

The School Fringe

WHAT PUPILS BUY AND EAT FROM SHOPS
SURROUNDING SECONDARY SCHOOLS

Key Findings

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THE CONTEXT

The government is investing a great deal in improving the food and facilities provided in schools --- and it needs to.

Substantial sums are being spent on new kitchens, staff retrained, recipes improved, ingredients subsidised, new standards for school meals introduced and inspected, junk food eliminated from vending machines, fruit distributed free, cookery classes made mandatory and gardening clubs created. These and still other initiatives are responses to increasing evidence of poor diets among schoolchildren, especially rising obesity.

But gaps exist in both our understanding and our action on school feeding. During the "school day" (between leaving and returning home), there are three sources for the food that secondary pupils eat --- what they bring from home, what they obtain in school, and what they buy on the "school fringe", the doughnut of shops that surround secondary schools.

In the past, there has been much research on school meals, but little focussed on the fringe. New policies have improved the food inside schools, but paid scant attention to what is available outside, in adjacent shops. In 2008, however, both the Department of Health and the School Foods Trust (SFT) have drawn attention to "junk food" establishments near schools. Nonetheless....

This is the first research project to record what pupils actually buy from fringe shops, the full range of their purchases, at all times of the school day. It is a small study, but it starts to fill a gap in our knowledge of what schoolchildren eat, where and why. It offers an input into future policy-making.

HOW WE DID THE RESEARCH

We selected two large, mixed comprehensive schools, one in leafy, affluent suburbia, the other in a poor, gritty city. Suburban school had a large catchment area, many pupils arriving by train or bus. Urban was a community school, to which most walked or cycled.

Both were in modern buildings, had their own kitchens, tuck shops and dedicated, if small, canteens. Compared with many secondary schools, they were well equipped.

Urban allowed pupils to leave at lunchtime if they had parental permission, which most did. Suburban let Sixth Formers out, but had a "locked gate" / "stay-on-site" policy for younger groups.

Next, we plotted all the nearby food shops that were actually patronised by pupils --- supermarkets, newsagents, bakeries, cafes, takeaways, and a mixed group of multiples and others. And we identified when schoolchildren used each of them --- enroute to school, at lunchtime, on the way home, or at multiple times.

For initial orientation, we interviewed teachers, catering managers, parents and shopkeepers. We had five group discussions with a dozen pupils each. We also asked them to provide details of what they had eaten during the whole 24 hours of the previous weekday.

Then, 322 pupils completed a 5-day "food frequency questionnaire" (FFQ), recording how often they normally ate common foods during the "school day" time frame. And where they obtained them -- from home, school or fringe. Most were in years nine and ten, aged 13-15, but at Suburban we included year twelve, aged 16-17, the ones allowed out at lunchtime.

However, adolescents seldom tell researchers fully or accurately what they eat. Just like their parents, only more so. For both boys and girls, this "underreporting" exceeds 30% of their daily intakes.

To measure fringe feeding independent of pupils' self-reports, the heart of the research involved observation in 16 shops, during three time periods, before, during and after school hours. We designed a special recording form, then noted what pupils bought, how much, when, and what they paid for it, including a variety of special offers.

We observed 631 purchases. But 44 of these were very large, later shared among friends or saved for eating throughout the week. Eliminating them left 587 "individual purchases", consumed by one pupil in one day. Next, we analysed their nutritional quality, using manufacturers data and British food composition tables. We then compared the nutrient profiles of purchases between boys and girls, the two schools, the three times of day, plus different types of shops, especially takeaways and others.

WHAT WE FOUND

This report summarises key findings of the research and the core evidence that supports them. It is intended as a concise overview

for everyone interested in school feeding. Later, longer documents will describe specialist aspects of the work and policy options.

Significance of the Fringe: Food bought in fringe shops provided users with at least 23% of recommended energy intakes for this age group. This is intentionally a minimum estimate, based solely on hard observational evidence. Potential additional sources of fringe food are described in the sections that follow, and brought together in a more comprehensive assessment at the end.

Nutritional Quality of Fringe Food: Fringe purchases contained on average 38% of calories from fat, compared with the Dietary Reference Value (DRV) of 35%. Total carbohydrate intake was roughly on target at 52%. Much of that, however, was sugar. Total sugars provided almost a quarter of energy, “non-milk extrinsic sugars” (NMES) 15%, more than a third above the recommended maximum of 11%. The salt content of fringe food was relatively low, at least as sold. But many pupils added salt to products in takeaways. The proportion of protein was adequate. In sum, the main nutritional problem with fringe food and drink is sugar.

Nutritional Quality of All Fringe Purchases

Percentage of energy intake	All pupils	Boys	Girls	Suburban	Urban
Fat %	38	39	37	38	38
Total carbohydrate %	52	52	54	55	48
Total sugar %	22	20	25	23	20
Non-milk extrinsic sugar %	15	12	21	17	12
Percentage of daily DRV					
Energy %	23	22	23	23	21
Protein %	26	27	25	21	35
Salt %	13	14	12	14	12

Food Sources: Of the three sources of food available during the school day (home, school, fringe), shops on the fringe were the most widely used. 80% of pupils bought something from them at

least once a week, so they said on the FFQ. Among those allowed out at lunch, usage rose to 97% at Urban and included everyone at Suburban. Food was brought from home by 68% of pupils. Schools were the least common source of food, used by only 59%. That is, over two-fifths of pupils never obtained any food from within school -- from canteen, tuck shop or vending machines.

Multiple Sourcing: The percentages above total to over 200%. That is because most pupils obtained food from more than one of the three sources available (home, school, fringe). Only 18% of pupils used just one. This is not unexpected. Most people compile their daily diet from multiple sources. But it does mean that policies to improve schoolchildren's diets must take account of the multiple sources from which they obtain their food.

Which Shops?: Pupils did not patronise all shops within a fixed distance of schools. Rather, our mapping showed pertinent shops concentrated along transport routes they used to get to school. For practical reasons, we studied only shops near the end of their journeys, on the fringe of the two schools. But, in all probability, they also bought food from shops near the start of those journeys, in their home neighbourhoods and, for Suburban pupils who travelled to school by train, around railway stations at both ends.

Frequency of Frequenting the Fringe: Pupils who bought food on the fringe said, on the FFQ, that they did so over six times a week each, on average more than once every day. But that figure was reduced by the many Suburban pupils locked in at lunchtime. They used fringe shops on average only 3.6x/wk. Suburban Sixth Formers, licensed to leave, bought fringe food 8.8x/wk. At Urban, usage was even higher, 11.5x/wk, on average more than twice a day. In contrast, those using the school as a source of food did so less than 5x/wk. Food brought from home was consumed 7.5x/wk.

Meal Pattern: That final number is odd, but revealing. Food brought from home is usually called a "packed lunch". But this "lunch" was consumed 7.5 times in a school week that contains only five lunch periods. It was eaten at various times of day, sometimes not during the lunch break at all. Almost a third of pupils skipped lunch altogether, rising to 45% of those kept in. Schoolchildren do not follow the conventional adult pattern of three meals a day --- breakfast, lunch, dinner. Morning break is the most common eating occasion, after school the most popular time for fringe feeding.

Breakfast: Breakfast was eaten irregularly by a third of pupils, and never by 11% of them. Both schools offered early morning food in their tuck shops, but had few takers. Over half the pupils claimed, in the FFQ, that they bought something from fringe shops enroute to school, mainly sweet foods and drinks. However, these were not breakfast substitutes. 86% of buyers said they saved such purchases for later. Anecdotal evidence from frontline staff and pupils, plus media reports, all suggest that some entrepreneurial schoolchildren are buying popular products, recently prohibited inside schools, on a larger scale, for later resale to friends. Some displacement of consumption from school to fringe appears to be taking place.

Nutritional Quality of Fringe Purchases by Time of Day

Percentage of energy intake	Before school	During school	After school
Fat %	28	43	41
Total carbohydrate %	66	48	51
Sugar %	46	17	18
Percentage of daily DRV			
Energy %	14	28	25
Protein %	8	45	25
Salt %	7	25	10

Hot Lunches: In the current debate about school feeding, much attention has focussed on hot school meals, in part because of the popularity of the Jamie Oliver television series. In both our schools, catering managers reported that only 6% of pupils ate any of the hot meals on any given day. In Urban, that is considerably less than half those entitled to free school meals. Some may, as critics suggest, intentionally avoid the new "healthy" dishes. But that is not what pupils said in group discussions, nor after sample tasting sessions. Many have never tried the new recipes. What they are avoiding is not healthy meals, but the canteens in which they are served. Daily canteen use was 44% in Suburban, only 15% in Urban. 43% of pupils never visit the canteen at all. Why not?

Diversion from Canteen: Pupils are diverted from school canteens by several forms of alienation. Eating at school involves long queues, in sometimes raucous disorder. Both canteens provided seats for less than a quarter of pupils. So entry during the hour-long lunch break is divided into staggered short sessions for different year groups. Attractive foods sell out early. Prices are perceived to be high. Boys especially prefer sport or other activities during lunch, eating during morning break instead, often with food bought in fringe shops. For older students, leaving school at lunchtime is a sign of maturity. School dinners and packed lunches are uncool. In sum, there are pull factors that draw pupils to fringe shops, but also push factors within schools that drive them out.

Takeaways: Fast food shops near schools raise concern. Their products are assumed to be fatty. Seven of our 16 shops fit this category. Ironically, the archetypal unhealthy fast food shop, McDonalds, was near Urban, but seldom used by pupils; it was too expensive. Local independent shops offered child-size portions at child-size prices. They organised fast service in busy periods, even took on extra staff. Their food was fattier, on average 45% of calories from fat, versus 32% from other fringe shops. But, the six takeaways around Urban, offering meat meals, also provided 70% of users' daily protein needs. Despite the surfeit of fast food outlets, our observations showed the most popular shop near Urban was the supermarket, with more visits than all takeaways put together. Hence, over-consumption of sugar was even greater than of fat.

Nutritional Quality of Food from Takeaways and Other Shops

Percentage of energy intake	All purchases		Suburban		Urban	
	Take away	Other	Take away	Other	Take away	Other
Fat %	45	32	45	34	44	25
Total carbohydrate %	44	60	49	58	39	68
Sugar %	4	39	3	35	4	53
Percentage of daily DRV						
Energy %	38	17	43	18	33	13
Protein %	53	15	31	19	70	8
Salt %	16	12	10	15	20	6

Price: Schoolchildren are very price-sensitive consumers. Not just McDonalds, but other shops, like coffee bars, were avoided on cost grounds. In discussions, pupils said school canteens were expensive compared to fringe shops, pizza particularly --- £1-30 a slice inside, £1 for a whole pie outside. "Nothing costs less than 70p; in the shops it's only 20p." Over a quarter of purchases we observed were in response to special offers --- percentage discounts, buy-one-get-one-free, multi-buys, child prices. Pupils sometimes pooled funds to take advantage of these incentives, sharing out food later.

Shop Theft: Some preferred not to pay at all. During our observation, one Suburban supermarket called in the police to check pupils' rucksacks, because 50% of doughnuts disappeared without reaching the till, 80% of some popular sweets, a whole case of Red Bull. Five local retailers then organised to protest to the school about pilferage. It is impossible to know the volume of food consumed in this way, or its nutritional quality. We assume stolen food was not recorded in the FFQ either, a novel form of underreporting. We asked pupils if they knew anyone who stole from fringe shops. Over half said they did. The principal objects of desire were sweet foods and drinks, purloined as well as purchased.

SOME PRACTICAL OPTIONS

Locked Gate / Stay-on-Site Policy: Improving or controlling what pupils buy on the fringe is difficult, both practically and politically. One option is a "locked gate" policy, not allowing pupils to leave school premises at lunchtime. This would never be a complete solution. Pupils could still bring in food from fringe shops, as many of ours did. The restrictions may even provoke pupil pedlars. Hence, keeping schoolchildren in school does not mean they will eat school meals. Nonetheless, this research indicates that such controls could have a substantial effect in reducing fringe feeding. The difference in fringe shopping between younger children at Suburban, who were kept in, and older pupils, who were allowed out, was 5x/wk --- suggesting, if not proving, that most were eating lunch out most days.

Small Portions: One strategy in the debate about obesity is portion control --- food should be packaged or served in smaller amounts. Of course, price-conscious pupils responded to special offers for large packs, like two litre soft drinks and 500g chocolate bars. However, much fringe food already comes in small portions.

Virtually all takeaway food was sold in smaller, cheaper, children's portions. Near our schools, independent shops and even supermarkets offered branded confectionery in tiny sizes with a price point of 10p per pack. Pupils bought handfuls at a time.

Restricting Fast Food Shops: Announcing the government's Obesity Strategy in January, the Secretary of State for Health proposed using planning controls to limit new fast food shops near schools. The idea provoked instant dissent from local authorities. The value of the initiative, in any case, substantially depends on the existing mix of fringe shops. For example, around Suburban, there was one takeaway. Urban already had six. The real significance of the proposal is that, for the first time, the fringe attained a place on the policy agenda. The nutritional problems created by fringe feeding were well documented in a official survey conducted in 1983. But successive governments have heretofore declined to engage with the issue.

CONCLUSIONS

Limitations of This Research: This is a small piece of research, more than a pilot study, less than a representative survey. It covered only two schools, both in southeast England, neither in a conurbation. It is no basis for generalising about fringe feeding in the whole UK. However, it provides the only credible information available on what pupils actually eat from the shops around schools. It is a start, on a subject now belatedly recognised as significant for children's health, on which action needs to be taken.

Nutritional Quality of All Food Sources: This research provides the first nutritional analysis of fringe purchases. As a result, in the UK, there are recent nutritional profiles of all three sources of pupils' food during the school day. Nelson and colleagues conducted a large study of secondary school lunches in 2004. In the same year, Jefferson and Cowbrough researched the packed lunches of secondary school pupils. Inconveniently, all three studies present their results in slightly different ways. But all agree on the most important point --- the nutritional quality of secondary schoolchildren's diet is not what is required. We have partly adjusted the data to be on as comparable a basis as possible. The results are set out in the following table.

Nutritional Quality of Food from All Three Sources

Percentage of energy intake	Fringe shops		Packed lunches		School food	
	Boys	Girls	Boys	Girls	Boys	Girls
Fat %	39	37	37	37	41	41
Total carbohydrate %	52	54	52	52	47	48
Total sugar %	20	25	23	24	-	-
Non-milk extrinsic sugar %	12	21	-	-	13	14
Percentage of daily DRV						
Energy %	22	23	31	37	29	31
Protein %	27	25	44	45	45	41
Salt %	14	12	16	16	18	15

Together, they confirm the problem. None of the three sources meet the dietary recommendations for schoolchildren. Any serious programme to improve schoolchildren's diets must pay attention to all of them.

Why this Research Underestimates the Fringe: A very condensed summary of our results, including price data, is presented in the final table below. In fact, the true situation with fringe feeding is almost certainly worse than it describes.

Earlier, in an intentionally conservative estimate, we said fringe shops provided users with at least 23% of their energy requirements. That is what we actually observed and recorded. But there are several reasons why the significance of the fringe in schoolchildren's diets is likely to be higher.

* Most important, each of our observations recorded what one pupil bought in one shop. But we know that many pupils, those allowed out at lunchtime, visited more than one shop a day, sometimes more than two. What they bought and consumed from these additional visits would substantially increase, perhaps even multiply, the amount the fringe contributed to their intakes.

* We were only able to study shops close to schools, hence "the school fringe". But pupils may buy additional food and drink from other shops on their journeys between home and school and back.

If we were able to measure all those purchases, the contribution of shops to pupils' diets during "the school day" would again rise.

* In order not to exaggerate the significance of the fringe in each individual's intake, we excluded large purchases that the buyer later shared out with friends. But our methods did not allow us to calculate how much individual pupils received from such sharing.

* We know that theft of food and drink from fringe shops occurs. We do not know how much, but some evidence suggests the amount is not trivial. However much pupils obtain illicitly, it enlarges the contribution from legitimate purchases.

In sum, we made unique and rigorous efforts to measure what pupils bought on the fringe, independent of their often misleading self-reports. Nonetheless, our recorded results on fringe feeding are certainly underestimates. And, for pupils allowed out of school at lunchtime, substantial underestimates.

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SUMMARY TABLE

Shop Purchases by Pupils

Mean values			Description	Weight (g)	Mean weight in Grams per purchase					
N	Cost (£)	Price Offer			kcal	Protein	Fat	CHO	Sugar	Salt (mg)
631	1.09	28%	<i>All purchases</i>	363	563	12.5	22.8	76.6	37.1	790
44	1.61	36%	<i>Multiple purchases</i>	804	1317	19.8	41.8	212.9	159.8	985
587	1.05	27%	Individual purchases	330	506	11.9	21.4	66.4	27.9	775
349	1.01	32%	Boys	349	540	12.7	23.2	69.6	27.5	829
238	1.11	20%	Girls	301	456	10.7	18.6	61.7	28.4	695
367	1.12	22%	Suburban	333	520	9.6	22.0	71.3	29.9	802
220	0.93	35%	Urban	323	483	15.9	20.3	58.2	24.5	729

"Price Offer" records the percentage of purchases that were obtained at a discounted price. These included multi-buys, child portion/price, reduced prices and buy-one-get-one-free.