

School food cost–benefits: England

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Abstract

Objective: To estimate the costs per relevant unit (pupils and meals) associated with improvements to school food and the potential economic and health gains that may result.

Design: Calculation of costs per relevant unit (pupils and meals) based on (i) Department for Education expenditure to support improvements in school food, 2005–2011 and (ii) measures of the changes in the number of pupils taking school lunch and the number of meals served over the same time period; plus examples of the use of linked data to predict longer-term economic and health outcomes of healthier eating at school.

Setting: England.

Subjects: Local authorities, government departments and non-departmental public bodies.

Results: Analysis of investment over a 6-year period indicates that costs of setting up and maintaining a change organization such as the School Food Trust were low in relation to short-term benefits in nutrition and behaviour. Models that predict long-terms gains to the exchequer and to quality-adjusted life years need further elaboration.

Conclusions: Modest levels of government investment in the delivery and promotion of healthier school food is likely to yield both short-term and long-term benefits in relation to nutrition, learning, economics and health.

Keywords
School food
England
Economics

Schools in England provide school lunches on site for 46% of primary-school pupils and 40% of secondary-school pupils⁽¹⁾. The majority of the remaining pupils bring a packed lunch, although in some secondary-schools pupils are allowed off-site at lunchtime. School caterers are required to provide food in accordance with compulsory school food standards^(2,3), except in academies which are exempt from the legislation. Catering services are provided through local authorities, private catering companies and in-school provision. Almost all secondary schools have a dedicated kitchen in which school food can be prepared from scratch; the majority of primary schools have either a dedicated kitchen or a mini or regeneration kitchen in which food can be plated or reheated, with limited facilities for basic preparation. A minority of primary schools (18%) have hot food transported in from elsewhere or serve cold food only.

The economic analysis of the impact of better school food in England has been undertaken in several ways. These include:

- implementation costs;
- income gains; and
- quality-adjusted life years.

These three approaches overlap, and none is conclusive. They all suggest, however, that investment in school food

presents good value for money and has demonstrable benefits in the both the short and long term.

Table 1 lists the potential benefits in terms of health, attainment and income in the short, medium and long term. The evidence base for each of them is strongest for short-term (proximal) outcomes and less good for medium- and long-term (distal) outcomes. One of the reasons for this is the cost of and foresight needed to set up robust longitudinal surveys. Relevant measures must be included at baseline so that meaningful outcomes can be assessed. For example, if the aim is to understand the impact of healthier eating at school on adult risks of diabetes, birth data (length and weight), weight gain in the first year, family history of diabetes, school food consumption and total diet in childhood all need to be assessed. Intervening changes in eating habits and changes in body weight over time throughout adulthood also need to be collected. How to model this effectively is a challenge. From the point of view of disease prevention, it is as important to understand the lifetime progression to a state of ill-health as it is to understand the proximal circumstances immediately preceding that state.

Attempts to evaluate the impact of healthier eating in childhood typically suffer from this lack of longer-term evidence and reflect instead the stronger evidence from more proximal interventions relating to outcomes.

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Table 1 Benefits of school food over time*

Time scale	Health	Attainment	Income
Now	Better nutrition Healthy growth	Better behaviour Better attendance Better grades	– – –
Later	Better nutrition Healthy weight Normal cholesterol Normal blood pressure	Better qualifications Better employment	Higher income More taxes paid
Much later	Less diabetes Less hypertension Less heart disease Less stroke Less cancer More quality-adjusted life years	More satisfying work Better social networks Better emotional well-being	Higher income More taxes paid Higher pension

–, Not relevant at school age.

*This list is not comprehensive, but indicative of major outcomes.

For example, the impact of cholesterol-lowering programmes in middle-aged men on risk of heart disease appears to favour late intervention⁽⁴⁾. This conclusion, based largely on randomized controlled trials, is reached in part because there is no comparable longitudinal evidence which evaluates the long-term impact on heart disease of eating healthily from childhood and the impact of school food policy on health-related outcomes in adulthood. Were such evidence available with the same level of robustness as the evidence from randomized controlled trails, the cost–benefit analysis could yield very different conclusions. Thus, the limitations of research approaches and a robust evidence base dictate policy and implementation decisions that are skewed toward proximal circumstances and interventions, ignore the cumulative impact of life-course events and may not be the most effective basis for improving public health. A further limitation is the lack of evidence for outcomes other than CVD morbidity and mortality. Long-term evidence relating school feeding to non-fatal outcomes (e.g. risk of diabetes), for example, is virtually non-existent. Equally, there is very limited evidence of the impact of school standards and feeding policies on total diet in the short term or over time. In consequence, there is a strong likelihood that the influence of school feeding programmes on adult health is substantially underestimated. In the absence of such evidence, it is important to consider the cost of implementing school food policies on the understanding that even if the long-term risks cannot be modelled appropriately or determined directly, there are changes in nutrition that can be brought about that are deemed desirable and accord with current government healthy eating policy. This is the subject of the first element of the current paper: a description of the unit costs of implementing and supporting change in school food, based on absolute costs relevant to policy outcomes (e.g. increases in take up of school lunches).

An effective, alternative strategy is to link together successive pieces of evidence collected at different life

stages. This can help to overcome the limitations of longitudinal studies by making the data collections more timely and relevant to outcomes. This is particularly the case when policy interventions supersede baseline data. (For example, the ALSPAC (Avon Longitudinal Study of Parents and Children) study⁽⁵⁾, begun in the early 1990s, cannot provide evidence in relation to children’s eating habits relevant to the introduction of school lunch legislation between 2006 and 2009^(2,3).) Timely, robust and coherent evidence on the impact of school food policy on adult outcomes relating to morbidity, mortality, economic and social well-being, etc. is therefore likely to require an alternative approach to classical randomized controlled trials or even community intervention trials with evaluation of only relatively short-term outcomes.

The remainder of the paper summarizes briefly two examples of ways in which successive longitudinal data drawn from a variety of sources can be used to illustrate longer-term gains in economics and health.

Implementation costs

School Food Trust spend per new school lunch pupil, per pupil eating more healthily at lunchtime and per meal provided

The School Food Trust (SFT) was set up to foster change towards healthier school food provision. Specifically, its role as a change agent was to increase school lunch take up, encourage and facilitate adherence to the school food standards, and to play supporting roles relating to specific stakeholder groups: clarifying the standards for caterers and parents; developing menus for school caterers; advising on monitoring and compliance; developing software for caterers to use to promote their services and menus, etc. to get across messages. The role was specifically to work with schools, caterers, local authorities, pupils, parents and other stakeholders about the way in which school food had changed and why⁽⁶⁾.

The SFT received £38 million in total over 6 years to support these activities. In addition, over this same period, government provided £480 million ring-fenced specifically to subsidize the cost of ingredients and in the second three years to allow the money to be spent on software for analysis in relation to the standards, for professional support and for small pieces of equipment. Food quality was an important component in making sure that the changed school meals were acceptable to pupils and parents, but the money was used as a subsidy for food and not specifically to promote higher take up. Other basic subsidies for school food from local authorities over this period did not change. The following calculations assess the approximate costs of providing this support.

Over a period of 6 years, from 2005 to 2011, the Department for Education (in its various incarnations) provided programme grants of £15.4 million (2005–2008) + £22.6 million (2008–2011), a total of £38 million to set up and run the SFT. During this same period, approximately 270 000 more pupils began taking school meals. Although there was an initial decline in take up following broadcasts in 2005 by Jamie Oliver about the poor quality of some school food, national take up increased between 2008–2009 and 2010–2011 by about 5% in primary schools and about 2.5% in secondary schools⁽¹⁾. This represents an increase by 2010–2011 of approximately 270 000 more pupils taking a school lunch than in 2007–2008. This includes both paid-for and free school meals. In relation to the direct funding for the SFT, therefore, it has cost approximately £38 million/270 000 = £141 for each pupil new to taking a school lunch. While the long-term impact of taking a school lunch is not fully known, from a public health perspective, £141 represents a small cost in relation to a change in eating habits in keeping with government guidelines and with the potential to affect lifetime eating habits (and concomitant improvements in health) that may accrue from an introduction to healthier eating in school.

In 2010–2011, there were approximately 3 million school meals served each day in England. This has varied slightly over time according to take up and the numbers of pupils on roll. Evidence from a national study of school food provision, choice and consumption in primary schools in England suggests that the balance of consumption has become more healthy (lower levels of fat (22%), saturated fat (16%) and non-milk extrinsic sugars (12%), salt (32%) and energy (8%); and higher levels of vitamin A, folate, dietary fibre and calcium (between 3% and 23%))^(7,8). Similar improvements have been demonstrated in the secondary sector⁽⁹⁾, and there is persistent evidence over many years that school lunches are more nutritionally sound than packed lunches^(10–12). For the purposes of the present analysis, therefore, it can reasonably be argued that the average school lunch consumed in both the primary and secondary sectors is more

nutritionally healthy than prior to the introduction of school food standards in England. The cost per child per year to have access to and consume a healthier school lunch (in relation to the costs of setting up and running the SFT over 6 years) would therefore be £38 million divided by 3 million meals per day divided by 6 years = £38 million/(3 million × 6 years) = £2.11. This approach takes into account the actual number of school meals served, as not every child has a school meal every day, so £2.11 represents the cost per child-equivalent across the entire year.

Finally, the SFT spend can be expressed in terms of the number of meals served over the period in which the SFT has been running. If the spend per child-equivalent per year is approximately £2.11 and there are roughly 190 trading days per school year, then the SFT spend per school lunch = £2.11/190 d = 1.1p/lunch. A penny per meal signifies how tiny has been the level of investment needed to finance a change management organization that has had a demonstrable impact on the pace and extent of change in school food services over a 6-year period and on children's eating habits nationally. A recent evaluation of the impact of the standards on total diet suggests that the healthier eating gains evident within school carry over to the total diet, i.e. the improved profile of eating in school is not compensated for by worse dietary habits outside school⁽¹³⁾.

Central government grants for school catering services

Many caterers were concerned that there would be direct costs relating to food, equipment, and kitchen and dining facilities in schools if the transition towards healthier eating following the introduction of the standards was to be successful. Government therefore provided a direct, ring-fenced grant to local authorities to support catering services in this transition. Between 2005 and 2008, government provided £240 million as a direct subsidy to support the costs of ingredients. This was equivalent to £240 million/(3 million meals served per day × 3 years × 190 trading days) = 14p/meal. A further ring-fenced grant of £240 million was provided between 2008 and 2011. After representation from the school catering industry, the scope for expenditure from this second grant was expanded to cover not only subsidies on food, but also to purchase software for nutrient analysis relating to the menu development and the monitoring of compliance in relation to the standards; professional support to achieve and monitor compliance with the standards; and small pieces of equipment (but not major kitchen refurbishments). When non-food expenditure was taken into account⁽¹⁴⁾, this was equivalent to a subsidy on food of approximately 11p per meal. A further £80 million was provided by the Department for Education for 2011–2012, but this was not ring-fenced. This money was spent similarly to spending in 2008–2011⁽¹⁾.

Income

Economic impact of healthy eating

The SFT commissioned an analysis of the economic gains that may accrue if healthier eating is associated with better attainment at school⁽¹⁵⁾. This would be mediated through higher educational qualifications, employment prospects, and lifetime earnings and taxes payable. The question is whether the net gain to the exchequer in tax revenues over the employment life of an individual pays for the implementation of healthier eating in schools. This analysis does not include the potential savings to the National Health Service from lower morbidity, nor higher productivity relating to better health. The model outlined below (elaborated fully in the publication on the SFT website⁽¹⁵⁾) is illustrative of the approach that shows how evidence from stages of progression through childhood and adulthood can be linked to generate useful conclusions.

A small study of the impact of the introduction of breakfast clubs on attainment in primary schools in poor areas of London provided the starting point⁽¹⁶⁾. Average changes in Key Stage 2 in the year following the introduction of breakfast clubs in thirteen schools was 0.72 points, significantly greater than the change (0.27) in nine comparable schools over equivalent time periods in which a breakfast club had not been introduced in the school. In each of several scenarios, the economic gain relating to the observed changes in attainment stood at between £1330 and £1692 over the life course (expressed in monetary value in 2008). Adopting the most conservative outcome, the findings suggest that the economic impact of the introduction of breakfast clubs was £1330 per pupil in the treatment group compared with control group. The number of children in the year groups participating in this initiative was approximately 675. Using the model described in the paper, the total economic benefit of the initiative was approximately £897 000. There was no accurate information on the costs associated with the implementation and delivery of the initiative (some of it being supported by volunteers, some through corporate or charitable sponsorship, and some through subsidies from both schools and parents). A least-favourable cost of implementation, based on the highest reported value, was about £8.00 per week per pupil attending the breakfast club. If it were assumed that 100% of pupils in the school attended the club (again, a least-favourable assumption for the purposes of modelling), the total annual cost associated with the provision of these services (assuming 190 school catering days per annum) would be in the region of £205 000. This implies that the ratio of benefits to costs was approximately 4.38 (£897 000/£205 000). In reality the ratio of benefits to costs may be significantly higher, as the gain in average Key Stage 2 results was based on far lower levels of participation.

Quality of life years added

Public Health Research Consortium

The Public Health Research Consortium (PHRC) carried out research to evaluate the impact of the introduction of school food standards on changes in provision and consumption (in relation to school food and total diet)⁽¹³⁾ and to assess the cost–benefits over time⁽¹⁷⁾. Their findings suggest that the cost of implementing the standards is small in relation to the likely gains in quality-adjusted life years that will accrue following the implementation of the standards to support healthier eating at school.

The PHRC analysis took into account the direct costs in relation to food, catering staff, etc. It did not, however, include the subsidy from central government to support the transition to healthier food in school catering, nor the cost of setting up and running a change management organization (the SFT).

Discussion

The evidence summarized in the current paper supports two conclusions in relation to the costs and benefits of introducing school food standards. First, the costs of promoting and implementing healthier eating over a child's school career are low. At just over a penny a meal, the short- and long-term benefits of instituting and maintaining a change support organization (the SFT) are immediately evident in terms of nutritional outcomes^(7,9), and highly likely in relation to longer-term economic⁽¹⁵⁾ and health⁽¹⁷⁾ outcomes. While it could be argued that the introduction of compulsory standards together with direct financial support for catering services might have achieved the same ends, the overwhelming experience of the SFT in overcoming resistance to change suggests otherwise. In every sector (catering, schools, parents), it was necessary to address anxieties about change and to do so in a way which was coordinated across sectors⁽⁶⁾. Without the presence of an organization dedicated to supporting the transition in school catering, it seems unlikely that the immediate nutritional or longer-term hypothesized economic and health benefits would have been achieved to the same extent, if at all. Thus, the benefits appear far to outweigh the costs of implementation.

Of course, these changes did not occur in isolation. The banking crisis which began in 2008 had complex effects on family incomes (remaining virtually static), spending patterns (reduced consumer spending) and food costs (food inflation varied between 2% and 6% per year over this period)⁽¹⁸⁾. While some families became newly qualified for free school meals, there were thus pressures against spending on school food in families on low incomes that did not qualify for free school meals: packed lunches are cheaper to provide (if less healthy) and are consistently viewed as the cheaper alternative

to school lunches when budgets are tight. Over this same period, three local authorities in deprived areas in England participated in a pilot study to provide universal free school meals in primary schools⁽¹⁹⁾, and one or two other local authorities instituted their own free school meal schemes in the primary sector. The changes thus represent the product of a number of competing trends. Given the initial widespread resistance to change, as evidenced by the initial rapid drop in school lunch take up following Jamie Oliver's revelations about the poor quality of food in some schools, it seems reasonable to assume that intervention by the SFT was at least in part responsible for the turnaround in this decline.

These costs are in line with other published findings relating to school-based food and health programmes, whether in low-income⁽²⁰⁾ or high-income countries⁽²¹⁾. They also confirm the notion that healthier diets are likely to cost more⁽²²⁾ (although improvements can be achieved with very modest increases⁽²³⁾) and that investment in both social change and ingredients are necessary to achieve desired outcomes. They suggest that appropriately focused, modest investment through schools to improve food quality and nutrition, intended to reach the child population and their families, represents good value for money when assessed against the broadest criteria⁽²⁴⁾. The investment value thus accords with other studies internationally.

Second, understanding the likely longer-term impact of improvements in school food on educational and health outcomes is complex. Modelling of the economic and health benefits is likely to be achieved only through concatenation of existing sets of evidence, appropriately selected in relation to the starting and end point of each analysis. Conlon's economic paper⁽¹⁵⁾, for example, required concatenation across four sets of data (primary school breakfast clubs – academic attainment at Key Stage 2; probabilities of progression through academic levels, including GCSE, A levels and higher and further education; educational outcomes and employment prospects; links between employment and lifetime earnings). Each of these medium-term longitudinal data sets requires appropriate starting and end points to facilitate linkage across life stages. Similar links are required in relation to the analysis of likely health outcomes. This assumes that the appropriate starting and end points can be matched, which is not a given.

Ultimately, the findings presented and summarized here suggest that improvements in school food are cost-effective, both in terms of economic gains by the exchequer relating to employment, productivity and taxation, and in terms of health outcomes. The economic modelling⁽¹⁵⁾ referenced in the current paper is probably conservative, while the modelling relating to health gains⁽¹⁷⁾ needs to take into account the costs relating to the setting up and running of the SFT and the subsidies for school food and catering support provided by government directly to catering

services. Further analyses of changes in growth and educational attainment in relation to changes in school lunch take up are currently being undertaken, and will contribute further to the evidence base for the cost-effectiveness of implementing and supporting school food standards in England.

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