Technical Report

The Social Return on Investment of *Food for Life* School Meals in East Ayrshire

Commissioned by: Robin Gourlay, Head of Facilities Management, East Ayrshire Council

Prepared by: Osbert Lancaster, Director, Footprint Consulting Ltd

Sheila Durie, Principal, Haldane Associates

Date: 12 December 08

Footprint Consulting Limited **www.footprintconsulting.org**

The Melting Pot 5 Rose Street Edinburgh EH2 2PR **t** 0131 243 2616 **e** osbert@footprintconsulting.org

Registered Office: 121, High Street | Forres | Morayshire | IV36 1AB Company No: SC262336

Contents

List of tables

1 Abstract

East Ayrshire Council's Food for Life initiative provides school meals to primary pupils based on healthy, unprocessed, local and organic ingredients. Established in a pilot school in 2004, by the school year 2007/8 the initiative covered 26 of the authority's 43 primary schools.

The initiative has won a number of awards and previous evaluations have recognised a range of social, environmental and health benefits. An evaluation commissioned by the Scottish Executive[i] reported that: "Further evidence of the monetary value of the economic, social and environmental impacts of local procurement will be crucial in encouraging local authorities to adopt new practices".

This study was commissioned by East Ayrshire Council to add to such evidence. It uses the Social Return on Investment methodology to investigate the benefits created for stakeholders by the activity and to place financial values on outcomes achieved.

During the school year 2007/8 the Food for Life initiative had a range environmental, economic, health and other outcomes. Making reasonable assumptions and applying recognised financial values to each of these outcomes demonstrates that the Food for Life initiative created over £500,000 of value for stakeholders.

The additional investment by East Ayrshire Council in the period (above the cost of providing 'non-Food-for-Life' meals) was 12.9p per school meal, or £70,838.

The Social Return on Investment Index of the Food for Life Initiative is 6.19. This means, for every additional £1 invested in the initiative over £6 of value is created in economic, social, environmental and other outcomes that are in line with the objectives of East Ayrshire Council and other stakeholders, and that contribute to the achievement of East Ayrshire's Single Outcome Agreement.

Sensitivity analysis – varying major assumptions – indicates the value of the return is unlikely to be below £3 for every £1 invested.

2 Introduction

In 2004 East Ayrshire Council set up Scotland's first 'Food for Life' initiative, where organic, local and fresh foods are used within the school meals service.

The project was initiated and managed by Onsite Services, which manages the catering, cleaning, janitorial and school crossing services functions of the Council.

The initiative involved adoption of new practices in procurement and development of local supply chains for key items. Local suppliers were contracted to supply a range of items, and menus were developed and changed, to increase the proportion of local, organic and seasonal food used in the school meals service.

In early 2008, a desk-based research project was undertaken by Haldane Associates to estimate the predicted social return for a roll out of the Food for Life initiative[ii]. This study was part of the European SROI Pilot, funded by the European Equal Programme and Communities Scotland, now part of the Scottish Government.

The report presented an analysis and findings from two pilots undertaken by Onsite Services within East Ayrshire Council: the first in 2004 in one primary school and the second in 11 primary schools, undertaken during 2005/06. The report was based on publicly available sources of information, and made a number of assumptions in order to estimate the social, economic and environmental value that could be created if the pilot was rolled out.

In mid 2008, East Ayrshire Council commissioned Footprint Consulting and Haldane Associates to produce a more detailed analysis of the Food for Life initiative. This study therefore takes actual data from the 2007/08 school year for the 26 schools involved in the pilot during the year, and has used more financial detail than was possible in the initial study. This report also extends the scope of the environmental analysis to include environmental impacts other than food miles. The authors have engaged with more of the stakeholder groups through direct contact, and have included the findings from consultation and customer surveys undertaken by Onsite Services.

This study updates and extends the original analysis, using a stronger and more reliable evidence base, and gives a current estimate of the social value creation arising from East Ayrshire Council's Food for Life initiative

3 Background and description

In August 2004 East Ayrshire set off a quiet revolution in Scottish school meal procurement when it established a pilot project at Hurlford Primary School near Kilmarnock to provide organic, local, and fresh food.

The primary objective of the pilot scheme was to "improve the health of primary school children and to educate children on food"[iii]. Everything else was secondary in the project's early stages, but an appreciation of environmental sustainability, community regeneration, employment, and other economic and social impacts all played some part in the Council's and Onsite Services's decision to continue the pilot. These impacts became more apparent during the development of the scheme, rather than being primary reasons for establishing the pilot at the outset.

During development of the scheme East Ayrshire adopted the Soil Association's Food for Life framework (see 3.6 below). In this report we refer to the new East Ayrshire school meals initiative adopting the framework as East Ayrshire's "Food for Life" initiative, and participating schools as Food for Life schools. This is to distinguish the new scheme, as it was rolled out, from the existing school meals service.

3.1 The profile of East Ayrshire

The Food for Life initiative is one response to particular issues that the Council and its Community Planning partners identify in East Ayrshire. On a range of indicators, East Ayrshire has performed less well than other areas of Scotland, reflecting its relative economic difficulties and consequent levels of deprivation and poor health in the population[iv].

East Ayrshire has suffered from the decline of deep mining and manufacturing industries over the last decades. The unemployment rate at the beginning of 2008 was the sixth highest in Scotland, at 3.5%, compared with the national average of 2.3%. Employment levels, qualifications levels and average earnings are all below the Scottish average.

Certain communities across the area experience significantly higher than average levels of unemployment and deprivation.

The Scottish Index of Multiple Deprivation 2006 shows that East Ayrshire has 18% of its people - almost 1 in 5 - living in areas which fall into the 15% most deprived areas in Scotland. 5% of the local population live in data zones ranked among the 5% most deprived in Scotland.

Deprivation is one of the main determinants of health and on a number of health indicators, East Ayrshire's population is less healthy than the Scottish average, and health inequalities exist between the most and least deprived areas of East Ayrshire.

Life expectancy in East Ayrshire's population is slightly less than the average across Scotland, although it has been increasing in line with national increases. In terms of the three main causes of premature mortality rates, namely cancer, coronary heart disease and stroke, trends are moving in a downward direction but in East Ayrshire are still higher than the Scottish national rate. Respiratory disease is a significant cause of premature mortality within East Ayrshire, with levels consistently above the Scottish average.

Levels of obesity in school children have increased over the last five years, with the greatest rise seen in primary 7 children. In 2004/05, 34% of primary school children were found to be overweight, 19% were obese and 11% were found to be severely obese. Obesity is known to lead to physical and mental health problems later in life. Oral health has also been identified as a priority. In 2007, 54% of P1 pupils were identified as not being 'caries free'.

The business profile of East Ayrshire is characterised by lower than average representation of service, technology and business industries, a legacy of the decline of heavy industry. There is a high level of commuting to the Glasgow area for work. Business survival rates are below the Scottish average.

East Ayrshire however possesses significant rural areas, and as such has current assets in terms of attractive property markets, high quality natural environments, a strong cultural heritage and therefore more scope for leisure and tourism. 32% of respondents considered their town or village as a 'Very Good Place to Live' and 51% of respondents considered their town or village to be a 'Good Place to Live'[v].

3.2 Child health and healthy eating policy context

The school meals development was set originally in the context of 'Hungry for Success', a national initiative by the Scottish Executive. The policy aimed to improve healthy eating though providing healthy school meals, to set nutritional standards for school meals and to improve uptake and remove the stigma attached to free school meals. It recommended a 'whole school approach' to improving standards.

In 2007 The Schools (Health Promotion and Nutrition) (Scotland) Act came into force; and built on the achievements of Hungry for Success. The Act requires local authorities to ensure that food and drink provided in schools complies with the nutritional requirements specified by Scottish Ministers in regulations.

This Act has led to 'Healthy Eating, Active Living: An action plan to improve diet, increase physical activity and tackle obesity', published by the Scottish Government in June 2008. The broad requirements of the action plan include objectives relevant to East Ayrshire's Food for Life initiative:

- Promote healthy food choices, meal preparation and eating habits by communicating practical achievable steps towards the consumption of a healthier diet
- Increase access to healthier food choices, particularly for those on low incomes and provide support, education and skill development to allow people to break through the barriers of food affordability and availability, and the negative impact of culture and lack of food skills
- Work with the food manufacturing, processing and retailing industries to further develop and promote healthier choices
- Ensure that primary food producers at both national and local level contribute fully to the achievement of Scottish dietary goals

- Monitor impact of current activity and ensure current policy and practice are supported by best available evidence.

A local Food and Health Action Plan for Ayrshire is currently out for consultation, with adoption anticipated by the end of this year. The priority actions include:

- Continue to support and roll out Health Promoting Schools and Hungry for Success.
- To work towards inclusion and highlighting of nutrition and sustainability in public sector contracts for food.

This local plan has built on the information and outcomes from East Ayrshire Council's Food for Life initiative.

3.3 Child health outcomes and good nutrition

Good nutrition is clearly recognised as vital for the health of everyone, not only for disease prevention but also for disease management and general well being. Good nutrition leads to improved wellbeing in both mental and physical health. Influencing children's eating habits at an early age is recognised as being vital to ensuring that they grow up to be healthy adults.

The local plan presents strong evidence that poor nutrition leads to increased risk and increased rates of many long term conditions such as obesity, some cancers, coronary heart disease (CHD) and stroke and diabetes, with these diseases contributing to increased early deaths. In terms of the specific dietary targets to encourage healthy eating, the evidence collected by the World Health Organisation[vi] and others suggests:

- Fruit and vegetables contain high quantities of antioxidants which may help to remove harmful chemicals from the body, maintain the immune system and protect against cancer. Eating five portions of fruits and vegetables every day can reduce the risk of oral, stomach and colorectal cancers.
- Targets are set specifically for increasing wholegrain and brown bread, breakfast cereals, rice, pasta and potatoes. Starchy foods such as these are high in energy and contain many vitamins and minerals that contribute towards good health. They are also low in fat and sugar so are an important part of eating for good health.
- Saturated fat is linked to a higher risk of CHD and stroke.
- Salt should be reduced as it can lead to high blood pressure which is a risk factor for CHD and stroke.
- Sugars should be reduced, especially for children, to help reduce obesity and dental decay. Children tend to have a higher intake of sugar than adults.
- The Food Standards Agency has increased the recommendation for oily fish consumption from once to twice a week. Fish, especially oily fish, contain Omega-3 fats which may reduce the risk of coronary heart disease.
- In 2005, the two most common causes of death in Scotland, were cancer (27% of all deaths), and CHD (19% of all deaths). These rates were the highest in Western Europe.
- It is estimated that about one in three cases of cancer is related to diet.
- Increased cancer risk comes from being overweight or obese and from eating large quantities of preserved meats such as ham and bacon. These can increase the risk of cancer of the oesophagus, colorectum, breast, endometrium and kidney.
- For CHD, many of the preventable risk factors are related to diet: being overweight or obese, raised blood cholesterol, high blood pressure and low intake of fruit and vegetables. The highest rates of CHD are among people who are overweight or obese and who live in areas of high deprivation.

- There is also evidence that healthier eating can improve mental well being and perhaps reduce the incidence of mental ill health. It can also improve children's concentration and is vital for brain development in babies and young children.

3.4 Development work

The school meals Food for Life initiative has required a range of developments to be put in place by EAC's Onsite Services:

- New menu planning to make the most of local and seasonal fresh produce and prepare meals from scratch, and avoid processed foods high in fat, sugar or salt
- Developing local food producers' capacity to supply the school meals service by introducing them to East Ayrshire Council's tendering procedures and providing information sessions
- Staff training with Catering Managers and school Head Teachers
- Developing new procurement procedures consistent with EU procurement legislation
- Promotional work within schools and with parents to encourage uptake.

This has been undertaken as a collaborative effort between Onsite Services, nutritionists, education staff, business support agencies and others, including national bodies such as the Soil Association.

3.5 Developing procurement methods

The development of ways to source food locally, without breaching EU procurement legislation, involved East Ayrshire Council in investigating and testing out a new approach to procurement. EU legislation prohibits the specification of local sources within contracts, as this could be anti-competitive, but East Ayrshire Council found that they could specify 'fresh' produce in their contract documentation, could specify delivery frequencies, specific varieties of supplies and production methods which could be more easily met by local food growers and suppliers. [vii]

The Council then encouraged and supported local food suppliers to tender for contracts. The Business Gateway locally, together with the Council, ran training sessions for local businesses in order to build their capacity to tender for the contracts.

East Ayrshire Council continue to buy food items through the ABC buying consortium – but contracts for certain supplies for the schools are placed directly with their local suppliers. This has allowed for a comparison between the food miles incurred by the Food for Life initiative and the ABC consortium, for the same food items.

3.6 Developing menus

Around the same time East Ayrshire was developing the new school meals scheme, the Soil Association Scotland was establishing a campaign – Food for Life – to encourage the provision of fresh, local and organic food in Scotland's schools.

East Ayrshire decided to adopt the Soil Association framework as a useful external benchmark. The Food for Life framework requires:

- 75% of food consumed each week should be made from unprocessed ingredients
- 50% locally sourced
- and 30% organic.

Using the new food suppliers and meeting the Food for Life targets involved Onsite staff and nutritionists in substantially altering the menus offered in the school meals service, and introducing more changes in menus, to reflect the availability of seasonal produce. This resulted in 'Healthy Choices Selection' menus, which are changed on a four weekly cycle.

Within the 'Healthy Eating, Active Living' action plan are specific targets to ensure nutritional standards in school meals menus.

Food Type	Target
Fruit & Vegetables	Average intake to double to more than 400g per day
Bread	Intake to increase by 45% from present daily intake of 106g, mainly using wholemeal and brown breads
Breakfast Cereals	Average intake to double from the present intake of 17g per day
Fats	Average intake of total fat to reduce from 40.7% to no more than 35% of food energy
	Average intake of saturated fatty acids to reduce from 16.6% to no more than 11% of food energy
Salt	Average intake to reduce from 163mmol per day to 100mmol per day
Sugar	Average intake of NME (non milk extrinsic) sugars in adults not to increase
	Average intake of NME sugars in children to reduce by half i.e. to less than 10% of total energy
Total Complex Carbohydrates	Increase average non-sugar carbohydrates intake by 25% from 124g per day, through increased consumption of fruits and vegetables, bread, breakfast cereals, rice and pasta and through an increase of 25% in potato consumption
Fish	White fish consumption to be maintained at current levels
	Oil rich fish consumption to double from 44g to 88g per week

Table 1: 'Healthy Eating, Active Living' nutritional targets for school meals.

Many of the above targets have already been incorporated into the Healthy Choices Selection menus. All pilot schools follow the same menu. A typical week's menu would be:

	Monday	Tuesday	Wednesday	Thursday	Friday
Starters	Melon wedges	Chicken and rice soup	Soup of the day	Seasonal fruit cocktail	Lentil soup
Main course 1	Chicken korma and mixed rice	Roast beef and Yorkshires and mash	Spaghetti Bolognese and garlic bread	Fish and chips and lemon wedges	Chicken mexicana wraps
Main course 2	Tuna patties	Spicy chicken fajitas	Pork and apricot sauce/mixed rice	Sloppy joes and wedges	Sausage and mash
Vegetarian	Pasta italienne	Broccoli tree bake	Veg curry and mixed rice	Veg crumble and wedges	Macaroni cheese
Vegetables	French beans with parsley	Carrots and sweetcorn	Broccoli and peas	Haricot beans	Diced carrot and turnip
Salad	Mixed salad plus	Mixed salad plus	Mixed salad plus	Coleslaw	Mixed salad plus
Sweet	Tropical granola	Ice cream and fruit	Chocolate and pear sponge	Fruit rice pudding	Caramel tart

Table 2: A typical menu at an East Ayrshire Food for Life school.

Chips are only served a maximum of once per week, and almost all dishes use unprocessed ingredients. Soup does not have added salt, one third of flour is wholemeal, and flour is used to thicken sauces.

Organic produce incorporated in the above menu would include a proportion of fruit and vegetables, such as carrots, potatoes, onions and broccoli, and grocery items such as milk, flour, macaroni, white and brown rice, sugar and lentils. Much of the vegetables, meat, eggs and cheese used were sourced through the new contract, with some other supplies purchased through the ABC contract also purchased locally, such as bread and milk.

In the pilot schools using the menu, 12 out of 15 products were sourced within 40 miles, compared to only 3 products on the standard menu.

3.7 The initial pilot results

By the end of the first pilot in July 2005, the school kitchen at Hurlford Primary school had significantly exceeded the Food for Life targets. Over 50% of the food served was organic, including fruit, vegetables, milk, flour, pulses and brown rice. 70% of the food used was local, including bread, farmhouse cheese, free range red meat, chicken and eggs. More than 90% of all food on the menu was made from scratch using entirely unprocessed raw ingredients.

East Ayrshire Council estimated that meeting the Food for Life targets had a huge effect on 'food miles'. Switching to more local suppliers had reduced the average distance travelled per menu item from 330 miles in the standard menu to 99 miles in the Food for Life menu.

In May 2005, the Council approved a roll-out to a further 11 primary schools. Another 13 schools joined the pilot in 2006/07 and one further school in 2007/08, bringing the total number of primary schools involved to 26. This represented pupil numbers of 5,157, or 56% of all

primary school pupils in East Ayrshire. 17 primary schools were not yet involved, and none of the secondary schools were involved.

3.8 Recognition of good practice

The Food for Life initiative has won a number of awards:

- The Guardian Public Service Award 2005
- Soil Association School Food Award of the Year 2006
- British Institute of Facilities Management Sustainability Award, 2006, Highly Commended

East Ayrshire is currently the only Scottish Council to have achieved commended status for all primary and secondary schools in the Scottish Healthy Choices Award Scheme.

An evaluation of the 11 school pilot was commissioned by the Scottish Executive, which reported in 2006[viii].

The evaluation found that East Ayrshire Council could keep within EU procurement procedures and still buy locally, increase fresh and organic produce available for school caterers, purchase significantly improved quality of ingredients and achieve this at a modest cost increase in each meal. The evaluation recognised that there were a range of wider benefits, such as reduced environmental damage through reduced 'food miles' and waste packaging, social benefits for children and parents, health benefits and possibly wider economic benefits for the local economy.

The authors also suggested that:

> *'The social benefits that food initiatives can bring are cross-cutting. These benefits are not always taken into account when decisions around school meal supply are made, as they do not have an obvious associated monetary value. Further evidence of the monetary value of the economic, social and environmental impacts of local procurement will be crucial in encouraging local authorities to adopt new practices.'*

3.9 Free school meals pilot

East Ayrshire Council was chosen as one of five local authorities by the Scottish Government to trial free nutritious school meals for all primary one to three children. The pilot ran from October 2007 to June 2008.

In October 2008, the evaluation report and research findings were published[ix]. This was followed by an announcement by the Scottish Government that all pupils will receive free meals in the first three years of primary school. The service will begin in 2010.

The evaluation found a significant increased uptake in meals, from 53% to 75%, during the trial period. There was a small positive effect on P4-P7 meals uptake as well. For the purposes of this study, we have not used absolute levels of the uptake of school meals, and have assumed that increased uptake would be the same within pilot and non-pilot schools, but it is still possible that there will be an effect on the results here of East Ayrshire Council's participation in the free school meals pilot.

The trial appeared to have increased pupil's willingness to try new foods, which carried forward into the home, by children asking their parents to try these new foods, and it also increased discussions between parents and children about their food preferences.

Pupils reported they were enjoying the meals and parents were encouraging their children to take them. Parents commented on the time and financial savings for them in using school meals and they said that it had eased some of the pressures of trying to make a varied and nutritionally balanced packed lunch on a daily basis.

There was however a view that it is not the best use of public money, as there are many people who can easily afford to pay for their child's lunch, and there was a concern that other parts of the budget might suffer as a result. This finding contrasts with the view of parents expressed in the 2006 evaluation and in other surveys that the FFL is value for public money[x].

Additionally, there was no evidence to suggest that children were asking for more junk food at home and that pupils were eating less healthily at home *because* they had eaten healthily at lunch time.

Around a third of parents agreed that their child was asking for more healthy foods at home and a similar proportion agreed that their child was eating more healthily at home. Very small proportions reported their children eating less healthily at home and asking for more junk food since the introduction of the trial.

The findings of this evaluation support EAC's theory that education about food, and exposure to new food through school meals, can change children's eating habits and consequently lead to healthier diets.

4 The SROI process

4.1 Overview of SROI

The Social Return on Investment (SROI) model provides an evaluation method for understanding, measuring and reporting on change, and the value that is created by an organisation or activity. It examines the social, economic and environmental impacts arising from the organisation's work, and attributes a value based upon common accounting and investment appraisal methods, in order to estimate its financial value.

The SROI methodology was first developed in the USA and has been adapted for a European and UK context to take account of differences in accounting practices, and to increase the involvement of stakeholders in the analysis. SROI is based on a set of principles:

Principle	Definition
Stakeholder perception	Understand the way in which the organisation creates change through dialogue with stakeholders
Scope and materiality	Acknowledge and articulate all the values, objectives and stakeholders of the organisation before agreeing which aspects of the organisation are to be included in the scope; and determine what must be included in the account in order that stakeholders can make reasonable decisions
Understand change	Articulate cleary how activities create change and evaluate this through the evidence gathered
Comparative	Make comparisons of performance and impact using appropriate benchmarks, targets and external standards
Transparency	Demonstrate the basis on which the findings may be considered accurate and honest; showing that they will be reported to and discussed with stakeholders
Verification[xi]	Ensure appropriate independent verification of the account
Financial proxies	Use financial proxies for indicators in order to include the values of those excluded from markets in the same terms as used in markets

The design and delivery of an SROI analysis involves a series of set stages and standards:

- Boundaries: Defining the scope of the work
- Stakeholders: Identifying and mapping objectives
- Impact mapping: Analysis of inputs, outputs and outcomes
- Indicators: Identifying the evidence base for impacts
- Data: Collecting required information
- Model and calculate: Financial modelling of social return
- Testing: Sensitivity analysis
- Present: Results
- Verification: Peer review

These stages and their treatment in this report are outlined below.

4.1.1 Boundaries

This study addresses East Ayrshire's Food for Life initiative as described in Section 2 above.

4.1.2 Stakeholders

The stakeholders and their objectives are described in Section 5 below, and the links with the local Single Outcome Agreement are described in Section 6 below.

4.1.3 Impact Mapping

The analysis of inputs, outputs and outcomes are described in Section 7 below.

4.1.4 Data

The data collection process and sources are described in Section 8 below.

4.1.5 Model & Calculate; Testing; Present

The financial modelling of the social return; testing with sensitivity analysis; and the presentation of results; are all described in Section 9 below and in associated Appendices.

4.1.6 Verification

Verification standards are still in development and not yet available, however Sheila Durie has been awarded Accredited SROI Practitioner status by SROI UK, the national body for assurance.

4.2 Terminology

There are a number of terms used within SROI which are likely to require further explanation, namely:

Impact: Impacts are outcomes achieved through activity, with a reduction to take account of any deadweight, drop off, attribution or displacement effects.

Deadweight: Deadweight is an estimation of the social benefits that would have been created anyway, without the intervention. SROI analysis provides a method for estimating how much of the benefit would have happened anyway by making use of available baseline data, and subtracting this from the organisation's calculated outcomes.

Drop off: Drop off refers to the proportion of an outcome that is not sustained. It can be calculated using benchmarking information or research evidence. E.g. in the situation of a project that supports disadvantaged people into employment, a proportion of people will drop out of employment soon after getting a job, which means that a proportion of the value created

through the project by producing employment outcomes is not sustained, and therefore would reduce the lasting value created by the project. Benchmarking this project against other projects' employment outcomes may be one way of estimating how to take drop off into account.

Attribution: In some situations the organisation will be sharing the returns with other agencies, who for example have all been involved in supporting individual participants. The additional value created has to be shared between those agencies, and only the proportion of the returns being generated by the organisation alone are included in the calculation of SROI.

Displacement: In some cases, the positive outcomes for stakeholders generated by an activity are offset by negative outcomes for other stakeholders. For example, an employment organisation may place individuals with employers at the expense of other individuals who are seeking work.

Proxy: A proxy refers to a substitute value which is used within SROI to financialise an outcome indicator, or to represent the value of that outcome e.g. an improvement to mental health, which might be reflected in a measurable reduction in the frequency of hospital visits for an individual per year, could employ an estimation of the unit cost for a hospital visit within the relevant area in order to derive a financial value of the impact of the intervention upon an individual's mental health.

5 Stakeholder analysis and engagement

The estimation of social return rests on an understanding of how different stakeholders are affected by an activity.

The 2006 evaluation of the Food for Life initiative surveyed the views of key stakeholders: children, parents, teachers, catering staff, local producers and catering and procurement managers. The stakeholder analysis for this study has relied on this work to identify the objectives and outcomes for these stakeholders, backed up by additional engagement during this study with other stakeholders such as EAC procurement staff, local producers and suppliers, and the NHS.

The Food for Life initiative impacts or is impacted upon by an extensive range of stakeholders, who report that they are benefiting from achieving the following outcomes:

Stakeholders	Inputs	Outputs	Outcomes
School children	Willingness to change habits	Increased school meals eaten Participation in educational visits or talks from local suppliers	Improved health Healthy school meals Better tasting school meals Greater understanding and appreciation of the local environment
Parents	Cost of meals (if applicable)	Increased school meals eaten More healthy meals eaten at home	Improved health of children Improved relationship with school Good use of public money Healthy eating habits established Greater understanding and appreciation of the local environment
Suppliers	Time invested in tender process Changes to distribution process	Profit on contracts Opportunity to employ more staff	More secure businesses Greater access to other contract opportunities Increased employment of staff Increased organic production Profile in the local community
EAC as Community Planning Partnership lead body	Cost of meals service	Improved uptake of meals Improved local economic output Reduction in C02 emissions Reduced pollution from organic production Reduced packaging waste Positive media coverage	Meeting SOA and national objectives Improving the health of schoolchildren Educate children about food Reduce environmental impact Improved externalities from organic production Improved perception of parents/locals of quality of school meals service Improved perception by local businesses of council's commitment to local businesses Reduce deprivation in East Ayrshire Improved reputation for innovation and quality
EAC Teaching staff	Time for introduction of service Food & Agriculture project development	Educational visits by suppliers	Higher quality learning experiences Curriculum development relevant to local area Improved relationships with the local community – 'putting something back' Improved behaviour in schools
EAC Catering staff	Small amount of additional time Training costs	Improved skills Improved attendance Reduced turnover	Increased job opportunities or earnings potential Supporting the local community Improved job satisfaction Improved service quality More ownership of service provided

Stakeholders	Inputs	Outputs	Outcomes
(cont) **EAC Procurement staff**	Additional time Additional staffing	Improved skills Improved systems Ensuring best value in procurement	Improved reputation for professionalism, innovation and quality Increased capacity to develop and implement sustainable procurement Increased job opportunities or earnings potential
NHS	Dietician support	Reduced demand on child health services Reduced dental decay in children	Improved health of children

Table 3: Food for Life initiative stakeholders, and how they impact on, and are impacted by, the initative.

6 Single Outcome Agreements

During 2007/08, East Ayrshire Council, like all local authorities, had developed a Single Outcome Agreement, as part of the Concordat between COSLA and the Scottish Government.

During the current year, the initial SOA will be developed in conjunction with the wider Community Planning Partnership for East Ayrshire, but the SOA rests on previous community planning strategies and as such reflects previous local agreements about the key issues to be addressed in the area and the priorities for action.

It seems relevant therefore, to examine the Food for Life initiative in the context of the current SOA and the Scottish Government's 15 national outcomes, and to explore how achievement of the national and local outcomes would be enhanced by the Food for Life initiative. Effectively this develops the stakeholder analysis of outcomes into a collective stakeholder perspective held in common by members of the Community Planning Partnership. Current members include:

- East Ayrshire Council
- Strathclyde Police
- NHS Ayrshire and Arran
- Strathclyde Fire and Rescue
- Scottish Enterprise
- Strathclyde Partnership for Transport
- Federation of Community Groups

The SOA was analysed, and local outcomes selected for their relevance to the aims of the Food for Life initiative. Not all the Scottish Government's 15 national outcomes are relevant, nor are all the outcome indicators mentioned in the SOA appropriate for the Food for Life initiative, and where necessary, these have been replaced with local indicators that would be measurable in the Food for Life initiative. The stakeholder outcomes gathered through engagement and by analysis of previous information from a range of stakeholders, are often expressed in different ways, and these have been included again here for comparison.

The results are shown in Table 4.

Stakeholders	National Scottish Government outcomes	Local Single Outcome Agreement outcomes	Stakeholder outcomes
School children	Our children have the best start in life and are ready to succeed	Healthy lifestyles for children and young people promoted	Improved health
	Our public services are high quality, continually improving, efficient and responsive to local people's needs	Staff skills and learning developed in-house to provide a world class catering service	Healthy school meals
	Our public services are high quality, continually improving, efficient and responsive to local people's needs	Staff skills and learning developed in-house to provide a world class catering service	Better tasting school meals
	We are better educated, more skilled and more successful	Access to learning opportunities to improve quality of life and well-being increased	Greater understanding and appreciation of the local environment
Parents	We live longer, healthier, lives	Health and well-being of the local population improved	Improved health of children
	We have strong, resilient and supportive communities, where people take responsibility for their own actions and how they affect others	Participation by people of all ages in community activity increased	Improved relationship with school
	We have strong, resilient and supportive communities, where people take responsibility for their own actions and how they affect others	Participation by people of all ages in community activity increased	Good use of public money
	Our children have the best start in life and and are ready to succeed	Healthy lifestyles for children and young people promoted	Healthy eating habits established
	We are better educated, more skilled and more successful	Access to learning opportunities to improve quality of life and well-being increased	Greater understanding and appreciation of the local environment
Suppliers	We realise our full economic potential with more and better employment opportunities for our people	Good quality job opportunities are available which are accessible to local people in East Ayrshire	More secure businesses

Stakeholders	National Scottish Government outcomes	Local Single Outcome Agreement outcomes	Stakeholder outcomes
(cont)	We live in a Scotland that is the most attractive place for doing business in Europe	Growth in East Ayrshire's business base	Greater access to other contract opportunities
	We realise our full economic potential with more and better employment opportunities for our people	Good quality job opportunities are available which are accessible to local people in East Ayrshire	Increased employment of staff
	We value and enjoy our built and natural environment and protect it and enhance it for future generations	The natural and built environment improved through sustainable development	Increased organic production
	We have strong, resilient and supportive communities, where people take responsibility for their own actions and how they affect others	Participation by people of all ages in community activity increased	Profile in the local community
EAC as Community Planning Partnership lead body	We live longer, healthier, lives	Health and well-being of the local population improved	Improving the health of schoolchildren
	We reduce the local and global environmental impact of our consumption and production	Reduced food miles	Educate children about food
	We value and enjoy our built and natural environment and protect it and enhance it for future generations	The natural and built environment improved through sustainable development	Reduce environmental impact
	We value and enjoy our built and natural environment and protect it and enhance it for future generations	The natural and built environment improved through sustainable development	Improved externalities from organic production
	We have strong, resilient and supportive communities, where people take responsibility for their own actions and how they affect others	Participation by people of all ages in community activity increased	Improved perception by parents and locals of quality of service
	We have tackled the significant inequalities in Scottish society	Financial inclusion within disadvantged communities promoted	Improved perception by local businesses of Council's commitment to local business

Stakeholders	National Scottish Government outcomes	Local Single Outcome Agreement outcomes	Stakeholder outcomes
(cont)	We are better educated, more skilled and more successful	Access to learning opportunities to improve quality of life and well-being increased	Reduce deprivation in East Ayrshire
	Our public services are high quality, continually improving, efficient and responsive to local people's needs	Staff skills and learning developed in-house to provide a world class catering service	Improve reputation for innovation and quality
EAC teaching staff	We are better educated, more skilled and more successful	Access to learning opportunities to improve quality of life and well-being increased	Higher quality learning experience
	Our public services are high quality, continually improving, efficient and responsive to local people's needs	Staff skills and learning developed in-house to provide a world class catering service	Curriculum development relevant to local area
	We have strong, resilient and supportive communities, where people take responsibility for their own actions and how they affect others	Participation by people of all ages in community activity increased	Improved relationships with the community - 'putting something back'
	We are better educated, more skilled and more successful	Access to learning opportunities to improve quality of life and well-being increased	Improved behaviour in schools
EAC catering staff	We are better educated, more skilled and more successful	Access to learning opportunities to improve quality of life and well-being increased	Increased job opportunities or earnings potential
	We have strong, resilient and supportive communities, where people take responsibility for their own actions and how they affect others	Participation by people of all ages in community activity increased	Supporting the local community
	Our public services are high quality, continually improving, efficient and responsive to local people's needs	Staff skills and learning developed in-house to provide a world class catering service	Improved job satisfaction

Stakeholders	National Scottish Government outcomes	Local Single Outcome Agreement outcomes	Stakeholder outcomes
(cont)	Our public services are high quality, continually improving, efficient and responsive to local people's needs	Staff skills and learning developed in-house to provide a world class catering service	Improved service quality
	Our public services are high quality, continually improving, efficient and responsive to local people's needs	Staff skills and learning developed in-house to provide a world class catering service	More ownership of service provided
EAC procurement staff	We are better educated, more skilled and more successful	Access to learning opportunities to improve quality of life and well-being increased	Improved reputation for professionalism, innovation and quality
	Our public services are high quality, continually improving, efficient and responsive to local people's needs	Staff skills and learning developed in-house to provide a world class catering service	Increased capacity to develop and implement sustainable procurement
	We are better educated, more skilled and more successful	Access to learning opportunities to improve quality of life and well-being increased	Increased job opportunities and earnings potential
NHS	We live longer, healthier, lives	Health and well-being of the local population improved	Improved health of children

Table 4: Stakeholder outcomes mapped against national and local outcomes.

It is therefore possible to align national and local indicators with the perspectives of the range of stakeholders affected by or having an effect on the Food for Life initiative. The stated outcomes from stakeholders, however, are expressed in their language and from their own perspective, and have therefore been used in the impact map.

7 Impact map

The impact map builds on the stakeholder analysis, by identifying indicators of achievement of outcomes which are then capable of being financialised by applying financial proxies. By combining the above two sets of stakeholder analyses into one set and taking account of key principles such as deadweight, one can construct a map of how value is created by the Food for Life initiative, from different stakeholder perspectives. The impact map is shown in Table 5.

Stakeholders	Stakeholder outcomes	Outcome Indicators	Financial proxies	Deadweight	Attribution	Drop off	Displacement
School children	*Improved health*	*Value of more time spent on physical activity*	*Value of time spent in physical activity in pilot as opposed to non-pilot schools* – ***not included***	*0*	*Estimate 25% to FFL*	*0*	*0*
	Healthy school meals	*Avoided spend on unhealthy snacks during and after school*	*Value of pocket money not spent on unhealthy snacks, or spent on healthy snacks* – ***not included***	*0*	*0*	*Increases in spend in 2008/09*	*0*
	Better tasting school meals	Increased uptake of school meals	Increased unit cost of healthy school meals	Estimated 2%	All included in EAC perspective	0	0
	Greater understanding and appreciation of the local environment	*Value of more time spent on educational trips to outdoor centres/farms/childrens centres*	*Value of time spent in trips in pilot as opposed to non-pilot schools* – ***not included***	*5% estimate*	*Estimate 25% to FFL*	*Estimate 5%*	*0*
Parents	*Improved health of children*	*Reduced time off work looking after children*	*Lost earnings* – ***not included***	*0*	*Estimate 25% to FFL*	*0*	*0*
	Improved relationship with school	*Value of additional hours volunteering in school in pilot vs non-pilot schools*	*Value per hour of volunteer time £12.66* – ***not included***	*13% level of adult volunteering in East Ayrshire*	*0*	*0*	*0*

Stakeholders	Stakeholder outcomes	Outcome Indicators	Financial proxies	Deadweight	Attribution	Drop off	Displacement
(cont)	*Good use of public money*	*Reduced complaints about FFL school meals*	*Value of staff time spent in dealing with complaints* – ***not included***	*0*	*0*	*0*	*0*
	Healthy eating habits established	*Avoided spend on unhealthy lunches or snacks during school hours*	*Value of avoided spend* ***– not included***	*0*	*Estimate 75% to FFL*	*Increased spend in 2008/09*	*0*
	Greater understanding and appreciation of the local environment	*Value of more time spent on educational trips to outdoor centres/farms/childrens centres*	*Value of time spent in trips in pilot as opposed to non-pilot schools* – ***not included***	*5% estimate*	*Estimate 25% to FFL*	*Estimate 5%*	*0*
Suppliers	More secure businesses	Profit increases from FFL contract	Value of profit i.e. net of increased costs	0	0	Only if suppliers lose contracts	12.5%, since 1 original supplier lost business
	Greater access to other contract opportunities	*Sales from new public contracts or maintenance of sales*	*Value of sales* – ***not included***	*0*	*0*	*Only if suppliers lose contracts*	*0*
	Increased employment of staff	Value of additional employment	Increased salaries and wages	0	0	Only if suppliers lose contracts	12.5%, since 1 original supplier lost business
	Increased organic production	Value of new land brought into organic production	Cost of land purchased by suppliers	10% estimate	Estimate 75% to FFL	Only if suppliers lose contracts	0
	Profile in the local community	*Increased sales direct to public in farm shops*	*Value of additional sales income* – ***not included***	*10% estimate*	*Estimate 25% to FFL*	*Only if suppliers lose contracts*	*0*

Stakeholders	Stakeholder outcomes	Outcome Indicators	Financial proxies	Deadweight	Attribution	Drop off	Displacement
(cont) **EAC as Community Planning Partnership lead body**	Improving the health of schoolchildren	Reduction in proportion of children with body mass index outwith a healthy range	Avoided costs of treating obesity-related conditions	11% of P7 children already obese	Shared with NHS, 50% to FFL	In deadweight	0
	Educate children about food	Value of FFL as health promotion campaign	Costs of alternative schools-based health promotion campaign	Estimated 10%	Estimate 75% to FFL	0, already achieved	0
	Reduce environmental impact	Reduced food miles	£25.50 social cost of CO2 per t/km Avoided costs of environmental damage	0	0	0	0
	Reduce environmental impact	*Reduced packaging of food supplies resulting in avoided landfill costs*	*Avoided cost per tonne of landfill* ***– not included***	*0*	*0*	*0*	*0*
	Improved externalities from organic production	Savings in costs to environment of externalities	Reduced unit cost per unit for externalities of organic food, varied by type of supply	0	0	0	0
	Improved perception by parents and locals of service quality	Increased uptake of FFL school meals compared to non-pilot schools	Additional income per school meal	Estimated 2%	Shared with EAC, 0%	0	0

Stakeholders	Stakeholder outcomes	Outcome Indicators	Financial proxies	Deadweight	Attribution	Drop off	Displacement
(cont)	*Improved perception by local businesses of Council's commitment to local business*	*Additional flexibility of suppliers in meeting the contract*	*Reduced staff time in managing deliveries* ***– not included***	*0*	*Estimate 25% to FFL*	*0*	*0*
	Reduce deprivation in East Ayrshire	Local economic impact of FFL contract	Multiplier impact of contract value	0	0	0	12.5%, since 1 original supplier lost business
	Improve reputation for innovation and quality	Value of media campaign to achieve similar reputational advantage	Cost of similar media campaign	Estimated 5%	0	0, already achieved	0
EAC teaching staff	*Higher quality learning experience*	*Not included*					
	Curriculum development relevant to local area	*Value of staff time spent in curriculum development in pilot as opposed to non-pilot schools*	*Value of staff time* ***– not included***	*0*	*Estimate 85% to FFL*	*0, already achieved*	*0*
	Improved relationships with the community – 'putting something back'	*Value of additional hours volunteering in the community in pilot as opposed to non-pilot schools*	*Value per hour of volunteer time* ***– not included***	*13% level of volunteering in East Ayrshire*	*0*	*0*	*0*

Stakeholders	Stakeholder outcomes	Outcome Indicators	Financial proxies	Deadweight	Attribution	Drop off	Displacement
(cont)	*Improved behaviour in schools*	*Reduced costs of guidance staff time in pilot as opposed to non-pilot schools*	*Costs of avoided guidance time in pilot as opposed to non-pilot schools – **not included***	*0*	*Estimate 25% to FFL*	*Exclusions in EAC schools*	*0*
EAC catering staff	*Increased job opportunities or earnings potential*	*Reduced staff turnover valued by reduced recruitment and induction costs in pilot as opposed to non-pilot schools*	*Avoided costs: average of per staff – **not included***	*0*	*0*	*0*	*0*
	Supporting the local community	*Not included*					
	Improved job satisfaction	Reduced staff absence levels in pilot as opposed to non-pilot schools	Average hourly cost of staff absence	7.41% absence rate in non pilot schools	0	0 – average rate across EAC has not changed since 2004	0
	Improved service quality	Increased uptake of FFL school meals compared to non-pilot schools	Additional income per school meal	Estimated 2%	Shared with parents, 85% to FFL	0	0
	More ownership of service provided	*Not included*					
EAC procurement staff	Improved reputation for professionalism, innovation and quality	Costs of media campaign to achieve similar reputational advantage	Cost of similar media campaign	Estimate 5%	Shared within EAC, 0%	0, already achieved	0

Stakeholders	Stakeholder outcomes	Outcome Indicators	Financial proxies	Deadweight	Attribution	Drop off	Displacement
(cont)	Increased capacity to develop and implement sustainable procurement	Avoided costs of staff training to create similar effect	Cost of professional training	Estimate 5%	Netted off against investment	0, already achieved	0
	Increased job opportunities and earnings potential	*Not included*					
NHS	Improved health of children	Reduction in proportion of children with body mass index outwith a healthy range	Avoided costs of treating obesity-related conditions	11% of P7 children severely obese	Shared with EAC, 50% to FFL	In deadweight	0
		Reduced dental decay in school children in pilot as opposed to non-pilot schools	*Reduced treatment costs arising from dental decay – **not included***	*46% of children are free of dental caries*		*In deadweight*	*0*
		Reduced future health conditions of cancer, coronary heart disease and stroke	Reduced future treatment costs	Estimate 10%	Overall attribution of future health costs estimated at 15% to FFL	In deadweight	0

Table 5: Food for Life initiative impact map. Impacts in *italics* not included in SROI analysis.

7.1 What wasn't included

Some outcome indicators and financial proxies are not included in the impact map for a range of reasons. For some outcomes identified through the stakeholder analysis, a reasonable indicator of the outcome could not be found. In some cases, a viable or reasonable financial proxy could not be found, to represent the indicator. In many cases, however, the data to calculate the impact could not be found, as the outcome information was not available. This is a common finding at this stage in development of outcome reporting based on SROI, but recommendations on data collection are contained in the recommendations section for consideration.

Many of the deadweight, attribution etc. values are estimates. Where research has identified an appropriate value, this has been used, but in many cases, such information cannot be found. These issues are explored further in the sensitivity analysis.

7.2 What was included

The analysis therefore was based on valuing the following indicators:

Outcome type	Indicator
Environmental outcomes	Reduced food miles leading to lower CO2 emissions
	Reduced food miles leading to avoided costs of environmental damage
	Lower environmental costs from replacement of conventional with organic products
Economic outcomes	Profit increases from FFL contract
	Value of additional employment
	Local economic impact of FFL contract
	Value of new land brought into organic production
Health outcomes	Reduction in proportion of children with body mass index outwith a healthy range
	Reduced future health conditions of cancer, coronary heart disease and stroke
	Value of FFL as health promotion campaign
Other outcomes	Increased uptake of FFL school meals compared to non-pilot schools
	Value of media campaign to achieve similar reputational advantage
	Reduced staff absence levels in pilot as opposed to non-pilot schools
	Value of staff training to create similar effect

Table 6: Food for Life initiative indicators used in the analysis.

8 Research methods

The analysis built on previous data from studies and evaluations of the East Ayrshire Food for Life initiative, with additional information obtained from the local suppliers and NHS Ayrshire and Arran, and additional analysis of purchases and food miles data.

8.1 Local suppliers interviews

Five local suppliers were selected who supplied the bulk of the local or organic supplies. They were telephoned to explain the purpose of the study, and then sent an email questionnaire to complete, which was then followed up with a telephone interview. The five were:

- Afton Glen Meats: supplying beef, pork, lamb and chicken
- Dunlop Dairy: cheese
- Corrie Mains Free Range Ltd: free range eggs
- Clyde Organics: organic milk
- Stair Organics: organic vegetables and fruit

The questionnaire used is contained in Appendix C. Organic suppliers were also asked if all their supplies came from their own activities, or whether they supplied produce from other growers.

The producers were very willing to participate in the study, and many referred unprompted to the significant impact that the EAC schools contract had had on their business or their profile in the community. All were highly supportive of the initiative.

8.2 Calculation of food volumes

Many of the environmental and social impacts of food are related not to the financial *value* of the food purchased, but to the *quantity* (weight or volume) of food of different types.

Within the resources of this project, analysing all the invoices for the period to calculate the total quantity of food purchased was not possible. We therefore estimated the quantities of selected product types, and focussed our analyses on those product types where there was a clear difference between products supplied to the Food for Life Schools and the non-Food for Life Schools.

The main impacts which vary by food quantity and type are environmental impacts, in particular:

- Food transport, where local sourcing will, all else being equal, have less impact than products transported over longer distances.
- Food production methods, where organic farming typically has lower impacts than conventional production.

We therefore needed to know the quantities of products purchased where there was a significant difference between the FFL and non-FLL school meals service, and for which we had sufficient other information to assess the financial value of the impacts. This led us to estimate the quantities of the following food types:

- Food from local suppliers, where the comparable product for non-FFL schools was sourced from a significantly greater distance.
- Organic food, broken down by product, e.g. flour, potatoes, sugar.

Margaret Paterson of Hurlford Primary School kitchen, provided us with an estimate of total annual purchases of the selected foods by Hurlford Primary, based on typical weekly purchasing patterns.

To estimate total purchases by all FFL schools, we divided the Hurlford quantities by the daily average number of customers for Hurlford school meals, and multiplied by the total daily average customers for school meals at all FF schools.

For more detail and assumptions made, see Appendix B.

8.3 Valuing the benefits of sourcing locally

One of the aims of EAC's Food for Life initiative is to source a proportion of food from local suppliers, leading to a reduction in 'food miles': the distance travelled by food from farm to plate. An in-house study by EAC Onsite Services indicated that the food miles of FFL schools was lower than that of non-FFL schools.

In the impact map above, we identified the following potential returns from reduced food miles, such as: lower greenhouse gas emissions such as CO2; lower infrastructure operating costs and depreciation; and lower costs of air pollution.

To quantify the impacts we needed to compare not just the distance travelled by food, but the total weight of that food. Multiplying the weight of food by the distance travelled gives the total "tonne kilometres" (tkm) of food purchased.

Within the resources of the project, a full analysis of the supplies purchased was not possible. We therefore took the in-house food miles study as a starting point to identify product types where there was a significant difference in food miles between the foods supplied to FFL and non-FFL schools. This, and more detailed estimates of the distance travelled, led us to focus on the following products: sugar, meat, flour, eggs, poultry, cheese and vegetables.

We estimated the distance travelled by different modes of transport of each product along the supply chain from ultimate producer to school kitchen. For each product group, we then multiplied the distance travelled at each stage in the supply chain by the total weight of product, to calculate the total tonne kilometres for each stage for the FFL products and the non-FFL products.

The environmental and social impacts of the food tonne kilometres were financialised using data from two sources:

- Climate change impacts were estimated by calculating associated carbon dioxide emissions and applying DEFRA's 'shadow price of carbon'.
- Non-climate change impacts were calculated using values from Sansom et al (1998)[xii].

For details and assumptions made, see Appendix B.

8.4 Valuing the environmental benefits of organic food sourcing

One of the aims of EAC's Food for Life initiative is to source a proportion of organically produced food. Organic farming has been shown to cause less environmental damage than conventional agriculture. Benefits of organic farming include: less water pollution; less emissions of greenhouse gases; less erosion and other soil damage; greater biodiversity and landscape value; and less human health risks from pesticides and micro-organisms.

A recent study by Pretty et al (2005)[xiii] calculates the total environmental and health costs of producing the UK's food under two scenarios: conventional agriculture and organic agriculture, and finds the costs borne by society and the environment are £1.5bn/year for conventional, and £0.4bn/year for organic agriculture.

For this report we aimed to calculate the financial value of the environmental and health benefits of replacing conventional food products with organic products in the Food for Life initiative.

Pretty et al compare the environmental and health costs of twelve major commodities when produced conventionally or organically. Applying these figures to the quantity of organic produce used by FFL schools allowed us to estimate the total saving in environmental and health costs.

For details and assumptions made, see Appendix B.

8.5 Other analysis

The main documents used in the analysis that were not available in the original SROI study were:

- Benchmarking reports on Onsite's catering performance
- Parent and children's consultation surveys
- Detailed records on uptake of meals
- EAC catering staff surveys.

8.6 Health impacts

In addition, further investigation was conducted into the longer-term health impact of improved nutrition. This is a complex area, with many uncertainties in the baseline and scientific results known to date. There are issues in extrapolating from known links between diet and health conditions to determine the possible impacts on small populations such as the pupils attending the pilot schools at some point in the future.

SROI researchers tend to be pragmatic, and suggest that it is better to try and estimate a known effect rather than assume it has no value. This is the approach that has been taken here.

Since for all health conditions we could find estimates of the costs of treating such conditions across the general population, we focused on scaling down from population estimates of treatment costs to the population sizes in the pilot FFL schools, rather than applying prevalence rates and estimating what proportion of children in the pilot schools might be affected by these health conditions in later life, and then applying unit costs of treatment for each condition.

We also discounted the calculated value forward 30 years. In the longer term, as time goes on, the health of school children who have been fed by the Food for Life initiative will be increasingly affected by other lifestyle factors as they become adults.

NHS Ayrshire and Arran provided information on the local Food and Health Action Plan, and signposting to the sources used to compile the evidence base on which the action plan has been developed. These sources have been collected together, and the robustness of the evidence base examined, by the World Health Organisation.

9 Results

The period chosen to compare the investment against the social return is the school year 2007 to 2008.

9.1 Overall SROI result

This study finds that for 2007/2008, the SROI Index for the Food for Life initiative was 1:6.19, which is to say that for every £1 East Ayrshire Council has invested in the initiative, it has returned £6.19 in social, economic and environmental value to its stakeholders.

This represents a return per pupil of £99.19 for an investment per pupil of £13.79 per annum.

The impact map suggested that many other outcome indicators and financial proxies could be identified, but many could not be developed as there was no data to allow a calculation of their value. Thus this calculation of social return is likely to be an underestimate.

The details of how this figure was calculated are set out below, and in the relevant appendices.

The results for the selected outcome indicators is shown in Table 7.

Outcome type	Indicator	Value in £'s
Environmental outcomes	Reduced food miles leading to less CO2	93,532
	Reduced food miles leading to avoided costs of environmental damage	3,513
	Savings in costs to the environment of externalities of organics	478
	Sub-total of environmental outcomes	**97,522**
Economic outcomes	Profit increases from FFL contract	61,813
	Value of additional employment	18,018
	Local economic impact of FFL contract	137,169
	Value of new land brought into organic production	41,250
	Sub-total of economic outcomes	**258,250**
Health outcomes	Reduction in proportion of children with a body mass index outwith a healthy range	62,104
	Reduced future health conditions: cancer	7,127
	Reduced future health conditions: coronary heart disease	2,496
	Reduced future health conditions: stroke	3,352
	Value of FFL as a health promotion campaign	1,887
	Sub-total of health outcomes	**76,966**
Other outcomes	Increased uptake of FFL school meals compared to non-pilot schools	42,259
	Value of media campaign to achieve similar reputational advantage	9,500
	Reduced staff absence levels in pilot as opposed to non-pilot schools	25,051
	Value of staff training (netted off against investment)	
	Sub-total of other outcomes	**76,810**
Total		**£509,547**

Table 7: Results for the selected outcome indicators.

9.2 Environmental analysis

The savings in environmental costs avoided by the Food for Life initiative, compared with a conventional school meals service, total £97,523. Over 99% of this is from sourcing local food, largely from reductions in CO2 emissions. Less than 1% is due to choosing organic over conventional produce.

£ (2007 prices)	Food for Life	Conventional (nonFFL)	Saving
Reduced food miles leading to less CO2	12,299	105,830	93,532
Reduced food miles leading to avoided costs of environmental damage	450	3,963	3,513
Savings in costs to the environment of externalities of organics	217	695	478
Total			**97,522**

Table 8: Savings in environmental costs

The following assumptions were made with regard to reduced food miles: no deadweight was included as there is no evidence that food miles would otherwise have been reduced during the period of analysis. However, given increased awareness of food miles and local purchasing, it is possible that in future non-FFL food miles may be reduced. This should be taken into account in projecting the SROI of future developments of the initiative. Drop off was assumed to be zero as there is no evidence FFL suppliers will be changing purchasing patterns. Again, this should be revisited when considering developments should local supply be insufficient to meet any increased demand. The savings were all attributed to the project, and displacement was assumed to be zero.

The assumptions regarding the savings due to lower external costs of organic agriculture were as follows: deadweight zero, no evidence organic produce would have been sourced without the FFL initiative; drop off zero, no evidence the savings will not be sustained; attribution, all to FFL; displacement, zero.

9.3 Economic analysis

This was mainly determined through information provided by local suppliers. The detailed results of the survey with local suppliers are contained in Appendix C.

Suppliers were asked to state the importance of the contract to their business, in terms of the percentage of turnover it represented. For some, this was not significant,[xiv] but nevertheless, all suppliers said the value of the contract outweighed their financial gain, as it had led to increased profile in the community, and increased access to new contract opportunities.

Suppliers' responses were cross-referenced to EAC's food purchases records. The reported additional expenditure incurred by suppliers was used to construct a gross profit figure, which represents a more realistic value of the contract to them than sales.

Suppliers gave information on additional staffing employed to service the contract. In some cases, no additional employment had been created, but existing staffing had been sustained, where it might otherwise have been at risk. The impact of this has not been taken into account.

The Scottish Government's Input-Output model was used to assess the economic impact of the contract spend on the wider economy, using the Type II multiplier for agriculture (1.8). In the original predictive SROI study, an LM3 study from elsewhere had been used to assess this impact.

One supplier had stated that they had acquired new land to service the contract and to increase their level of organic production. The value of this land was used as the proxy for the value to the local economy of increased organic production, and increased sales of organic produce resulting in further reduced environmental damage and increased biodiversity.

Local economic indicator	£ (2007 prices)
Profit increases from FFL contract	£61,813
Value of additional employment	£18,018
Local economic impact of FFL contract	£137,169
Value of new land brought into organic production	£41,250
Total	**£258,250**

Table 9: Results for local economic indicators.

The assumptions made were that since 3 out of the 5 suppliers contacted said that the EAC contract was not a significant percentage of their turnover, deadweight used was 60%; and that since in the original tendering exercise, one supplier from the local area who had previously supplied EAC had been unsuccessful in gaining a contract, there had been a displacement effect of 12.5%.

9.4 Health outcomes analysis

The FFL is aimed at improving child health and educating children and parents about the value of healthy eating. Thus the health outcomes can be valued in terms of future avoided treatment costs, but also in terms of the value of FFL as a health promotion activity.

The evidence base suggests a link between diet and nutrition and obesity, and a link between diet, nutrition and obesity and the following major health conditions:

- Cancer
- Coronary Heart Disease (CHD)
- Stroke[xv]

These health conditions also lead to premature mortality, as well as incurring treatment costs within the NHS. The estimation of the value of improved health outcomes from the FFL could also value avoided early mortality, which would significantly increase the overall calculated value for health outcomes. This however is a contentious area, and is explored further in Appendix D, together with the detailed assumptions and calculations on which the figures below rest.

Attribution of the impact of the FFLI towards achieving health outcomes is difficult to estimate. In this study, an estimate has been made that the FFLI would be responsible for contributing 15% of the value of improved health outcomes for CHD, cancer and stroke and 50% for obesity outcomes however, it may be far less, or in fact far more. This is explored further in the sensitivity

analysis in section 9.8 below. In a similar vein, deadweight is an estimate (at 10%), given the complexities of projecting incidence of these diseases in small populations, and lack of information about the lifestyles of children in the pilot schools, which would have an impact on their future health.

9.4.1 Obesity

In Scotland, 1 in 5 boys and 1 in 10 girls are obese[xvi]. The Food and Health Action Plan for East Ayrshire suggests that obesity levels in East Ayrshire primary school children are now higher than this average, and therefore the potential savings if improved school meals lead to a reduction in body mass index may be higher.

The costs of obesity treatment in Scotland are estimated to be in the region of £171 million[xvii].

Based on these treatment costs per head of population, if every child in the area were of a healthy weight, then some £3.28 million might be saved in East Ayrshire by the NHS. This allows an estimate of the savings in treatment to the NHS if all the children in the pilot schools were of a healthy weight, taking into account those who are already obese as the figure for deadweight.

9.4.2 Cancer

The costs of treating cancer in Scotland represents around 8% of all NHS spend. [xviii] Dietary factors appear to account for around 30% of all cancers[xix]. If the per head costs of treatment are applied to the FFL pupil numbers and then discounted 30 years into the future, with deadweight and attribution accounted for, an estimated value of £7,127 is arrived at.

Given the deprivation levels in East Ayrshire, the figures should be weighted to take account of poorer health in the area, but no method for doing this could be found, so the estimate may be on the low side.

9.4.3 CHD and strokes

The costs of treating and managing CHD are enormous - £3,248million in the UK in 2006 – and an estimated £3,172miilion for strokes[xx]. There is a clear link between reduced sodium intake and reduced deaths from CHD (estimated by WHO at 16%) and strokes (estimated at 22%). Using a similar methodology to the above results in an estimate of £2,496 for CHD and £3,352 for strokes.

9.4.4 Health promotion campaign value

In 2004/05, the Scottish Government spent £1,219,442[xxi] on health promotion advertising or 24 pence per head. The cost of the 'Drinkwise' media campaign alone in 2002/03 was £2.1million. The Drinkwise campaign could be regarded as of similar importance to the FFL campaign, in terms of policies on health in the population. The cost of this similar campaign was then applied to the pilot schools population, on the assumption that there would be a small marginal decrease in the cost of health promotion advertising resulting from the food pilot, or that this figure could represent other lifestyle benefits which children (and their parents) would experience. This gave a small value of £1,887, representing the avoided costs of mounting a schools campaign directly to school children and their parents to improve eating habits.

The overall estimation of the value of health outcomes resulting from the FFL is shown in Table 10:

Health indicator	£ (2007 prices)
Reduction in proportion of children with a body mass index outwith a healthy range	62,104
Reduced future health conditions: cancer	7,127
Reduced future health conditions: coronary heart disease	2,496
Reduced future health conditions: stroke	3,352
Value of FFL as a health promotion campaign	1,887
Total of health outcomes	**76,966**

Table 10: The value of health outcomes resulting from FFL.

9.5 Other outcome analysis

There were three other outcomes which did not fall into the above categories, but where a financial proxy and financialisation method could be found.

9.5.1 Service quality

Parents were very supportive of the Council's use of public money to purchase food from local suppliers. The surveys of pupils' and parents' views of the quality of school meals also showed a high satisfaction rating – 67% of children thought their school meals tasted better and 77% of parents thought the FFL was a good use of public money[xxii].

Thus EAC benefited from an improved perception of the overall quality of the service, and this was valued by exploring the uptake of school meals in the pilot as opposed to the non-pilot schools. EAC had detailed figures for this. We took the uptake in 2006 as the baseline figure, and in 2007, the uptake in the pilot schools was found to be 2.2% higher than in non-pilot schools. Uptake had increased in both types of schools, which would appear to be down to the impact of EAC's participation in the free school meals pilot.

It was assumed that the rate of increased uptake would be the same in both pilot and non-pilot schools.

Applying the cost per school meal to the number of extra pupils taking school meals in the pilot schools resulted in a value of £42,259.

An estimate of 2% was made for deadweight. From historical records, school meals uptake had been improving overall within EAC's school meals service. It has also been assumed that most, but not all, of the value of this uptake should belong to EAC, but other stakeholders might have a role to play in creating this impact, mainly parents who encourage their children to eat school meals. The impact of the free school meals pilot may also have a role to play.

9.5.2 East Ayrshire Council's reputational gain

The FFL pilot had gained considerable attention from other Councils and statutory bodies, as well as government. They had received media coverage and had requests to give presentations. Thus the Council gained a reputation for innovation and excellence in this area, which has a value to them. An estimate was made of this by valuing what the Council might have had to spend in a dedicated campaign to achieve the same effect. It was assumed that a media campaign funded by EAC to create the same effect would cost at least £10,000.

A number of potential benefits for both catering and procurement staff were identified. The effect which was studied was the impact on staff absence in the pilot schools, as Onsite Services could supply data on this.

9.5.3 Reduced staff absence

Staff absence can be taken as an indicator of greater commitment to the service, and EAC thought that the effort in training staff and getting them involved in more cooking from scratch would increase staff ownership and commitment, resulting in fewer absences.

This would seem to be borne out: catering staff in the pilot schools had an absence level of 1.81% lower than the non-pilot schools. The estimate of the number of lost days that were avoided in the pilot schools was valued through wages.

The overall estimation of the value of other outcomes resulting from the FFL is shown in Table 11:

Other outcomes	£ (2007 prices)
Increased uptake of FFL school meals compared to non-pilot schools	42,259
Value of media campaign to achieve similar reputational advantage	9,500
Reduced staff absence levels in pilot as opposed to non-pilot schools	25,051
Sub-total of other outcomes	**£76,810**

Table 11: Financial benefits of other outcomes.

9.6 Investment

The additional cost of 12.9 pence for the food costs per school meal now represents the main investment in FFL.

From the detailed analysis provided by EAC, there were 549,130 individual school meals provided through FFL during the study year, representing an extra investment of £70,838 to provide the healthy menu choices.

It was assumed that the avoided costs of staff training, identified in the impact map as a benefit arising from FFL, would be netted off the investment costs in terms of additional staff time invested by catering and procurement staff in managing FFL. The additional time invested by catering staff was in fact now reported to be very small.

9.7 SROI Index

This is calculated using the following formula:

Calculated social value less investment, divided by investment:

(£509,547 - £70,838) / £70,838 = 6.19

9.8 Sensitivity analysis

The purpose of a sensitivity analysis is to vary the key assumptions which have the greatest power to affect the result.

The following main assumptions have been made in calculating the social and environmental return from FFL:

- No attribution involved in economic outcomes
- No attribution involved in environmental outcomes
- No deadweight involved in environmental outcomes
- 50% attribution of obesity outcomes to FFL

If attribution for environmental and economic outcomes is assumed to be 50%, then the SROI index reduces to 1:3.68.

If this scenario, plus applying deadweight for environmental outcomes of 10% and reducing the attribution of obesity outcomes to FFL to 25%, then the SROI index reduces to 1:3.17.

If this also holds, and the attribution of future health outcomes to FFLI reduces to 5%, then the SROI index reduces to 1:3.05.

Thus, the value created by the FFL is unlikely to be less than a return of £3 for every £1 invested.

10 Discussion

10.1 Overview

The Social Return on Investment Index for the Food for Life initiative has been calculated as 6.19.

This indicates that for every additional £1 invested in the FFL schools meals, above the spend on non-FFL schools meals, over £6 of value is created in economic, social and environmental outcomes that are in line with the objectives of East Ayrshire Council and other stakeholders.

There is of course always uncertainty in such studies. However, changing some of the assumptions as described in the
Sensitivity analysis, Section 9.8 above, indicates that the value of the return is unlikely to be below £3 for every £1 invested.

10.2 Comparison with predictive SROI analysis

The earlier predictive SROI suggested a social return of 9.84 for the 26 school primary pilot. The main reason for the difference is that the multiplier used to scale up from the calculation of the SROI for the 11 school pilot proved not to be accurate. It was based on the absolute difference in the uptake of school meals in the first 12 pilot schools, which suggested an increase of 17.7%.

The provision of more detailed information by EAC for this study allowed for direct comparison of the school meals uptake figures for pilot as opposed to non-pilot schools, which was not possible in the original study. This reduced the overall value of the increased uptake of school meals, which accounts for most of the variation.

In addition, further reflection has suggested that attribution and deadweight issues should be given a higher prominence in some of the calculations.

10.3 Food Miles

It is notable that 95% of the return on investment associated with environmental impacts is due to reductions in carbon dioxide emissions from local sourcing. Indeed the actual reduction may be higher as the amount of refrigeration in the food chain is likely to be lower with local sourcing,

as refrigeration accounts for around 2.4% of the UK's CO2 emissions – excluding refrigerated transport and commercial cold stores for which data is not currently available[xxiii].

The food miles analysis focussed on food products where there was clear evidence of a difference between the distance travelled between FFL and non-FFL schools. There may well be further opportunities to source other food products more locally. Furthermore, such opportunities for reducing food miles will not be associated just with buying direct from local suppliers – the major food distributors also have the potential to reduce food miles through changes to their purchasing and distribution strategies. Indeed, with the likely continued increase in fuel costs, commercial pressures may encourage such developments.

10.4 Organic produce

Surprisingly less than 1% of the reduction in environmental impacts comes from a switch from conventional to organic produce. While this might suggest that the price premium paid for organic produce fails to yield sufficient return, we believe it highlights opportunities to go further.

The FFL schools' organic purchases are largely vegetables (12 tonnes), potatoes (8 tonnes), and other plant derived products such as flour, lentils, beans etc (9 tonnes). The reduction in environmental impact by choosing organic for these products ranges from 0.37 p/kg for potatoes to 1.40 p/kg for flour.

In comparison the figures for meat, poultry, dairy and egg products are considerably higher, ranging from 52.7 p/kg for beef to 0.70 p/litre for milk. Given the quantities of such products purchased (e.g. beef 18 tonnes; pork 13 tonnes) the opportunity to reduce environmental impacts by switching to organic supplies is considerable – environmental value would increase by £11,348. If this were the case, the switch from conventional to organic production would account for 10% (rather than less than 1%) of the total reduction in environmental impact. See Appendix B for details.

This suggests environmental impacts could be further reduced by switching to organic supplies of meat, poultry, dairy and eggs – and by reducing the overall proportion of meat in the menu.

It is also worth noticing the potential for interaction between social, environmental, economic aspects of this analysis – 20% of the organic vegetables supplied are grown locally, and the majority of the remainder are from Scottish sources. The producer reports their business has grown, with more staff and a greater area under organic cultivation. This means the benefits of this sourcing decision are captured locally – including a reduction in the negative impacts of conventional farming on the local environment.

11 Recommendations

11.1 Recommendations from environmental analysis

Our recommendations fall into three areas:

- Action that can be taken in the light of these results
- Recommendations for further consideration and investigation
- Recommendations for data collection and management.

11.1.1 Recommendation for action

- Consider opportunities to reduce food miles by greater local sourcing, especially of primary products such as meat.
- Encourage contracted food distributors to minimise food miles and overall CO2 emissions.

- Encourage the ABC buying consortium to adopt similar procurement approaches.

11.1.2 Recommendations for investigation

- Investigate the social return on investment of sourcing organic meat, poultry, dairy and eggs.
- Investigate the opportunities to change the menus to reduce the environmental impacts of meat, poultry, dairy and egg production. (Note the savings from reducing the quantity of meat etc purchased might offset the higher price of organic products.)
- Refrigeration in the supply chain has significant CO2 emissions. However little data is currently available: we recommend monitoring research by others in this area[xxiv].

11.1.3 Recommendations for data collection and management

Much of this analysis depends on the quantity of food purchased and the distance it has travelled. In this study this information was not available and we therefore estimated this for a selection of products. We believe these estimates have enabled us to provide a reasonable analysis of the current situation, and to make meaningful recommendations.

It is worth noting that the Climate Change Bill is likely to require public bodies to report on greenhouse gas emissions and develop policies to reduce them. This analysis of the Food for Life initiative already demonstrates how this is possible, but also highlights the difficulty of obtaining accurate figures.

We therefore recommend that EAC considers establishing systems to record weight and distance travelled of all council purchases, including food, in order to meet these challenges.

11.2 Recommendations in other areas

In common with many SROI studies at this stage of development, values for some outcomes could not be found due to lack of data. Onsite Services collect a wide range of performance management information, conduct surveys of children's and parent views, and have a range of evaluation information, but even with this extent of information, information on some outcomes is not available. The recommendations for further data collection, to value other outcomes, include:

- Monitoring reduced packaging waste being sent to landfill.
- Undertake a more detailed survey of eating habits outside of school, to determine if less 'junk' food is being eaten by children in the FFL pilot schools and if healthy eating is being carried forward into the home. Evidence from the free school meal pilot suggests this could be happening.
- Analyse the obesity and dental outcomes by participation or non-participation in the school meals pilot.

One outcome that might have been estimated was the improved perception of behaviour in school, which was mentioned by parents. The quantitative survey of parents in the evaluation of the free school meals pilot asked for perceptions of any behavioural changes, both after school and at meal times, and a small proportion of parents *had* noticed improvements in behaviour. 15% agreed that since the introduction of free school meals their child had been better behaved after school and 23% agreed that their child had been better behaved at meal times. Researchers thought however that parents were over-reporting benefits in the hope that free meals would continue. Teachers had reported no change in behaviour.

It would be helpful to know if this is in fact the case within the pilot as opposed to non-pilot schools.

12 Conclusions

The Food for Life initiative in East Ayrshire Council's schools is making a significant contribution to the achievement of many outcomes contained in the Single Outcome Agreement for the area.

Value is being returned to stakeholders in the Community Planning Partnership, and to the Scottish Government, as well as to children, parents, East Ayrshire Council as a corporate body and to its staff. The FFL has returned value for the local economy, for the environment and for the NHS, as well as returning direct value to East Ayrshire Council and its residents.

This study has confirmed the suggestion in the 2006 evaluation study, that 'the social benefits that food initiatives can bring are cross-cutting'.

The 2006 study suggested that 'further evidence of the monetary value of the economic, social and environmental impacts of local procurement will be crucial in encouraging local authorities to adopt new practices'. This study has confirmed the general level of return that might be expected from such an initiative, and identified how that return is split across economic, social and environmental objectives.

Appendix A: Acknowledgements and disclaimer

This report has been prepared for Robin Gourlay, Head of Facilities Management, East Ayrshire Council by: Osbert Lancaster, Director; Footprint Consulting Ltd; and Sheila Durie, Principal, Haldane Associates.

The authors would like to thank Robin Gourlay, Andrew Kennedy, Zoe Mavridou and Margaret Patterson for their efforts in assembling the information on which this report is based. In addition the authors would like to thank Jeremy Nichols for his comments on a draft of this report.

The analysis is essentially a modelling exercise and should not be used for formal accounting purposes.

Appendix B: Environmental analysis

Calculation of food volumes

Basis of Comparison

Food volumes were calculated in order to financialise the benefits of sourcing local food and organic food. When calculating food volumes, and in the subsequent analyses, we compared purchases to supply meals meeting Food for Life standards (FFL), with purchases to supply 'conventional' (non-FFL) school meals.

As explained below, the quantities of various food products supplied for FFL schools were provided to us by EAC. To compare this with non-FFL schools, we assumed that non-FFL schools would purchase the same quantity of similar products but from different suppliers or produced to different standards. I.e. we assumed that where FFL schools bought 888 kg of cheese from a local supplier, we assumed non-FFL schools bought 888 kg of similar cheese from a national supplier; similarly where FFL schools bought 12 tonnes of organic vegetables, we assumed non-FFL schools bought 12 tonnes of conventionally grown vegetables.

Products selected

The total quantity of food purchased was calculated for the following products:

- All organic products
- Meat, poultry, eggs and cheese

Organic produce was selected in order to compare the costs of organic and conventional production; and where relevant, the benefits of local sourcing. Meat, poultry, eggs and cheese were selected to calculate the benefits of local sourcing.

Methodology

Step 1: Estimate quantities for Hurlford School

Margaret Patterson of Hurlford School kitchen estimated typical weekly purchases for Hurlford School; these were multiplied by 38, the number of school weeks, to give annual quantities.

Assumption: Patterson informed us these quantities were typical, and where there was seasonal variation, for example vegetables, the total weight of vegetables would be similar across the year, even when the actual varieties changed.

Step 2: Estimate annual quantities per customer at Hurlford School

For each product we divided the annual quantity by the daily average number of customers for school meals at Hurlford School (171).

Step 3: Estimate annual quantities for all FFL schools

Multiply the annual quantity per customer at Hurlford, by the total daily average customers for school meals at all FF schools (2,906).

Asssumption: Purchasing patterns and menus are similar across all FFL schools. Patterson informed us that this was a reasonable assumption. She noted however that some school kitchen buy small quantities of organic fruit. Without further data we ignored fruit purchases.

Note on units

Data on most products was available by weight (kg). Exceptions were milk (litres) and eggs (dozen). These units were appropriate for calculating the cost of conventional compared with organic production. For calculating the impact of food miles, the weight of eggs was calculated assuming average weight of an egg at 55g.[xxv]

The quantities purchased are summarised in below, categorised differently to meet the needs of the relevant analysis.

Local Sourcing

Overview

To calculate the benefits of local sourcing, we identified products supplied to FFL schools which travelled a significantly shorter distance that those for non-FFL schools. For these products we estimated the distance travelled; the total tonne kilometres; and applied cost factors to calculate the environmental costs of the FFL and non-FFL supply chain. We then did the same for comparable non-FFL products, and calculated the financial benefit of local sourcing.

Identifying products

Using an EAC study of FFL food miles, we identified products where there was a significant difference between the FFL and non-FFL purchases. While the FFL initiative purchases from a number of local suppliers, not all of those suppliers where included in this analysis. In the case of milk, the nature of the milk industry, and the fact that milk is a low margin, high bulk product, it is likely that the non-organic milk supplied to non-FFL schools, will come from producers and distributors a similar distance to the supplier of organic milk. The case of fish is similar: despite a local fish supplier for FFL schools, all fish supplied is likely to have been caught in the same seas, and landed at the same ports.

We included in this analysis a product where the food miles are higher for FFL schools – sugar. FFL schools use organic sugar from sugar cane, grown in Malawi; non-FFL schools use conventional sugar from sugar beet, grown in the UK. This was the only FFL product identified with higher food miles.

Estimating distance travelled

For each of those product types, we then estimated the distance travelled in each of the following stages of the supply chain:

- From supplier to school. This was taken to be from the actual supplier in the case of FFL contracts, and to be the supplier's nearest depot for non-FFL contracts.
- From producer to supplier, broken down into distance travelled on UK roads, by sea, and on overseas road. These distances were estimated based on information provided where available, and in other cases using our knowledge of food distribution. In the cases of non-FFL contracts, each product was sometimes sourced from different countries across the year. However, the data available to us, did not reveal the proportion of the total contract supplied from each country. We therefore estimated total distance travelled conservatively.

The supplier and origin of the selected products is shown in Table 12:

Item	FFL		Non-FFL	
	Supplier	Origin	Supplier	Origin
Sugar	Green City	Malawi	Brakes	UK, England
Meat	Afton Glen Meats	Cumnock	Campbells	Scottish
Flour	Green City	Berwickshire	Brakes	UK, France, Germany
Eggs	Corrie Mains	Mauchline	Brakes	Abdnshire, UK
Poultry	Afton Glen Meats	Auchincruive	3663	UK, South America, Europe
Cheese	Dunlop Dairies	Dunlop	Brakes	England
Vegetables	Stairs	Tarbolton	Forsythes	UK, Italy

Table 12: The supplier and origin of the selected products.

Calculating tonne kilometres

For each product group, we then multiplied the distance travelled at each stage by the total weight of product purchased, and calculated the total tonne kilometres for each stage for the FFL contracts and the non-FFL contracts.

The results are shown in Table 13 and Table 14.

FFL	Total qty	suppl>school		origin > supplier					
		by road		UK road		ship		o/seas road	
Item	kg	km	tonne kms	km	tonne kms	km	tonne kms	km	tonne kms
Sugar	153	40	6	725	111	11,000	1,682	700	107
Meat	35,518	25	888		0		0		0
Flour	3,229	40	129	120	387		0		0
Eggs	1,279	14	18		0		0		0
Poultry	6,458	20	129		0		0		0
Cheese	888	13	12		0		0		0
Vegetables	11,624	14	163		0		0		0
Total			**1,345**		**498**		**1,682**		**107**

Table 13: Food for Life food miles: Quantities of selected product; estimation of distance travelled; and calculation of tonne kilometres.

Non-FFL	Total qty	suppl>school		origin > supplier					
		road		road		ship		o/seas road	
Item	kg	km	tonne kms	km	tonne kms	km	tonne kms	km	tonne kms
Sugar	153	40	6	500	76				
Meat	35,518	90	3,197	100	3,552				
Flour	3,229	40	129	500	1,614				
Eggs	1,279	40	51	290	371				
Poultry	6,458	120	775	500	3,229				
Cheese	888	40	36	500	444				
Vegetables	11,624	52	604	499	5,800	66	767	330	3,836
Total			**4,798**		**15,087**		**767**		**3,836**

Table 14: Non-FFL food miles: Quantities of selected product; estimation of distance travelled; and calculation of tonne kilometres.

To develop these estimates, within the time and financial resources available, we had to make a number of assumptions about the distance travelled:

- In the stage 'supplier to school', the school was assumed to be located in Kilmarnock.
- For FFL vegetables, the supplier responded in our questionnaire: "80% veg from other suppliers, nearly all Scottish". We therefore assumed the average distance from producer to supplier at 100km.
- For non-FFL vegetables, we were informed by the EAC fod miles study which included some information on sources of vegetable supply. Having reviewed DEFRA figures on vegetable imports, we assumed 67% was UK production, and assumed average distance from producer to supplier at 400km. Of the remaining 33% we assumed this was imported from Benelux, Italy and Spain, and estimated average distances of: overseas road, 1000km; cross channel ship, 200 km; and UK road from south coast ports to depot of 700km. The figures in Table 13 and Table 14 have been adjusted to take account of the proportion imported.
- Shipping: We assumed sugar from Malawi was carried in a container ship to Felixstowe (based on previous research for another client); and vegetables carried on a roll-on roll-off passenger ferry.
- All road distances were estimated using Google Maps 'Directions', to give actual road distances, not 'as the crow flies'. Shipping distances estimated using GoogleEarth, again actual rather than 'as the crow flies' distances.
- None of the distances estimated took account of possible additional movements of products in the supply chain, for example to distribution centres, or to factories for processing or in the case of livestock to slaughterhouses. The relative importance of this to FFL and non-FFL supply chains is not known.

Climate change impacts

To calculate the CO2 emissions from food transport, the total tonne kilometres are multiplied by the relevant emission factors. The emission factor depends on the mode of transport. We selected the most appropriate emission factors for each stage of the foods' journey along the supply chain – see Table 15.

GHG Conversion factors	kg C02/tkm	Notes/assumptions
UK Road		
supplier>school	0.283	Table 12b, Average Van/Light Veh, 50% load fctr
origin>supplier	0.132	Table 13b, UK Average 'All HGVs',
Overseas Road	0.132	Table 13b, UK Average 'All HGVs',
Ship		
Container ship	0.013	Table 14, Large Container Vessel
Ferry	0.384	Table 14, Large RoPax Ferry

Table 15: Selected greenhouse gas emission factors. Source: 2008 Guidelines to Defra's GHG Conversion Factors.

Using the relevant emission factors, the total CO2 emissions from the FFL contracts and the non-FFL contracts, and the difference between them, were calculated.

Transport Mode	Total Tonne Kilometres		CO2e emissions tCO2		Saving
	FFL	Non-FFL	FFL	non-FFL	(non-FFL less FFL)
UK Road					
supplier>school	1,345	4,798	381	1,358	
origin>supplier	498	15,087	66	1,991	
Overseas Road	107	3,836	14	506	
Ship					
Container	1,682		22		
Ferry		767		295	
Total			**482**	**4,150**	**3,668**

Table 16: Total CO2 emissions associated with delivery of selected products for FFL schools and equivalent non-FF products.

DEFRA recommends[xxvi] using the Shadow Price of Carbon (SPC), to value the emissions of greenhouse gas emissions resulting from a proposed policy. For 2007, the shadow price of carbon is £25.50 per tonne of CO2.

Applying SPC to the CO2 emissions, allows the climate change costs associated with the transport of food to be calculated.

FFL	non-FFL	Saving
£12,299	£105,830	£93,532

Table 17: Total climate change costs associated with delivery of selected products for FFL schools and equivalent non-FF products.

Non-climate change impacts

A study by Sansom et al (1998) for the then Department of the Environment, Transport and the Regions, estimated the costs to society of UK transport, and identified the following costs:

- Climate change costs
- Cost of infrastructure (operating costs and depreciation)
- Congestion
- External accident costs
- Air pollution
- Noise

For the purposes of this study, we considered the marginal costs of infrastructure, congestion, accidents, air pollution, and noise. We did not use Sansom's figures for climate change, instead we used the more recent DEFRA guidance as described above.

Marginal costs of transport per tonne kilometre

Sansom et al (1998), calculate these marginal costs in pence per kilometre (p/km) travelled, for different vehicle types. However, we needed to reflect the weight of food transport over distance – in tonne kilometres. We therefore recalculated Sansom et al figures to give costs in p/t.km. This was calculated using a simple ratio using Defra's figures for CO2/km and CO2/t.km. The marginal costs are shown below.

	p/vkm	p/tkm
LDV	25.31	26.92
HGV Rigid	57.42	17.71

Table 18: Marginal costs to society of transport by Light Delivery Vehicle and Rigid Heavy Goods Vehicle, 2007 prices. Derived from Sansom et al (1998).

It should be noted that Sansom et al give high and low estimates for each of their figures, for this report we have used the mean values. Sansom et al use less fine grained vehicle categories than Defra. We have assumed transport to schools from the supplier uses light delivery vehicles and to the supplier is in rigid heavy goods vehicles. We have only taken account of transport within the UK in calculating the costs of infrastructure, congestion, accidents, air pollution, and noise.

The total costs from infrastructure, congestion, accidents, air pollution, and noise were calculated by multiplying the tonne kilometres by the relevant costs for each mode of transport.

	Total Tonne Kilometres		Costs £		
	FFL	Non-FFL	FFL	non-FFL	Saving
UK Road					
supplier>school	1,345	4,798	362	1,292	
origin>supplier	498	15,087	88	2,671	
Total			450	3,963	3,513

Table 19: Total tonne kilometres and associated costs to society from external costs of transport (excluding climate change), for FFL schools and equivalent non-FF supply chain.

The case of organic sugar

As noted above organic sugar is sourced from Malawi, while conventional sugar is from the UK, and as such is the only FFL product we identified with higher food miles than the comparable non-FFL product. Out of interest we examined the impact this had on CO2 emissions for the FFL supply chain by assuming organic sugar could be supplied from the UK, and would travel the same distance as the non-FFL sugar.

The projected reduction in CO2 emissions is 40 tonnes, and the benefit in reduced climate change impacts is £1,034, an 8% reduction in both cases.

Valuing the environmental benefits of organic food sourcing

Overview

This analysis is based on comparing the environmental and health costs of organic, versus conventional food. Pretty et al (2005), calculate environmental and health costs of twelve producing 12 commodities (Table 20).

These costs result from adverse effects, including pesticides in water; nitrate, phosphate, soil and *Cryptosporidium* in water; eutrophication of surface water; methane, nitrous oxide and ammonia emissions to atmosphere; direct and indirect carbon dioxide emissions to atmosphere; soil erosion and organic matter losses from soils; losses of biodiversity and landscape values; adverse effects to human health from pesticides, micro-organisms and BSE.

Product	Conventional	Organic	Saving	Unit
flour	1.72	0.32	1.40	p/kg
potatoes	0.42	0.05	0.37	p/kg
fruit	1.44	0.25	1.19	p/kg
vegetables	0.61	0.01	0.60	p/kg
oil seed rape	3.54	0.69	2.85	p/kg
sugar beet	0.22	0.04	0.18	p/kg
beef	64.79	12.09	52.70	p/kg
pork	12.81	3.79	9.02	p/kg
poultry	5.68	1.91	3.77	p/kg
lamb	43.57	16.30	27.27	p/kg
milk	1.22	0.52	0.70	p/litre
eggs	3.96	1.44	2.52	p/doz

Table 20: Environmental and health costs of producing a unit of food using conventional and organic production, and the saving per unit from organic production.

The quantities of each product purchased were multiplied by the relevant cost for each production method, and the difference calculated to give a total figure for the financialised reduction in adverse effects.

In detail

Stage 1: organise food categories

Not all the data for purchases of organic food fitted into the product groups presented by Pretty et al (Table 20) as that study only considered the major types of UK produce. Our purchasing data however including processed products, such as pasta, and produce not grown in the UK, such as lentils. We therefore grouped similar products together and calculated total quantities.

Pretty et al category	Weight (kg)	Products included	Notes
Flour	8,769	Flour	
		Flour based products: pitta; pasta; noodles; cous-cous	Adjusted for dry weight as appropriate
		Similar products: oats; rice; muesli; pulses	See assumptions
Potatoes	8,072	Potatoes	
Fruit		-	
Vegetables	11,624	Vegetables	
Oil Seed Rape	387	Sunflower spread	See assumptions
Sugar Beet	289	Sugar; syrup	See assumptions
Beef		-	
Pork		-	
Poultry		-	
Lamb		-	
Milk	34,872	Milk	Unit=litres
Eggs		-	

Table 21: Quantities of organic produce purchased, organised into categories used by Pretty et al (2005).

Assumption: Some of the organic products are produced overseas, for some of these no figures for a UK grown equivalent is available. In the absence of other data, we have assumed the environmental and health costs are the same as UK figures. This may be reasonable in some cases (eg vegetables and flour based products) but less so in others where the species and agricultural practices are quite different: eg sugar cane compared with sugar beet; and attributing costs for UK flour production to overseas lentil production. However, as will be seen below, these assumptions do not materially affect the results of the study.

Stage 2: Apply costs

For each category we multiplied the quantity by the cost factor for organic and conventional production, and calculated total savings as shown in Table 22:

Category	Unit	Saving /unit	qty	FFL	Non-FFL	Total Saving
		pence	kg	£	£	£
Flour	p/kg	1.40	8,769	28	151	123
Potatoes	p/kg	0.37	8,072	4	34	30
Fruit	p/kg	1.19	0	0	0	0
Vegetables	p/kg	0.60	11,624	1	71	70
Oil Seed Rape	p/kg	2.85	387	3	14	11
Sugar Beet	p/kg	0.18	289	0	1	1
Beef	p/kg	52.70		0	0	0
Pork	p/kg	9.02		0	0	0
Poultry	p/kg	3.77		0	0	0
Lamb	p/kg	27.27		0	0	0
Milk	p/litre	0.70	34,872	181	425	244
Eggs	p/doz	2.52		0	0	0
Total				**217**	**695**	**478**

Table 22: The reduction in environmental and health costs due to sourcing organic produce. All prices in 2007 £.

Note that any differences in the distance travelled by food in the supply chain is addressed separately – see Section 8.3.

Potential impact of sourcing organic meat, poulty, eggs and cheese

It is clear that the major reductions in environmental and health impacts are associated with meat, dairy and poultry production. However, the FFL initiative only purchases organic milk. We have examined the impact of switching to purchasing all meat, dairy and poultry products to organic sources. Table 23 shows such a switch would have environmental and health benefits valued at £11,348, giving a total saving of £11,826.

Such a reduction in impacts would be significant in the context of the overall benefits of the FFL initiative. However, the additional investment that the price premium for organic produce would impose would need to be taken into account to calculate the Social Return on Investment of such a move.

Produce	Unit	Reduction p/unit	qty	FFL £	nonFFL £	reduction £
flour	p/kg	1.40	8,769	28	151	123
potatoes	p/kg	0.37	8,072	4	34	30
fruit	p/kg	1.19	0	0	0	0
vegetables	p/kg	0.60	11,624	1	71	70
oil seed rape	p/kg	2.85	387	3	14	11
sugar beet	p/kg	0.18	289	0	1	1
beef	*p/kg*	*52.70*	*17,759*	*2,147*	*11,506*	*9359*
pork	*p/kg*	*9.02*	*12,593*	*477*	*1,613*	*1136*
poultry	*p/kg*	*3.77*	*6,458*	*123*	*367*	*243*
lamb	*p/kg*	*27.27*	*1,292*	*211*	*563*	*352*
milk	p/litre	0.70	34,872	181	425	244
milk for cheese	*p/litre*	*0.70*	*8,879*	*46*	*108*	*62*
eggs	*p/doz*	*2.52*	*7,749*	*112*	*307*	*195*
Total				**3,333**	**15,159**	**£11,826**

Table 23: The projected reduction in environmental and health costs from switching all meat, dairy and poultry to organic supplies. Items currently produced under conventional agriculture in italics.

Appendix C: Local suppliers' questionnaire

Text of Questionnaire

The text of the suppliers' questionnaire is shown below.

1. Business name
2. Please list all the items you supply to the EAC school meals initiative
3. What percentage of your total business income is represented by the contract? Are you prepared to tell us confidentially what the value of your contract is?
4. What have been the benefits to you from undertaking the contract?
5. What might have happened to your business without the contract?
6. How often do you make a delivery for this contract?
7. Do you supply each school individually or deliver to a central depot
8. What and how many vehicles do you use (e.g. HGV's, vans)
9. Are your deliveries refrigerated?
10. Roughly what's your delivery mileage in a month to supply the contract
11. Do you have to clean the items you supply before delivering them?
12. How are your supplies packaged
13. Do you supply any items from other producers as a regular part of the contract (please estimate the overall percentage of your contract supplied from other producers)
14. Have you hosted any school visits? If so, how many
15. Please tell us about any additional costs you have had as a result of the contract:
    a. Extra staffing (numbers and/or extra hours)
    b. Equipment (the cost of lease/purchase):
    c. New premises (cost)
    d. New transport (cost)
    e. Refrigeration (cost)
    f. Land (the cost of lease/purchase)
    g. Any other costs
16. Are you planning to re-tender for the contract? Please say why.

Findings from suppliers survey

To protect confidentiality, suppliers have been referred to by number.

1. Percentage of their turnover represented by the EAC contract:

Supplier	Percentage of turnover
1	2%
2	8%
3	5%
4	30%
5	33%

Thus, some suppliers were relatively small providers, but for two, the EAC contract was a significant part of their business.

The total estimated value of the contract for these suppliers, from EAC figures, was

2. Benefits from the contract

Supplier	Benefits reported
1	'A door opener'. The link to the Council gives credibility and is good for the CV
2	Increased income, feeling and reputation of benefiting the community, helping kids to eat better helps society in ways that are not yet tangible
3	Financial benefits, plus goodwill: recognition for being associated with the initiative, the Council's publicity mentions the link with local suppliers
4	Financial, continuity and helping to negotiate their suppliers costs down, a 'door opener' and a good thing to be associated with
5	Able to keep and increase staffing, recognition in the community for being associated with the pilot – e.g. recognised at farmers' markets

3. What would have happened to the business without the contract

Supplier	Response
1	Useful contract but not essential, goodwill is very useful though in generating other business
2	Not as well off but would still be in business, but the goodwill and reputational advantage is very important
3	Not too much impact if hadn't got the contract
4	Would grow the business at a slower rate
5	Would have been much smaller scale with lower employment

4. Delivery details

Supplier	Response
1	Fortnightly, with top ups on demand, deliver to individual schools, believes a central depot for local suppliers might be helpful, use one van and a pick up, not refrigerated, minimal additional mileage since fitted into pre-existing schedule
2	2/3 per week, deliver to individual schools, use one van, not refrigerated,. About 340 additional miles per month to supply schools
3	Monthly, with top ups on demand, deliver to individual schools, one van used, not refrigerated, around 100 additional miles per month
4	Twice weekly, deliver to individual schools, one van, refrigerated, 1000 additional miles per month
5	Weekly, with top ups on demand, deliver to individual schools, 2 vans, refrigerated, 500 additional miles per month

5. Packaging

Supplier	Response
1	Items not cleaned, packed in trays
2	Items not cleaned, supplied in cardboard boxes with some individual items in paper bags
3	Items not cleaned, vacuum sealed and supplied in cardboard boxes
4	Items not cleaned, supplied in shrink wrap
5	Items not cleaned, supplied vacuum packed in re-usable trays

6. Additional investment to service the contract

Supplier	Response
1	10 hours staffing per month
2	9 hours staffing per week, packing and mileage costs, £55,000 land purchase
3	5 hours staffing per week
4	18 hours staffing per week, new van
5	1 FTE staff member, new van

All suppliers stated their intention to re-tender for the contract, for both financial and reputational reasons. For the two larger suppliers, the contract was very important to them.

Appendix D: Valuing health outcomes

Population figures

The mid-2007 population estimates of the General Registrar for Scotland were used in calculating health outcomes:

- Population of EAC: 119,570
- Population of Scotland: 5,144,200

The pupil numbers in the pilot schools were 5,137.

Obesity

Lothian Health Board estimated in 2007 that a saving of £22million would result if everyone in Lothian was of a healthy weight. The population of Lothian is 809,790, giving a unit saving per head of population of £27.17. As discussed in the narrative above, the health of the East Ayrshire population is lower than average, as the unit savings are likely to be higher.

Applying this unit saving to the pilot school population gives a value of £139,560, which is adjusted as follows:

	Value £	Deductions
Value	139,560	
Deadweight	15,352	11% severely obese
Drop off	0	In deadweight
Net value	124,208	
Attribution	62,104	50% to FFL
Net value	**62,104**	

Table 24: Calculation of net value of FFL in relation to obesity.

Cancer

In 2002, the cost of cancer treatment to the NHS in Scotland was calculated at £425.4million. Uprating this to 2007 values gives £494.6million. Dietary factors are estimated to account for approximately 30% of cancers in industrialized countries, according to the World Health Organisation[xxvii]. 30% of the cost figure for the Scottish population was then applied pro rata to the pupil numbers in the FFL pilot schools. This figure was then discounted forward for 30 years, on the assumption that cancers would not start appearing until the children were approaching middle age. The discount rate used was 3.5%, the Treasury's rate for discounting social values.

This showed:

	Value £	Deductions
Value	52,789	
Deadweight	5,279	Estimated at 10%
Drop off	0	In deadweight
Net Value	47,510	
Attribution	40,384	15% to FFL
Net value	**7,127**	

Table 25: Calculation of net value of FFL in relation to cancer.

A figure for deadweight could not be found, so an estimate of 10% was used.

Coronary Heart Disease and stroke

The British Heart Foundation has calculated the treatment costs for CHD and strokes[xxviii]:

	CHD		Stroke	
	£ million	% of total	£ million	% of total
Primary care	135	4.1	57	1.8
Outpatient care	104	3.2	37	1.2
Accident and emergency care	23	0.7	11	0.3
Inpatient care	2,369	72.9	2,967	93.5
Medications	618	19.0	100	3.2
Total health care costs	3,248		3,172	
Cost per capita	**£54**		**£52**	

Table 26: Cost of CHD and stroke.

These were then calculated per head for the Scottish population and then the pilot school numbers.

The World Health Organisation study suggested that 'a universal reduction in dietary intake of sodium by 50 mmol per day would lead to a 50% reduction in the number of people requiring antihypertensive therapy, a 22% reduction in the number of deaths resulting from strokes and a 16% reduction in the number of deaths from coronary heart disease'. A 50 mmol reduction is the target figure in the Scottish Government's 'Healthy Eating, Active Living: An action plan to improve diet, increase physical activity and tackle obesity' document. It has been assumed that

the salt reduction in the FFL menus is aimed at meeting this reduction figure, all the literature, menus etc suggests that this is in fact the case. If the impact of a reduction in salt intake does result in 22% reduction in future strokes and a 16% reduction in CHD, then the value of the FFL menus in combating future CHD and strokes in terms of avoided treatment costs is:

CHD	Value £	Deductions
Value	18,489	
Deadweight	1,849	estimate 10%
Drop off	0	In deadweight
Net value	16,640	
Attribution		15% to FFL
Net value	**2,496**	

Table 27: Calculation of net value of FFL in relation to CHD.

Strokes	Value £	Deductions
Value	24,828	
Deadweight	2,483	estimate 10%
Drop off	0	In deadweight
Net value	22,345	
Attribution		15% to FFL
Net value	**3,352**	

Table 28: Calculation of net value of FFL in relation to stroke.

Avoided early mortality

The WHO technical report suggested that early mortality could be avoided through improved diet leading to reduced risk of disease.

HM Treasury and Government departments have been investigating for some time how to place a statistical value on a human life in the context of evaluating how to make policy changes, and how to assess the 'Value of a Preventable Fatality', or VPF, and 'Quality Adjusted Life Years', or QUALYs. There is research under way to get better understanding of these concepts and how to place appropriate financial values on them[xxix].

These approaches are often misunderstood to mean that a value is being placed on an individual life. This is not the case. It is simply another way of saying what people or governments are prepared to pay to secure a certain averaged risk reduction, in this case, improved health and avoided premature death from health conditions related to diet. In the UK, a VPF of £1.25 million has generally been used, based on work on avoiding road traffic fatalities[xxx]. The basis for this calculation has generally been the value of economic input to society. VPF is not to be confused with the value society, or the courts, might put on the life of a real person or the compensation appropriate to its loss.

In the context of this study, the question is, how does the provision of better nutrition in early life, and establishing health eating habits, affect people's longevity, and are there ways in which the value of this can be reasonably estimated?

The National Institute of Clinical Excellence uses a threshold of £30,000 per QUALY, as the level of cost of an intervention such as a new treatment above which it is not deemed to be cost effective. This is clearly well above the intervention cost per pupil supported by East Ayrshire Council.

The Scottish Government has used these approaches in assessing the health benefits of investing in more physical exercise programmes to tackle the nation's ill health. This analysis follows their application of the NICE guidance to a different context, and in a context which is more relevant to FFL [xxxi].

The authors suggest that for each death averted, that individual would have achieved a normal life expectancy for their age, which gives an estimate of the total number of life years saved by an intervention. The number of life years saved can then be valued using the NICE figure of £30,000.

References & Notes

[i] Bowden C., Holmes, M. and Mackenzie H, 2006, *Evaluation of a Pilot Scheme to encourage local suppliers to supply food to schools*, SEERAD

[ii] Durie S., 2008, 'Hungry for Success – Local Food for School Meals: a predictive SROI Report', Social Economy Scotland and Communities Scotland

[iii] Bowden C., Holmes, M. and Mackenzie H, 2006, 'Evaluation of a Pilot Scheme to encourage local suppliers to supply food to schools', SEERAD

[iv] Information in the following section has been taken from the East Ayrshire Community Plan and the NHS Food and Health Action Plan draft consultation document

[v] Survey results quoted in East Ayrshire's Single Outcome Agreement

[vi] World Health Organisation Technical Report Series 916 'Diet, nutrition and the prevention of chronic diseases', 2003, at http://whqlibdoc.who.int/trs/WHO_TRS_916.pdf

[vii] Integrating sustainable development into procurement of food and catering services, Scottish Executive May 2004. http://www.scotland.gov.uk/Topics/Government/SPD/17839/16689

[viii] Bowden C., Holmes, M. and Mackenzie H, 2006, *Evaluation of a Pilot Scheme to encourage local suppliers to supply food to schools*, SEERAD

[ix] J. MacLardie, C. Martin, L. Murray and K. Sewel, 2008, 'Evaluation of the Free School Meals Trial for P1to P3 Pupils, Scottish Government, Edinburgh at http://www.scotland.gov.uk/Publications/2008/08/29114033/0

[x] Onsite Catering survey of parents of children in FFL pilot schools, 2007

[xi] SROI is a relatively new methodology. Verification standards are still in development and not yet available, however Sheila Durie has been awarded Accredited SROI Practitioner status by SROI UK, the national body for assurance. For more information see http://www.sroi-uk.org

[xii] Tom Sansom, Chris Nash, Peter Mackie, Jeremy Shires and Paul Watkiss: Surface Transport Costs and Charges, Great Britain 1998

http://www.its.leeds.ac.uk/projects/STCC/surface_transport.html

[xiii] Pretty, J.N., Ball, A.S., Lang, T., Morison, J.I.L.; Farm Costs and food miles: An assessment of the full cost of the UK weekly food basket; Food Policy 30 (2005)

[xiv] and this ratio was used to calculate the deadweight

[xv] The evidence is explored in the World Health Organisation Technical Report Series 916 'Diet, nutrition and the prevention of chronic diseases', 2003, at http://whqlibdoc.who.int/trs/WHO_TRS_916.pdf

[xvi] *Obesity in Scotland An epidemiology briefing*, 2007, Scottish Public Health Observatory

[xvii] Walker A. 2003, The Cost of Doing Nothing - the economics of obesity in Scotland, National Obesity Forum

[xviii] ISD figures for 2002

[xix] WHO, op cit

[xx] British Heart Foundation at www.heartstats.org

[xxi] http://openscotland.gov.uk/Topics/Government/17963/hlthpromtnspend

[xxii] From Bowden C., Holmes, M. and Mackenzie H, 2006, 'Evaluation of a Pilot Scheme to encourage local suppliers to supply food to schools', SEERAD

[xxiii] Tara Garnett; 2007; Food refrigeration: What is the contribution to Greenhouse Gas emissions and how might emissions be reduced? Working paper produced as part of the work of the Food Climate Research Network

http://www.fcrn.org.uk/frcnResearch/publications/PDFs/FCRN%20refrigeration%20paper%20final.pdf

[xxiv] For example the Food Climate Research Network www.fcrn.org.uk

[xxv] British Egg Information Service. http://tr.im/3ys

[xxvi] DEFRA: Climate change: valuing emissions *Updated* guidance on the Shadow Price of Carbon

http://www.defra.gov.uk/Environment/climatechange/research/carboncost/index.htm

In particular: "How to use the Shadow Price of Carbon in policy Appraisal"

http://www.defra.gov.uk/environment/climatechange/research/carboncost/pdf/HowtouseSPC.pdf

[xxvii] WHO Technical Report Series 916 'Diet, nutrition and the prevention of chronic diseases', 2003

[xxviii] Original reference used by BHF was Allender S, Scarborough P, Peto V, Rayner M, Leal J, Luengo-Fernandez R and Gray A (2008) European cardiovascular disease statistics. European Heart Network: Brussels.

[xxix] This is a complex area of research – for an introduction, visit the Green Book at http://greenbook.treasury.gov.uk/annex02.htm

[xxx] In 2002 prices, Department for Transport (2002) *Highway Economics Note,* No.1. Department for Transport, London.

[xxxi] Gillespie and Melly, 2003, 'Health and economic benefits of increased physical activity in Scotland', 2003, Scottish Economic Report