

*Fresh Fruit in Schools
evaluation 2002-2004:
summary report*



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Introduction

The importance of good nutrition

Good nutrition is essential during childhood, as it is a time of rapid growth, development and activity. This is also a vital time for healthy tooth development and prevention of decay. A balanced diet in childhood helps to ensure that children grow well and do not get overweight as they get older. It is therefore important that the food and eating patterns to which young children are exposed - both in and outside the home - are based on good nutrition.¹

The role of fruit and vegetables in a healthy balanced diet is well recognised.¹ They have an important role in protecting against several major health problems that affect Northern Ireland, including heart disease and cancer. They also make valuable alternatives to confectionery and crisps as between-meal snacks. Experts recommend that we eat five or more portions of fruit and vegetables each day.²

Recent research indicates that there is much that can be improved about eating patterns among people of all ages in Northern Ireland. The *Eating for Health?* survey published in 2001 highlighted that the consumption of fruit and vegetables in Northern Ireland is much lower than is currently recommended.³ For example, according to their parents, only 12% of 5-11 year old children in the survey ate five or more portions each day, while 15% do not eat any fruit or vegetables on a daily basis.

In contrast, children here eat a lot of snacks that are high in fat and/or sugar. For example, more than two out of five boys and almost half of girls aged 5-11 years were reported to eat confectionery at least once a day. Around half of boys and girls of the same age were also reported to eat savoury snacks such as crisps at least once a day.³

This research also indicated that people from low income households tended to have less healthy eating patterns generally, and to eat less fruit and vegetables in particular, than those living in more affluent circumstances. These groups also reported most difficulties in making dietary changes because of issues such as the cost, availability and accessibility of fruit, vegetables and other healthy food choices. People from low income households are also known to experience more ill health and to die younger than those from higher income households.

Encouraging and enabling young children to develop healthy eating patterns offers great potential to invest in public health for generations to come. Research highlights that eating patterns developed during childhood tend to be continued into adulthood.⁴ Many of the chronic diseases that occur later in life begin to develop during childhood.

Young people's eating patterns can be shaped through a variety of routes. Schools offer a most important opportunity for educating children on nutritional issues and facilitating and encouraging healthy eating patterns alongside the development of academic and social skills.

The Fresh Fruit in Schools pilot scheme

In October 2002 the Fresh Fruit in Schools scheme was launched. The scheme has its roots in the public health strategy, *Investing for Health*.⁵ This strategy, developed by a cross-departmental group (the Ministerial Group on Public Health) and launched in 2002, provides a framework for action to improve health and wellbeing which focuses in particular on the sources of good health and on inequalities in health.

The Fresh Fruit in Schools scheme was developed by the Investing for Health team at the Department of Health, Social Services and Public Safety, the Health Promotion Agency for Northern Ireland (HPA) and the four Health Action Zones (HAZs) as a pilot project that would initially provide free fruit to selected schools. Funding for the scheme was secured by the Ministerial Group on Public Health to run between October 2002 and June 2004. The scheme was coordinated regionally by the Investing for Health team and managed and delivered locally by the four HAZs.

The Fresh Fruit in Schools scheme aims to provide one piece of fruit per day to children in P1 and P2. The main objective of the scheme is to raise awareness of the benefits of fruit consumption among children and to instil healthy eating practices at an early age. In total, 87 schools were chosen from within the four HAZ areas to participate in the scheme. Schools were selected on the basis of deprivation criteria such as higher provision of free school meals (FSM) and elevated scores on a scale for decayed, missing or filled teeth (DMF).

In addition to existing local experience, a similar scheme, the National School Fruit Scheme, has already been piloted in more than 500 schools in England. The initial evaluation there showed that the scheme was popular with the children, their parents and teachers.⁶ There is some evidence that the scheme is encouraging children to choose fruit. In some instances children are reported to have overcome their initial reluctance to eat fruit or to try new fruits, largely as a result of positive peer influence.

The evaluation of the National School Fruit Scheme also highlighted a number of wider benefits in the school. For example, teachers report that the scheme is a support to teaching and learning about healthy eating and has been used to support science, numeracy and literacy in schools. Other benefits of the scheme included improved attention levels, an increased ability to settle down to work and better behaviour generally among the children.⁶

Aims of the Fresh Fruit in Schools pilot scheme:

- to provide access to fruit for P1 and P2 children within selected schools;
- to promote awareness of the benefits of healthy eating and good food hygiene;
- to encourage children to develop the habit of eating fruit;
- to encourage children to adopt and sustain healthy eating patterns in school, at home and in the community.

Aims of this report

This report briefly outlines how the scheme was organised and presents summary findings from the evaluation of the first two years of the scheme. The evaluation examined the process of introducing and managing the scheme, and assessed the impact on schools, the children and their parents.

How the scheme operated

Selection of schools

Schools were selected for the pilot from the four HAZ areas using a range of indicators including:

- the proportion of school pupils receiving free school meals (FSM scores);
- Noble indicators (Noble deprivation measure);⁷
- levels of decayed, missing or filled teeth (DMF scores);
- school type (controlled or maintained);
- rural/urban location (in Armagh and Dungannon and Western HAZs);
- geographical spread within the HAZ area.

Additional criteria

In North and West Belfast HAZ an additional criterion was applied. Participation was made dependent upon signing up to a healthy snack policy, which involved all children in the school being restricted to only milk, water, fresh fruit or vegetables during mid-morning break time.

Profile of participating schools

In total, 87 schools took part between October 2002 and June 2004. This comprised 20 schools in North and West Belfast HAZ, 15 in Northern Neighbourhoods HAZ, 22 in Armagh and Dungannon HAZ and 30 in Western HAZ. Participating schools were from a range of school types including controlled, grant maintained and special category schools, eg Irish speaking, integrated and special schools.

Management and administration

To facilitate the management and administration of the scheme, each of the areas brought together representatives from a range of sectors to form a steering group for their area. Membership comprised representatives from local schools, health promotion, oral health, the community dietetic service, local Education and Library Boards, the school meals service and the local council. Schools were also advised to identify one member of staff to act as fruit coordinator. In many schools this was the principal.

Supply of fruit

The process for supplying fruit varied between the HAZ areas. In North and West Belfast HAZ, the emphasis was on supporting local suppliers and businesses. Schools were given scope to pick their own supplier, and five local suppliers and one supermarket were selected. Schools negotiated regularity of delivery from all suppliers except the supermarket, where teachers purchased fruit daily. In this HAZ area the steering group drew up quality standards and complaints were communicated directly to the supplier.

In Armagh and Dungannon HAZ, fruit suppliers were invited to tender to supply fruit to schools. The type of fruit supplied was reviewed monthly by the steering group. The Northern Neighbourhoods and Western HAZs linked with the school meals service. Schools in these areas liaised directly with the school meals service on issues of type of fruit, quality and delivery schedule.

Support to schools

All the HAZs supported the schools in their areas with regular visits and advice and guidance on healthy eating. A regular seminar for principals was held to introduce the scheme and to keep schools informed of evaluation outcomes and developments. In North and West Belfast HAZ, schools were provided with advice on developing a healthy eating policy and in Western HAZ they were supported to enter the Health Promoting School Awards in that area. Financial support was provided in some HAZ areas to cover the costs of necessary equipment such as chopping boards. In two HAZs wormeries were provided to schools via partner organisations.

Cost

The budget for the first two years of the Fresh Fruit in Schools scheme was £400,000 (£200,000 per year). Twenty percent of funding was spent on the regional elements of the scheme including resource materials and promotional items, research and evaluation. The remaining £320,000 was given to the Health Action Zones for coordination of the scheme and the procurement and distribution of fruit. Across the four areas the average spend on fruit was approximately 80% of the allocated budget with 20% spent on scheme coordination.

Regional elements

The HPA developed a range of support materials and resources to promote the scheme, which was branded as “The Snack Pack”. A number of Snack Pack cartoon characters that would appeal to children were developed in order to create a scheme identity and to encourage children’s involvement in and loyalty to the scheme. The Snack Pack characters were featured on all the materials produced to support the scheme, which included:

- **Information for schools:** an A4 booklet outlining the aim of the scheme and the practical issues that would need to be addressed when considering the school’s involvement in the scheme. This was produced in both English and Irish.
- **Teachers’ support materials:** an A4 booklet offering a wide range of suggestions for linking with the curriculum. This was produced in both English and Irish.
- **An A3 size classroom poster:** featuring 12 common and less familiar fruits.
- **A series of activity sheets:** for use by the children.
- **Information for parents:** an A5 leaflet outlining the aims of the scheme and the health benefits of eating more fruit (and vegetables), and urging parents to encourage their children to eat the fruit provided. It also outlined suggestions for how fruit (and vegetable) consumption could be increased at other times of the day. This was produced in both English and Irish.
- **A range of promotional items:** these could be used by teachers as prizes for competitions, to reward good work, or to encourage consumption of fruit. They included stickers, mugs, pencils, erasers, rulers, sharpeners, frisbees, yo-yos and fridge magnets, all branded with the Snack Pack characters.
- **A website:** www.thesnackpack.net was created to support the scheme and to allow teachers to access PDFs of the printed materials.

The HPA was also commissioned to manage the evaluation of the scheme on a regional basis.

Evaluation aims, objectives and methodologies

Aims

To assess:

- the best means of delivering and distributing fruit into schools;
- the impact this has on children's diet, and other effects on the child, the classroom, schools and parents;
- the sustainability and wider application of the project.

Objectives

To assess:

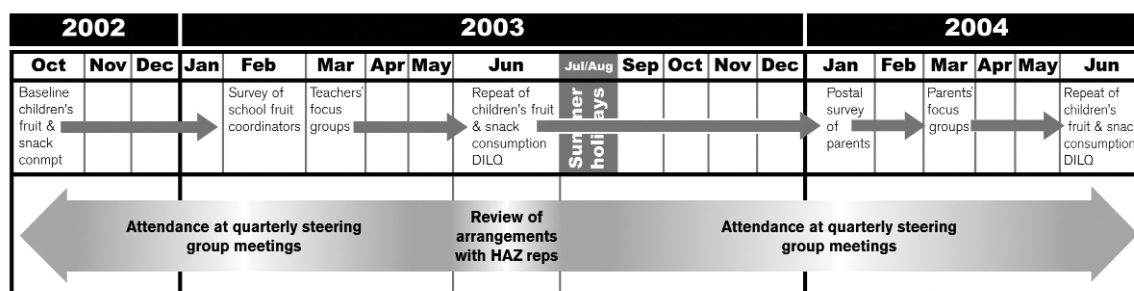
- the operation of the scheme - supply and distribution, and sustainability;
- the impact on children's consumption of fruit;
- the impact on the classroom, and the wider school;
- the impact on eating habits at home, and any other impacts.

Overview of methods

A variety of methods, both quantitative and qualitative, was used to gather the data and information needed to fulfill these objectives over the two years of the pilot. The evaluation approach was designed to be flexible from the outset, so that if issues arose that required further investigation or investigation using a different approach, this could be facilitated.

Evaluation work was carried out with school fruit coordinators, teachers, children and parents, as well as with the HAZ representatives. Figure 1 summarises the methods used over time.

Figure 1: Evaluation timeline



Evaluation carried out with school staff was based on a postal questionnaire sent to all schools and a number of focus groups held with teachers. Parents' views and opinions were gathered by means of a postal survey supplemented by focus groups.

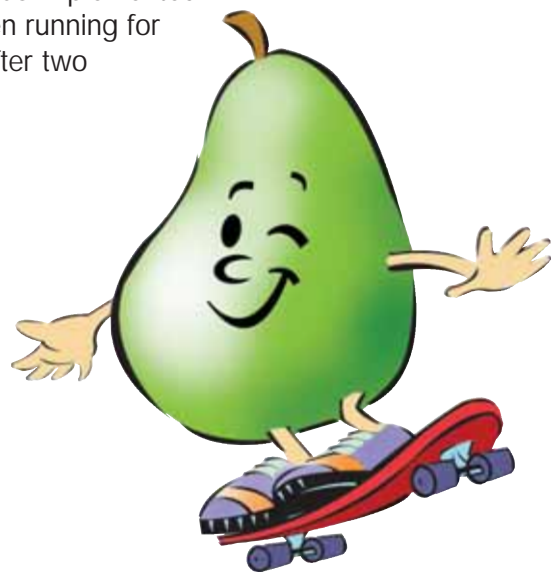
A method of evaluation also had to be developed to assess whether children's consumption of fruit and of high fat/high sugar snacks changed over the course of the pilot scheme. Research with children of this age (four to six years old) can present difficulties, because understanding the question and recalling the answer depends on the child having reached a certain level of cognitive development. A self-completion instrument already existed called the "Day in the Life of..." questionnaire (DILQ), which was designed and validated for use with children aged between seven and nine years old.⁸ In consultation with teachers, we adapted this instrument for use with P1 children, and trialled it on a small number of children.

Taking a more qualitative approach, we used the DILQ as a prompt to aid discussion between the child and the researcher. Using the questionnaire to prompt the child about each stage of their day, the researcher asked what they had to eat at breakfast, on the way to school, at break time, and so on until bedtime, and recorded their response. The responses were analysed and relevant foods were then categorised as either fruit or snacks. A daily fruit score and a daily snack score were then calculated for each child in the study. This research was carried out with a sample of 160 P1 children immediately before the scheme began to measure a baseline (October 2002). It was then repeated with the same children at the end of the first year (June 2003) and at the end of the second year (June 2004) of the pilot scheme, and the scores were compared over time to measure any changes in the children's eating habits.

A mean fruit score and a mean snack score were calculated for all individuals in the sample and also for every school. Comparative analysis (one way analysis of variance - ANOVA) was carried out to assess if there were any statistically significant differences by sex, HAZ area, school size (proxy for rurality), management type and whether or not a school has any other health initiative in place at each phase of the scheme. Chi-square was used to investigate differences in fruit score throughout the scheme.

Free school meal entitlement (FSM) was also used as a proxy for school socioeconomic status (SES). It is important to note, however, that schools were deliberately chosen to take part in the scheme because they were located in areas of social disadvantage. The average FSM for all schools involved in the Fresh Fruit in Schools scheme is 44%; this compares to an average of 28% for Northern Ireland as a whole. So these categories are only relative to each other, not representative of the SES of schools in Northern Ireland as a whole. Schools were categorised as low FSM if the level of entitlement was between 0 and 28%; medium if FSM was between 29% and 53%; and high if FSM was between 54% and 100%.

Further analyses (paired t test) were also carried out to assess if there was a statistically significant difference in scores before the scheme was implemented (baseline, October 2002), after the scheme had been running for one academic year (year 1, June 2003) and again after two academic years (year 2, June 2004).



Summary findings

Supply and distribution

Overall, schools were very satisfied with the reliability of their fruit deliveries, with 93% rating it as excellent or good. However, the quality of fruit delivered was rated as excellent by less than half the schools (38%). Those in the North and West Belfast HAZ area (where schools chose their own local supplier) were more likely than schools in other areas to say the quality of their fruit was excellent (60%).

The role of fruit coordinator was most likely to be filled by the school principal/head teacher (39%), followed by P1 teachers (25%) and P2 teachers (12%). Only 5% of coordinators were non-teaching staff. In some cases responsibility for coordination was shared.

School catering staff were most likely to be responsible for receiving deliveries of fruit (39%). Classroom assistants were most likely to be responsible for washing fruit (69%) and dividing it into batches (63%), with teachers most likely to distribute the fruit (66%) and to supervise children eating it (52%).

Although teachers regarded the time taken to distribute the fruit as worthwhile, almost all teachers stated that the classroom assistant was vital to the smooth running of the scheme. This was time that the classroom teacher could not justify taking out of their teaching time each day.

The majority of schools distributed the fruit at morning break (91%), with 4% of schools distributing it before the school day begins. Compared with other schools, schools in the Armagh and Dungannon HAZ area were more likely to distribute fruit at the beginning of the school day rather than at break time.

Although many teachers initially expressed concern over the possible encroachment on their time, many also identified the scheme's potential for enhancing current healthy eating policies within the school. The scheme was considered to be a big encouragement for P1 and P2 pupils to eat more healthily at break time.

“as a school we encourage healthy eating, without much success though as children are very much into crisps and fizzy drinks, we have managed to ban sweets a few years ago, no real success of getting children interested in fruit. But now the fruit is free it has made a real difference to the P1 and P2 children's eating patterns at break time”
Western HAZ P2 teacher

While nearly half of schools (47%) were concerned about the additional demands on staff time before the scheme began, this dropped to 23% once it had been up and running for three months. The amount of staff time taken up varied depending on how the school approached the implementation of the fruit scheme. For those schools that handed out a whole piece of fruit to each child, the time required was approximately five minutes to ensure that all fruit was washed. Schools that cut the fruit into pieces spent more time, requiring about 10-15 minutes to prepare and distribute the fruit, and to ensure that everything was cleaned up afterwards. The majority of schools (95%) felt that the demands placed on staff time by the fruit scheme were reasonable.

Information and promotional materials

The vast majority of schools (90%) made use of the information and promotional materials. Promotional materials were more likely to have been used to reward pupils in the North and West Belfast and Western HAZs than in the other HAZ areas.

Teachers were pleased with the quality of information initially provided about the scheme, with many stating that it was “very informative” and “well thought out”. Schools reported a wide variety of uses for scheme materials, with 82% using materials for topic work and 76% as visual aids. Just 11% of schools reported using scheme materials for homework purposes. Overall, 96% of schools reported that the scheme had helped with teaching of the school curriculum over a broad range of topics. Table 1 below shows the subject areas highlighted by the schools that used the scheme to support the curriculum.

Table 1: Aspects of school curriculum that the scheme was used to teach

	Yes (%)
Health education	97
Science	82
Social skills	65
Numeracy	64
Art	63
Literacy	56
Geography	33
Cooking	24
Information technology	23
Base (n): 78	

The impact on the classroom and the wider school

Virtually all schools (99%) welcomed the scheme as a supplement to children’s diets and 100% agreed that it supported teaching about healthy eating. None of the participating schools withdrew from the scheme over the course of the two year pilot project.

Some schools said it helped consolidate efforts they had already been making to get the children to eat more healthily at break time. Teachers had previously found that when rules restricting high sugar/high fat foods were introduced, many children didn’t bring anything to eat at break time. The free fruit ensured that every child had something to eat.

Almost 6 out of 10 schools (59%) reported that participation in the fruit scheme had led to the development of positive outcomes for the school that were not directly concerned with healthy eating. The three most common benefits reported were decreased litter (59%), improved ethos and atmosphere of the classes involved (58%) and greater involvement with other health promoting schemes (58%).

Over a third of schools reported improvements in pupils' concentration levels (38%) and in their ability to settle down to work (36%). Improvements were more likely to be reported in HAZ areas where additional snacking restrictions had been implemented (ie North and West Belfast and Western HAZs).

Teachers spoke of a knock-on effect; a number of schools now supplied the whole school with fruit either one day a week or on a less regular basis. HAZ coordinators were aware of schools now being more willing to take on health promoting schemes and suggested that free fruit almost acted as a catalyst for other health promoting initiatives within the school.

Changes in consumption of fruit

Despite early concerns, all teachers were pleasantly surprised at the ease with which almost all children developed the habit of eating fruit at break time. Teachers were aware of very few children, if any, who did not participate in the fruit scheme.

"I am surprised as to how well the children have taken onto eating only fruit at break time, I did expect there to be a number of problems with it"

North and West Belfast HAZ teacher

Both teachers and children reacted positively to the introduction of the free fruit. Three out of four schools reported that their pupils had eaten all or nearly all of the fruit and 90% of teachers said they believed that consumption of fruit had increased among the target group since the scheme began.

The majority of teachers stated that the main positive aspect of the scheme was that children are now eating more fruit than they would have eaten before, and are eating different types of fruit that they wouldn't otherwise have had the opportunity to try.

"exposed to a wider variety of fruit than they would have previously experienced and every child gets a piece of fruit daily"

North and West Belfast HAZ P1 teacher

The DILQ consumption study carried out with a sample of children in October 2002, June 2003 and June 2004, showed that by the end of two years of the scheme 54% of the children were eating more fruit than before, while 27% showed no change and 19% were eating less (see Figure 2).

Figure 2: Change in fruit consumption between baseline (October 2002) and June 2004

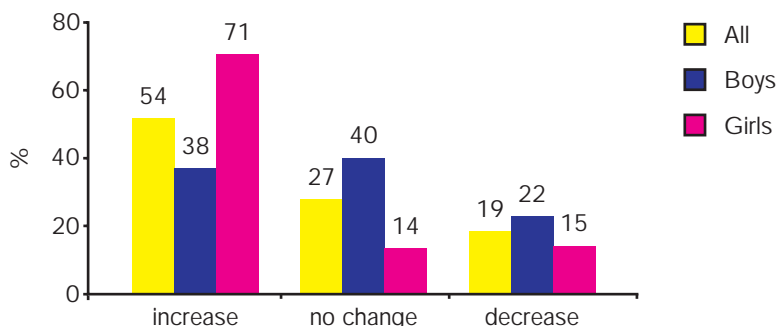
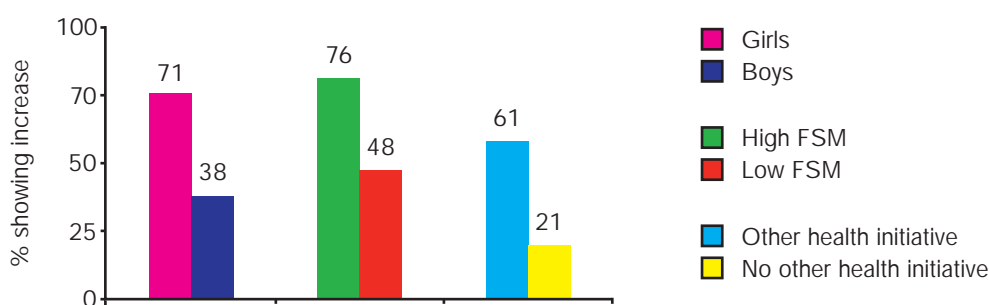


Table 4 in the appendix shows how the children's fruit consumption changed over the course of the scheme, broken down by sex, free school meal entitlement (which gives an indication of local levels of deprivation), school size, HAZ area and whether or not the school had another healthy food/drink initiative in place.

Girls showed a greater improvement than boys: 71% of girls had increased their fruit consumption compared to 38% of boys (see Figure 2).

Children in schools with the highest free school meal entitlement (FSM) and in schools with another healthy food/drink initiative in place showed a greater increase than their counterparts. Over three quarters (76%) of children in high FSM schools increased their consumption compared to 48% of children in the lower FSM schools, and 61% of children in schools with another initiative showed an increase compared to 21% in schools with no other initiative.

Figure 3: Increase in fruit consumption by sociodemographic characteristics



The number of times a child had eaten fruit was added up during the course of the day to give a daily fruit score for each child. The fruit scores for each child were then used to calculate a mean daily fruit score for each school or sociodemographic group. These scores were calculated for the baseline study in October 2002, at the end of the first year of the scheme (June 2003) and again at the end of the second year (June 2004). See Table 5 in the appendix.

Mean fruit scores increased significantly for all groups. The overall mean fruit score at baseline was 0.78. It increased significantly ($p < 0.001$) to 1.30 at the end of the first year of the scheme and to 1.48 at the end of the second year. The slight rise in mean fruit score between the end of the first and second years (1.30 to 1.48) was not statistically significant, which suggests that improvements made during the first year with the introduction of the scheme have been maintained but not built upon.

After two years, variations in mean fruit score were observed between different groups. Figures 4, 5 and 6 all demonstrate that the groups showing the greatest increases in daily mean fruit score at the end of the two years were girls, children from high FSM schools and children from schools with another health initiative in place.

Figure 4: Change in mean fruit score by gender

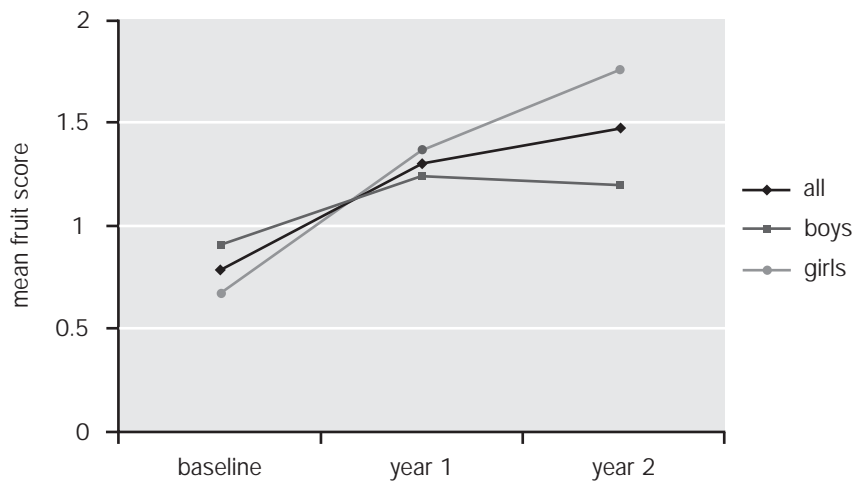


Figure 5: Change in mean fruit score by free school meal category

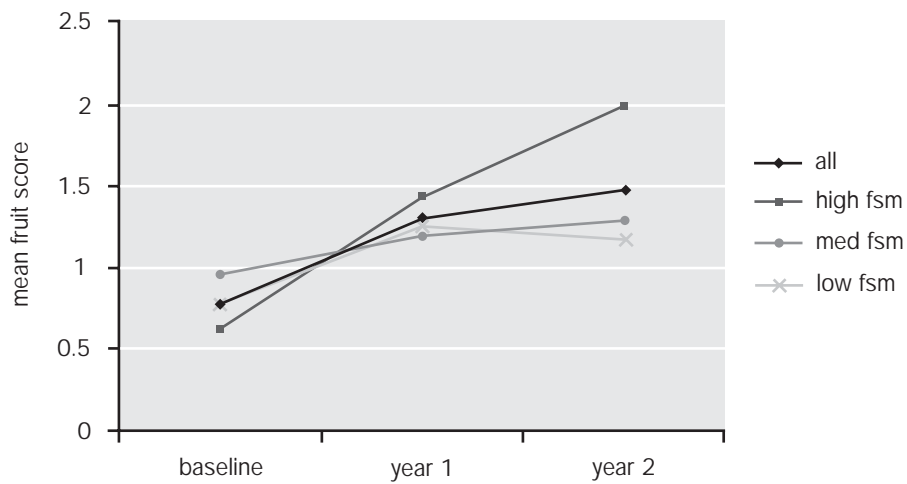
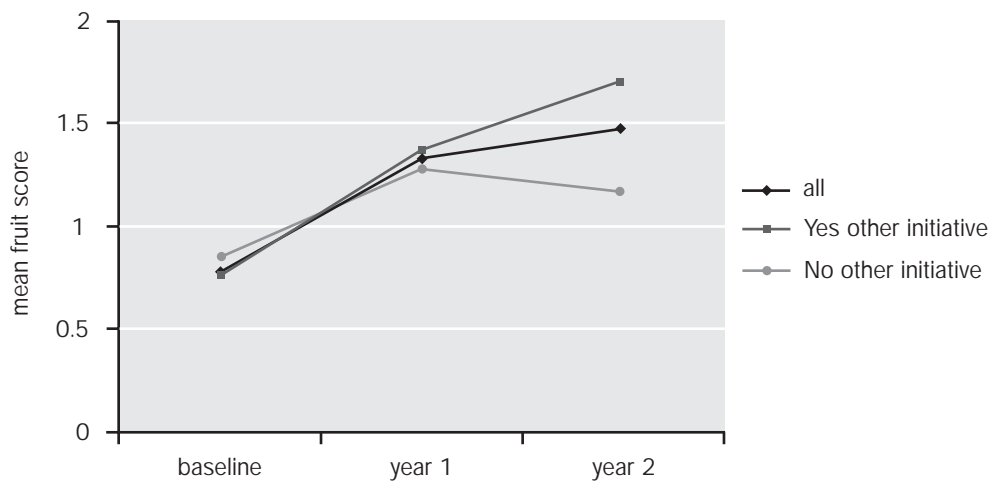


Figure 6: Change in mean fruit score by other healthy eating initiative



Changes to fruit and snack consumption outside breaktime

Consumption data was collected for specific times of the day (eg break time, lunch time, travelling home from school, tea time and after tea time). Table 2 below demonstrates that the changes to the children's daily fruit eating pattern mostly reflect changes to consumption at break time.

Table 2: Mean fruit scores by time of day

Mean fruit scores for all	Baseline	Year 1	Year 2
Overall	0.78	1.30	1.48
Break time	0.33	0.95	1.04
Lunch time	0.17	0.14	0.17
Outside school	0.28	0.21	0.27

As Table 2 shows, at the end of the first year there had been a slight decline in the frequency of fruit being eaten at lunch time and outside school, but both scores had recovered by the end of the second year, resulting in little overall change by the end of the two year pilot period.

The overall scores for fruit consumption outside school mask a marked gender difference. Girls' consumption of fruit increased significantly from 0.18 at baseline to 0.37 by year 2, while boys' consumption outside school declined from 0.37 at baseline to 0.16 at the end of year 2 (see Table 6 in the appendix).

Impact on consumption of high sugar/high fat snack foods

Using the same method as for the fruit scores, daily snacking scores were also compiled for children in the sample and mean daily snack scores were calculated for each school or sociodemographic group (snacks included all high sugar/high fat foods such as confectionery, chocolate, biscuits, crisps). The mean snack score overall had significantly increased from 3.33 snacks per day at baseline to 3.89 at the end of year 2 (June 2004).

When analysed by sociodemographic characteristics, an increased snack score was observed in all groups independent of gender, HAZ, FSM entitlement, school size, management type or other initiatives. This rise was significant in North and West Belfast (2.69 to 4.44), for girls (3.20 to 4.24) for those in schools with the highest FSM entitlement (2.79 to 4.08) and the largest schools (3.64 to 4.62). See Table 7 in the appendix.

Table 3 below presents snack scores by times of day over the three data collection periods: baseline (October 2002), at the end of year 1 (June 2003) and at the end of year 2 (June 2004). The daily snacking pattern reflects mostly the consumption of snacks outside school and highlights the decline in snacking at break time at year 1, following the introduction of the scheme, (this is maintained in year 2). This may be more indicative of the effect of restrictions on snacking (or active discouragement of unhealthy snacks by schools) than the effect of fruit itself.

These findings would suggest that providing fruit in school has had no wider impact on levels of snacking on high sugar/high fat foods at lunch time.

The strict snacking policy in North and West Belfast HAZ has done little to discourage snacking overall, as snacking outside of the fruit time, particularly outside school, has increased significantly over the lifetime of the scheme. However it could be said that the scheme or the policies that have been encouraged alongside it has contributed to a reduction in the number of times that high sugar foods have been eaten over the course of the day.

Table 3: Mean snack scores by time of day

Mean snack scores for all	Baseline	Year 1	Year 2
Overall	3.33	3.19	3.89 ^{bc}
Break time	0.58	0.24 ^a	0.25 ^c
Lunch time	1.04	1.34 ^a	1.54 ^{bc}
Outside school	1.71	1.60	2.10 ^b

^a-significant difference between baseline and year 1

^b-significant difference between year 1 and year 2

^c-significant difference between baseline and year 2

Wider impact on parents' awareness and family eating behaviour

When asked if they were aware of the Fresh Fruit in Schools scheme, 94% of parents surveyed said yes. They were then presented with a number of statements about the scheme and asked to state whether they agreed or not:

- 88% of parents agreed that fruit in school has contributed to their P1/ P2 child having a healthier diet.
- 58% agreed that because of the scheme their children will now eat fruit. Parents of children attending schools with a high free school meal (FSM) entitlement were significantly more likely to agree with this statement (65%, $p < 0.001$).
- 62% of parents agreed that they now buy more fruit as their child asks for it. This varied by HAZ area and FSM category, with significantly more parents of children attending schools in the North and West Belfast HAZ area or with a high FSM entitlement answering yes to this statement.
- However, it appears that some parents who would previously have given their child fruit to take to school for break or lunch have stopped doing so, as 59% agreed with the statement that they do not have to give their children fruit to take to school any more as it is provided. This may account for the 27% of children whose fruit consumption showed no overall change over the two years of the pilot scheme. This suggests that parents see the fruit as a replacement rather than a supplement to their children's diets.
- 60% of parents agreed that their child eats more fruit in school and 52% agreed that their child now eats more fruit at home. This is reflective of the findings in the consumption study.

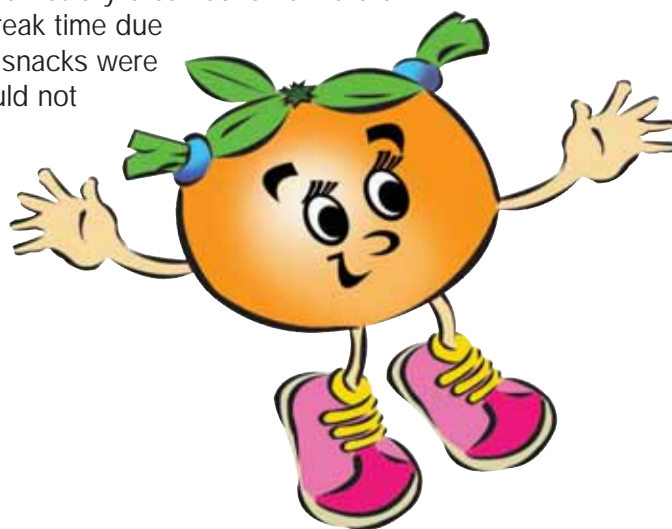
Focus group findings suggested that children's awareness of healthy eating via the scheme could have an impact on parents' attitudes and sometimes their behaviour. Children (particularly girls) were acting as valuable communicators of the healthy eating message. There were several examples in the focus groups of healthy eating advice being transmitted from the child to the parents and of parents acting on that advice in what they now provide for their children.

Compared to the general public, parents of children participating in the Fresh Fruit in Schools scheme were more likely to be aware of the daily recommended intake of fruit and vegetables (71% of parents correctly identified the recommended level as five or more portions a day, compared to 53% of the general public).⁹

Parents did not perceive that there had been a direct positive impact on siblings' consumption of fruit; however, an indirect effect may be indicated by the fact that 62% of parents reported having made at least one dietary change over the last year to their own diets and 97% to that of their family. The most common dietary change reported for the family was to eat more fruit and vegetables (84%).

Parents thought the main advantages of the scheme were that it introduced fruit to children and parents who wouldn't previously have bought or eaten it, and to those who already ate some fruit it provided encouragement to try a wider variety of fruits. Children would try fruit at school that they would not eat at home. Parents highlighted positive peer influence and the fact that everyone got the same thing to eat at break time (removing the element of competition over types or brands of snack) as the key to this.

When asked if they would be willing to contribute to the cost of the fruit, some parents said yes, but others were concerned that paying would be prohibitive. Parents of children attending schools where there was already a healthy break scheme were of the view that if choice was introduced at break time due to a cost being applied, and high sugar/fat snacks were once more an option, then the children would not willingly eat fruit.



Discussion

What are the best means of delivering and distributing fruit into schools?

Supply to schools

There were no major problems with fruit supply for either of the two models used. In the North and West Belfast HAZ area, the HAZ made a positive decision to support businesses in the local community, so chose a process whereby the schools made arrangements with a local supplier. This gave schools a choice of supplier and the opportunity to negotiate on price and choice of fruit. No extra burden on staff was reported for this HAZ area as a result of this arrangement and fruit coordinators in this HAZ area were more likely than those in other areas to rate the quality of fruit as excellent.

In the other three areas a service agreement was made with the school meals service, or in the case of Armagh and Dungannon after a tendering process a provider who also worked through the school meals service was secured. It was felt that this single provider approach would reduce bureaucracy and secure keener prices. Schools liaised with the school meals service on issues of fruit type, quality and delivery schedules, and the arrangements were reviewed periodically. From the perspective of schools and HAZ coordinators, this approach has worked efficiently and has been cost effective. One aspect of this arrangement that is slightly less favourable than the North and West Belfast HAZ approach is that fruit coordinators were slightly more likely to complain about the quality of the fruit and requested a wider variety of fruit.

Distribution within schools

Different schools used different approaches: in some schools the school meals staff took responsibility for receiving and preparing the fruit, while in others the classroom assistants did most of the preparation. Teachers handed the fruit out to the children in the majority of schools. According to fruit coordinators, the burden on staff in reality was less than they had anticipated (before the scheme started 47% perceived there would be a big time burden, this fell to 23% once the scheme had been up and running for three months). Overall, staff felt that the time they needed to put into the scheme was reasonable (95%), but teachers highlighted the contribution of the classroom assistant in aiding distribution.

The majority of schools distributed the fruit at morning break. Dedicating time to distribution was seen as important in encouraging the children to take a piece of fruit, but peer group influence was also important in encouraging children to eat fruit they had never tried before. This proactive approach also emphasised the importance of the scheme to the child and to the parents. In one school where there was no active distribution by staff and where children were expected to pick up a piece of fruit on their way to the playground, parents were continuing to send less healthy snacks to school. Parents highlighted this lack of proactive approach as a reason why their children did not eat the fruit provided.

What impact has the scheme had on children's diet, and what are the other effects on the child, the classroom, school and family?

Children's diet

The greatest improvements in fruit consumption were observed for those whose fruit intake was poorest to begin with, ie girls, those in small schools (rural areas) and those in schools with high free school meal uptake. For a sizeable proportion (27%), there has been no net gain in fruit consumption. It could be interpreted from the data that the intake of children who ate some fruit to begin with has remained the same, suggesting that fruit previously supplied by parents to take to school has been withdrawn in the knowledge that fruit is being provided free in school. Indeed the survey of parents appeared to confirm this, with 59% of parents agreeing that they no longer need to send fruit to school.

Almost one in five children (19%) has shown a decline in fruit consumption. The majority of these are boys and children from schools that have no other healthy eating/drinks initiative in place.

Final analysis across all three phases by time of day shows that statistically significant increases have occurred at break time but not at lunch time or outside school for eating fruit (except for girls). Boys' consumption outside school has declined. It has been acknowledged by others that school based health promotion is often assumed to have uniform effects on boys and girls; however, it is evident here that the impact on boys has not been as great as that on girls.¹⁰ Parents' focus group findings provided examples of children carrying the message home to parents; however, all these examples came from girls. Although we cannot say for certain at this stage, it may be that boys are less likely to communicate either health messages or even just 'what happened in school today' to their parents and so the impact on the parents of boys and on the boys themselves is reduced. This is an area that requires further research.

Another factor evident in pupils whose fruit consumption declined is that they are more likely to come from a school that has no other food policy or initiative encouraging healthy eating in place. From the evidence provided from the areas that imposed a snack policy, we can see that fruit consumption increases when these less healthy food choices are not available. If chocolate, sweets and crisps are an option, children will not choose fruit, which suggests that some sort of discouragement of these foods is necessary to the success of the Fresh Fruit in School scheme. It may also be the case that schools without other healthy food policies or initiatives are less motivated to promote health or healthier eating, which in turn may reduce the impact on the children and the communication of the scheme's messages to their families. A holistic policy would strengthen the message to both the children and the parents.

Having emphasised the positive effect of an overall healthy eating policy, it is important to note that there is also evidence from the consumption data and parents' focus groups that where schools imposed a strict policy that banned high sugar and high fat snack foods then children consumed more of these types of foods outside of school. More research is required to explore the effect of policies which ban or restrict foods, and their impact on the overall eating pattern. Approaches which focus on positive ways to promote health and wellbeing could be more helpful. The use of incentives and rewards as the main motivators also needs to be investigated. Strict bans may encourage what parents referred to as "something illegal" and may make children consider some foods as automatically more attractive just because they are banned, meaning that more 'illegal' foods are eaten outside school than would be otherwise.

While the scheme has done little to impact on the **quantity** of high sugar or high fat snacks consumed, in schools that have implemented a policy banning or strongly discouraging these foods at break time it has had an effect on reducing the **frequency** of snacking, which in turn also has benefits for oral health. The messages on reducing children's access to these foods need to be emphasised to parents.

Communicating the message home

In terms of the scheme's impact on diet at home, findings from focus groups suggested that children's awareness of healthy eating via the scheme or other initiatives was enough to impact on parents' attitudes, knowledge and in some cases their behaviour. However, it is difficult to separate the benefits of the fruit scheme from the benefits of an overall healthy snack policy in terms of the message getting through to parents.

There are specific examples in the focus group findings of parents who have made definite changes to their families' eating habits, for example buying more or a wider variety of fruit, "stopping the lemonade man", or plain biscuits instead of chocolate.

There is a high level of awareness among parents of the recommendation for eating five portions of fruit and vegetables and there is an obvious link between fruit and vegetables and a healthy diet. The focus groups showed that parents know fruit and vegetables are healthy, but that few really understand the specifics of why they are healthy. These parents had no obvious knowledge of the health benefits of eating fruit. Also for a proportion of parents in focus groups the fruit in school helped cancel out the "junk" that the children ate at other times, and in other groups they saw it only as a way of displacing the junk food rather than gaining something nutritious.

While the message has filtered through to home, as noted above, most examples provided in group discussions are from the mothers of girls rather than boys. This may help to explain the gender variation in fruit consumption, particularly out of school hours.

Examples also emerged of children bringing home messages of other children eating less healthy snacks (in disapproval). School policies, taster sessions, theme days and promotional items had all proved useful in communicating the message to the children and this in turn got the message sent home. Communication was most likely to occur when new fruits were sampled. Theme days and taster sessions were important in renewing interest and reinforcing the messages being taken home. All of these effects depend on a proactive school and an interested teacher making use of the additional resources and support on offer from their Health Action Zone, who in particular facilitated vital links with other school health personnel and initiatives.

Impact on siblings

Younger children do not appear to have influenced their older siblings; however, in any further development of the scheme, consideration should be given to the influence of older children on their younger siblings. Parents agreed that there seems to have been little evidence of younger children's consumption of fruit impacting on the habits of older children. There are, however, examples in the focus groups where the younger children aspire to following the habits of their older siblings and are put off healthy foods if they aren't eaten by older siblings or older children. Parents' discussions highlighted the power of peer and older sibling influence, with examples of learned behaviour. This leads to the question of whether P1 and P2 is the right age group to start with. Indeed if the scheme started further up the school with the oldest children, a downward effect might be noted more easily than an upward effect. Findings would suggest that the scheme may have a wider impact if a whole school approach – to a healthy snack policy at least – is taken.

Parents' healthy eating awareness

Parents at the focus groups demonstrated a wide range of levels of awareness of healthy eating messages and this was quite starkly varied by socioeconomic group. The lowest socioeconomic group had little nutrition awareness with the emphasis being on sugar (due to oral health schemes in school) and weight control through diet clubs. These parents often focused on the quantity of food their children ate rather than the nutritional value. There was also some evidence of a belief that more expensive automatically means better. Some parents aspired to being able to provide their children with pre-packaged processed meals specifically targeted at children, as they presume that these foods must be nutritionally designed for children. This highlights the power of advertising, not only over the child, but also over the parents. In addition, some parents who claimed to be aware of healthy eating messages were still misinformed to an extent, eg bananas being hard to digest, not eating apples after a certain time of day.

There is a need for continued and well targeted information about the specific benefits of healthy eating, especially on the benefits of eating fruit and vegetables and how much to provide. Any information developed should underline that the fruit provided in school is a supplement to the child's diet, not a replacement for fruit they already eat, and offer encouragement to parents to keep providing fruit.

Sustainability

The children seemed to have willingly accepted fruit as part of their daily routine and schools are keen for the scheme to be sustained. The question now arises as to how it can be maintained long term. Parents had mixed views about the idea of paying for the fruit; some would willingly pay, but others felt the cost would be prohibitive.

"If you balanced it out say you have a whole squad of wee ones and you had a choice of either going and buying a packet of biscuits and dividing them up or going out and buying a selection of fruit and one won't eat this kind and the other won't eat that, you are going to spend a fortune on fruit then. You are going to take the easy option."

Parent from Western HAZ, high FSM school



Feedback in the parents' focus groups suggested that part of the value of the scheme lay in the fact that everybody had the same thing for break. If choice was reintroduced because the formal scheme was either stopped or made optional (eg if parents had to choose whether or not to pay for fruit for their child), then most parents believed that the children would not willingly continue to choose fruit over other types of snack. Discussions with parents of P3 children confirmed this perception. Once the children left the scheme at the end of P2 and were allowed to choose what to eat at break time, peer influence played a major role. Parents noticed that even though their children had previously happily eaten fruit, they now would not do so, even if fruit was provided, since it was not mainstream for the whole class to eat it.

The main benefits of the scheme are most obvious in the schools where mean fruit consumption was very low to begin with, ie schools with the highest FSM scores (indicating that they are likely to be in an area of socioeconomic disadvantage). Children from these schools showed the greatest improvement in fruit consumption, and parents of children in these schools were more likely to agree that their children now eat fruit because of the scheme, and that they now buy more fruit because their child asks for it.

On the other hand, these parents still had the lowest awareness of the recommended daily intake of fruit and vegetables, and were most likely to agree that they do not have to send fruit to school with their child any more as it is provided. Parents were acting in response to, but not really understanding, the whole healthy eating message. As mentioned above, this shows the need for sustained and well-targeted promotion of the specific benefits of healthy eating, especially of fruit and vegetables and how much to provide. An additional concern is that the scheme is potentially less likely to be sustainable in these schools if parents are asked to pay for fruit.

Conclusion

The evaluation has given early indications of positive impact but it is important to note that a long time is needed to measure fundamental shifts such as behaviour change in parents and children. It is possible that as the scheme continues to embed in school life that other changes will accrue.

Findings indicate that the scheme is achieving the objective of increasing fruit consumption, particularly among those for whom consumption was zero to begin with. This is a considerable achievement in itself. However, the scheme is not having the desired knock-on effect (so far) of significantly increasing healthier eating behaviour beyond the fruit that is being offered at school.

This analysis suggests that when fruit is made available to children they will eat it, but that it may not be the beginning of a whole new healthier eating habit for this age group. Providing fruit in school has not led to a significant increase in the consumption of fruit at any other time of day or at home. This is true particularly for boys and in schools that had no other healthy eating/drinks initiative in place. The message that the fruit is a supplement to whatever fruit the child eats already, and not a replacement for it, is important to schools, parents and the children themselves.

In addition, there is no evidence yet that providing fruit will lead to a decline in high sugar/high fat snacking. Snacking on these foods has shown no decline, and these snacks are eaten alongside the fruit or at another time. At best fruit has displaced snacks at break time, particularly in those schools that have adopted a healthy break time policy. This is still a valuable effect, as it leads to a reduction in the frequency of the children's exposure to high sugar foods, which may contribute to an improvement in oral health. Nevertheless, it is clear that the norm of eating fruit in school has been well accepted and other benefits may accrue over time.

This would also suggest that for maximum effect the Fresh Fruit in Schools scheme is best adopted in schools that are prepared to have a complete healthy eating policy and where all children have the same options for snacks. It also would appear to be more successful in schools that are proactive in reinforcing the message by having a policy or rewards, using the incentives, having theme days or offering a variety of fruits, all of which help get the message communicated to the home and increase the impact beyond break time eating habits.

Future plans

Research with parents during the first two years of the scheme has highlighted that while parents are keen to provide a healthy diet for their children and keen for schools to take an active role in this, they are unsure or misinformed about what a healthy diet really is, which foods are healthier than others and why fruit specifically is so important.

The scheme sought to address some of these issues in its third year (2004-2005) by developing a magazine aimed at and tested with parents, which sought to impart some healthy eating messages and information in an attractive and easy to read format. *Fresh* magazine aimed to emphasise to parents that the fruit provided in school was a supplement to their children's diet, not a replacement for fruit they already ate, and to encourage parents to incorporate more fruit and vegetables into packed lunches and meals cooked at home. Evaluation is ongoing to assess the impact that *Fresh* magazine may have had on parents' knowledge and behaviour.

Another aspect which emerged over the first two years has been the way in which the Fresh Fruit in Schools scheme has acted as a catalyst for schools to become more open to 'health' initiatives in general. Many of the schools taking part have resisted previous efforts by health agencies to engage them in health promotion, eg oral health or healthy eating initiatives. Schools and steering group personnel (at local and regional levels) are aware of an opening of channels of communication and partnership working between schools and health professionals and agencies. This will be examined further in the next stage of evaluation.

The HAZs are now exploring possible models of operation which aim to make the scheme sustainable. Some schools have been asked to pass on the costs for the fruit to parents in full or in part. Future evaluation work will focus on the impact that this has on sustainability of fruit consumption and other impacts on attitudes, knowledge and behaviour of the schools and the parents involved. It will be essential to monitor the effect of such changes, especially given that the overall impact of the programme so far has been greatest in the schools serving more disadvantaged communities.

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Appendix

Table 4: Overall change in fruit consumption between baseline (October 2002) and end of year 2 (June 2004) by sociodemographic characteristics

	Increase (%)	No change (%)	Decrease (%)	Base (n)	Sig (p)
Mean for ALL	54.4	26.9	18.8	160	0.000 S
<i>By sex</i>					
Boys	38.3	39.5	22.2	81	0.000 S
Girls	70.9	13.9	15.2	79	
<i>By free school meal entitlement</i>					
Low (0-28%)	48.3	32.8	19.0	58	0.002 S
Medium (28.1-53%)	38.8	38.8	22.4	49	
High (53.1-100%)	75.5	9.4	15.1	53	
<i>By school size</i>					
Small (< 106)	74.4	23.1	2.6	39	0.000 S
Medium (106-266)	36.4	37.9	25.8	66	
Large (267-520)	61.8	16.4	21.8	55	
<i>By management type</i>					
Grant maintained	58.0	20.5	21.6	88	0.116 NS
Controlled	50.0	34.7	15.3	72	
<i>By other initiative</i>					
Other scheme (not including milk/ breakfast scheme)	64.0	38.3	15.0	100	0.007 S
No scheme or milk /breakfast scheme	21.0	36.7	25.0	60	
<i>By HAZ area</i>					
North and West Belfast	64.1	12.8	23.1	39	0.033 S
Armagh and Dungannon	38.6	36.4	25.0	44	
Northern Neighbourhoods	69.4	19.4	11.1	36	
Western	48.8	36.6	14.6	41	

Table 5: Comparison of total mean daily fruit score (excluding fruit juice) at baseline, end of year 1 and end of year 2

	Baseline mean fruit score	Sig (p)	Year 1 mean fruit score	Sig (p)	Year 2 mean fruit score	Sig (p)
Mean for ALL	0.78		1.30		1.48	0.000
<i>By sex</i>						
Boys	0.89	NS	1.23	NS	1.20	0.001
Girls	0.67		1.37		1.76	
<i>By free school meal entitlement</i>						
Low (0-28%)	0.78	NS	1.26	NS	1.17	0.000
Medium (28.1-53%)	0.96		1.20		1.29	
High (53.1-100%)	0.62		1.43		1.98	
<i>By school size</i>						
Small (< 106)	0.44	0.006	1.38	NS	1.72	NS
Medium (106-266)	1.00		1.17		1.26	
Large (267-520)	0.76		1.40		1.56	
<i>By management type</i>						
Grant maintained	0.81	NS	1.34	NS	1.66	0.022
Controlled	0.75		1.25		1.25	
<i>By other initiative</i>						
Other scheme (not including milk/ breakfast scheme)	0.74	NS	1.34	NS	1.66	0.007
No scheme or milk /breakfast scheme	0.85		1.23		1.17	
<i>By HAZ area</i>						
North and West Belfast	0.82	NS	1.41	NS	2.15	0.000
Armagh and Dungannon	0.93		1.18		1.09	
Northern Neighbourhoods	0.53		1.33		1.25	
Western	0.80		1.29		1.44	

Table 6: Comparison of mean fruit score outside school (excluding fruit juice) at baseline, end of year 1 and end of year 2

	Baseline mean fruit score	Year 1 mean fruit score	Year 2 mean fruit score
Mean for ALL	0.28	0.21	0.27
<i>By sex</i>			
Boys	0.37	0.25	0.16 ^c
Girls	0.19	0.16	0.38 ^{bc}
<i>By free school meal entitlement</i>			
Low (0-28%)	0.24	0.22	0.21
Medium (28.1-53%)	0.39	0.12 ^a	0.27
High (53.1-100%)	0.23	0.26	0.34
<i>By school size</i>			
Small (< 106)	0.16	0.21	0.28
Medium (106-266)	0.32	0.20	0.26
Large (267-520)	0.33	0.22	0.27
<i>By management type</i>			
Grant maintained	0.33	0.23	0.32
Controlled	0.22	0.18	0.21
<i>By other initiative</i>			
Other scheme (not including milk/breakfast scheme)	0.26	0.24	0.32
No scheme or milk /breakfast scheme	0.32	0.15	0.18
<i>By HAZ area</i>			
North and West Belfast	0.28	0.23	0.44
Armagh and Dungannon	0.34	0.20	0.18
Northern Neighbourhoods	0.25	0.17	0.14
Western	0.24	0.22	0.32

^a-significant difference between phase 1 and phase 2

^b-significant difference between phase 2 and phase 3

^c-significant difference between phase 1 and phase 3

Table 7: Comparison of total mean daily snack scores at baseline, end of year 1 and end of year 2

	Baseline mean snack score	Year 1 mean snack score	Year 2 mean snack score
Mean for ALL	3.33	3.19	3.89 ^{bc}
<i>By sex</i>			
Boys	3.46	3.68	3.54 ^c
Girls	3.20	2.70 ^a	4.24 ^{bc}
<i>By free school meal entitlement</i>			
Low (0-28%)	3.62	3.59	3.84 ^c
Medium (28.1-53%)	3.57	3.67	3.73 ^c
High (53.1-100%)	2.79	2.32	4.08 ^{bc}
<i>By school size</i>			
Small (< 106)	3.33	3.64	3.67 ^c
Medium (106-266)	3.08	2.74	3.41 ^{bc}
Large (267-520)	3.64	3.42	4.62 ^{bc}
<i>By management type</i>			
Grant maintained	3.05	2.97	4.11 ^{bc}
Controlled	3.68	3.47	3.61 ^c
<i>By other initiative</i>			
Other scheme (not including milk/breakfast scheme)	3.09	2.93	4.01 ^{bc}
No scheme or milk /breakfast scheme	3.73	3.63	3.68 ^c
<i>By HAZ area</i>			
North and West Belfast	2.69	2.13	4.44 ^{bc}
Armagh and Dungannon	3.18	3.89	3.64
Northern Neighbourhoods	4.22	3.61	3.78 ^c
Western	3.32	3.10	3.73 ^c

^a-significant difference between phase 1 and phase 2

^b-significant difference between phase 2 and phase 3

^c-significant difference between phase 1 and phase 3



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