Healthy Food Provision and Promotion in Primary School: What impact is it having on food choices?

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KEY FINDINGS

- The physical and social environment exerts an important influence on pupils' uptake and experience of school meals.

- Effective management and co-ordination by school staff during lunchtime has a positive impact on pupils' experience of lunch and on the general atmosphere in school canteens. Active encouragement by teaching and catering staff as well as practical steps to make healthy foods easily accessible and attractive to pupils can increase uptake.

- Open access to a free breakfast service in deprived urban areas can provide children from these areas with a healthy breakfast.

- The majority of primary school pupils bring crisps, sweets or chocolate into school to eat during break time.

- The consumption of fresh chilled water during mealtimes is still relatively low despite the presence of water machines although pupils drink water at other points during the school day.

- Free fruit distribution during the school day is a successful way of encouraging pupils to eat fruit regularly at school.

- Vegetables remain an unpopular food choice with children – the provision of vegetables by 'stealth' as part of meals in parallel with hands-on, creative, educational interventions needs to continue to promote uptake.

- Primary 7 pupils display less healthy eating behaviour than younger age groups.

INTRODUCTION

The Scottish diet is high in fat, salt and sugar and low in fruit and vegetables. Scottish children and young people follow a diet that falls short of national recommendations and is less healthy than that of other European countries. [1-3]

School food policy and the school environment have an important role to play in provision and promotion of healthy food and drinks. [4-6] 'Hungry for Success: a whole school approach to school meals in Scotland' presented a range of far reaching and holistic recommendations in relation to: the establishment of nutrient standards; links between the curriculum and food provision in schools; elimination of stigma for free meal recipients; partnership working; and improvements to the social and physical environment in schools. [7] The aims and objectives of 'Hungry for Success' (HFS) resonate with other policy drivers such as 'Being Well – Doing Well', the framework for health promoting schools, which aims to encourage schools to promote the physical, social, spiritual, mental and emotional health and well-being of all pupils and staff and to work with others in identifying and meeting the health needs of the whole school and its wider community. [8]

Healthy eating initiatives in Glasgow schools

Glasgow City Council provides a spectrum of initiatives and services designed to provide and promote healthy food and drinks throughout Glasgow schools across the school day.

Glasgow's 'Big Breakfast' provides open access to a free breakfast as part of a multi-strand approach which aims to improve nutritional intake of primary school children, improve their attendance and punctuality and contribute towards higher educational attainment.

Fruit Plus provides pre-school children, primary school children and children attending special schools with free fruit five times a week during the school year. The main aim of Fruit Plus is to encourage a fruit eating habit amongst pupils that will continue into their adult and home lives. The project places emphasis on integrating the principles of healthy eating into various areas of the school curriculum with the aim of improving health and attainment levels.

Fuel Zones, a 'High Street' style canteen service operates in all primary and secondary schools. This canteen service replaced traditional school dining rooms with the aim of creating a bright, informal and positive atmosphere where pupils could enjoy a tasty, healthy lunch. Fuel Zone menus were developed using a phased approach with the aim of attracting and retaining pupils in the first phase and of influencing food choices and diet during subsequent phases. The Fuel Zone approach was introduced into secondary schools in 1997 and into primary schools during 1999. Following the publication of HFS, Glasgow retained its Fuel Zone model and repeated a phased implementation which has gradually reduced the presence of processed foods on the menu.

Glasgow's Refresh provides pupils in Glasgow schools with access to free drinking water throughout the school day. This initiative was established in 2003 in order to ensure that pupils had access to adequate amounts of fluids during the school day and to provide fresh, free, chilled drinking water accompanied by drinking cups or glasses within school canteens.

Monitoring and evaluation of healthy eating initiatives

To date, monitoring and evaluation of Glasgow based initiatives has taken various forms. Methods employed have included pilots, surveys, interviews, consultations (formal and informal), as well as quantitative exercises such as the collection of product control information (daily tallies of foods and drinks distributed during the school day). Past evaluations and consultation exercises indicate that healthy eating initiatives in Glasgow schools appear to have had a positive impact on school-based access to healthy food and on pupils' attitudes and behaviour with regard to healthy eating. [9, 10] In depth research and evaluation would allow a scrutiny of the impacts of healthy food provision and promotion across the school day on pupils' consumption within school. Further research could usefully explore the impact of school-based initiatives on pupils' food and drink choices beyond the school gates.

The role of the Glasgow Centre for Population Health

The Glasgow Centre for Population Health (GCPH) is a partnership between Glasgow City Council (GCC), Greater Glasgow and Clyde NHS Board and the University of Glasgow, supported by the Scottish Executive. A research and development centre, focused on health inequalities, it seeks to build a better understanding of Glasgow's health and its determinants, evidence of effective approaches for improving health in Glasgow, and new insights and thinking about population health, suited to the 21st century.

Through its core staff team and commissioned projects, the Centre undertakes new research, brings together people from diverse backgrounds, provides opportunities for analysis and debate about past and current approaches to improving Glasgow's health and seeks to inform future public health policy and practice in a range of areas.

The research study

The elected members of Glasgow City Council (GCC) were interested in a formal evaluation to elicit evidence of good practice and effective approaches in the provision and promotion of healthy food and drinks in schools, and to explore effects both within and beyond the school in order to identify where further improvements and development could be made to optimise services.

GCPH, in collaboration with Direct and Care Services (DACS) and the Education Department of GCC, conducted quantitative and qualitative research in selected Glasgow primary schools in May 2006 to ascertain types of food and drinks consumed across the school day and to explore the influence of the physical and social environment on food choices. Six primary schools situated in the North of Glasgow were selected to participate in the research. All six schools were located in areas of high socio-economic deprivation.

This report provides an overview of findings and trends from analysis of data gathered from the six participating schools.

AIMS AND PURPOSE

The overall aim of the research was to investigate the impact of the availability of healthy choices through GCC's school meals service on actual consumption of food and drinks by pupils, to identify differences in consumption between groups, and to identify important influences in relation to the physical and social environment.

Research questions were:
1. What foods/drinks are currently consumed and discarded by Glasgow school pupils?
2. What is the quality of the physical and social environment with regard to provision of food and drinks in schools?
3. Are there differences in consumption between different groups of pupils?

APPROACH AND METHODS

A research agency was commissioned to conduct fieldwork, analyse data and to collate and write up results. Data collection took place in six primary schools during May 2006; researchers spent three days in each school collecting the following data:
- photographs of the general physical environment of the school and activity during breakfast and lunchtime;
- observations of the physical and social environment during breakfast and lunchtime; consumption and wastage of food and drinks during that period;
- a questionnaire survey with pupils who attended breakfast service and with a stratified random sample of P1–P7 pupils who took a school lunch;
- a questionnaire survey with class teachers in each school regarding distribution and consumption of fruit.

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Profile of schools

All six schools were situated in deprived areas. An extract from a map produced by the Scottish Executive Geographic Information Service, of Glasgow City primary and secondary schools mapped by the Scottish Index of Multiple Deprivation, locates primary and secondary schools geographically and uses colour coding to represent degree of deprivation.[11] All six schools were located in the darkest blue areas on this map.
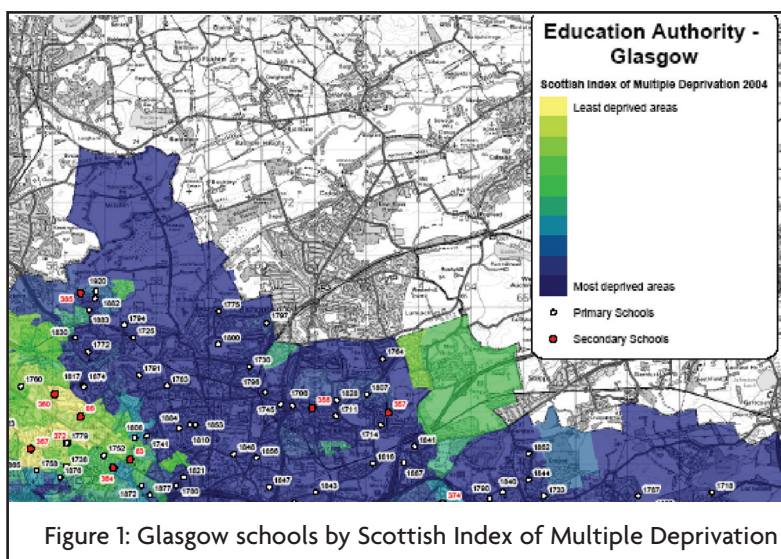
Figure 1: Glasgow schools by Scottish Index of Multiple Deprivation

Table 1 presents selective socio-demographic data for the combined school population with comparisons (where possible) with Glasgow and Scotland. These data were obtained from the Scottish Executive[a] and from Glasgow City Council Education Department.[b] Individual level school data are not presented to preserve anonymity of participating schools.

[a] Data obtained from Scottish Executive School Statistics Department and National Statistics Publication – School Meals in Scotland 2006.
[b] Data obtained from Glasgow City Council School Roll and Free Meal Entitlement Information 2005-2006

Table 1: Socio-demographic school data

	Participating primary schools	Glasgow	Scotland
Primary school roll Percentage of pupils from black and ethnic minority background	1,097 11% of total primary school population	40,577 13% of total primary school population	390,725 Not available
Free meal entitlement (FME) [c]	58%	36%	18% of total population
Pupils present taking school lunch	798	21,874	175,478
Percentage of pupils present taking school lunch	73%	60%	47%
Pupils attending breakfast service on a daily basis	289	7,532	N/A

[c] Under the conditions of the Education (Scotland) Act 1980, parents who are in receipt of Child Benefit and one of the following benefits can apply for free school meals for their child: Income Support; Jobseekers Allowance (Income Based only); Child Tax Credit only (with an income of less than £14,155 and no Working Tax Credit)

FINDINGS AND CONCLUSIONS

Breakfast service

The breakfast service appeared to run very smoothly due to effective management systems employed by catering staff. There was a relaxed atmosphere, pupils seemed happy and at ease. All schools provided space for pupils to play indoor games or the option to play outside after they had eaten breakfast.

Two hundred and five pupils who attended breakfast service were surveyed during the research period, representing 71% of the Glasgow City Council total for breakfast service attendees in the participating schools.

Figure 2 displays breakfast service attendees by year group across the schools. A high degree of variability is evident across schools. Primary 4 – 7 pupils comprised the majority of attendees.

Figure 2: Breakfast service attendees by school
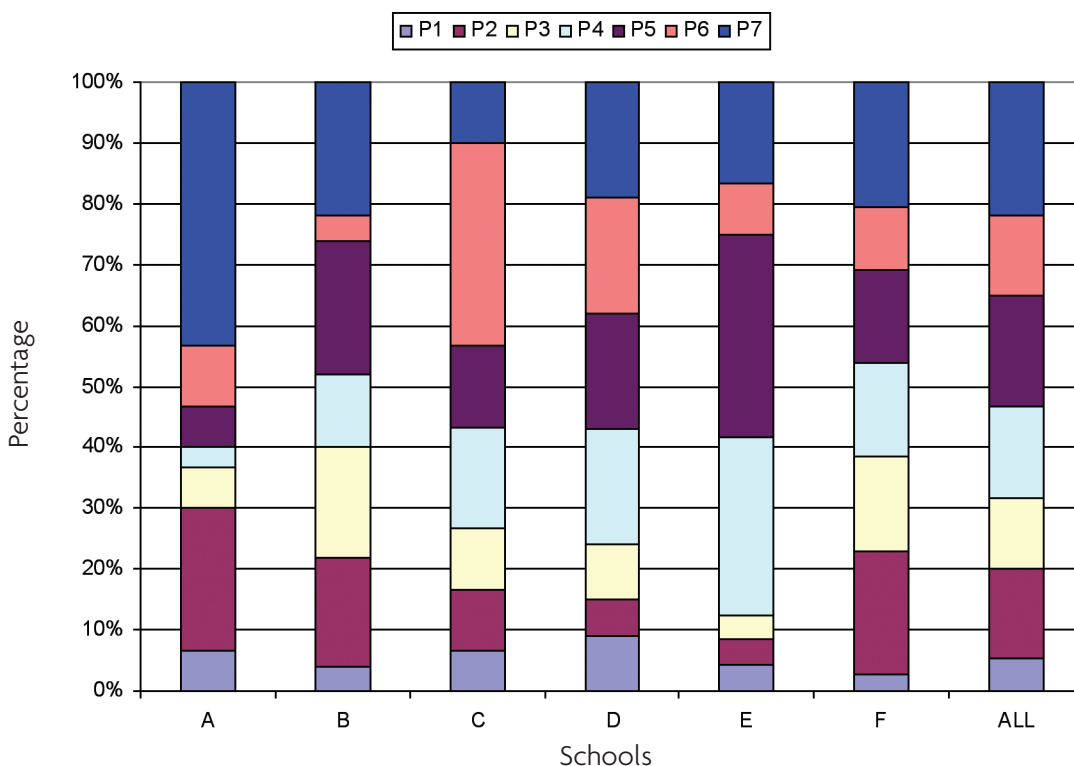
(N = 205, Missing = 0)

- Approximately 65% of attendees had free meal entitlement;
- 31% of respondents had breakfast at home (usually cereal or toast) before attending the breakfast service ;
- Toast and pure apple juice were the most popular food and drink choice;
- On average, 6% of food and drinks was discarded at breakfast time.

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Lunchtime

Observation

Across the six schools, there were differences in their physical design and appearance, and in the organisation of lunchtime, management of pupils and the promotion of food.

There were six meal options at lunchtime and when teachers described the meals to their pupils, it helped pupils to make their selection. The order in which classes went to lunch varied across the week in each school. Pupils in an early lunch sitting had the full choice of meals on offer. Pupils who had lunch in the later sittings often had limited meal choices. Senior teachers eating lunch with pupils, effective queue management systems and constructive interaction with the pupils all had a positive impact on the dining environment.

In addition to their meals, pupils could also choose from a 'pick n mix' selection which included soup, bread, fruit, vegetables, yoghurt, milk and pure fruit juice. Uptake of these additional items was affected by their placement in relation to the serving counter and the extent to which staff promoted the items. There were marked differences among the six schools in the average number of 'pick n mix' items sold per pupil. In the schools where these items were placed on the main serving counter, rather than elsewhere in the canteen, pupils selected a greater number of items. Active encouragement by staff also increased uptake.

Observation of consumption and wastage at lunchtime illustrated variation in the amount of food discarded between the various food and drink categories and meal types that were on offer (see Table 2). Main meals containing vegetables such as peas and sprouts had higher proportions of waste than those where the vegetables were 'hidden' such as in chicken curry and beef casserole. Lower wastage of food categories such as salad fayre, salad bowl and fruit may be a reflection of the pupils choosing these items being more motivated to eat this type of food.

Table 2: Lunch wastage by meal type

| Food category	Estimated percentage waste
Main meal	26%
Cold sandwich	25%
Vegetarian main meal	23%
Hot sandwich	19%
Portion of vegetables	19%
Snack meal	17%
Salad fayre	13%
Salad bowl	10%
Fruit	10%
Drinks	10%
Other	5%
Total	11%

Questionnaire survey

Five hundred and fifteen pupils from P1 – P7 classes were surveyed across the six participating schools. This sample represented 65% of the pupil population who took school lunch. Results highlighted that, on the day that pupils were surveyed:

- 85% had eaten breakfast, the majority of whom had it at home;
- 53% had drunk water in class during the morning;
- 79% had eaten a snack at playtime – usually crisps and/or sweets/chocolate;
- 7% of pupils stated they had eaten fruit as a snack;
- 6% had a fizzy drink at break time;
- 22% had a carton of juice, water or a yoghurt drink.

Figure 3 illustrates snack consumption by year group. This was a multiple response question so the number of responses is higher than the number of pupils who answered the question. Crisps and sweets/chocolate were popular snacks across all year groups. Multiple responses were recoded to allow analysis of snack consumption as one response per pupil. Further Chi square analysis on these recoded variables showed that 60 percent of those who had a snack ate crisps and significantly more pupils who ate crisps were girls ($p<0.01$). Crisp consumption also increased with age. A higher percentage of boys than girls consumed sweets/chocolate at break time although this difference was not significant ($p=0.05$). Overall, one in five pupils drank juice at break time. Drinking juice was less common among P7s than the younger pupils.
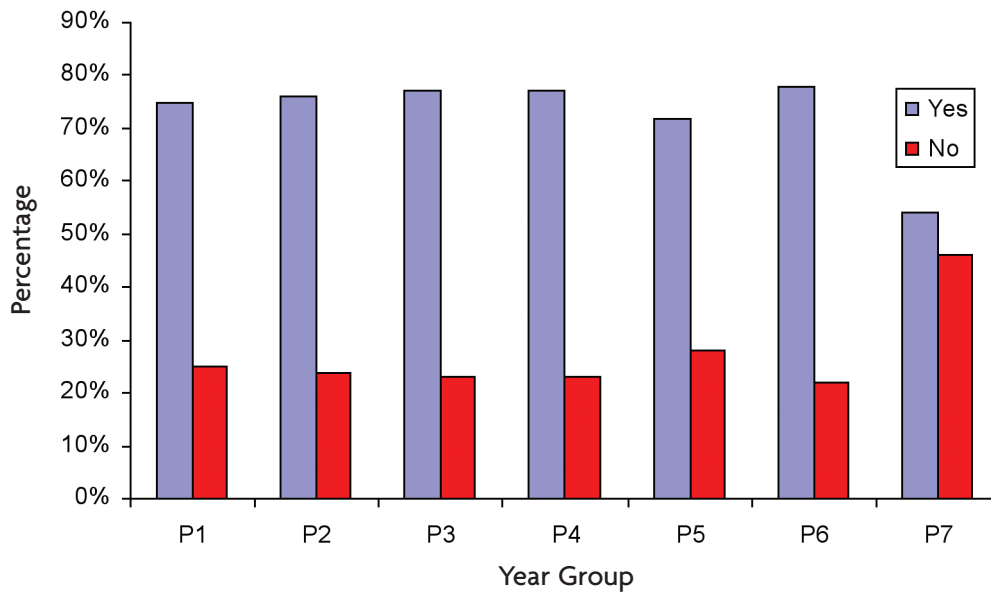
Figure 3: Break time snack consumption by year group
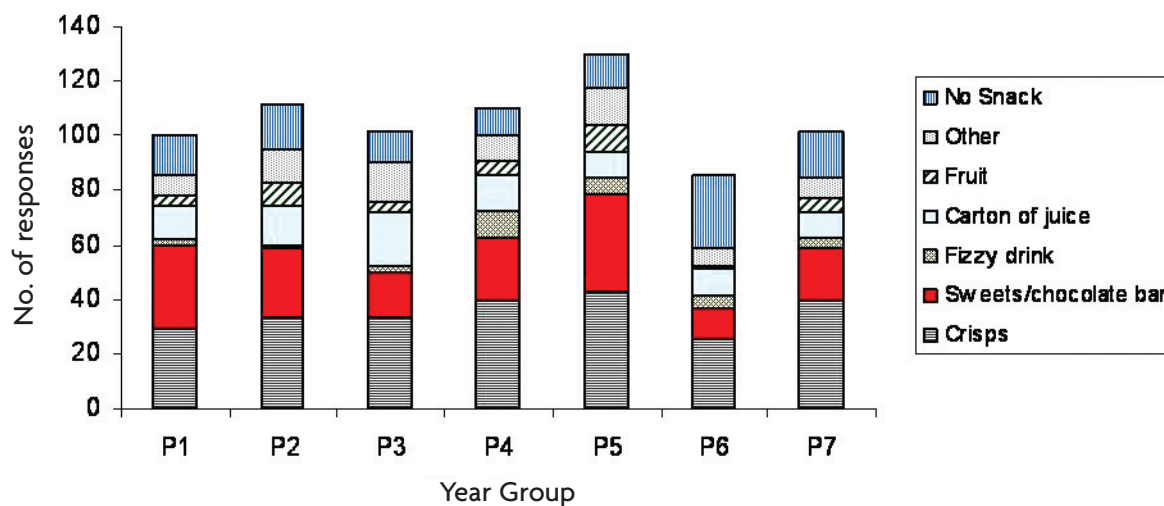
(N = 742, Missing = 0)

Pupils were asked if they were hungry by lunchtime. Figure 4 displays responses. Significantly fewer P7 pupils said they were hungry by lunchtime than pupils in other age groups (p<0.05).

Figure 4: Pupil responses regarding whether hungry by lunchtime or not

(N=515, Missing = 0)

Fruit Plus

Fruit was distributed during the afternoon in all of the schools. According to the questionnaires completed by class teachers:

*   The majority of teachers considered the fruit that was distributed to be of good/excellent quality;
*   Bananas and grapes were the most popular fruits and pears were the least popular;
*   Over 90% of teacher responses indicated that most pupils ate a piece of fruit daily;
*   A greater proportion of P7s than other class groups refused fruit;
*   The majority of teachers were aware of the Fruit Plus pack, designed for use in class to support the promotion and consumption of fruit at school but only 19% of them stated that they had used the pack in their lessons.

The teachers made some additional points about the Fruit Plus pack and the distribution of fruit:

"Great way of encouraging children to eat fruit";
"The pack is outdated and other resources may be more appropriate";
"The children are disappointed when the fruit does not arrive or is late";
"It would be great if the children could try some less mainstream, more unusual fruit".

● **Conclusion**

School food policy plays an important role in the promotion of a healthy diet amongst Scottish children and young people. The recent review of the Scottish Diet Action Plan (SDAP) highlighted that, although the Plan had largely been unsuccessful in meeting its targets, promoting healthy eating and food provision in schools was a significant success story.[12] Factors presented as influential included strong national level leadership and investment by the Scottish Executive; public and political support and integration with HMIE schools performance assessments; clear implementation plans for local authorities to ensure that support existed at all levels; strong branding of HFS which helped to define the project and facilitate a number of other SDAP recommendations. The authors commented:

"The success of food and health policy implementation in schools is founded upon the forging of close partnership working between health and education and a commitment to the shared goal of improving children's diet and improving educational attendance, achievement and attainment by engaging with the health improvement policy agenda. Its successful implementation has also relied on the support of teaching staff, support staff, catering staff and parents."

Not only has this research provided useful information regarding consumption and wastage of food and drinks supplied by DACS, it has reinforced evidence from the literature and from other research studies on the effectiveness of local systems and approaches employed to promote healthy food and drinks and to manage meal times. This study highlights examples of good practice that should prove useful to the wider primary school sector.

Research findings will help to inform future planning and service delivery and an action plan for DACS and the Education Department has been drawn up in response to findings. The Nutrition and Health Promotion (Scotland) Bill will provide further incentive and leadership to ensure that school based provision and promotion of healthy food and drinks continues to develop using a child centred, whole school approach in keeping with the principles behind the health promoting school model.[13] The research findings indicate that Glasgow has already made considerable progress in this respect.

The next phase of the evaluation will provide further important insights regarding the relationship between school based provision of healthy food and drinks and the home. This second stage of the research will explore the impact of school-based initiatives on pupils' dietary preferences and behaviour in their homes and on their families. It will also explore inequalities in impact between groups and influential factors in food procurement and consumption. Qualitative research methods will be used, and the study will take account of the fact that school-based provision and promotion of healthy foods and drinks takes place in the context of many other individual, community and societal influences operating at global, national, regional and local levels. Nonetheless, in order to explore and 'unpack' the context behind children's dietary preferences and behaviour outside school and to plan appropriate services, further dialogue and debate with parents and pupils is vital.

RECOMMENDATIONS

Implications for policy and practice

Physical and social dining environment

Features of the physical and social environment that had a positive impact on the general atmosphere and on pupils' experience at lunchtime were:

- the appearance of the dining room – plenty of natural light, decorated walls, brightly coloured tables and chairs with ample spacing;
- management and co-ordination at mealtimes – well ordered, short queues often resulted in less noise, less disorder and more relaxed catering and teaching staff;
- the presence of teachers eating the same meals amongst the pupils appeared to add to a relaxed and positive eating environment.

Every school is limited by the physical dimensions of its dining room but certain measures would lead to an improvement in pupils' experience of lunchtime. These measures could be as simple as opening the curtains to let in more sunlight, changing the management of the lunch queue or improving the décor or artwork on the walls. An HM Inspectorate of Education (HMIE) report detailing progress on the implementation of HFS cited the importance of a pleasant physical environment and décor in school dining rooms. [14]

Measures to optimise the social environment have also been endorsed by The National Institute for Health and Clinical Excellence in its recently published guidance on effective interventions in schools to prevent obesity. The guidance states that:

"Children should eat meals in a pleasant sociable environment free from distractions. Younger ones should be supervised; if possible, staff should eat with them."[15]

Break time snacks

The majority of pupils ate crisps, sweets or chocolate during break time. If teachers were able to exert more control over food and drinks that children bring on to the school premises, eating habits at break time would be improved. In addition, if the distribution of fruit was moved to the morning it might also help to reduce the amount of unhealthy snacking. The increasing prevalence in childhood obesity at a Scottish level provides an important imperative to promote a healthier diet amongst children and action in this area could provide clear leadership on this issue.[16] Fifty nine per cent of five year old children in Greater Glasgow have obvious or advanced tooth decay - the consumption of sweets, chocolate and fizzy drinks plays an important part in poor dental health.[17]

Lunchtime

Meal options - making decisions

There appeared to be a number of factors that influenced pupils in their selection of food and drinks at lunchtime. The display tables used in all schools were a helpful way of showing children what food was available. The descriptions provided by some teachers in conjunction with the display tables assisted younger pupils to choose and this practice could be extended to other schools. Help from school staff to ensure pupils were able to make choices at lunchtime was also recommended by the HMIE report.

One school employed a 'traffic light system' as a signal to the children about the 'healthiness' of the meals on offer. Although this approach is well intended, all Fuel Zone meals are nutritionally balanced and incorrectly labelling some foods as 'unhealthy' sends out confusing messages to the pupils and the staff.

The uptake of items from the 'pick n mix' such as fruit, yoghurt, and soup varied significantly across the six schools. Opportunities for pupils to consider their choice and for staff to encourage pupils to select items were enhanced by locating 'pick n mix' items on or very near serving counters.

Meal options - availability

Pupils' meal selection was influenced by the order in which they came to lunch, with far fewer options for pupils towards the end of the rota system. On a daily basis, the number of portions per meal category to be made available was estimated based on the perceived popularity of the meal and number of portions sold previously. Whilst minimising the number of unsold meal portions is important to the efficient management of the catering service, balancing this against the ability to offer pupils a variety of choice can be difficult. It would be beneficial to consider ways to ensure that pupils towards the end of the lunch period still have a similar meal choice to those who have earlier access to choices.

Meal consumption

The most frequently discarded food was vegetables. When the vegetables were incorporated into the main meal there was less wastage. The importance of overtly influencing the healthy eating behaviour of school-aged children is recognised but it is likely that the use of vegetables by stealth, alongside the promotion of eating 'visible' vegetables needs to continue to promote uptake. Research commissioned by the Food Standards Agency in 2004 concluded that theory-based food education lessons alone were unlikely to alter eating behaviour. The most successful interventions were those perceived by children to be novel and fun, using cartoon characters, multi-media or the internet, and were 'hands on' e.g. involving growing foods, or cooking classes. Covert canteen manipulations seemed to be most effective in reducing fat and salt but these measures did not provide education about healthier eating choices. [18]

Water consumption at meal times

The amount of water consumed during mealtimes was low, partly due to the availability and promotion of cartons of pure fruit juice and milk, but also because in most schools, pupils did not have access to their water bottles and no glasses or cups were provided to allow them to drink water. Schools could ensure that fresh, chilled water and glasses or cups are available during all mealtimes.

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Fruit Plus

The distribution of fruit appeared to be successful within the six schools and in general, the fruit was considered to be of good quality. There were some clear favourites such as bananas, and some consistently unpopular fruit such as pears. Some teachers suggested the introduction of more unusual fruit for pupils to try and that existing fruit supplied could be reviewed to reflect the popularity of some fruits and to test out the opportunities to distribute less common fruits.

The Fruit Plus pack was used by only a minority of teachers. Reasons included lack of time and a view that the pack was outdated. A new curriculum pack is currently in the final stages of development as a collaborative project between NHS Greater Glasgow and Clyde, GCC Education Department and DACS. As well as covering healthy eating, this new pack provides resources for several other health related topics to provide a more holistic resource which teachers should find relevant and useful to a number of areas in the curriculum.

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CONTACT

Fiona Crawford

Public Health Programme Manager (Local Authority Health Improvement Programmes)

Glasgow Centre for Population Health

Level 6, 39 St Vincent Place,

Glasgow G1 2ER

Tel: 0141 221 9439

Email: fiona.crawford@drs.glasgow.gov.uk

Web: www.gcph.co.uk