SCHOOL FOOD TRUST
Eat Better Do Better

Research Summary

Primary school food survey 2009

1. School lunch: provision, selection and consumption

Overview

By September 2008, all primary schools in England were required by law to meet new food-based and nutrient-based standards for school food provision. The School Food Trust has carried out a survey to assess the impact of the standards on catering provision and pupil food selection and consumption in a nationally representative sample of 136 primary schools in England. The survey replicates a similar survey carried out in 151 primary schools in 2005.

Compared with 2005, caterers now provide a more healthy lunch, including more vegetables and salad, starchy foods not cooked in fat (like pasta and rice), fruit, fruit juice, and fruit-based desserts, and fewer desserts without fruit, chips and other starchy foods cooked in fat, and no crisps or confectionery.

By limiting the range of foods to healthier options, pupils now take healthier lunches. For example, the average meal taken now contains over two portions of fruit and vegetables, and is lower in fat, sugar and salt. In consequence, pupils eat healthier meals at lunchtime. For example, fat provides about 29% of lunchtime energy (well below the 35% maximum allowed), and saturated fats provide around 11% (meeting the target). The average sodium content of a meal has dropped by almost one-third since 2005. Reassuringly, average wastage did not increase, as some had feared.

This Research Summary is the first of three that the Trust plans to publish relating to this survey. The next one will be on packed lunches, and the third one on the impact of specific catering practices and school policies on lunchtime catering provision and pupils' consumption.

Background

Since September 2008, all primary schools in England have been required by law to comply with new standards for school lunch.[1] The purpose of this legislation is to enable pupils to eat more healthily at lunchtime and throughout the school day. These standards replace the food-based standards introduced in 2001.[2] The 2001 standards helped to ensure that healthy food and drink options were available throughout the lunch service, but did nothing to limit the range of less healthy options available. Nor did they address the provision of food across the school day. The new standards balance the range of choice toward healthier options, and include non-lunch provision. For example, a portion of fruit and vegetable must be provided at lunchtime for every pupil having a school lunch. Chips can be served occasionally, but not every day, as before.

Aims of the overall survey

- Observe and record the provision of all food and drink in the dining room
- Observe and record the food and drink choices of a random sample of pupils having a school lunch
- Determine the consumption and wastage of all food and drink served
- Measure the consumption of food and drink from packed lunches[a]
- Assess the nutrient content of school lunches and packed lunches[a]
- Assess compliance of provision with the food-based and nutrient-based standards for school food
- Ask catering providers and Head Teachers about the arrangements for provision and school policies relating to healthy eating[a]

How the data were collected

The study was carried out by a consortium of workers from the School Food Trust, *Nutrition Works!*, and Taylor-Nelson-Sofres. A nationally representative sample of 6696 pupils in 136 primary schools in England was recruited between February and April 2009 to assess the lunchtime eating habits of primary school pupils. A further 3428 pupils who brought packed lunches were also recruited. Caterers provided planned menus as well as other information relating to catering practices. Head teachers were interviewed by telephone about school food policies and finances.

Between February and April 2009, trained field workers collected observations at lunchtime on five consecutive days at each school. Each day, fieldworkers made a list of all food and drink served at lunch time and recorded the number of portions of each item provided. They weighed and recorded typical portion weights, and recorded the number of pupils catered for. They then observed and recorded the food and drink items taken and eaten by 10 randomly selected pupils having a school lunch. When pupils had finished their lunch, they returned their trays to the field workers who then recorded and weighed leftovers. For a further five randomly selected pupils who brought a packed lunch to school, field workers recorded the weights of each item of food and drink eaten (allowing for food left over). Caterers were asked to provide copies of their school lunch menus and recipes (with details of ingredients and cooking methods).

The present results are compared with those from a similar study carried out in 2005 in a nationally representative sample of 7166 pupils attending 151 primary schools in England.[3]

Food and drink provided by caterers at lunchtime

Figure 1 compares the pattern of food and drink provision in 2009 with 2005. Based on direct observations of what was available at lunchtime, each bar in the figure shows how many different types of food or drink were provided in a given food group as a percentage of *all* items provided by the caterer.[b] For example, in 2005, 18% of *all* types of food and drink provided were a vegetable or an item of salad; in 2009, this had increased to 22%. Healthier foods promoted by the new standards, such as vegetables and salad, fruit, starchy foods not cooked in oil, milk and yogurt, water, fruit juice, and fruit-based desserts, together represented a 12% greater share of the types of food and drink provided in 2009 compared with 2005. Conversely, foods regarded as less healthy (including 'other' desserts (i.e. not containing fruit), condiments,[c] starchy food cooked in fat, and non-permitted items such as savoury snacks, confectionery, chocolate, soft drinks) together represented 12% less of the types of items provided in 2009 compared with 2005. Although these changes seem relatively small, they underpin a substantial move toward healthier food selection, as revealed in Figure 2.

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[a] Findings on packed lunches and the impact of catering practices and school policies on lunchtime catering provision and consumption will be presented in subsequent Research Summaries.

[b] This is based on a count of the *types* of food and drink offered, not the number of portions, as this was not measured in 2005. The percentage of healthier food *portions* served in 2009 is likely to be higher.

[c] Condiments include ketchup, mayonnaise, chutney, and other sauces (not salt and pepper).

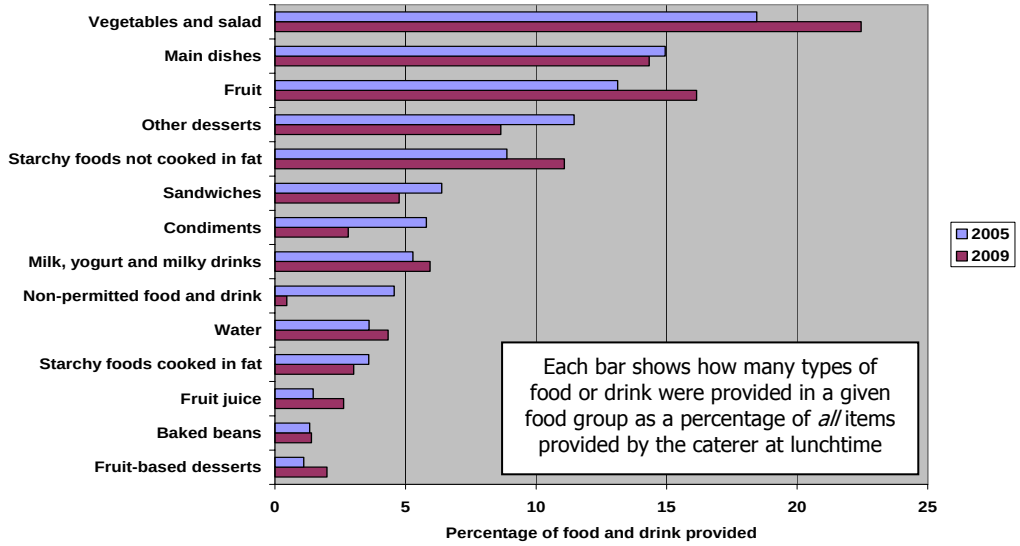

Figure 1. Percentage of types of food and drink items provided by caterers at lunchtime, by food group, primary schools, England, 2005 and 2009[*]

[*] All differences were statistically significant at p≤0.01 except main dishes and baked beans. Vegetables and salad included raw and cooked vegetables (but do not reflect the contribution from vegetables in main dishes). Fruit based desserts contained an average of 40% fruit. Base (schools): 2005: 151; 2009: 136

Food and drink selected by pupils at lunchtime

The main purpose of introducing stricter regulations relating to school food was to change the balance of food and drink available at lunchtime toward healthier options. Figure 2 shows the impact of these changes on pupils' food selection. Based on direct observations of what was on pupils' trays, the figure compares the percentage of pupils having a school lunch who took items of food and drink from specific food groups in 2005 and 2009. The changes, on average, have been in what could be deemed a 'healthy' direction. For example, in 2009, 74% of pupils took servings of vegetables and salad, compared with 59% in 2005. Similar trends were seen for starchy foods not cooked in fat, water, fruit, milk and yogurt, fruit-based desserts, and fruit juice. In contrast, fewer pupils took the less healthy options: 'other' desserts, starchy foods cooked in fat, non-permitted items[d] (savoury snacks, confectionery, chocolate, sweetened soft drinks), and condiments.

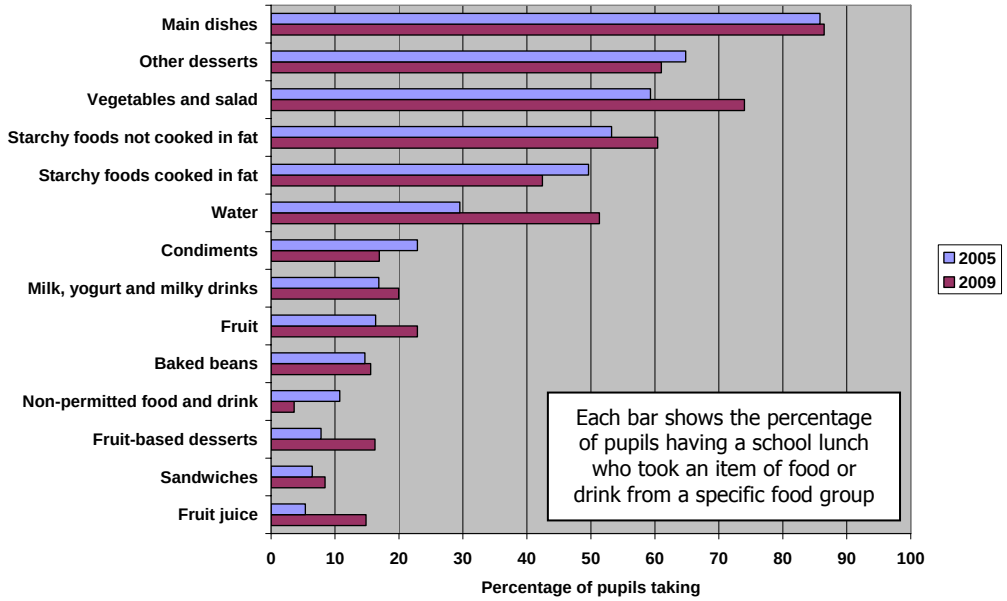

Figure 2. Percentage of pupils having a school lunch who took specific items of food and drink, by food group, primary schools, England, 2005 and 2009[*]

[*] All differences were statistically significant at p≤0.001 except for main dishes and baked beans. Vegetables and salad included raw and cooked vegetables (but do not reflect the contribution from vegetables in main dishes). Fruit based desserts contained an average of 40% fruit. Base (pupils): 2005: 7166; 2009: 6696

[d] Items not permitted under the regulations. Two schools were cooking with confectionery (e.g. chocolate chips) at lunchtime, and eight provided squash, or milkshakes with excess amounts of sugar.

Figure 3 summarizes the *change* in the percentage of pupils taking items in a specific food group between 2005 and 2009 (equal to the *differences* in the percentages shown in Figure 2). For example, in 2005, 29.5% of pupils took water with their lunch; in 2009, this had increased to 51.3%. Thus, the graph shows that 21.8% more pupils took water to drink in 2009 than in 2005. Similarly, about 15% more pupils took vegetables or salad in 2009 compared with 2005, 9% more took fruit juice, and so on. In contrast, 4% fewer pupils having a school lunch took 'other' desserts (non-fruit-based desserts); 6% fewer took condiments; 7% fewer took starchy foods cooked in fat (chips, potato wedges, roast potatoes, etc.); and 7% fewer pupils took items from the non-permitted group at lunchtime.[e] These changes represent significant advances toward healthier eating at lunchtime amongst primary school pupils.

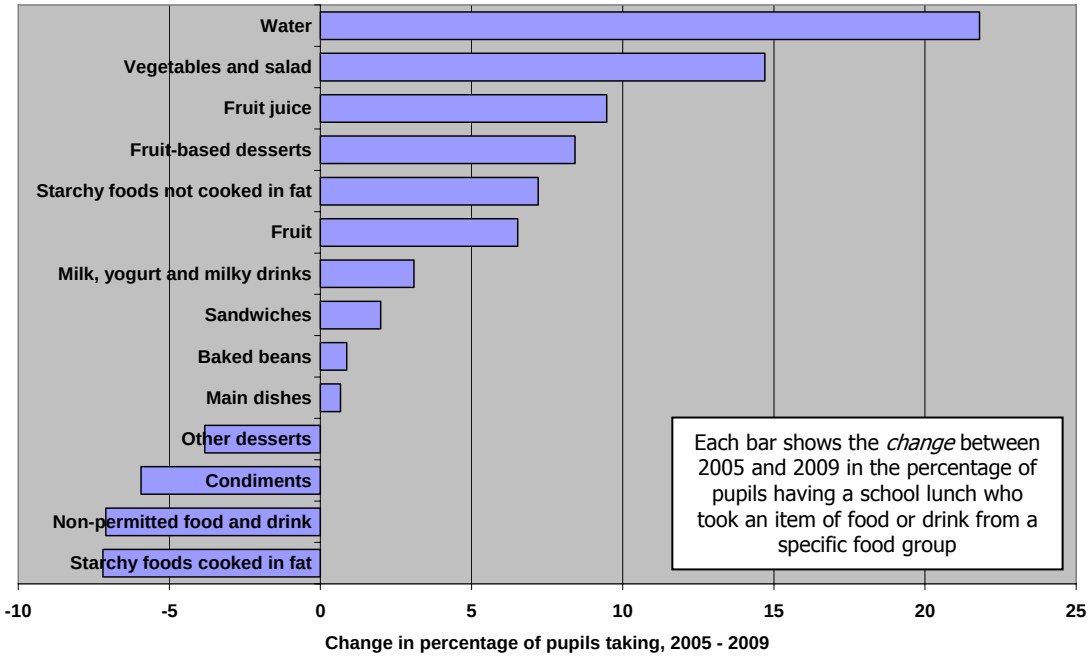

Figure 3. Change in the percentage of pupils having a school lunch who took specific items of food and drink, by food group, primary schools, England, 2009 compared with 2005*

*All differences were statistically significant at p≤0.001 except for baked beans. Vegetables and salad included raw and cooked vegetables (but do not reflect the contribution from vegetables in main dishes). Fruit based desserts contained an average of 40% fruit. Base (pupils): 2005: 7166; 2009: 6682

Food and drink eaten by pupils at lunchtime

Consumption by food group

The food and drink that pupils ate at lunchtime was measured by direct observation. Field workers noted the food and drink taken by each pupil in the sample; the weight of a standard portion was based on direct measurements made in each school; and the amount of food left over by each pupil was weighed.

Table 1 shows the percentages of pupils who took food and drink from specific food groups, and the average amounts of food and drink taken and eaten by those who took the items. The percentages in the table reflect those shown in Figure 2 for 2009.

Pupils in 2009 were taking a healthier balance of foods compared with pupils in 2005. Their selections included plenty of meat, poultry, fish and main dishes with protein. Only 11% of pupils took meat products (sausages, burgers, sausage rolls, etc.), reflecting their reduced availability at lunchtime. Over half of pupils took vegetables (this does not include the vegetables contained in mixed dishes) and almost a quarter took salad. About 40% took fruit or a fruit-based dessert. Over half of pupils had plain water to drink.

[e] Two schools were cooking with confectionery (e.g. chocolate chips), and eight were providing squash or milkshakes with excess sugar to drink.

Table 1. Percentage of pupils taking specific food and drink items, weight as taken, weight as eaten, and wastage, by food group, primary schools, England, 2009

	Pupils taking	Weight as taken		Weight as eaten		Plate wastage*	
Food Group	%	g mean	g sd**	g mean	g sd	g	%
Meat, poultry, fish	33.1	58.7	27.7	48.5	28.6	10.6	18.9
Meat product	10.9	79.8	38.0	69.5	35.4	10.5	11.3
Protein & carbohydrate	9.3	113.3	52.6	86.4	52.7	28.1	24.3
Protein & vegetable	9.3	107.1	35.2	77.6	46.1	30.5	31.0
Protein, carbohydrate & vegetable	21.4	113.6	62.9	85.0	59.9	29.6	25.1
Protein other	6.6	37.2	18.5	31.5	18.7	6.0	16.4
Carbohydrate & vegetable***	5.4	101.8	52.5	69.6	51.8	33.7	34.6
Carbohydrate	60.4	86.0	56.3	61.5	49.6	25.7	28.3
Starchy foods cooked in oil	42.4	74.0	30.7	59.1	33.7	15.4	20.6
Vegetables	57.1	60.0	27.2	39.1	28.5	22.5	40.7
Salad	22.9	40.8	25.1	30.3	24.5	11.6	32.6
Baked beans	15.6	85.2	22.9	74.5	27.9	11.0	13.9
Sandwiches	8.4	84.9	55.2	66.3	52.7	19.2	27.3
Fruit	22.9	80.3	43.7	56.4	42.6	25.1	32.7
Fruit-based dessert	16.2	82.9	33.3	64.9	39.6	18.8	23.8
Other dessert & dessert accompaniment	61.0	85.8	52.7	74.7	52.7	11.8	14.9
Milk, yogurt & milky drinks	20.0	134.9	52.6	110.3	56.3	24.7	17.4
Fruit juice	14.8	132.7	48.3	114.0	52.4	19.0	14.1
Water	51.3	124.0	30.5	93.6	47.6	31.8	26.1
Condiments	16.9	48.2	34.0	44.4	33.2	3.9	10.9
Non-permitted drink	3.0	145.9	29.7	123.2	47.2	22.7	15.5
Dessert containing confectionery	0.6	48.8	21.4	43.5	23.5	5.5	11.0

Base: 6,696 pupils

* The differences between the weight as taken and the weight as eaten were computed item by item within each food group, so the values are not equal to the differences between the averages as given in the table.

** sd: standard deviation

*** These are mainly vegetable-based dishes (e.g. vegetarian lasagne) and have been included in the vegetable and salad food group in the Figures.

Of the food and drink taken, pupils left about 24% as plate waste.[f] Reassuringly, this was little changed from 2005 (23%), and not substantially higher as some had feared.[4] Wastage varied by type of item. Unsurprisingly, it was lowest for items like meat products, baked beans, and dessert containing confectionery, but even items like chips and starchy food cooked in oil were wasted (about 21%). The highest average wastage was seen for vegetables, carbohydrate and vegetable dishes, fruit and salad. This suggests that more needs to be done to encourage pupils to finish eating the vegetables, salad and fruit which have been taken.

One of the key objectives of the food-based standards was to ensure that every pupil had access to one portion of fruit and one portion of vegetables at each meal. Table 2 shows the average number of portions[g] of vegetables and fruit taken and consumed. On average, pupils were taking over two portions of fruit and vegetables per day. When all sources of fruit and vegetables were taken into account, across all pupils, an average of 2.2 portions were taken and 1.6 portions eaten.

Amongst 'consumers' (those pupils who took an item), an average of 2.3 portions were taken and 1.8 portions eaten. These findings are conservative, as there is a small contribution of vegetables in sandwiches and pulses in mixed dishes that could not be taken into account because of lack of recipe data. About 35% of pupils consumed at least two portions of fruit and vegetables on a given day, and over half consumed at least one and a half portions. This represents a substantial move toward the goal of the

[f] Overall percentage plate waste was calculated as the mean of the plate waste of every item (weight of food or drink not eaten by a pupil divided by the weight of the food or drink served). This is likely to be a slight overestimate, as some measurements included containers (e.g. yogurt pots) which could not readily be weighed separately from the wasted food itself during the weighing process in the dining room.

[g] One portion of vegetable=40g; one portion of fruit =40g.
One portion of fruit juice=150ml; one portions of beans and pulses=40g. Fruit juice, and baked beans and pulses count as maximum of one portion per day.
Composite dishes contained an average of 28% vegetables; fruit based desserts contained an average of 40% fruit.
Proportion of baked beans to pulses as served=0.97

legislation to ensure that every pupil has two portions of their "five a day" from a school lunch.

Table 2. Number of portions of vegetables and fruit taken and eaten, by food group, primary schools, England, 2009

Food or drink	As served			As eaten		
	% taking	Consumers only	All pupils	% taking	Consumers only	All pupils
Vegetables, salad or dishes with vegetables	74.3	1.6	1.2	70.4	1.2	0.8
Baked beans and pulses	32.4	0.9	0.3	30.6	0.8	0.2
Fruit or fruit-based desserts	38.5	1.5	0.6	36.1	1.2	0.4
All foods containing vegetables, salad, baked beans, pulses or fruit (excluding fruit juice)	92.0	2.3	2.1	89.2	1.7	1.5
Fruit juice	14.8	0.8	0.1	14.5	0.7	0.1
All food and drink containing vegetables, baked beans, pulses or fruit (including fruit juice)	93.4	2.3	2.2	91.0	1.8	1.6

Base: 6696 pupils

Nutrient intake

Table 3 shows the mean energy and nutrient content of school meals "as taken" and "as eaten" in 2009. The values are shown separately for Infant and Junior pupils because the energy and nutrient requirements *("Nutrient-based standard")* differ by age group. With few exceptions, the average meal "as taken" met the standards (shown in **bold**). This is a remarkable achievement on the part of school catering services across England.

Table 3. Comparison of mean nutrient intake from school lunch taken and eaten by 2482 Infant pupils and 4200 Junior pupils with the nutrient-based standards, primary schools, England, 2009

Nutrient	Infants			Juniors		
	As taken	As eaten	***Nutrient-based standard***	As taken	As eaten	***Nutrient-based standard***
	Mean	*Mean*		*Mean*	*Mean*	
Energy (kcal)	**483.7**	369.8	*465-514*	496.3	403	*529-585*
Protein (g)	**18.4**	**14.0**	*5.9*	**18.8**	**15.2**	*8.5*
Carbohydrate (g)	**70.9**	53.7	*65.2*	71.9	58	*74.2*
NMES (g)*	**13.8**	**11.1**	*14.3*	**14.5**	**12.4**	*16.3*
Fat (g) *	**15.9**	**12.4**	*19*	**16.6**	**13.7**	*21.6*
SFA (g) *	**6**	**4.7**	*6*	**6.3**	**5.2**	*6.8*
Fibre (g)	**5**	3.6	*3.9*	**4.8**	3.7	*4.5*
Sodium (mg) *	514.9	406.7	*357*	**544.8**	**453.5**	*595*
Vitamin A (µg)	**348.5**	**244.9**	*140*	**326.7**	**240.8**	*175*
Vitamin C (mg)	**25.3**	**17.9**	*10.5*	**22.5**	**16.9**	*10.5*
Folate (µg)	**66.5**	**48.4**	*35*	**63**	48.4	*53*
Calcium (mg)	**204**	**160.7**	*158*	**204.7**	169.3	*193*
Iron (mg)	**2.3**	1.7	*2.1*	2.4	1.9	*3*
Zinc (mg)	2.1	1.6	*2.3*	2.2	1.7	*2.5*
Percent energy from:						
Protein	15.7	15.8	-	15.8	15.8	-
Carbohydrate	**55.7**	**55.5**	*50*	**55**	**54.8**	*50*
NMES*	**10.2**	**10.9**	*11*	**10.4**	**11**	*11*
Fat*	**28.3**	**28.4**	*35*	**28.9**	**29**	*35*
SFA*	**10.6**	**10.8**	*11*	**10.9**	**11**	*11*

Base (pupils): Infant: 2482; Junior 4200; 14 pupils could not be identified by age and were not included in the analysis
* To meet the standard, mean nutrient content should be below the value shown
- No standard for percent energy to be met from protein
Values shown in **bold** – standard met

Energy "as taken" met the standards in Infants but not in Juniors, and the energy content of an average meal as eaten was below the standard in both groups. This may not be inappropriate, given the need to reduce overweight and obesity, but more needs to be done to examine this issue (see section below on Challenges).

The average meals "as taken" and "as eaten" by both Infants and Juniors met the standards for percentage energy from carbohydrate, non-milk extrinsic sugars (NMES),fat, saturated fat; and exceeded the standard for fibre. Again, this is a remarkable achievement on the part of the caterers in providing meals with a healthier balance of sources of energy and levels of fibre.

While the Infant meals "as taken" met the standard for iron, Junior meals "as taken" did not, and the average meals "as eaten" for both Infants and Juniors did not meet the standard for iron. The zinc content of the average meals "as taken" and "as eaten" was below the standards for both Infants and Juniors. Caterers have been working hard to increase the iron and zinc content of lunchtime meals, but clearly more work needs to be done.

Although meals "as eaten" did not meet the standards so consistently compared with "as taken" (Table 3), there were many improvements (typically greater in Infants than in Juniors) in comparison with the nutrient content of average meals eaten in 2005 (Figure 4). The most consistent differences between 2005 and 2009 were decreases in the NMES, fat, saturated fat, and sodium content of an average school lunch, and increases in the levels of vitamin A, folate and fibre and (in Infants) vitamin C and calcium. For example, the average Infant lunch "as eaten" had 32% more vitamin A in 2009 compared with 2005 (due largely to the increase in vegetable content), and over 20% less fat. Remarkably, the average meal in 2009 contained almost one-third less sodium compared with 2005, a substantial shift toward the standard. Because both sucrose (ordinary sugar) and fructose (fruit sugar) contribute to NMES, the decrease in NMES hides the fact that consumption of sucrose has declined even more markedly and the consumption of fructose (from fruit juice) substantially increased. Values for zinc were not computed in 2005 so cannot be included in the figure.

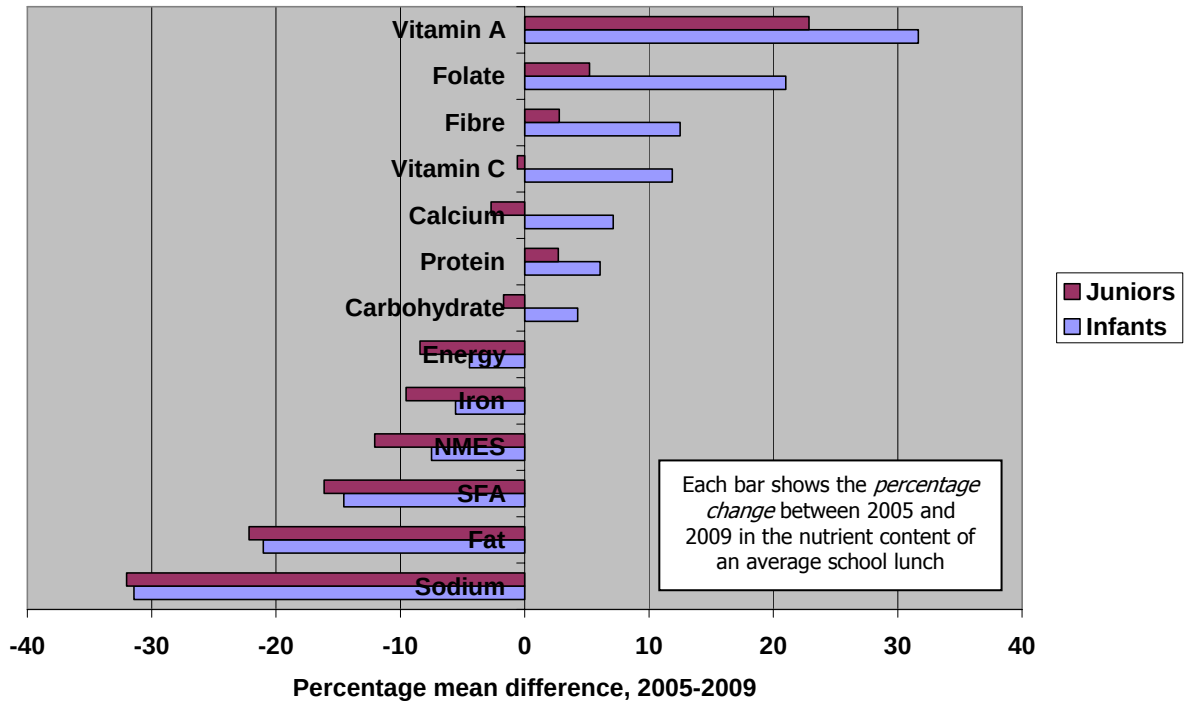

Figure 4. Percentage mean difference in the nutrient content of an average meal as eaten, 2009 compared with 2005, energy and nutrients, primary schools, England, by age group*

*All differences between 2005 and 2009 were statistically significant at p≤0.001 except Juniors: carbohydrate and calcium (p=0.009) and vitamin C (p>0.05). Base: (pupils): 2005: Infant 3035, Junior 4023; 2009: Infant 2482, Junior 4200

Compliance with nutritional standards for school food

The final food-based and nutrient-based standards introduced in primary schools in England in 2008 provide benchmarks for caterers to provide food and drink that will enable pupils to have balanced, healthy meals at lunchtime. Compliance with the standards in law relates to *planned* provision. For 113 schools that provided full menu cycles, it was possible to determine if the food-based standards had been met in relation to planned provision. It was not appropriate to include the planned provision for 23 schools, for which additional information on recipes and cooking practices was needed. It was also possible to assess *actual* provision against the standards in order to see how well actual provision matched up with planned provision. Because the data for actual provision related to only one week of direct observations in the dining room, standards which required assessment over two or three weeks (meat products, oily fish) could not be assessed in relation to actual provision.

Food-based standards

The majority of schools met most of the standards based on planned provision[h] (Figure 5). The percentages in the figure show the sum for schools that either definitely met the standards or that were likely to be meeting standards (based on information provided by the caterer about recipes, product information and cooking practices).

The lowest percentages were for meat products and starchy food cooked in oil – some schools were still serving sausages, burgers and chips more often than they should. The lapses, however, were usually relatively minor (one or two items in the planned provision over the amounts stipulated by the standards). Even where standards were met less often, however, the evidence suggests that there was good engagement by the caterers with the food-based standards. For example, in 2005, starchy foods cooked in oil (including chips, roast potatoes, etc.) were served almost every day – an average of 4.4 days per week. In 2009, this had fallen to 3.4 days per week; the standard is not more than three times per week.

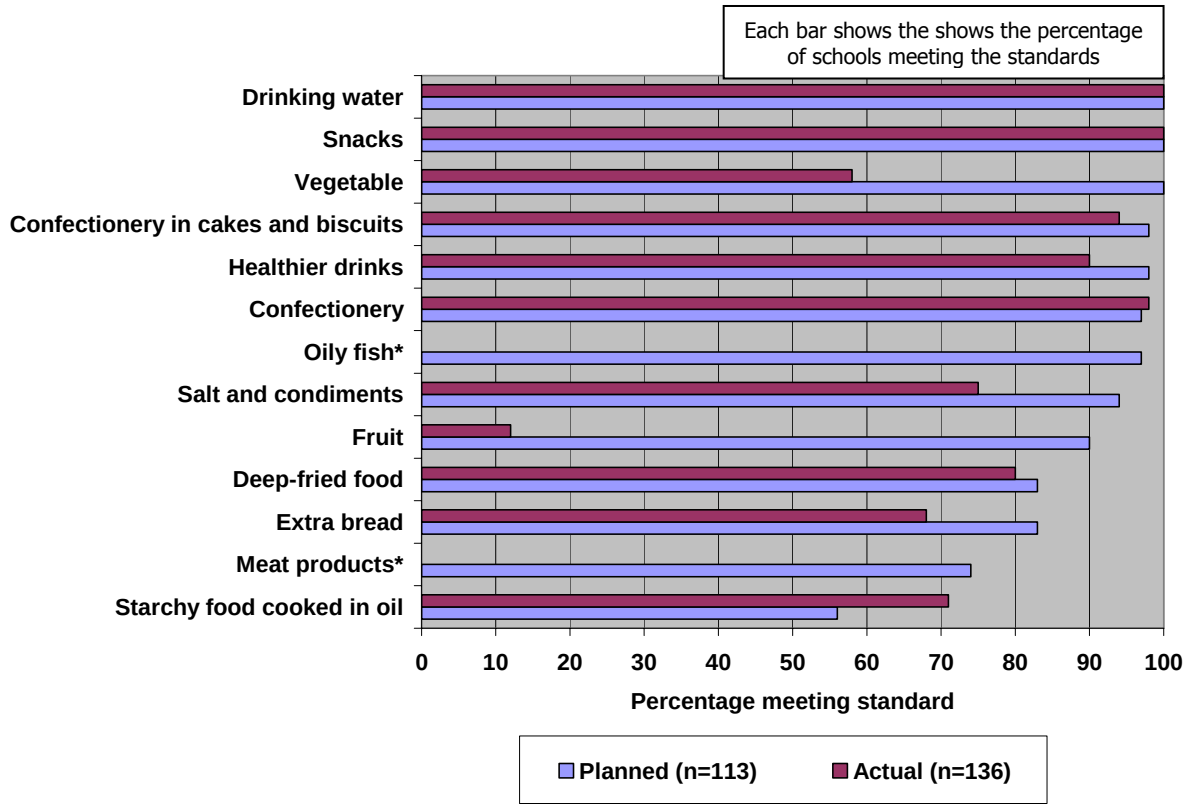

Figure 5. Percentage of schools meeting food-based standards, based on planned or actual provision, primary schools, England, 2009.

Base: planned 113 schools; actual 136 schools.

* Standards for oily fish and meat products cannot be measured over a one week inventory, so percentages for actual provision not shown.

[h] Based on menu cycles of between one and four weeks provided by the school caterer

Actual provision[i] complied reasonably well with the standards also. Only for two items, vegetables and fruit,[j] was provision less likely to meet the standards than planned provision (Figure 5). For vegetables, this shortfall was minimal: 58% of schools met the standard fully, a further 20% provided on average at least 90 portions of vegetables per 100 pupils, and only 7% of schools provided less than 80 portions per 100 pupils. This arose partly because they were trying to avoid wastage. For fruit, the shortfall was greater: 12% of schools provided a portion of fruit per pupil every day; a further 22% provided at least three-quarters of a portion; a further 34% at least half a portion; and only about one-third of schools were providing less than half a portion of fruit per pupil per day. In spite of the shortfall in meeting the standards for vegetables and fruit, it is important to bear in mind that on average, pupils were taking over two portions of fruit and vegetables at lunchtime (Table 2). Clearly, if the standards were met more often, more pupils would be likely to eat two portions of their "five a day" at lunchtime. Clearly, more still needs to be done to help caterers provide especially more fruit, and to encourage pupils to eat more fruit.

There were still some issues with compliance for condiments and extra bread, but these arose typically from a lack of clarity on the part of the caterer about how often these items should be provided. Overall, the level of compliance with the food-based standards was good, and reflects a major shift in patterns of food provision since their introduction.

Nutrient-based standards

The mean energy and nutrient content of an average school lunch was compared with the nutrient-based standards for primary schools. The calculation of an average school lunch was based on actual provision observed in the dining room over one week.[k] Over 80% of school catering provision met the standards for protein, carbohydrate, dietary fibre, vitamins A and C, folate and calcium. Around one-half of schools met the standards for fat, iron and zinc, and a further 14%-19% were within ±10% of standard.

Table 4. Energy and nutrient content of an average school lunch compared with nutrient-based standards, based on actual provision of food and drink, primary schools, England, 2009.

Nutrient	Standard	Nutrient content of average meal		Schools meeting the nutrient-based standard: Met		Within ±10% of standard		Not within ±10% of standard	
		mean	*se*[*]	*n*	*%*	*n*	*%*	*n*	*%*
Energy (kcal)	504-557	626.3	13.0	*See text*					
Protein (g)	7.5	23.7	0.5	136	100	0	0	0	0
Carbohydrate (g)	70.6	90.3	1.8	117	86	8	6	11	8
NMES (g)	15.5	19.0	0.6	46	34	15	11	75	55
Fat (g)	20.6	21.1	0.6	73	54	23	17	39	29
Saturated fat (g)	6.5	8.0	0.2	37	27	22	16	78	57
Fibre (g)	4.2	6.4	0.1	128	94	5	4	3	2
Sodium (mg)	499	674.3	18.3	26	19	10	7	101	74
Vitamin A (µg)	175	505.7	17.7	135	99	0	0	1	1
Vitamin C (mg)	10.5	37.1	1.5	136	100	0	0	0	0
Folate (µg)	53	86.1	1.9	132	97	3	2	1	1
Calcium (mg)	193	279.6	9.4	112	82	14	10	11	8
Iron (mg)	3.0	3.0	0.1	65	48	19	14	52	38
Zinc (mg)	2.5	2.7	0.1	73	54	26	19	37	27

Base: 136 schools
[*] se: standard error

[i] Based on an inventory of actual provision in the dining room made by direct observation

[j] Compliance with the fruit standard included portions of fruits, fruit juice and fruit based desserts (containing an average of 40% fruit). Compliance with vegetables included portions of salad, raw and cooked vegetables, and composite dishes including vegetables (containing an average of 28% vegetables).

[k] Although compliance with the standards should be assessed on the basis of planned provision, it was felt to be more useful to use the more comprehensive data for actual provision in all 136 schools over one week rather than to limit the analysis to the 113 schools for which full data on planned provision were available. Additionally, the expectation is that planned and actual provision should be closely aligned to pupils' selection of food and drink. Weekly variations in the nutrient content of planned and actual provision were believed to be similar, and therefore the differences in the nutrient content of planned vs actual provision were likely to be small. This is therefore a conservative view of compliance with the nutrient-based standards.

The standards met least often were for energy, non-milk extrinsic sugars (NMES), and sodium. The energy content of the average school meal is above the standard. The reason for this is not immediately obvious, and more analysis will be undertaken to assess the contribution of portion size and the provision of energy dense items like desserts, deep fried products, and meat products. Although many schools did not meet the standard for sodium, it is important to note that the sodium content of meals "as taken" and "as eaten" is about one-third lower than in 2005. This reflects substantial changes in the use of fresh rather than pre-prepared foods, as well as a response by food manufacturers to reduce the levels of salt. More needs to be done to encourage these trends.

The average meal met about 10 out of the 14 standards and over 50% of schools consistently met 9 of the 14 standards. The vast majority of schools provided an average lunch that met between 7 and 10 standards (117 schools, or 86%) or more than ten standards (17 schools, or 13%); only two schools provided an average lunch that met fewer than 7 standards. A further 5%-26% of schools were within ±10% of the standards.

When a school met a given standard, it was more likely that pupils in that school would take and eat meals that were healthier. For example, in schools that met the standard for NMES, 74% of pupils took a meal that also met the standard, and 80% of meals as eaten met the standard. In schools that did not meet the standard, the values were 52% and 62%, respectively. There is therefore a direct relationship between the school meeting the standard and the proportion of pupils taking and eating healthier meals.

Within the standards, notionally 'less healthy' items can still be provided, but there are restrictions on the frequency with which they can be served. 'Starchy foods cooked in fat', for example, can still be provided up to three times per week across the school day, and the average provision is now only just above this level (3.4 days per week). On the days when these foods were served, however, caterers were likely to provide lots of portions, and in consequence, pupils were more likely to take them. So for example, although only 3% of the *types* of food provided were starchy foods cooked in fat (Figure 1), they represent 8% of all the foods taken by pupils.

Overall, the findings suggest that primary school caterers have made very significant progress towards providing lunches which meet both the food-based and nutrient-based standards. It is important to remember that the field work for the survey was carried out only six months after the deadline for meeting the standards had passed.

Challenges

The success in encouraging more pupils to take healthier items at lunchtime (Figure 2 and Figure 3) and to take and eat more healthy lunches (Table 1 and Table 2) was achieved through a combination of legislation to change the balance of provision toward healthier options and the work of the Trust to support the development of skills and to change attitudes across a wide range of stakeholders. There are, of course, further changes that need to be made to provide food and drink fully compliant with the standards and to encourage pupils to make consistently healthy choices at lunchtime.

Caterers need to:

- Continue to reduce the number of times that starchy foods cooked in fat and meat products are provided
- Increase the range of ways in which fruit and fruit-based desserts are provided
- Encourage more pupils to take fruit and fruit-based desserts at lunchtime
- Find more ways to include vegetables in recipes
- Increase the iron and zinc content of recipes and meals
- Reduce the amount of salt used in cooking

Pupils need to be encouraged to:

- Take more portions of fruit
- Eat more of the vegetables and fruit taken
- Choose alternatives to starchy foods cooked in oil and meat products even when they are on the menu

It is not clear whether the low energy content of meals as eaten means that some children may not have had enough to eat at lunchtime, or if the pupils on average have energy requirements that are below the nutrient-based standard. In light of the need to reduce levels of overweight and obesity, more needs to be done to explore whether or not the energy content of meals taken and eaten at lunchtime is consistent with the energy needs of the pupils, and to link with the "me size meals" encouraged by Change4Life.[5] Additionally, a consultation on energy requirements by the Department of Health is currently under way.[6]

Conclusions

The findings in this summary provide strong evidence that lunchtime food provision and food consumption in primary schools in England have changed substantially for the better since 2005. A good proportion of schools have catering provision that meets both the food-based and nutrient-based standards. This is a very significant achievement on the part of the caterers. Improvements need to be made in terms of the level of compliance with some standards (e.g. for iron and zinc) and in encouraging pupils to make healthier food choices at lunch time in line with the improved pattern of provision.

On balance, these findings suggest that primary school pupils in 2009 who had school lunches were responding positively to the changes that had been made in lunchtime provision of food and drink. Take up of school lunch in the schools in this sample was 43%, above the value reported for primary and special schools in the annual survey for 2008-2009 (39.3%).[7] This suggests that healthier food is not a barrier to increasing take up in primary schools. Most important, pupils were taking and eating substantially more healthy school meals compared with pupils in 2005.

Research and reporting

The research was designed and carried out by Michael Nelson, Dalia Haroun, Clare Harper, and Lesley Wood of the School Food Trust, members of the TNS research team (Gillian Prior, Louise Hall, Suzi Smyth), and Jenny Poulter of *Nutrition Works!*. This Research Summary was prepared by Michael Nelson, Dalia Haroun, Clare Harper and Lesley Wood. Copies are available from the School Food Trust website: www.schoolfoodtrust.org.uk

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[3] Nelson M, Nicholas J, Suleiman S, Davies O, Prior G, Hall L, Wreford S, Poulter J. *School Meals in Primary Schools* in England. Research Report No. 753. Department for Education and Skills/Food Standards Agency. London. 2006.

[4] In a survey of school waste, WRAP reported a figure of 46% for food waste in primary schools (quoted in the Times Education Supplement – Scotland, 4 Dec 2009), but this was expressed as the percentage of total waste that was food, not the percentage of food taken by pupils that was wasted. It included food from morning break (e.g. free fruit) as well as food at lunchtime.

[5] http://www.nhs.uk/change4life/Pages/MakeChangeMeSizeMeals.aspx

[6] http://www.sacn.gov.uk/reports_position_statements/reports/draft_energy_requirements_report_scientific_consultation_-_november_2009.html

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