community (on-line or face to face).

Fife Diet members pledge to

Eat local (defined bio-regionally), eat less meat, eat more organic, reduce food waste and compost more.

The recent study of Fife Dieters showed that on average their carbon footprint from food was 27% below the UK norm, with some members' diets coming in as low as half the UK average.

Why less (and better) meat?

So eating less and better meat - say gradually reducing UK consumption to the world average over the next ten years - will contribute towards:

- **Supporting grass-fed beef and lamb systems which can lock up more greenhouse gas emissions than they produce, particularly silvopastoral systems, use marginal land, and/or contribute to a rotation, providing fertility for cereal or vegetable crops.**
- **Supporting extensive systems for pig and poultry production where animals can have better if slightly less 'efficient' lives.**
- **Reducing the need for imported GM soya and for the 2 million tons of meat (40% of consumption) imported into the UK each year.**
- **Improving our overall health.**

Why organic?

Some of the benefits of organic production (carbon sequestration, no GM feed) have already been described.

Other principal benefits include:

- **Higher animal welfare standards: all animals must have access to pasture, higher space standards in housing, no mutilations such as beak-clipping in hens or nose-ringing in pigs, no large sheds housing thousands of pigs or poultry.**
- **Greater biodiversity above ground as well as below.**
- **No pesticides used in production so no residues: and just as importantly for food imported from developing countries no farmers exposed to pesticide without proper storage or protection facilities.**
- **In processed foods, very few permitted additives.**

- **No chemical nitrogen used, reducing carbon footprint of production, negative impacts on soil quality and water pollution risks.**

In many situations, higher dry matter of vegetables and higher concentration of useful nutrients.

Why local?

Food transport is estimated to account for 2-3% of our greenhouse gas emissions, and refrigeration (both in the home and in the cold chain) about the same.

The term has made many people aware of how far some of the food in their supermarket has travelled and prompted them to seek more local alternatives. However it was not long before reports appeared showing why it was really more efficient in carbon terms to buy sheep from New Zealand and send Scottish sheep to France, or grow tomatoes in Spain rather than the Clyde Valley.

Further complications arise when balancing development and environment issues. Many small farmers in developing countries supply us with fresh fruit, but the small percentage of air-freighted produce accounts for around half of the emissions arising from fruit and vegetable transport (Garnett, 2008). As Garnett points out, long distance supply chains in transport not only require associated infrastructure (roads, ports, runways) but are also hard to reverse since they both facilitate more production and processing at a distance and undermine local capacity.

Waiting for the strawberries and the new potatoes; buying the new season lamb (more summer than spring round here); eating fresh tomatoes in the summer and dried in the winter; preserving the glut of fruit and vegetables in autumn to see us through the winter - all this saves carbon and embedded water. But it also helps to rebuild local food culture, and can be done by communities as well as by individuals.

Thoughtful experiments such as the Fife Diet have gone beyond the simple concept of food miles, showing the benefits of eating locally and seasonally not just to individuals' carbon footprints but also to local producers, family food budgets and local food culture.

Changing the food economy

Strategies for change have to combine top down approaches such as legislation, taxation and regulation with bottom up efforts in social marketing, public education and consumer mobilization. While both strategies are needed, our particular emphasis in this report is action at the level of community and civil society.

The individualisation of food purchasing, preparation and consumption is a symptom of the problem and a focus on individual change is inadequate given the ‘surround sound’ of global food¹⁹.

“We cannot escape our predicament by simply continuing to rely on the aggregation of individual choices to achieve sustainable and equitable outcomes”²⁰.

The key change we envisage is a move towards a ‘many to many’ food network, both co-existing with and challenging the ‘hourglass’ model which concentrates power with multinational food companies which can control farmers and consumers.

Food lends itself to community level actions, in that demand is constant, predictable and relatively easy to aggregate: many of the processes in simple food manufacturing can be done on a small scale; and storage of seasonal surpluses can be done economically. Our current model of ‘adding value’ by creating highly processed and highly branded food products, together with just in time delivery systems tends to obscure the fact that getting food on people’s tables has historically and can in future be done at a human scale using right size technology. Such a system would be more resilient, generating greater social cohesion and common knowledge about food.



Figure 3: An illustration of the agri-food chain in six European countries with the numbers of stakeholders at each level (Source: Grievink 2003, as cited in Bonny 2006, p.7)²¹.

One of the key barriers to expanding the local food economy is the asymmetry of risk between small producers and consumers. For local food systems to flourish and scale up, producers need more predictable demand and consumers need more predictable and in some cases more affordable supply. But while consumers have a convenient alternative in the form of the supermarket, producers typically have to choose whether to put all their eggs in the local food basket or all their eggs in the wholesale to supermarkets basket.

Both social capital and financial capital are needed to grow the market.

Slow money

One of the drivers behind price instability in food commodities is increased speculation. During the credit crunch, hot money moved out of real estate and into food commodity trading, amplifying price movements caused by droughts, floods or pestilence. Modern money markets have nothing to do with actually buying, owning and selling food, but instead use computers to buy and sell stock thousands of times a second to make money out of marginal price differentials in global markets. This 'fast money' makes the rich richer and the poor more vulnerable.

'Slow money' is a term coined recently by Woody Tasch²² to describe a very different form of investment, with individuals investing directly in local food enterprises and being willing to leave money in for a long time at a low rate of interest.

There are many variations on this theme. Some local food projects in the UK have already raised start-up capital as loans or bonds from local individuals, sometimes topping up with loans sourced through the Internet. Bondholders can be paid in food rather than cash. Some projects have members committed to buy produce regularly through a standing order.

Large-scale consumer buying groups such as exist in many Italian cities could procure food from local farms with a forward contract. Food mutuals and credit unions could allow people on low incomes to access local food affordably.

Recommendations for Fife Council

This requirement for farming, consumers and the food economy to change in parallel means that development of the local food system is likely to stall without local leadership and institutional support.

Fife Council and planning partners have begun the process of developing a food policy and this will help to connect specific projects and schemes in a coherent framework. The areas for local action set out below mostly build on and extend existing work in Fife. We have not made any recommendations on public health or obesity reduction as this is not our area of expertise.

1 Support 'grow your own' and community growing projects

Growing on a small scale in private gardens, allotments and community gardens is an integral part of maintaining a live food culture. This direct engagement in getting food out of the ground puts the heart into a local food system.

There are also of course health benefits from the exercise of digging and weeding. Allotments and private gardens often are climate and wildlife-friendly, but in some cases fertiliser and herbicide/pesticides are used at significant levels for the area involved. A recent study of allotments²³ showed that the largest element in the carbon footprint of vegetable production was from driving there and back - having the allotment close enough for people to be able to walk or cycle would clearly help.

Allotments in Fife

Fife currently has 485 allotments - about the national average per person and the Council is committed not just to increasing the number of allotments but also to help people make best use of them. Fife published its Allotment Strategy in December 2009.

Two new sites opened in 2010, with three more in the pipeline, while existing sites are also getting upgraded. The Council's keen for allotment sites to become 'community growing spaces' with shared storage and facilities, raised beds for people with mobility problems and a venue for education. Peter Duncan, the Council's allotments officer is working closely with Elmwood College to provide 'hoe, sow and grow' courses across the region for new allotment holders, as well as offering people half and quarter size 'starter plots' to get them going.

The Council is also creating opportunities for further horticultural training in its major parks. As Duncan explains "We're sticking a plaster over a massive horticultural gap - I reckon about thirty years in this country".

The current figure equates to about 1 person in 750 with an allotment, while the figure in England is estimated at 1 in 200 - so there is plenty of room for development.

There are of course many people growing fruit and vegetables in their own gardens rather than allotments. Based on households supplied with a brown bin for recycling garden waste, we estimate that there are 14,000 gardens in Fife - which, assuming a local authority semi-detached house has an average back garden size of 120sq m could mean a potential land asset of up to 1,680ha across Fife - a significant supplement to the 2500ha used for commercial fruit and vegetable production in the region.

Obviously the aspect and topography of gardens will vary but older housing stock was all built on greenfield sites so much of the garden area has the potential to be productive.

We do not know how much of this garden ground is already put to work producing fruit and vegetables. As well as encouraging more Fifiers to grow their own through classes and courses and posters in public places, there is an opportunity to support the local economy through encouraging people to market their produce through a scheme like Country Markets.

Country Markets Ltd enables individual producers to sell their home-made and home-grown items locally and co-operatively, directly to the public. It is a membership-based co-operative social enterprise operating throughout England and Wales. Country Markets Ltd has an annual turnover of around £10 million, around £9 million of which is returned to the 12,000 producers. It is divided into 65 regional Market Societies operating over four hundred markets.

Country Markets Ltd also provides a training, information and education service for its producers, researching and disseminating information regarding current legislation from DEFRA, Trading Standards Officers, Environmental Health Officers and other regulatory bodies. Country markets do not operate a Market Society in Scotland.

Shortage of land does not appear to be a barrier to developing a local food system in Fife, but if needed there are also currently 104ha of vacant land and 726ha of derelict land. Most sites will have problems of contamination or absence of top soil, or derelict buildings to remove.

There are also underused green spaces - for example in hospitals and parks - where community growing spaces could be developed. The Royal Edinburgh Community Garden is one good example of NHS land being used to promote food production, conservation, community cohesion and health.

2 Build capacity for mutual food initiatives

As the interviews with local farmers demonstrated, the barriers to entering the local food system are often to do with skill, knowledge, time and risk rather than willingness. However, there is also a communication gap between farmers and communities, despite the range of successful farm shops in Fife.

As the research with Benarty Community Forum showed, there is interest in accessing local food but there are barriers of information and distribution rather than simply cost.

As the Council's experience of local food procurement shows, there are barriers to local farmers engaging with procurement contracts, individually or collectively. Taken together, these point to the value of a proactive and sustained dialogue to help develop more collaborative and efficient supply chains and routes to market. This dialogue would include conversations within neighbourhoods, community groups, schools, church congregations and workplaces: meetings of interested groups with farmers' organisations as well as individual farmers and visits to farms: bringing together local food producers to identify opportunities and develop collaborative approaches.

A team of people from a range of backgrounds including farmers could be recruited and supported to work on this.

As this dialogue develops, one of the local agencies (for example University of St Andrews Sustainability Institute) could explore the scope for 'slow money' to support the development of the local food system by providing capital and reducing risk.

Exploring the local food system in Lochgelly

This former mining area is surrounded by farmland and local people remember the connections that used to exist with local farms such as doorstep milk delivery. There is strong local interest in creating community growing spaces and access to local food, for example through a farmers' market or a café. Members of the local community forum helped to organise a survey of people's views on local food.

The area has a credit union of 1000 members which could mobilize purchasing power to procure fresh food from local producers. For example, a £2 per week payment to the credit union could create a local food budget of £100k annually - enough to engage small to medium farmers in growing for a local market. (As explained in Part 2 of this report one of the main barriers perceived by farmers was lack of a guaranteed market, with farmers growing a field of potatoes or vegetables and being left with unsold produce).

3 Support local food systems through joint public procurement

Fife Council spends £6.5m a year on procuring school meals, providing 22,000 meals a day to children at 150 schools, providing a 2 course lunch for £1.65 using 70p worth of ingredients. This budget, like other public sector budgets, will come under pressure as funding cuts take effect.

The Council's procurement service is working to increase the proportion of food sourced from Fife. It's not a straightforward job, given the lack of processing facilities such as pasteurizing and bottling plants for milk, and butcheries for meat - so the next best thing is to encourage larger companies outside Fife to link what they buy from Fife to what they sell back.

Fife Council can opt out of national contracts, and can split contracts into lots so that smaller producers can apply. However, while all contracts are published on the accessible Public Contracts Scotland website, the response from local farmers has been limited to date.

Although public spending on food is a small proportion of the total spend, local procurement emphasizes the important service being provided by farmers and growers to feed our children, hospital patients, and people in care. It can also provide a farming business with a steady and predictable income stream, and make use of seasonal surpluses, whether lamb in November, root crops in winter, or summer fruit and salads.

While some ingenuity is needed to write tender specifications which encourage local sourcing, public bodies can specify organic production as a requirement. As shown by East Ayrshire, this may mean only a small increase in cost while sending an important signal about commitment to sustainable procurement.

The NHS in Fife has a significant catering budget, as do the further and higher education institutions. A joint approach to developing local capacity to provide public food would be more effective than parallel efforts.

By combining expertise, these agencies could also develop menu guidelines for public food in Fife which combine nutritional, fair trade and environmental criteria (including for example sustainable fishing practices and water stewardship as well as biodiversity, good employment practice and carbon footprint). Expect to see more pearl barley risotto, air dried fruit, kale, rapeseed oil and haddock.

Sustainable food procurement in schools has already proved to be achievable, as shown by the best practice case study in East Ayrshire Council, supported by the Scottish Executive "Hungry for Success" initiative. The initiative started with a pilot project of £20,000 per year in one primary school and expanded gradually to 26 schools, with the final aim of reaching 44 primary schools and 9 secondary schools in the county. The Council followed the Soil Association's Food

for Life' guidelines which it continues to support despite budget pressures, An independent report²⁴ showed a social return on investment of over £6 for every additional £1 spent by the Council.

Food for Life

At least 75% of food ingredients must be unprocessed.

At least 50% of food ingredients must be locally sourced.

At least 30% of food ingredients must be organic.

The meals provided must meet Caroline Walker Trust nutritional standards.

The children must receive education programmes supporting sustainable food and farming and healthy eating.

4 Support local food training and enterprise

The recession has brought high unemployment, not least among young people, but for the local food sector to flourish it needs new entrants and new local food system enterprises (including social enterprises).

This is a good time for the further education sector to be talking to existing small scale producers about skills gaps, training courses, apprenticeships, internships and so on.

Skills such as market gardening, orchard management, baking, butchery, bee-keeping, cheesemaking, running a market stall, finding and cooking with seasonal local fresh produce, are all in short supply.

A 'school for artisan food' - either on a single site or a 'virtual' school could start to become a focus of expertise in the new food economy. It would help to develop the community of practice in Fife, and create opportunities for the local food pioneers such as Jane Stewart of Anster cheese and Matthew Roberts from the Steamie bakery to share their skills.

Intelligent honey

The University of St Andrews has established its first honey bee colony on University grounds, with the support of the Fife Beekeeping Association.

Beekeeping contributes to local food production and also helps support our environment through pollination. Bees are worth £26 billion to the global economy, and £200 million in Britain.

However, honey bees are currently under threat from a number of different pests and diseases, including the Varroa mite. In the last 20 years there has been a dramatic 50 per cent decline in bee numbers in Britain.

The University of St Andrews beekeeping initiative will:

- **Help deliver a sustainable bee population for future generations.**
- **Pave the way to high quality honey production.**
- **Enable University researchers to make effective behavioural and ecological observations.**
- **Allow local volunteers to be trained to observe high standards of bee husbandry.**

An important consideration on where to locate the hives on campus was the availability of food and water for the bees and as a result the Estates Grounds Department will be planting a variety of fruit trees to provide the bees with a diversity of the forage resource they need and so weather permitting we may get some honey next year!

Research by the National Pollen and Aerobiology research unit has shown that honeybees in suburban settings enjoy a more diverse diet than their rural counterparts. The urban bees find a richer diversity of pollen because they visit a much wider range of flowers than bees foraging in the countryside.

5 Recycle soil nutrients

One of the key qualities of local food systems is thriftiness.

Bellfield Organics in Fife successfully recycle used vegetable oil to run their vegetable delivery vans, picking the oil up on route to customers. Only a small proportion of the oil will be from rapeseed grown in Fife, but this is one of the more sustainable forms of biofuel.

Both central and local government are committed to waste prevention and reduction, and the landfill tax escalator concentrates minds admirably. Fife has made great progress in recycling rates in recent years.

Recycling organic materials is vital in returning nutrients and carbon to soils, and green waste compost made from brown bin collections is a good start.

Fife Council has successfully piloted a doorstep food waste collection service in Markinch and is starting to roll this out across Fife over the next few years. This is an ambitious project, currently transporting food waste to an in-vessel composting plant outside Fife and exploring the scope for a new anaerobic digestion plant located in Fife. Anaerobic digestion confers the double benefits of producing clean renewable energy including electricity and heat as well as soil

nutrients. 90% of residents said they were satisfied or very satisfied with the new system which reduces the size of the general waste collection.

In the UK households throw away around 20% of the food they buy equating to over £8 billion pounds per annum. This waste adds considerably to the cost of food for households, with single person households most affected. Methane released from burying food waste in landfill sites contributes the equivalent of 25% of road traffic emissions to greenhouse gas emissions as well as contributing to the public nuisance of landfill odour. Nearly 70% of this food waste is preventable, as demonstrated by schemes such as the successful Kitchen Canny from Changeworks.

Recovering and using some of the energy in food waste is a huge improvement on having food waste emit methane in landfill sites. Other things being equal, anaerobic digestion is more efficient than composting, which creates heat through aerobic digestion but does not capture it. However, composting can be done at home or at a community level by citizens, does not need a collection system with associated emissions, and recycles the nutrients very locally. In due course small scale decentralised anaerobic digestion facilities will develop for community level application.

It is also important for households and caterers to reduce food waste at source, since this not only saves them money but reduces our overall food demand and the associated packaging, processing and transport.

Food waste currently cannot be fed to pigs or poultry, but in many situations this is a more efficient use of the energy and nutrients.

It is important to retain a focus on recycling as an ecosystem service, not just an industrial process. Developing several smaller local anaerobic digestion plants in partnership with farmers who have slurry or other suitable materials may provide a more efficient option than one large plant with the associated transport costs. While this raises regulatory issues, it helps farmers reduce diffuse pollution, make better use of onsite nutrients and returns those nutrients to the bioregion. Waste heat from such systems can also support food production on farm protected horticultural systems.

Biochar created by controlled burning of woody materials such as pallets, cardboard and so on not only locks up carbon for hundreds of years when incorporated into soil but also increases crop yields significantly in many soils through improving soil microbial activity and water retention. The process of making biochar also produces gas for heating. Farm scale biochar plants could become a familiar part of the local food landscape and would make an excellent addition to composts or anaerobic digestion based fertilisers.

Consideration also needs to be given to the long term mineral status of soils. Soil remineralisation at a domestic, community and farm level should be actively promoted for its benefits in maintaining soil health and productivity as well as improving the mineral status of key foods.

A significant barrier to the recycling of nutrients into our soils is the behaviour of some farm assurance schemes such as Quality Meat Scotland and supermarket purchasing policies which place significant barriers to the use of source segregated recycled bio-materials such as food waste in spite of the strict standards applied to them e.g. PAS 100 for compost and PASS 110 for anaerobic digestate. These barriers need to be overcome or we face further problems in long term soil health and high carbon foot print foods.

Local authority planning departments also need to improve their ability to spatially integrate such facilities to maximise their efficiency and viability.

Finally, a thrifty local food system would make better use of the 'taboo' organic wastes; human sewage sludge, meat and bone meal, abattoir and butchery waste. In a shrinking world, we need to recycle all the nitrogen, phosphate and potassium we can - and extract the embedded energy along the way.

6 Help farmers produce and market more sustainable food

Farming in Fife is highly productive - but there are many ways to reduce its environmental footprint. This recommendation focuses on reducing soya use - but there are many other changes from better manure management to winter cover crops and agroforestry which would reduce the footprint of agriculture in Fife at little or no cost to the producer.

The dairy industry has already started work to reduce the carbon footprint of dairy producers, and there is scope for Scottish Agricultural College, Scottish Enterprise and Green Business Fife to engage proactively with other farmers and growers. Farming has often been disconnected from the wider business community, but with a carbon footprint of 13% of Scotland's total it is too important to be ignored.

Europe's main imports from the rest of the world are fruit and soya, with soya alone accounting for an area two or three times the size of Scotland.

Fife's share of that soya consumption used to make the pork, chicken, eggs, milk and even some of the beef we eat is around one thousandth of European imports - or 38,000 tonnes.

These three articulated lorry loads a day took 12-15,000 hectares to produce - an extra 25% 'ghost acres' on top of the arable land we use. Harvesting, processing and shipping the soya from South America also used energy and infrastructure. The land use change from forest to soya plantation also generated a massive release of CO₂ from the cut down trees and the soil.

Much of the soya in pig and dairy cattle feed and some of the soya in chicken feed could be replaced by home-grown protein such as peas, which grow well in Fife, and to a lesser extent by rapeseed. Like soya, peas leave some residual nitrogen for the following crop. The current Europe-wide Legume Futures project led by Scottish Agricultural College and Scottish Crop Research Institute will also help in the medium term.

Using home-grown protein may not be cheaper in the short term and may mean a slight drop in growth rates or milk yields – possibly to the benefit of animal welfare. It will be easier for farmers to make the change if they see public demand for low-soya or no-soya meat, milk and eggs.

We are conscious in making these recommendations that as yet there is no local multiagency group to progress them in Fife (or in other local authorities). Money is tight – which can be a good reason for getting together to tackle an important issue where no one agency has all the questions, let alone all the answers.

Implications for national food policy

“There is a strange Scottish paradox, despite producing fantastic food and drink we have one of the poorest diet-related health records in the developed world.” Recipe for Success

Every social change emerges through a soup of individual values and choices, actions by civil society, changes in science, technology and material conditions, and actions by government.

While central government actions enable and ‘allow’ the change to more sustainable local food systems, the actions of individuals, communities, producers and organisations of producers, NGOs, churches, local government and the NHS are as important in the long term.

Ultimately, it’s a cultural change: local food has to become part of ‘the way we do things round here’.

If the local food movement flourishes, by 2020 we will see 20% of Scots growing 20% of their own food or sourcing it within 20 miles.

We will see pledges like the Fife Diet as just part of how people do food in Scotland. We - and the visitors to Scotland - will see distinctive regional food cultures, with local organic food ubiquitous everywhere from major sporting events to B&Bs.

We will see parishes in Glasgow investing their food budgets in the supply chain which brings them grass-fed beef from Mull as well as the one which brings them tomatoes grown in the Clyde Valley using renewable energy from the organic dairy next door, and the one which brings them organic fair trade coffee from

Ethiopia. We will see more trees on farmland locking up carbon and enhancing biodiversity, more pigs in the woods eating catering waste and other by products, and more backyard poultry producing eggs for the neighbourhood. This is more Big Society than Big Government - but government needs to provide policy and financial support to create and maintain the momentum for change.

Recipe for Success was a landmark process as for the first time it sought to integrate food policy across different domains of public policy. The key government action after May 2011 is to review and build on Recipe for Success, starting with a parliamentary enquiry into food in Scotland.

This should form part of a continuing public dialogue about the future of food which engages consumers, producers, NGOs and pro-poor groups, food and drink companies, researchers, MSPs and government. Crucially, this should also involve local government and health services as key stakeholders.

As part of this dialogue we would argue for government policy to balance the support the growth of 'food for exports' with support for 'food for people' - improving public health and nutrition here, adapting food production to mitigate climate change and enhance ecosystem services, and strengthening local food systems.

Most farms in Scotland are viable only because of the Single Farm Payment. This CAP subsidy requires farmers to maintain their land in a reasonable state but is not linked in any way to the production of local food, enhancement of biodiversity, greenhouse gas balance or other ecosystem services. The challenge for government is to refocus public support for farming and growing to produce more local and more sustainable food on valued and viable farms.

As policy and practice evolve, the local food movement must work harder to engage Scotland's influential development and environment NGOs as well as churches, further and higher education, womens' organisations and local authorities in exploring common ground.

Common Agriculture Policy reform, along with review of Scotland Rural Development Programme (SRDP) and LEADER funding, offer opportunities for farming and food to become better integrated at local level. Local authorities and planning partners have a locus in these discussions. Food, as the government says, is everybody's business.

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