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Eoin Murphy

Effect of Free School Meals Nutrition on Educational Attainment

1 Introduction

This briefing note was commissioned by the Committee for Employment and Learning to provide a discussion of academic research on the effect of free school meals (FSM) on educational attainment.

The paper provides a review of existing research including studies based on Jamie Oliver's "Feed Me Better" campaign, the effects of nutritional intake on children and the economic benefits of introducing healthier meals into schools.

2 Background

A number of studies have been carried out on child nutrition, spurred in part by the work of celebrity chef Jamie Oliver and the television programme "Jamie's School Dinners" highlighting the poor quality of some of the food being provided in school canteens (such as the infamous and now banned "turkey twizzler").

The programme followed Oliver as he tried to convince local councils in England and the UK Government to improve the quality and nutritional content of school meals.

Whilst Jamie Oliver did not take the most scientific of approaches during the programme, it did highlight the importance of good quality food being available in schools. The campaign resulted in a number of schools across the UK altering their canteen menus to improve food quality with moves to expand the provision and quality of school lunches across the UK and highlighted the potential importance of good nutrition at an early age.

In 2009 the Labour Government introduced the Healthy Lives, Brighter Futures strategy which launched a series of initiatives on child development¹.

The strategy paid particular attention to health including developing healthy opportunities. In terms of school meals, the strategy wanted to increase the uptake of healthy school meals via:

- The Department for Children, Schools and Families and the Department of Health have initiated pilots to test the health and educational outcomes expected from introducing FSM for all Primary pupils. The pilots also test extending FSM eligibility to a wider group of low income families than current rules allow;
- The pilots are to run for 2 years to July 2011. The Departments will set up a joint fund of £20 million to implement and evaluate the pilots, which will be matched by £20 million from local authorities and Primary Care Trusts (PCTs); and
- The government stated they will consult on whether to change the law to allow those local authorities and schools that wish to develop different approaches to offering subsidised meals to do so.

One year on from the publication of this strategy it was reported by the Department of Health that three pilots were underway on extending FSM, with more to follow. In addition there was a proposed extension to FSM eligibility which would increase the number of primary pupils able to receive FSM by 500,000. This project was expected to commence in September 2010.

3 Northern Ireland's Current FSM System

In Northern Ireland FSMs are not universally available to school pupils. Suitability is determined via means testing of the child's parent's income and whether or not they are in receipt of any benefits.

Pupils are eligible to Free School Meals if²:

¹ Department of Health and the Department for children, schools and families, Healthy Lives, brighter futures: The strategy for children and young people's health http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_094397.pdf (first accessed 16th July 2010)

² Education Support for Northern Ireland Benefits, Free School Meals <http://www.education-support.org.uk/parents/benefits/free-school-meals> (first accessed 27th July 2010)

- the parent/guardian is in receipt of Income Support, Income-Based Jobseeker's Allowance, Income-Related Employment and Support Allowance, or if a pupil claims Income Support in their own name; or,
- the parents receive the Child Tax Credit; and are ineligible for the Working Tax Credit because they work less than 16 hours per week; and have an annual taxable income of £16,190 or less; or,
- the parents receive Working Tax Credit; and have an annual taxable income of £16,190 or less and whose child/children are born on or after 2 July 2002 and attends full-time nursery school, primary school or special school; or
- he/she has a statement of special educational needs and is designated to require a special diet; or
- he/she is a boarder at a special school; or,
- he/she is the child of an asylum seeker supported by the Home Office National Asylum Support Service (NASS); and
- the parent receives the Guarantee element of State Pension Credit.

Education and Library Boards are responsible for administering the award of FSM.

The Office of the First Minister and Deputy First Minister (OFMDFM) developed a ten year strategy for children and young people in Northern Ireland³. Part of this strategy is the:

...development of a new policy framework for health promoting schools to assist schools to make effective arrangements for supporting the health and well being of pupils and staff.

In addition, the strategy intends to develop a major initiative to improve the quality of food provision in schools.

4 Scotland's Current FSM System

The Scottish Government has introduced a number of initiatives regarding school lunches, starting in 2003 with 'Hungry for Success'.

Since this programme began, a number of Acts and Regulations have been passed to promote healthy eating in schools, with the focus on getting the balance right regarding meals and encouraging pupils to make informed choices.

In Scotland free school meals can be claimed if a parent/guardian is receiving⁴:

- Income Support (IS);
- Income based Jobseekers Allowance (JSA);

³ OFMDFM, 2006, Our Children and Young People – our pledge: A ten year strategy for children and young people in Northern Ireland 2006 - 2016

⁴ Scottish Government, School Lunches, www.scotland.gov.uk/topics/Education/Schools/HLivi/schoolmeals

- Child Tax Credit (CTC) but not Working Tax Credit and your income is less than £16,190 (with effect from April 6 2010); and
- Both maximum child tax credit and minimum working tax credit and your income is below £6,420 (with effect from April 6 2010).

Legislation was passed in November 2008 to enable local authorities to provide free school lunches to all Primary 1 to 3 pupils from August 2010. However, as a result of the increased strain on the public sector caused by the financial crisis this will be phased in, with schools that are in the 20 per cent most deprived communities in a Council area being targeted as a priority. Councils will subsequently work towards providing a nutritious free meal to all children in Primaries 1 to 3.

Discussions with Scottish civil servants found that regulations regarding the food and drink provided in Primary Schools were only introduced in 2008 and for Secondary Schools in 2009. As such no studies have yet been carried out by the Scottish government on the effect these guidelines have had on children's educational attainment or eating habits.

5 England and Wales Current FSM System

In England and Wales, as with the other regions, parents do not have to pay for school lunches if they receive any of the following:

- Income Support;
- income-based Jobseeker's Allowance;
- income-related Employment and Support Allowance;
- support under Part VI of the Immigration and Asylum Act 1999;
- the Guarantee element of State Pension Credit;
- Child Tax Credit, provided they are not entitled to Working Tax Credit and have an annual income (as assessed by HM Revenue & Customs) that does not exceed £16,190; or
- Working Tax Credit during the four-week period immediately after their employment finishes or after they start to work less than 16 hours per week.

Children who receive any of the qualifying benefits listed above in their own right are also eligible to receive free school meals.

The School Food Trust carried out a review of school meal take up in England for the year 2009 – 2010⁵.

It found that the take up of school meals rose by 2.1 per cent from 39.3% in 2008 – 09 to 41.4% in 2009 – 10 for Primary Schools. In real terms, the number of pupils taking school lunches rose by 321,000 with just under half of this increase receiving FSM.

⁵ School Food Trust, Nelson et al July 2010, School Lunch take up in England 2009 – 2010

Reasons cited by LAs for the increase include:

- School policy on food;
- Marketing of meals to pupils, parents and head teachers (in the Primary sector);
- Increased eligibility and take up of FSM;
- Stay on site policies in Secondary Schools;
- Static and better attitudes to healthier meals; and
- Positive support (or a neutral attitude) to the provision of school meals on behalf of head teachers, governors and local councillors.

As stated in the report:

This represents a substantial change since the Jamie Oliver broadcasts in 2005, and a growing awareness that the quality of school food has improved dramatically.

The study identified issues still needing to be addressed within the sector:

- Poor kitchen and dining facilities;
- Reluctance by some pupils, parents and head teachers to engage with the healthy eating agenda;
- The need for longer lunchtimes balanced with the needs for physical activity; and
- The wider environment around schools.

The study sums up by stating:

It will require further research outside the scope of this survey to evaluate the impact of healthier eating at school on the health, well-being, behaviour and attainment of children in England.

It must be noted that following the recent change in the UK Government, Education Minister Michael Gove has announced plans to axe free school meals for half a million primary school children from low income families⁶ in England.

6 Studies on School Meals and Nutritional Content

One of the larger studies conducted on the impact of school meals on academic achievement was completed in 2006 by the Centre for Research on the Wider Benefits for Learning⁷. The review asked two main research questions:

- How does nutrition impact upon health outcomes in children?; and
- How can the health outcomes that manifest as a result of nutrition impact upon school life experiences and outcomes?

⁶ The Guardian 22nd June 2010 Free school meals: Health professionals join the backlash over cuts <http://www.guardian.co.uk/education/2010/jun/22/free-school-meals-health-backlash-cuts> (first accessed 21st July 2010)

⁷ Centre for Research on the Wider Benefits for Learning June 2006 Sorhaindo, A and Feintstein, L What is the Relationship Between Child Nutrition and School Outcomes

To answer these questions the study's authors carried out an extensive literature review. The literature review examined research that looked at areas such as nutrition, socio-economic background of parents, breastfeeding and other variables which may have an impact on a child's academic achievement.

The study made a number of key findings:

- There is a complex interrelationship between nutrition, health, education, social and economic factors;
- Nutritional deficiencies prior to school entry have the potential to impact upon cognition outcomes in school age and adolescent children;
- Children with nutritional deficiencies are susceptible to moment to moment metabolic changes that impact upon cognitive ability and performance of the brain. Treatment with nutritional supplements can result in improved performance;
- Maintaining adequate levels of glucose throughout the day contributes to optimising cognition, suggesting nutritional intake should be designed to sustain an adequate level of glucose and to minimise fluctuations between meals;
- Nutrition, especially in the short term, is believed to impact upon individual behaviour (for example a lack of vitamin B has a causal relationship with aggressive behaviour and personality changes in teenagers);
- The development of food preferences in children depends on a range of biological and social factors;
- Food preferences in children are largely determined outside school (i.e. via parents, advertising and marketing);
- The constraints of low income create practical barriers to healthy eating. Additional socio-economic factors reinforce the effects of deprivation; and
- Obesity has adverse health implications but there are also important social repercussions of obesity experienced in youth.

The study went on to make the following recommendations;

- It may be helpful to have curriculum developed that incorporate children's understanding of nutrition and thus be more likely to encourage change;
- There may be a need to adopt a collaborative approach between schools and parents to address children's nutritional choices;
- There is an opportunity to capitalise on initiatives such as the extended schools policy, which have created an opportunity for schools to engage with parents and local communities, to improve diets and promote healthy eating among children; and
- It may be appropriate to consider changes to the structure of the school day, to improve the maintenance of glucose levels and promote better cognition among students.

A study carried out by the University of Teesside and the Food Standards Agency in 2006 involved a review of research on the effect of nutrition and dietary change on learning, education and performance of children⁸.

The study was unable to draw any firm conclusions as a result of the variety of research methods used and inconclusive results, stating that:

The findings from this report suggest that currently there is not enough evidence to show that diet / nutrition effects education, learning and performance of school aged children. This report is important, as it will inform policy makers and practitioners of the need to carry out more research (particularly within the UK) before any decisions can be made with regard to the role of nutrition in education.

In addition, a number of the studies reviewed failed to take account of factors such as socio-economic background, poverty rates of individual maturation and neurodevelopment, all of which have implications on cognition⁹.

The School Food Trust carried out an overview of research in the UK on the link between child nutrition and health. The review identified and summarised recent and ongoing research relevant to the remit of the Trust¹⁰.

It reached conclusions in three areas:

- Diet and food choice;
- School based research and school food; and
- Food related research associated with health and cognitive function.

In terms of results relevant to this paper, the review found that:

- There is limited evidence to conclude that the introduction of breakfast clubs has a positive influence on nutrient intake, behaviour or academic attainment; and
- More research is needed to provide evidence of the relationship between a healthy diet and subsequent physical and mental well being. Developing collaborative research programmes and working with partners will strengthen messages about the need for healthy eating and tackling obesity.

The review concludes by stating:

Limited research activities investigating the impact of diet and nutrition on health, behaviour and academic achievement highlights the need for

⁸ University of Teesside and Food Standards Agency, April 2006 A systematic review of the effect of nutrition, diet and dietary change on learning, education and performance of children of relevance to UK schools <http://www.food.gov.uk/multimedia/pdfs/systemreview.pdf> (First accessed 19th July 2010)

⁹ Please note, the University of Teesside review was carried out on research conducted mainly in the USA and all papers discussed were pre 2006. Of the 29 papers considered in detail, 15 were on breakfast, 6 on sugar and ADHD, 5 on fish oil and 2 considered vitamin supplements. The final study examined good diet but was dropped due to poor quality.

¹⁰ School Food Trust The Link Between Child Nutrition and Health: An Overview of Research in the UK

continuing research activities to build a robust evidence base that supports the case for change.

7 Studies on School Meals and Academic Achievement and Behaviour

Studies on academic achievement and behaviour in school are relatively limited, with the focus generally around health outcomes rather than educational. However, a few studies do focus on this area.

A study by Feinstein et al¹¹ in 2008 tested the impact of diet at several points in childhood on children's school attainment. The study, using longitudinal data from the Avon Longitudinal Study of Parents and Children (ALSPAC)¹², examined differences between children who used packed lunches and those who ate school meals. It also took into consideration children's diet before they started school.

The study used three measures of attainment:

- School entry assessments at ages 4-5;
- Key Stage 1 tests at ages 6-7; and
- Key Stage 2 tests at ages 10-11.

Diet and achievement are influenced by a number of socioeconomic, demographic and lifestyle factors. In order to ensure these did not influence the outcome of the study, controls were applied in order to remove any confounding bias.

The study found that a child who eats a higher level of junk food at age 3 than their peers are associated with lower test scores at Key Stage 2. For children with a 'health conscious diet' it was found that they had higher test scores at Key Stage 2.

However:

Although there was a negative association between early 'junk food' consumption and later attainment scores, the estimated effect was small, suggesting that nutrition may have a diminishing role in attainment as children grow older... This may indicate a developmental period or stage where children are more susceptible to the long term cognitive impact of poor nutrition.

Feinstein et al identified policy implications for the study, stating that it:

...highlights the importance of diet before entry into formal education for later school attainment and calls for a concerted effort between schools,

¹¹ Journal of Epidemiol Community Health 2008 Feinstein et al Dietary Patterns Related to Attainment in School: The Importance of Early Eating Patterns

¹² ALSPAC is an ongoing population based study designed to investigate the effects of environment, genetics and other influences on the health and development of children and has 13,988 participants born between 1 April 1999 and 31 December 1992.

families, government departments and other agencies to improve the nutritional intake of children.

The School Food Trust is a non-departmental public body created by the Department for Education and Skills in 2005 to promote the education and health of children and young people by improving the quality of food supplied and consumed in schools.

It has carried out a study on school lunches to determine if the introduction of healthier food has a positive impact on learning behaviour in primary schools¹³.

The study involved six primary schools over a twelve week period with four intervention schools and two control schools.

The four intervention schools had a variety of food interventions, such as new menus compliant with food based standards, health eating workshops and providing better marketing materials (such as menus with pictures of the meals). The schools also had changes made to the dining environment such as alterations to the layout, the queuing system and the redecorating of the dining room.

In order to test changes to pupil behaviour, students were initially observed prior to the beginning of the 12 week period to establish a baseline and again at the end of the intervention.

Behaviour was observed in three ways:

- Pupil-teacher interaction;
- Pupil-pupil interaction; and
- Working alone.

Behaviour was determined as either on-task (pupils level of concentration) or off-task (pupils were disengaged and/or disruptive). They study found that following the intervention, pupils were 3.4 times more likely to be on task in pupil-teacher interaction compared with pupils from the control schools. Conversely, pupils from the intervention schools were 2.3 times more likely to be off task in pupil-pupil interactions than in the control schools.

The study concluded that:

This study provides some objective evidence that an intervention in primary schools to improve school food and the dining environment has a positive impact on pupils' alertness and their ability to learn in the classroom after lunch. However, if this raised alertness is not appropriately channelled and supervised, it may result in increased off-task behaviour when pupils are asked to work together.

¹³ School Food Trust School Lunch and Learning Behaviour in Primary Schools: An Intervention Study
www.schoolfoodtrust.org.uk/download/.../sft_slab1_behavioural_findings.pdf (first accessed 23rd July 2010)

A recent study by Belot and James (2009)¹⁴ used the “Jamie Oliver Feed Me Better” campaign as its source material. As the campaign focused on a specific area (the Greenwich Borough in London, England) it was possible to conduct a before and after study on the pupils of schools who joined the project.

The study used pupil and school level data from the National Pupil Database and School Census. It subsequently compares educational outcomes (at Keystage 2, which has three main components – English, Maths and Sciences) before and after the reform with neighbouring Local Educational Authorities (LEAs) acting as control groups.

Belot and James investigated three outcome variables:

- Educational Outcomes;
- Take-up Rates; and
- Sickness Absenteeism.

The study found that Key Stage 2 results were significantly improved after the introduction of the improved school meals, with results in English and Science most effected. For English, between 3 and 6% more pupils scored level 4 and between 3 and 8% more pupils gaining level 5 in Science.

Belot and James concluded that there was no evidence that the campaign helped children who take Free School Meals, with the authors suggesting that it is FSM pupils who would find the change in menu most difficult as:

...these pupils were probably eating the “unhealthy” meals on a daily basis and would therefore maybe the most put off by the change in menus.

In terms of take up rates of FSM, the study found no change.

Absenteeism is divided into authorised and unauthorised absences. Authorised absences are those that are formally pre-arranged with the school and are mostly linked to sickness. The study found that authorised absences dropped by 0.8% which may not seem a significant figure but equates to 15% of the average rate of absenteeism. There was no apparent effect on unauthorised absences.

The study also examined the costs and benefits of the project for the schools themselves. By September 2007, 28,000 children from the county benefited from the programme, at a cost of £1.2 million for the council (£43 per child). The majority of these costs were one off and capital based, such as new kitchens and equipment, as many of the schools were simply not outfitted for cooking food from scratch.

Whilst assessing the economic benefits of healthy school lunches, Belot and James used a similar process to that used by Machin and McNally (2008) for their analysis of the benefits of the Literacy Hour introduced to schools in the 1990s. Machin and

¹⁴ Institute for Social and Economic Research, January 2009, Belot, M and James, J Healthy School Meals and Educational Outcomes http://www.iser.essex.ac.uk/files/iser_working_papers/2009-01.pdf (first accessed 23rd July 2010)

McNally calculated the overall benefit of the programme in terms of future labour market earnings using the British Cohort Study, that includes wages at age 30 and reading age at 10. Machin and McNally estimated the benefit of literacy hour to be between £75.40 and £196.32 per annum per child, adding up to a lifetime benefit of between £2,103 and £5,476.

Belot and James state that:

The effects we have identified are comparable in magnitude to those estimates by Machin and McNall.

8 Studies on School Meals and Economic Benefit

It is important to consider the economic implications of nutritious school meals and academic achievement. As seen above in the Belot and James study, it can be suggested that pupils that achieve better through primary and secondary school will provide additional benefit to the economy.

A study by Shemil et al¹⁵ evaluated school breakfast clubs and identified three areas where the introduction of clubs could have an economic impact:

- Individual (children, parents, school based staff);
- Institutional (school, family, service provider); and
- More widely (government, employers, etc).

The study examined four lines of enquiry:

- Description of financial structures and costs;
- Description of resource inputs and estimation of associated costs;
- Estimation of cost consequences that may result from the effects of clubs on schools, children, their families and communities; and
- An analysis of relationships between the net costs of implementing and maintaining the clubs and observed benefits of the clubs.

Qualitative data gathered from the study found that participants frequently suggested that improvements in attendance, punctuality, behaviour and concentration were attributable to the presence of a club and had improved the marginal efficiency of resources allocated to teaching and learning.

In addition, several parents who were questioned as part of the study stated that where breakfast was provided for free at school there was a reduction in household food costs, which could make a considerable financial contribution for the family. Other benefits include a reduction in childcare costs and increased opportunities for parents to work or study.

¹⁵ Childcare, Health and Development, September 2004 Shemil et al A National Evaluation of School Breakfast Clubs: Where Does Economics Fit in?

The study's authors stated:

This factor would not only impact directly at the level of the family economy, but would also, from a societal perspective, precipitate changes in the indirect costs associated with the value of production.

However, the study concluded that:

The costs of a school breakfast club appears to be associated with some weak benefits (as well as some unmeasured societal benefits linked to employment and family economy) but it is not possible to conclude whether or not this initiative was the best way to use the available funding.

9 Summary

Consideration of the studies discussed in this paper has highlighted a number of key points:

- Nutrition has an effect on academic achievement and behaviour in children, however, the extent and duration of this effect is still unclear, although one study found an improvement in Key Stage test results following the Jamie Oliver Feed Me Better Campaign was introduced to schools in England;
- Junk food can have a negative impact on learning for children aged 3;
- Diet before entry into formal education has an impact on later school attainment;
- Interventions to improve school food and the dining environment can have a positive impact on pupils alertness, behaviour and their ability in the classroom; and
- There may be potentially significant long term economic benefits from improving the nutrition of school meals.

Whilst there is a body of evidence surrounding the effect of healthy school meals on children, it must be noted that a number of studies highlighted the need for more research in this area. Importantly, with regional governments rolling out FSM to more schools and greater numbers of children, the opportunity for research into its effects is improving, although these studies will by the nature of the topic being examined, necessitate longitudinal studies.