

‘Is Eating out of School a Healthy Option for Secondary Pupils?’

**A Feasibility Study to Explore the
Nutritional Quality of ‘Out of School’
Foods Popular with School Pupils**

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**Fiona Crawford, Anne Ellaway,
Dionne Mackison and John Mooney**



**UNIVERSITY OF
STIRLING**

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- Paul Birkin, Team Leader, Environmental Health and Trading Standards, Glasgow City Council
- Helen Clark, Quality Improvement Officer, Education Services, Glasgow City Council
- Fiona Crawford, Public Health Programme Manager, GCPH
- Anne Ellaway, Programme Lead, Neighbourhoods and Health, MRC/CSO Social and Public Health Sciences Unit (MRCSPHSU), Glasgow
- Helena Hailstone, Project Manager, Cordia (Services) LLP
- Dionne Mackison, Public Health Nutritionist, University of Stirling
- Kelda McLean, Research Coordinator/Administrator, GCPH
- John Mooney, Career Development Fellow, SCPHRP

Professor Martin Caraher (City University, London) and Professor Annie Anderson (University of Dundee), provided expert advice and support.

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Introduction

Healthy school food policy is recognised as important in promoting children and young people's nutritional health.¹ The school lunchtime environment and school meal standards have improved through policy and legislation.^{2,3} Concerted efforts have also been made to provide healthy foods and drinks and promote their uptake by primary and secondary pupils through a number of school-based programmes and initiatives and through the Scottish Curriculum for Excellence.^{4,5,6,7}

Although there are signs of success in relation to increased school meal uptake in primary schools, uptake of secondary school meals is declining⁸ and in many urban areas secondary school pupils can be observed purchasing lunchtime food and drinks from external outlets situated near schools.⁶ Building on previous research and evaluation facilitated by the Glasgow Centre for Population Health in collaboration with Glasgow City Council and the Scottish Centre for Social Research,⁹ this study aimed to assess the quality of popular foods purchased by pupils from outlets in study areas near five Glasgow secondary schools against Scottish Nutrient Standards for school lunches,¹⁰ introduced following the passage of the Schools (Health Promotion and Nutrition) (Scotland) Act 2007.³

Research aim and objectives

The principal research question was:

How does the quality of popular foods purchased by secondary school pupils from outlets near Glasgow secondary schools compare with Scottish Nutrient Standards for school lunches?

Objectives were as follows:

- To describe numbers and types of commercial outlets near five Glasgow secondary schools.
- To identify outlets popular with pupils and observe pupil purchasing behaviour.
- To purchase and analyse samples of popular savoury food items to compare nutritional quality against the Scottish Nutrient Standards for school lunches (NSS).

Approach

The research was undertaken as a collaboration between: the Glasgow Centre for Population Health (GCPH); the Scottish Collaboration for Public Health Research and Policy (SCPHRP); the MRC/CSO Social and Public Health Sciences Unit, Glasgow (MRCSPHSU); the University of Stirling; and Glasgow City Council (GCC). Funding for the study was provided by GCPH and SCPHRP and each partner contributed resource in kind in the form of individual staff time and organisational support. A member of the GCPH team fulfilled the role of administrator/research co-ordinator for the duration of the study.

A research steering group was established which included key investigators from the above organisations along with representatives from GCC's Environmental Health Department, GCC Education Services and Cordia (Services) LLP (the organisation responsible for delivery of school-based food and drinks in Glasgow schools). GCC's Director of Education and NHS Greater Glasgow & Clyde's Director of Public Health

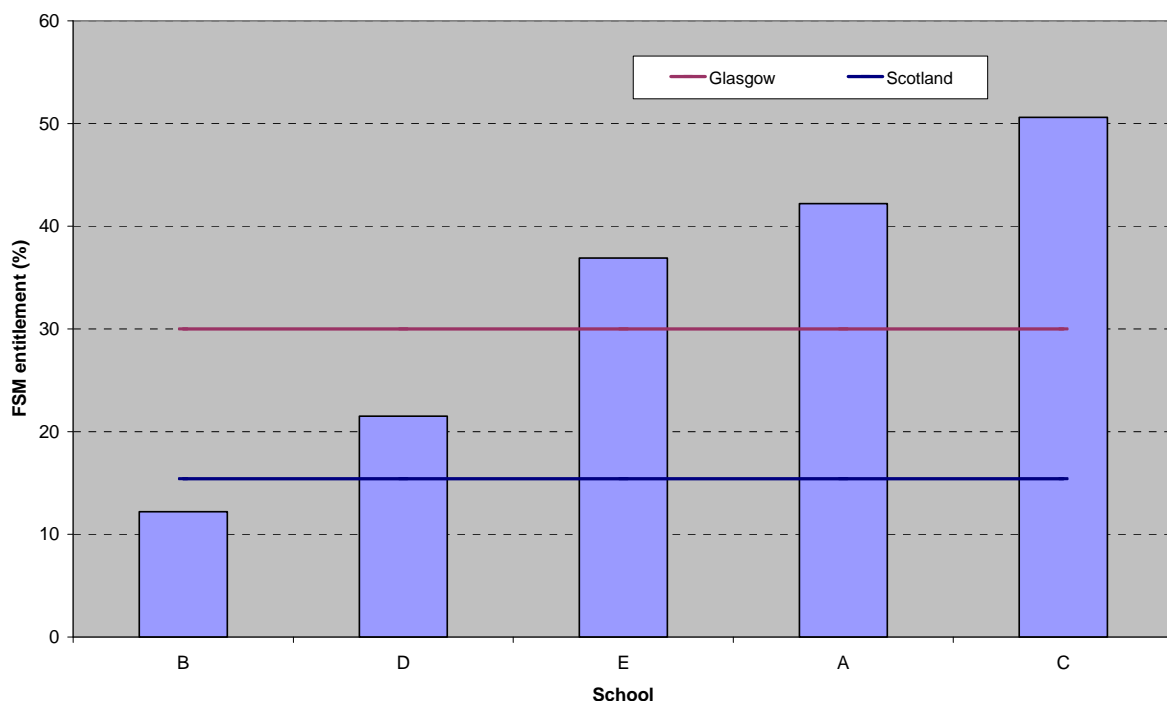
were briefed regarding the research. Two experts in the field, Professor Martin Caraher (City University, London) and Professor Annie Anderson (University of Dundee) acted as external advisors to the research study.

One of the purposes of this study was to test how feasible it would be to collect data on the food purchasing behaviour of secondary school pupils who eat out of school at lunchtime. The study used mixed methods, described below, to address research objectives. Prior to undertaking the research, ethical approval for the study was obtained from the University of Glasgow College of Social Sciences Ethics Committee for Non-Clinical Research Involving Human Subjects.

Study area selection

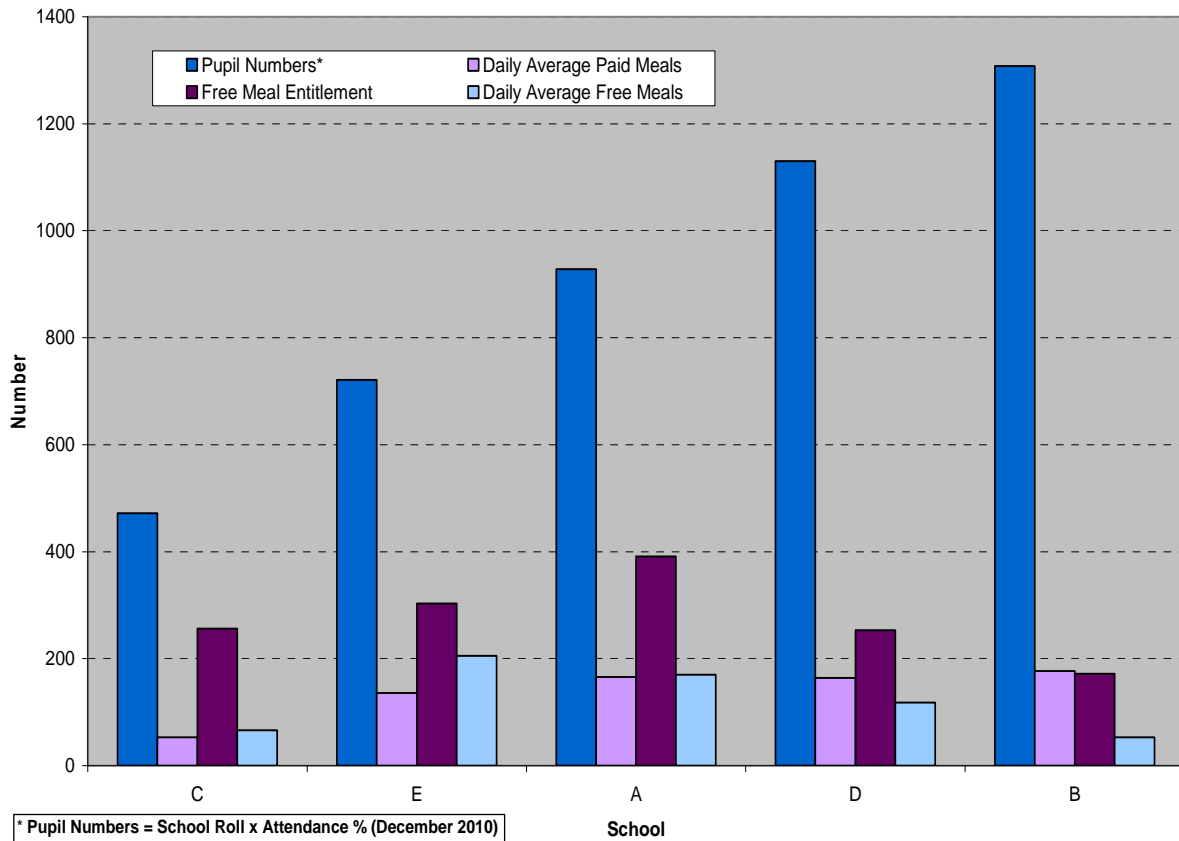
Study areas were selected around five secondary schools in Glasgow each based on an approximate radius of 10 minutes walk from the school gate. Each study area represented a different geographic area of the city, a contrasting physical and socio-demographic environment, and a variable pupil population in terms of school roll and socio-economic characteristics (represented by free school meal (FSM) entitlement). School rolls in the five pilot secondary schools varied, the smallest school roll was 600 and the largest 1300. Figure 1 shows the range of FSM entitlement across the five pilot secondary schools which varied from 12.2% to 42.2%. Average FSM entitlement in Glasgow secondary schools is 30%, double that for Scottish secondary schools which is 14.4%.⁸

Figure 1: FSM entitlement in pilot secondary schools
Source: School Meals in Scotland, 2012⁸



A snapshot of local school meal data supplied by Cordia in October 2011, shown overleaf in Figure 2 illustrates that school meal uptake in the pilot schools, whether free or paid for, was very low. Anecdotal information from Cordia staff indicates that this low uptake is common throughout many secondary schools in Glasgow.

Figure 2: School meal uptake in pilot secondary schools
Source: Cordia Data, October 2011



Research Methods

One of the purposes of this study was to test how feasible it would be to collect data on the food purchasing behaviour of secondary school pupils who eat out of school at lunchtime. The study used mixed methods, described below, to address research objectives. Prior to undertaking the research, ethical approval was obtained from the University of Glasgow College of Social Sciences Ethics Committee for Non-clinical Research Involving Human Subjects.

GIS mapping to provide numbers and location of commercial outlets selling food in each study area

Building on previous research exploring the density of food outlets around Glasgow secondary schools,¹¹ the external commercial food environment in the area around five Glasgow secondary schools was mapped using GIS software and GCC Environmental Health Department's database of food-related commercial premises. Accuracy and comprehensiveness was cross-checked by 'ground truthing' during the fieldwork, when researchers were able to assess the reliability and comprehensiveness of these data 'on the ground'. During fieldwork, researchers observed and identified outlets that appeared to be most popular with pupils within each study area, and this information was used to inform the more detailed assessment and purchase monitoring of popular lunchtime choices.

Qualitative data collection regarding characteristics and type of food and drinks sold by food outlets

The commercial food environment around selected schools was described and characterised through observational data collection. Researchers gathered data regarding the characteristics of commercial outlets within a ten minute walk from each of the five sampled schools and observed which were popular with pupils using an observational checklist (drawing on methodologies developed in similar research elsewhere).^{12,13}

Observational data collection during one school lunchtime to identify meal choices popular with secondary pupils

Preliminary observational scoping work in the vicinity of one of the study areas was conducted in May 2011 to establish the parameters for observational data collection. This included: identification of outlets observed as popular with pupils for the purchase of food and drinks; observation regarding length of queues at food outlets and types of food/drinks purchased; whether gender/age/ethnicity seemed to influence purchasing behaviour; and whether promotional offers (e.g. 'two for one', meals deals etc.) were offered by outlets.

Following this scoping exercise a 'purchase monitoring' pro-forma was developed, piloted, refined and then utilised by members of the research team. Between 10am and 2pm on a designated school day (Friday), 15 researchers (two to four per area) visited each of the five study areas to observe pupil purchasing patterns. In addition to the use of the pro-forma for data collection, and where possible, researchers questioned shopkeepers and outlet staff regarding items sold and what they perceived as popular with pupils. Researchers all carried individual identification and information leaflets (see Appendix 1) explaining the purpose of the research which they distributed to shopkeepers/store managers in outlets visited in the morning, prior to the data collection. A separate pupil information leaflet was also carried by researchers for issue to any pupil who became aware that s/he was being observed and asked for information (see Appendix 1).

Purchase of selected meals and nutritional analysis of meals

Through observation, researchers identified what appeared to be the most popular savoury food items purchased by secondary pupils in each of the five study areas, during the lunch-time break of each study area school. In collaboration with environmental health colleagues, sampling officers purchased 50 pre-agreed items during the following week, recording the name of the outlet where the item was purchased, study area and cost of each item.

Approximately ten savoury food items were purchased per study area, representing items observed as popular with pupils. Labelled/branded items, which were repeatedly observed as popular purchases across study areas, were assumed to be consistent in relation to nutritional content and portion size and were only purchased in one study area. Unlabelled items which were available from small chains (e.g. fish and chip shops) were sampled and analysed in more than one area to explore possible variations in portion size and nutritional content of similar items.

Samples were analysed by Glasgow Scientific Services. Nutritional analysis qualified energy content, total fat, saturated fat and salt, which were compared directly with the

NSS. The NSS specify maximum levels of energy and other specified nutrients (e.g. total fat, saturated fat, non-milk extrinsic sugars and sodium) and the minimum level for other key nutrients (e.g. protein, total carbohydrate, fibre, iron, calcium, vitamin A, vitamin C, folate and zinc) in an average day's school lunch. The guidance contains criteria for primary and secondary school lunches. For the purposes of this study the criteria for secondary school lunches was used.

Results

Numbers and types of commercial food outlets in study areas

As previously noted, the five study areas were located in different parts of the city and varied in terms of urban landscape, street design and commercial environment. There was marked variation in numbers of outlets identified within a ten minute walk from each school, ranging from five in the area with the lowest number present to thirty in the area with the highest. Concentrations of outlets were identified near schools in three out of the five study areas, often on busy roads. Observational fieldwork revealed the presence of additional outlets which had not been identified through the mapping exercise.

Outlets present were heterogeneous and included chip shops, kebab shops, convenience stores, newsagents, bakeries, vans, cafés, pizzerias, sandwich shops and supermarkets. There was a diversity of internal environments and items on sale and some outlets used targeted marketing strategies to encourage pupils to buy food and drinks including lunchtime offers, meal deals and price promotions. Mobile street traders (vans) were observed stationed at the school gates of two of the schools during the lunchtime period, driving off as soon as lunchtime was over.

Characteristics of food outlets popular with pupils

The commercial outlets that were most popular with pupils were often those which sold chips. Many of the popular outlets appeared to be small independent businesses, however a number of chain or franchised businesses also attracted large groups of pupils. There was evidence of outlets using targeted marketing and promotional strategies to attract pupils as customers including discounted lunchtime prices, special meal deals and loyalty card offers. Turnover during the lunchtime period was very rapid – shopkeepers seemed to be aware that pupils had limited time to buy and consume food and drink choices, so were well prepared with lunchtime produce set out ready for sale.

Description of pupil purchasing patterns

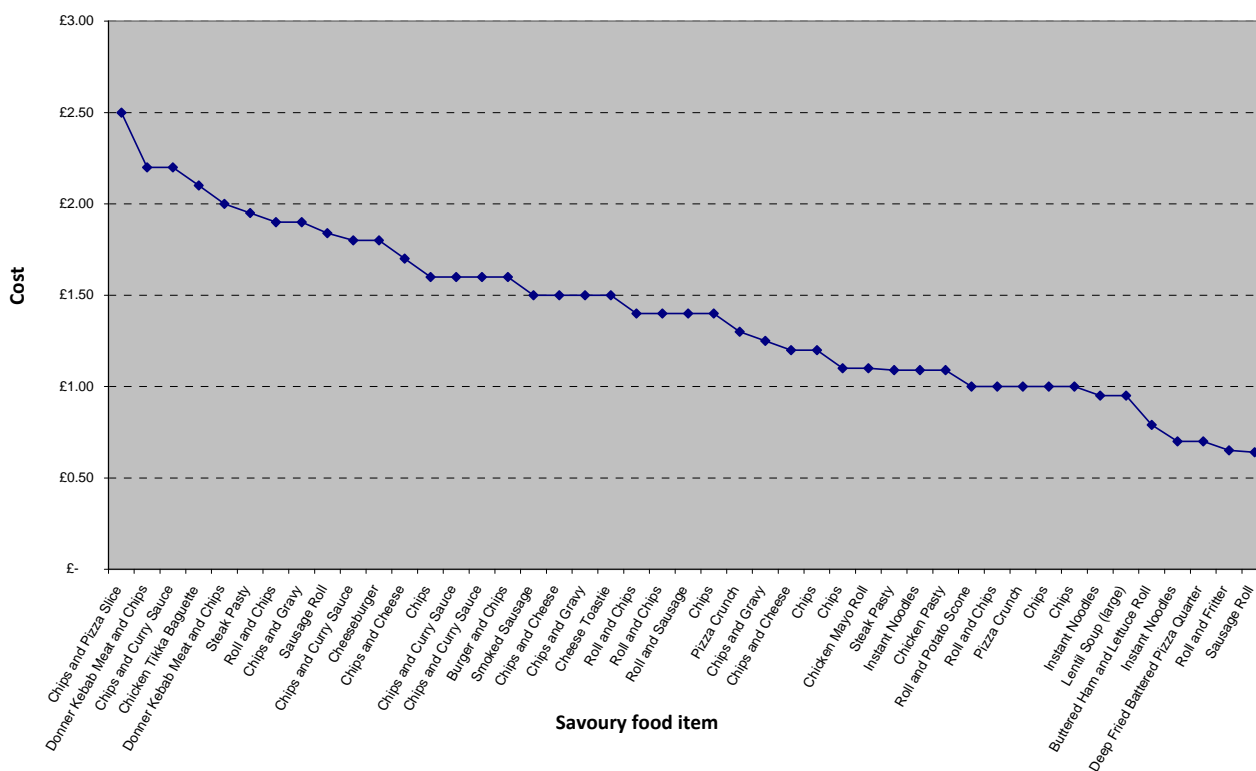
Observers noted a brisk exodus out of school by pupils when the school lunchtime bell rang as there was a relatively short 40 minute lunch break. Long queues of pupils quickly formed at popular outlets – there was some evidence of particular age/gender groups favouring certain outlets. There was a very rapid turnover in relation to items purchased.

The most popular purchases contained chips often accompanied by bread rolls, curry sauce, gravy, cheese, etc. Other popular food items were sausage rolls, pizza, pot noodles, beef burger/cheese burger, rolls and sausage and doner kebabs. High levels of traffic and busy roads were a feature of all study areas and in one particular area pupils had to cross a very busy main road to be able to access the outlets. Many pupils augmented their main purchase with additional items such as sugared drinks, chocolate,

crisps and sweets. No pupils were observed buying fruit or bottled water in any of the study areas. Appendix 2 provides more detailed observational findings.

As noted above, chips were observed to be a very popular choice and were purchased from a range of outlets. Of the 45 individual savoury purchases analysed, chips comprised all or part of 24 of the purchases (53%). With the exception of one roll containing lettuce and a portion of lentil soup, there was no inclusion of vegetables or salad in any of the samples analysed. Figure 3 shows that there was a large variation in the cost of savoury food items – the cheapest item (a sausage roll) cost 64 pence and the most expensive item (chips and pizza slice) cost £2.50.

Figure 3: Cost of savoury food items



Nutritional analysis

Nutritional analysis of 50 purchased items was conducted. Of the 50 purchases, four were ‘meal deal’ options (i.e. they included a carbonated drink and/or confectionary/bakery goods), and one item was a commonly purchased home-baked item (a sweet doughnut type cake known as a yum-yum). These five items were excluded from the main analysis and results for the remaining 45 items are presented below. A number of very similar items (such as chips and curry sauce) were purchased from different outlets in order to compare their nutritional content.

The nutritional information per 100g and per portion of all items sampled is reported in full in Appendix 3. The nutrient composition of items varied greatly. The range (e.g. minimum and maximum value) of nutritional values per 100g and per portion is reported in Table 1. Per portion data represent the nutritional information for the item as purchased and intended for consumption.

Total sugar was excluded from the nutritional analysis for two reasons. Firstly, items sampled were predominantly savoury foods and given the financial constraints of the study, sampling labelled confectionery items (with existing nutritional information) was considered unnecessary. Secondly, with regard to sugar, the NSS prescribe a maximum value of no more than 19.5g for non-milk extrinsic sugars (NMES). Non-milk extrinsic sugars are sugars that are not incorporated into the cellular structure of foods and include sugars released from fruit when it is blended or juiced, table sugar, honey and added sugar in cakes, sweets and soft drinks. As it was not possible to determine NMES (from total sugars) using the laboratory analysis, total sugars were not included in the nutrient analysis. However, modelling work combining the laboratory analysis with nutrition information provided on commonly purchased sugared drinks and crisps has been conducted to assess the potential additional energy intake of off-site school lunchtime purchases (see page 12).

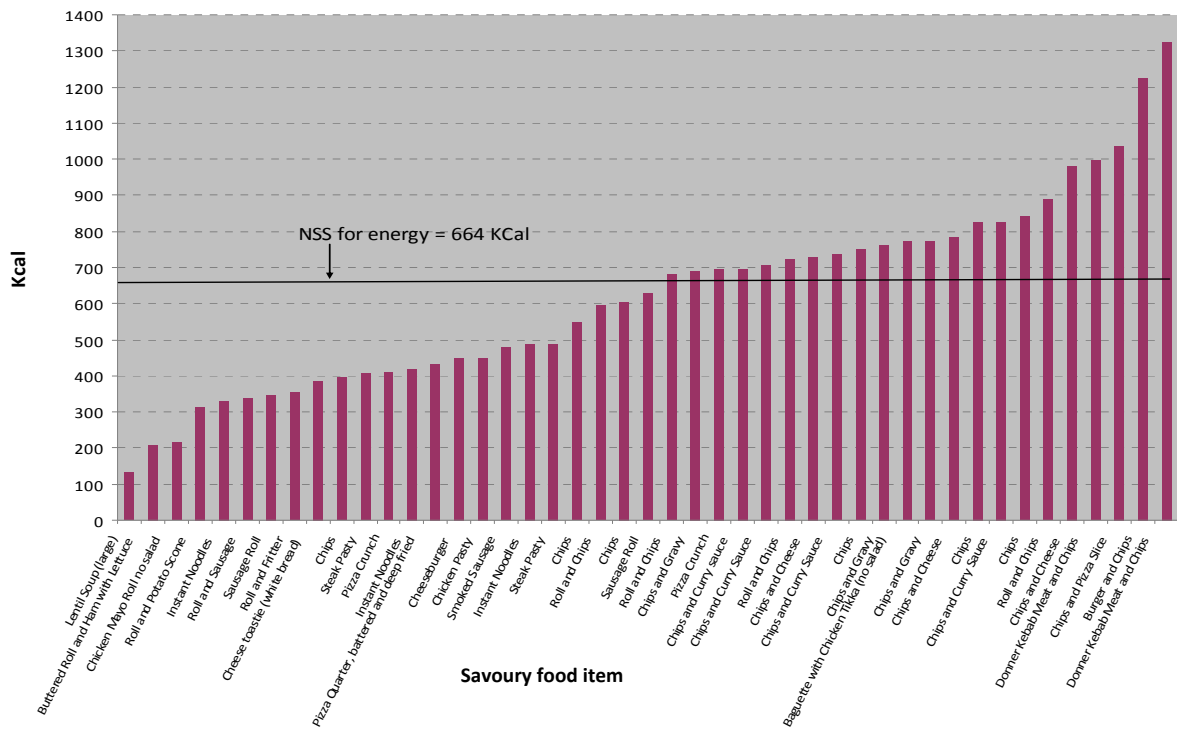
Table 1: Range of nutrient composition per 100g and per portion for 45 items

Nutrient	Minimum – Maximum Range	
	Per 100g	Per Portion
Energy (kcal)	50 - 413	131 - 1323
Total fat (g)	0.7 – 15.8	1.7 – 81.5
Saturated fat (g)	0.4 – 18.0	0.8 – 30.6
Salt (g)	0.1 – 2.19	0.4 – 4.5

Given that the 45 samples analysed were single items and not necessarily representative of the entire lunch time consumption, the comparison with the NSS (which refers to an average school lunch) has limitations as it is not comparing like with like. However, the single items analysed do provide an insight into the nutritional quality of items purchased in relation to the NSS. For example, the energy content of the most calorific sample analysed was 1323 kcals (per portion) in contrast to the 664 kcals recommended by the NSS. Similarly, total fat for items sampled ranged from 1.7 to 81.5g per portion - the upper value being more than three times the NSS (25.8g). Upper values for the saturated fat and salt content of items analysed were also substantially higher than the values recommended by the NSS e.g. 30.6g for saturated fat compared to 8g NSS and 10.8g for salt compared to 2g.

Figure 4 displays the energy content per portion for samples, which varied from 131 - 1323 Kilocalories (kcal).

Figure 4: Energy content per portion



As can be seen in Figures 5 and 6, total fat and saturated fat content was similarly variable, ranging from 2 - 80g and 1 - 30g, respectively, while salt content varied from 0.4 - 4.5g.

Figure 5: Total fat and saturated fat content per portion

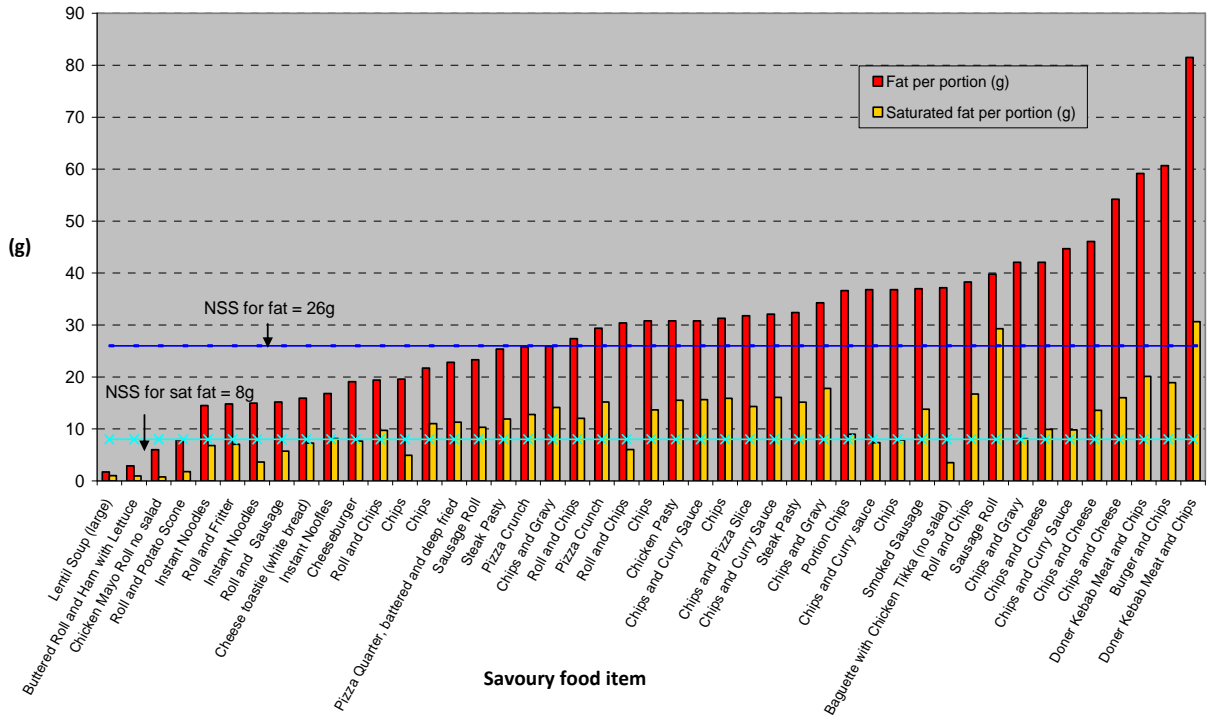
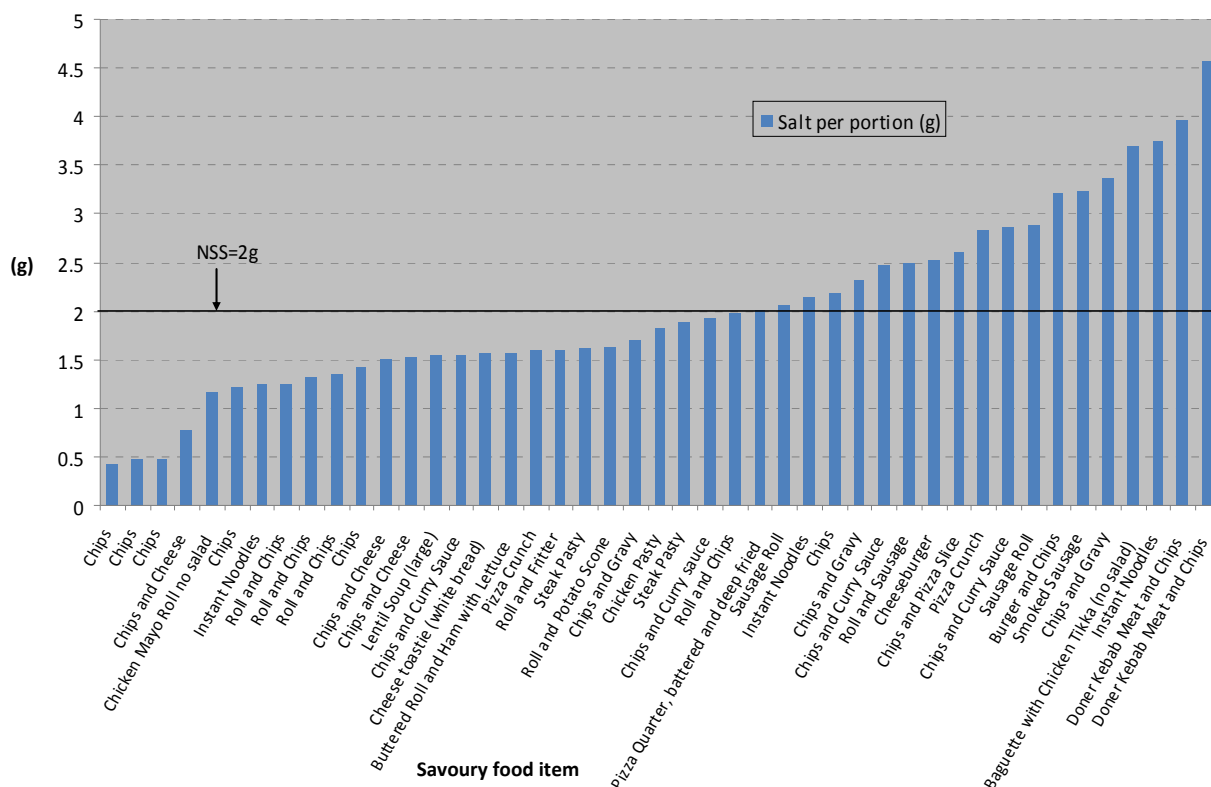


Figure 6: Salt content per portion



With regard to compliance with the NSS, approximately half of the samples exceeded the recommended energy levels; over half exceeded the recommended total fat and saturated fat levels; and over a third exceeded the recommended salt levels. Thirty seven of the 45 savoury food items sampled did not comply with one or more of the NSS for total fat, saturated fat or salt.

Compliance with the Food Standards Agency Traffic Light Criteria

The samples purchased were also profiled using the Food Standards Agency (FSA) Traffic Light (TL) front of pack signposting system.¹⁴ The TL signposting system was devised by the FSA for use on “composite, processed foods” purchased in the retail environment. The application of the TL system to foods purchased from fast food venues does not, strictly speaking, adhere to the TL guidelines outlined in the technical guidance. However, it is considered an appropriate tool to provide “at a glance” nutritional information with documented use of the TL system on menus in catering venues reported.¹⁴

Using the FSA technical guidance,¹⁴ the 45 samples analysed were assessed for concordance with the TL system. A summary of concordance with the TL system is reported below in Table 2. A substantial majority of the samples analysed obtained red colour coding for total fat and saturated fat (73% and 82% of samples respectively). Over half of samples (53%) obtained an amber colour coding for salt. It should be noted that this analysis was conducted excluding the addition of table salt or condiments.

Table 2: Summary of samples analysed and their corresponding TL signpost ¹⁴

Nutrient	Number of Samples (n=45)		
	High content per portion	Medium content per portion	Low content per portion
Total fat	33 (73%)	10 (22%)	2 (4%)
Saturated fat	37 (82%)	4 (9%)	4 (9%)
Salt	18 (40%)	24 (53%)	3 (7%)

Meal deals and modelling

Although not within the scope of the main nutritional analysis for this research (which focussed on individual savoury items), it was observed that pupils often supplemented their main savoury item with additional items. This was either in the form of a 'meal deal' (where the retailer offers a set combination of a savoury item, a drink and/or a snack) or when pupils independently purchased additional snack/drink items.

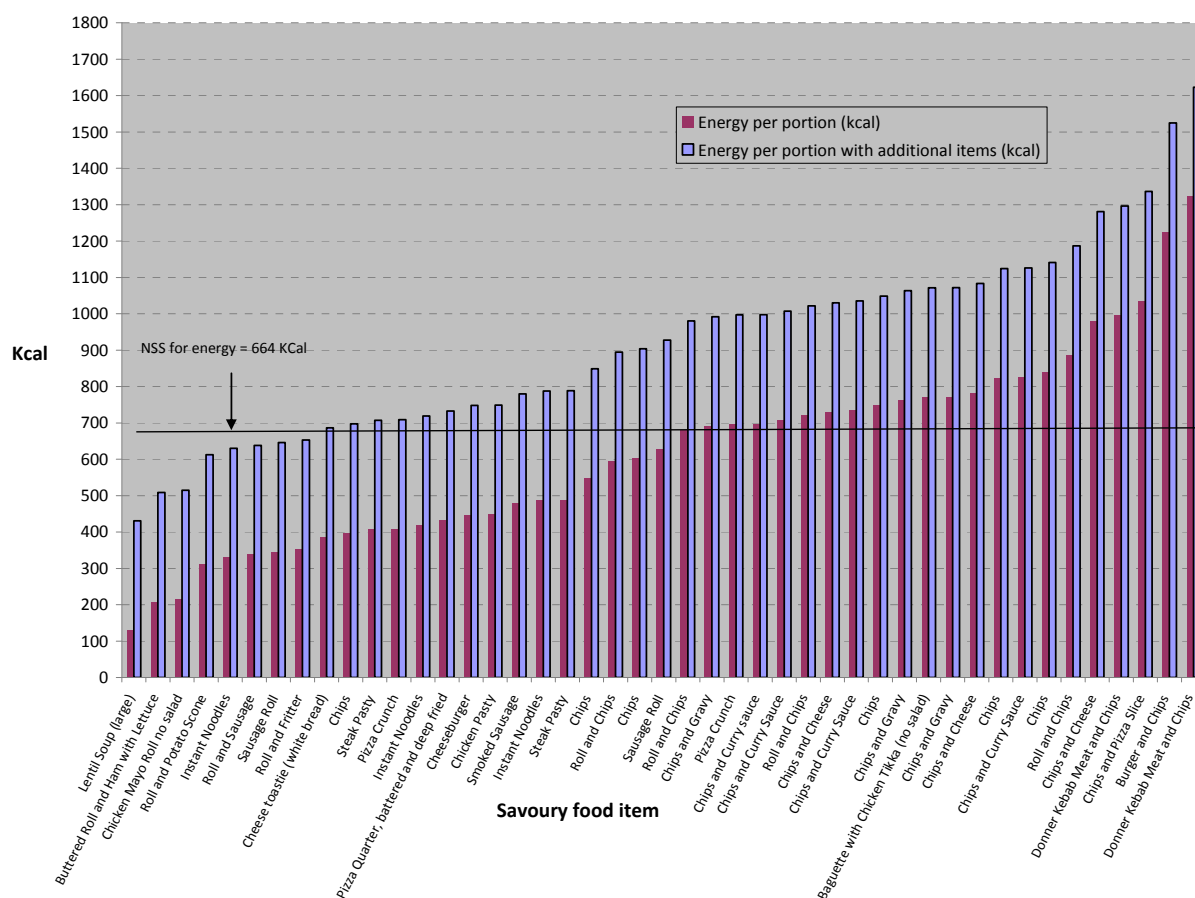
Five different types of 'meal deals' were observed being purchased/consumed. These were:

- Chicken tikka baguette, cake and a drink (£2.50).
- Four chicken nuggets, chips and draught cola (£2.99).
- Chips and cheese and a can of cola (£1.80).
- Portion chips and rice with curry sauce and a can of sugary drink (£2.30).
- Baguette, cookie and draught sugary drink for £1.99 (special price for pupils).

Our limited observations in this area raise several important issues. The first is that drinks and snacks can substantially increase the energy, total fat, saturated fat, sugar and salt content of a young person's lunch. For example, a can of cola alone contains around 40g of sugar (notably, the NSS allows for just 19.5g of non-extrinsic milk sugars for secondary pupils).

In terms of energy content, initial modelling suggests that, by adding an additional packet of crisps and a soft drink to our savoury items, nearly all of these 'meals' would exceed the 664 kcals stipulated in the NSS. Figure 7 illustrates the impact of adding a standard packet of crisps and a 330ml can of cola to each of the purchases analysed.

Figure 7: Energy content of meals with the assumption of an additional can of soft drink and packet of crisps (i.e. an additional 300 kcals)



Modelling the data in this manner is speculative and more research is required to explore popular combinations of foods and drinks that pupils purchase and consume. Further research of this type would require a creative approach to data collection as when young people shop for lunch 'off-site' they often visit a number of outlets during their lunch break, in order to find the best deals. However this modelling exercise provides further insight into the potential impact of 'off-site' school lunch time purchases on a young person's overall daily nutrient intake.

Discussion

This study highlighted a stark contrast between the nutritional quality of the food available within school and that commonly sold by external commercial outlets near schools. Findings indicate that most pupils who eat out of school at lunchtime buy unhealthy, convenience food of very poor nutritional quality. Many outlets selling food in the study areas appear to be offering meal deals and promotions to pupils which include food and drinks that school canteens are not permitted to provide such as crisps, confectionery and sugared drinks. Previous evaluations of school lunchtime stay-on-site policies and programmes have highlighted staff and parental concerns regarding the presence of commercial outlets in the vicinity of schools and their patronage by pupils who leave school at lunchtime.^{6,15} These concerns relate not only to the consumption of unhealthy food and drinks but also relate to fears regarding road safety, bullying, truancy, stranger danger etc. Findings from this study provide further evidence justifying

professional and parental/carer concerns regarding the adverse impacts on pupils' health and well-being of leaving school at lunchtime.

Over recent years, a number of policies and plans have been published, driven by converging policy agendas aiming to address both the poor nutrition in many population groups in Scotland and the steadily increasing prevalence of obesity in children and adults.^{16,17,18} The most recent Scottish Government publication in this regard, 'Preventing Overweight and Obesity in Scotland: A route map towards healthy weight' sets out plans and actions to prevent obesity at a population level.¹⁹ Specific measures that are recommended in the school setting include:

- Supporting schools to make remaining in school for lunch more attractive to secondary school pupils through a range of innovative approaches.
- Exploring measures to restrict access by children to nutritionally inappropriate meals and high energy and energy-dense foods from businesses located in the vicinity of schools.¹⁶

In relation to measures that can be taken within school, school lunchtime stay-on-site policies for junior secondary pupils have now been implemented by more than half of Glasgow's 30 secondary schools, following an initial pilot and evaluation. Follow up research conducted in 2011 to explore facilitators and barriers to sustaining these stay-on-site policies concluded that they offer a very promising way forward for school-based promotion of healthy eating.¹² The provision of lunchtime activities was found to be one of the factors leading to success due to their popularity with pupils, who enjoyed participating in these activities with their friends. It was recommended that the provision of lunchtime activities should be sustained in future stay-on-site policies. However, despite largely positive feedback from younger secondary pupils regarding their experience of staying in school for lunch, it was clear that many of them intended to leave the school premises at lunchtime to buy lunch off-site when they progressed to their second year. The research concluded that more work needed to be done on managing pupils' expectations, assumptions and priorities in relation to healthy eating. Communication with parents/carers and greater parental/carer involvement in school-based healthy eating initiatives and policies were identified as important.

An additional approach to encourage pupils to stay on site at lunchtime has recently been introduced by Cordia, Glasgow City Council's school meals provider. Cordia has recently established external food kiosks in the grounds of two Glasgow secondary schools.²⁰ These kiosks sell a range of hot and cold foods and drinks and provide pupils with an alternative to eating in the school canteen (whilst complying with the NSS). Initial feedback from pupils and uptake of foods and drinks from these kiosks is very promising.

There are a number of potential regulatory levers outwith the school setting that could help restrict exposure to unhealthy foods and drinks. In relation to fiscal policies, evidence is growing that health-related food taxes can improve health, particularly if accompanied by subsidies on healthy foods.^{21,22} Sales tax on sugared drinks, sweets and snacks has been introduced in the US, Australia and in several European countries.²³ Politicians have proposed that the UK should consider taxing unhealthy food and drinks to help tackle growing obesity levels.²⁴ Modelling studies predict that a 20% tax on sugary drinks in the US would reduce the overall prevalence of obesity by 3.5%.²⁵

An increasing number of local authorities in the UK and further afield are testing out the use of licensing and planning powers in an attempt to restrict the number and concentration of commercial outlets selling unhealthy food in local neighbourhoods and near schools.^{26,27} There is potential for these measures to be employed by national and local government in Scotland, building on current developments such as licensing of alcohol outlets and through more explicit public health input into local development plans. In addition, consideration could be given to strengthening the role of local authority environmental health departments to equip them with greater powers in relation to food safety and hygiene and to include nutritional assessment/regulation within their remit.

As well as regulatory levers, collaborations with the commercial/business sector should be developed. Scotland's National Food and Drinks Policy, launched in 2009, aims to "*ensure that the Scottish Government's focus in relation to food and drink, and in particular our work with Scotland's food and drink industry, addresses quality, health and wellbeing, and environmental sustainability, recognising the need for access and affordability at the same time.*"²⁸ There is potential to learn from and extend initiatives such as the Scottish Grocers' Federation's Healthy Living Programme which encourages convenience stores to develop and promote healthier products in local stores²⁹ and Consumer Focus Scotland's Healthy Living Award, which works with the catering sector in Scotland to encourage changes to catering practices and ingredients.³⁰

Conclusion

To conclude, if healthy nutrition in neighbourhoods around schools is to become a reality, a range of factors and influences at local, regional, national and global level need to be considered and addressed. Schools cannot tackle this alone and it will not happen overnight but progress in this arena will yield enormous dividends in relation to the future nutritional health and wellbeing of our children and young people.

Appendix 1 – Information leaflets



Information Sheet – Outlets

What is the study about?

There is a lot of interest in what young people eat and how that might influence their well-being. We know quite a lot about what they eat in school but not much about what they buy outside. So we'd like to find out a bit more about what foods are most popular with school pupils when they buy their lunch in local shops.

How will my involvement help the study and do I have to take part?

Although your help would be much appreciated as it may help us better understand the food buying habits of young people living in different areas, you are under no obligation to take part as your involvement is entirely voluntary.

What will happen to the results of the research study?

The information collected from the study will be collated and used in our research and help to inform policy and practice.

Will the information I provide be kept confidential?

Yes. Shops and individuals will not be identified by name in our research.

For further information please contact:

Kelda McLean
Research Co-ordinator
Glasgow Centre for Population Health
94 Elmbank Street
Glasgow G4 9LJ
Tel: 0141 287 6959
Email:
kelda.mclean@glasgow.gov.uk

If you have any questions or concerns about this research, and would like to speak to someone independent of the research, please contact:

Terri Hume or Georgina Wardle
University of Glasgow
College of Social Sciences
Ethics Committee
Room 104
Florentine House
53 Hillhead Street
Glasgow G12 8QF
Tel: 0141 330 3007
Email: Terri.Hume@glasgow.ac.uk



Information Sheet - Pupils

What is the study about?

There is a lot of interest in what young people eat and how that might influence their well-being. We know quite a lot about what young people eat in school but not much about what they buy outside. So we'd like to find out a bit more about what foods are most popular with school pupils when they buy their lunch in local shops and takeaways.

What information are we collecting?

We will observe all the shops and takeaways around your school to see which ones are most popular, by counting the number of people inside and outside the shop. After that, we will try and observe what foods are most popular by speaking to shopkeepers, and by having a look at what pupils are carrying and eating outside the shops and takeaways.

Will details about my purchases be available to my parents and teachers? What will happen to the results of the research study?

Parents and teachers **will not** be told about what individual pupils eat and buy as we are interested in **WHAT** is being bought, but not **WHO** is buying. Parents and teachers will only be given information about the things such as the *total number* of pupils who visit certain shops and the *total number* of purchases for certain items. The findings will also be collated (pulled together) and published in reports and journals.

Can I opt-out of this study?

Yes, if you do not wish your purchases to be included, then let the researchers know and they will not take a note of what you buy. They will however still count you in the total number of people who visit the shop or takeaway.

For further information please contact:

Kelda McLean
Research Co-ordinator
Glasgow Centre for Population Health
94 Elmbank Street
Glasgow G4 9LJ
Tel: 0141 287 6959
Email: kelda.mclean@glasgow.gov.uk

If you have any questions or concerns about this research, and would like to speak to someone independent of the research, please contact:

Terri Hume or Georgina Wardle
University of Glasgow
College of Social Sciences
Ethics Committee
Room 104
Florentine House
53 Hillhead Street
Glasgow G12 8QF
Tel: 0141 330 3007
Email: Terri.Hume@glasgow.ac.uk

Appendix 2 - Summary table of observational findings: outlets and items available

Outlet	Approx no of pupils, inside and immediately outside outlet	Chain or Independent	Characteristics of pupils (age, gender)	Observation of most popular food items consumed (and price, where available) * Nutritional analysis conducted
School A The outlets frequented by pupils are all within 10 minutes walking distance and are concentrated in three areas around the school. Some of the outlets are in a located in a row of shops in a residential area close to the school, and the others are on a busy main road.				
Fish & chip shop	10	Independent	Mostly male, junior pupils	Pizza crunch (£1.20) * Chips and gravy (£1.60) * Smoked sausage (£1.40) *
Convenience store	15-20	Chain	Mixture of age groups, mostly male pupils	Chocolate Crisps (15p-35p) Energy drinks (£1.35) Carbonated drinks Lollipops/sweets
Convenience store	7	Independent	Mostly senior males	Chocolate Sweets Carbonated drinks
Sandwich shop	20-30	Independent	Mixed, but mostly senior females	Chips (£1.30) * Hot and cold filled rolls (£1) * Toasties (£1.50) *
Convenience store	15-20	Independent	Mostly younger males	Sweets Crisps Carbonated drinks
Convenience store	25	Chain	Mixed gender, mostly younger pupils	Instant noodles (99p) * Carbonated drinks Sausage rolls (99p) * Crisps (15p)
Mobile catering unit	40	Independent	Mostly male pupils of all ages	Chips/ Chips and gravy (£1) * Roll and sausage (£1.40) * Beefburger/cheeseburger * (& chips) (£1.70/£1.80) Instant noodles (80p) Carbonated drinks
School B The outlets that are popular with pupils are concentrated in two areas to the east and west of the school. These outlets are located on a busy main road, within 5 minutes walk of the school, and are across a busy main road.				
Convenience store	3	Independent	Mostly younger female pupils	Instant noodles (95p) *
Bakery & sandwich	6	Independent	Male and female pupils of	Chicken tikka baguette (£2.10) *

Outlet	Approx no of pupils, inside and immediately outside outlet	Chain or Independent	Characteristics of pupils (age, gender)	Observation of most popular food items consumed (and price, where available) * Nutritional analysis conducted
shop			all ages	
Take-away outlet - pizza	25-30	Chain	Mostly younger male pupils	Slice of pizza (£1.99)
Bakery & sandwich shop	12-16	Independent	All ages	Sausage roll (64p) * Baguette
Bakery & sandwich shop	20	Independent	Mostly males of all ages	Sausage roll (64p) * Cakes, doughnuts and sweet pastries * Steak pasty * Sandwiches
Fish & chip shop	50	Independent	Mostly younger males	Pizza Roll and fritter Chips (£1) * Roll and chips (£1.50) * Sausage and chips (£2.99) Pizza slice and chips (£2.99) *
Fish & chip shop	-	Independent	-	Roll and fritter (65p) * Pizza quarter, battered and deep fried (70p) *
Convenience store	18	Independent	Mostly younger pupils, male and female	Instant noodles Crisps Carbonated drinks Filled rolls
Convenience store	-	Independent	-	Chips (£1.10) * Chips and cheese (£1.20) * Roll and chips (90p) *
Takeaway outlet – kebab and international	-	Independent	-	Chips, rice and curry sauce with can (£2) *
School C The outlets popular with pupils are mainly located within a small shopping centre that is within 5 minutes walk of the school, on the other side of a main road.				
Sandwich shop	25	Chain	Mostly females, junior and senior	Meal deal: Sub roll with sliced meat, cheese, cookie and a drink (£1.99) Nachos Wraps
Bakery & sandwich shop	20-30	Chain	Male and female pupils of all ages	Sausage rolls (64p) * Steak pasties * Sweet pastries *

Outlet	Approx no of pupils, inside and immediately outside outlet	Chain or Independent	Characteristics of pupils (age, gender)	Observation of most popular food items consumed (and price, where available) * Nutritional analysis conducted
Convenience store	20-25	Independent	Mostly females of all ages	Chips (£1) Chips and curry sauce (£1.10) * Roll and chips * Roll and potato scone * Soup *
Convenience store	15	Chain	Male and female pupils of all ages	Crisps Carbonated drinks Ice lollies
Fish & chip shop	15-20	Independent	Mostly males of all ages	Chips Chips and cheese Chips and gravy (£1.60) * Pizza crunch (70p) * Roll and chips *
Supermarket	5	Chain	Mostly males of all ages	Energy drinks, 1ltr (79p)
Café	15	Independent	Male and female pupils of all ages	Chips, cheese and can (£2) * Burger, chips and can (£2)
Convenience store	2	Independent	Very few pupils	Salad roll (79p) *
School D is situated in a mixed commercial and residential area. The outlets popular with pupils are spread along a busy main road within 5 minutes walk from the school.				
Sandwich shop	19	Chain	Mostly female pupils of all ages	Meal deal: Baguette, cake, crisps and drink (£2.50) * Toasties Paninis
Fish & chip shop	20-30	Chain	Mostly younger males	Chips (£1) * Chips and curry sauce (£1.40) * Roll and chips Burger
Take-away outlet – fried chicken	15-18	Chain	Younger male and female pupils	Meal deal: chicken nuggets, chips and can *
Take-away outlet – kebab & international	5-7	Independent	-	Donner Kebab meat and chips (£1.50) * Chips (£1) * Chips and cheese (£1.50) *
Café	15	Independent	All age groups	Chips and cheese * Chips and gravy * Instant noodles *

Outlet	Approx no of pupils, inside and immediately outside outlet	Chain or Independent	Characteristics of pupils (age, gender)	Observation of most popular food items consumed (and price, where available) * Nutritional analysis conducted
				Burger and chips
Sandwich shop	22	Chain	Younger female pupils	Meal deal: Sub roll with sliced meat, cheese, cookie and a drink (£1.99)
Bakery & sandwich shop	20	Chain	Males and females of all ages	Sausage rolls * Steak pasties * Chicken pasties
Take-away outlet – kebab & international	10	Independent	Younger male pupils	Chips and curry sauce Chicken chow mein
Take-away outlet – kebab & international	15-18	Independent	Younger pupils	Donner kebab meat and chips (£2.80) *
School E is situated in a residential estate. The outlets are popular are concentrated in or around a large modern shopping centre, which is a few minutes from the school, across a very busy main road.				
Fish & chip shop	20-25	Chain	Younger pupils	Chips and curry (£1.40) * Chips and gravy Chips with salt and sauce (£1) * Small fish supper Cans Roll and chips
Bakery & sandwich shop	12-14	Chain	Males and females of all ages	Sausage roll (64p) Steak pasty (£1.09) * Chicken pasty (£1.09) Doughnuts (58p) Crisps Carbonated drinks
Mobile catering unit	10-15	Independent	Younger males	Burger and chips (£1.60) * Chips and curry sauce Chips and gravy
Supermarket	25-30	Chain	Males and females of all ages	Carbonated drinks Chocolate Biscuits (4 packets for £1) Crisps Ice poles
Supermarket	5	Chain	Senior pupils	Pasta bowls Sandwiches

Appendix 3 – Table of findings: nutritional analysis (sorted by energy content)

Food purchased	Outlet type	Study Area	Portion size (g)*	Energy (kcal) per portion (and per 100g)	Salt (g)	Total Fat (g)	Saturated fat (g)
Donner Kebab Meat and Chips	Take-away outlet - kebab & international	D	515	1320 (357)	3.96	81.5	30.6
Burger in a Bun & Chips	Mobile catering unit	E	480	1230 (480)	3.22	60.7	18.9
Chips and Pizza Slice	Fish & chip shop	B	450	1040 (450)	2.61	31.8	14.3
Donner Kebab Meat and Chips	Take-away outlet - kebab & international	D	319	994 (312)	4.56	59.2	20.1
Chips and Cheese	Convenience store	B	354	981 (277)	1.52	54.2	16.0
Roll and Chips	Convenience store	B	307	887 (289)	1.26	38.3	16.7
Chips	Fish & chip shop	D	389	841 (216)	2.18	31.3	15.9
Chips and Curry Sauce	Convenience store	C	367	826 (225)	1.54	44.7	9.83
Chips	Fish & chip shop	B	365	824 (226)	0.44	30.8	13.7
Chips and Cheese	Take-away outlet - kebab & international	D	261	783 (300)	1.51	42.1	9.94
Chips and Gravy	Fish & Chip shop	C	454	772 (170)	2.32	34.3	17.8
Baguette with Chicken Tikka (no salad)	Bakery & sandwich shop	B	262	772 (294)	3.70	37.2	3.50
Chips and Gravy	Café	D	371	764 (206)	1.71	42.1	8.13
Chips	Convenience store	B	278	749 (269)	0.47	36.6	8.97
Chips and Curry Sauce	Fish & chip shop	D	413	735 (178)	2.48	32.1	16.1
Chips and Cheese	Café	D	217	730 (337)	0.78	46.1	13.6
Roll and Chips	Fish & chip shop	B	309	722 (234)	1.36	27.4	12.0
Chips and Curry Sauce	Fish & chip shop	E	416	707 (170)	2.87	30.8	15.6
Chips and Curry Sauce	Sandwich shop	A	332	697 (210)	1.93	36.8	7.36
Pizza Crunch	Fish & chip shop	A	214	697 (325)	2.83	29.4	15.2
Chips and Gravy	Fish & chip shop	A	434	692 (158)	3.37	25.9	14.1
Roll and Chips	Convenience store	C	245	680 (278)	1.32	30.4	6.05
Sausage Roll	Convenience store	A	163	628 (385)	2.89	39.8	29.3

Food purchased	Outlet type	Study Area	Portion size (g)*	Energy (kcal) per portion (and per 100g)	Salt (g)	Total Fat (g)	Saturated fat (g)
Chips	Mobile catering unit	A	177	604 (342)	1.22	36.8	7.88
Roll and Chips	Fish & chip shop	C	282	594 (211)	1.98	19.4	9.70
Chips	Fish & chip shop	E	250	548 (219)	1.43	21.7	11.0
Steak Pasty	Convenience store	A	148	489 (331)	1.61	32.4	15.1
Instant Noodles	Café	D	294	488 (166)	2.14	16.8	8.18
Smoked Sausage	Fish & chip shop	A	147	480 (326)	3.22	37	13.8
Chicken Pasty	Bakery & sandwich shop	D, E	135	449 (334)	1.82	30.8	15.5
Cheeseburger	Mobile catering unit	A	168	448 (266)	2.52	19.1	7.66
Pizza Quarter, battered and deep fried	Fish & Chip shop	B	125	433 (345)	2.01	22.8	11.3
Instant Noodles	Convenience store	A	322	419 (130)	1.26	14.5	6.83
Pizza Crunch	Fish & Chip shop	C	98.9	408 (413)	1.56	25.8	12.8
Steak Pasty	Bakery & sandwich shop	B, C, D, E	138	407 (296)	1.90	25.4	11.9
Chips	Take-away outlet - kebab & international	D	144	397 (276)	0.48	19.6	4.94
Cheese Toastie	Sandwich shop	A	121	387 (320)	1.56	15.9	7.27
Roll and Fritter	Fish & Chip shop	B	123	353 (286)	1.60	14.8	7.06
Sausage Roll	Bakery & sandwich shop	B, C, D, E	97.9	346 (353)	2.06	23.3	10.3
Roll and Sausage	Mobile catering unit	A	118	338 (286)	2.49	15.2	5.73
Instant Noodles	Convenience store	B	201	330 (164)	3.74	15	3.62
Roll and Potato Scone	Convenience store	C	108	313 (290)	1.63	7.9	1.81
Sweet Pastry	Bakery & sandwich shop	B, C, D	57.8	258 (447)	0.68	14.6	6.91
Chicken Mayo Roll (no salad)	Sandwich shop	A	90.7	215 (237)	1.16	6	0.77
Buttered Roll and Ham with Lettuce	Convenience store	C	116	208 (180)	1.56	2.9	0.93
Lentil Soup (large)	Convenience store	C	261	131 (50)	1.54	1.7	1.01

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