Secondary school food survey 2011
2. School lunches versus packed lunches

Overview
By September 2009, all secondary 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 in a nationally representative sample of 80 secondary schools in England to assess the impact of the standards on catering provision and pupil food selection and consumption by pupils taking a school lunch. In addition, the food consumption of pupils bringing a packed lunch was evaluated.

School lunches as eaten contained more energy, carbohydrate, protein, fibre, vitamin A, vitamin C, calcium, folate, iron and zinc, and less salt compared with packed lunches.

Neither school lunches nor packed lunches as eaten reached the energy levels recommended in the nutrient-based standards. Both types of meals therefore had levels of sugar, fat, saturated fat and salt below the maximum levels permitted by the standards. Neither type of meal provided the levels of vitamins and minerals required to meet the nutrient-based standards (based on about one third of daily requirements) with the exception of vitamin C. School lunches provided lower percentages of energy from fat and saturated fat compared with packed lunches.

Average fruit and vegetable consumption in both types of lunch was lower than the level recommended in the standards (one portion of fruit and one portion of vegetables), but average consumption was higher in pupils taking a school lunch (0.8 portions) compared with pupils having a packed lunch (0.6 portions).

Overall, these findings support the view that secondary school lunches are more healthy than packed lunches. They highlight the need to improve school lunches further, however, and to encourage healthier choices and increased take up as a route to healthier eating in schools.
Background
Secondary school pupils have a variety of food options at lunchtime. They may have food provided by the school (paid-for or free); bring their own packed lunch from home or other food purchased on the way to school; go home for lunch; go off-site to purchase food from local outlets, or choose not to eat at lunchtime. Take up of school lunches in secondary schools during 2010-2011 was 37.6%, suggesting that more than half of pupils probably had a packed lunch or went off site.

Pupils choose lunch options consistent with their personal priorities (sit with friends, socialize, the ‘customer journey’, value for money). Packed lunches are often seen by pupils as a way of providing preferred foods at lunchtime, and avoiding having to queue for lunch. Studies comparing school lunches with packed lunches in primary schools consistently show that school lunches have a healthier food and nutrient profile than packed lunches, with noticeably less non-milk extrinsic sugar (NMES), saturated fat and sodium. Two studies comparing school lunches with packed lunches in the secondary sector have also been completed. The first, predating the introduction of the school food standards, showed that amongst 757 14 and 15 year olds in Cambridgeshire, protein, starch, carotene and folate, but also saturated fat and salt, were higher in school lunches than in packed lunches. A more recent study in 136 pupils from 11 secondary schools in four local authorities in England showed that school lunches had higher folate, vitamin C, fibre, iron and zinc content compared with packed lunches.

Since the introduction of the mandatory food-based and nutrient-based standards in secondary schools in September 2009, there is clear evidence to show that school food provision at lunchtime has become healthier. Whilst these standards do not apply to packed lunches brought from home or other food brought into school, about half of the secondary schools in this study did have written policies about food brought into school (data not shown).

The present study is the first national survey in England to compare school lunches with packed lunches and other food brought into school following the introduction of compulsory nutritional standards for school lunches in secondary schools in September 2009. Based on direct measures of lunchtime consumption in a nationally representative sample of 80 state-maintained secondary schools in England, the findings highlight the key differences between 5,969 school lunches and 1,823 packed lunches.

Aims of the overall survey
The survey was undertaken to:
- 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

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a Subsequently referred to in this report as packed lunches. 94% of items brought into school were for lunch (rather than a snack).

b Findings on food and drink provision, choices of pupils having a school lunch, consumption and wastage, and assessment of compliance of provision with the food-based and nutrient-based standards for school food are presented in an accompanying research report.
• measure the consumption of food and drink from packed lunches
• assess the nutrient content of school lunches and packed lunches
• assess compliance of provision with the food-based and nutrient-based standards for school food
• ask catering providers and headteachers about the arrangements for provision and school policies relating to healthy eating

How the data were collected
The study was carried out by the School Food Trust, with TNS-BMRB providing support for sampling and field work.

A nationally representative sample of 80 secondary schools in England was selected. The food choices and nutrient intakes of 1,823 pupils bringing a packed lunch (741 boys; 1,064 girls; 18 sex not recorded) and 5,969 pupils taking a school lunch (2,696 boys; 3,229 girls; 44 sex not recorded) were recorded. Fieldwork was conducted over the lunchtime period on five consecutive days at each school between October 2010 and April 2011. Each day, trained fieldworkers randomly selected five packed lunch pupils and fifteen school lunch pupils and observed, weighed and recorded all their lunch items and leftovers.

Further details on the collection methods of school lunch data along with findings about school lunches can be found in the report on the Secondary School Food Survey 2011: 1. School lunch: provision, selection and consumption.9

Food and drink eaten by pupils at lunchtime
Figure 1 compares the percentage of pupils who ate specific types of food and drink, by food group, by type of lunch (school lunch or packed lunch). The differences are typical of differences between a hot and cold meal. For example, children eating a packed lunch had higher sandwich consumption and lower main dish and starchy food consumption compared with those eating a school lunch.

Notably, 69% of pupils eating a packed lunch had ‘non-permitted foods’ (non-permitted snacks (e.g. crisps): 37%; non-permitted drinks (e.g. high in sugar): 26%; confectionery and/or cakes and biscuits containing confectionery: 40%), compared with only 9% of pupils eating a school lunch.
Figure 1. Percentage of pupils having specific items of food and drink at lunchtime, by food group, by type of lunch, secondary schools, England, 2011.*

Base (pupils): 1,823 bringing packed lunches; 5,969 taking school lunches.

*All differences between the lunch types were statistically significant (p<0.005), apart from dairy products (p=0.080) and fruit juice (p=0.838).

**Fruit and vegetables**

Table 1 shows the average number of portions of fruit and vegetables (including contributions from composite dishes) eaten by pupils having school lunches compared with pupils having packed lunches.

Nearly half of all pupils taking a school lunch (49%) had vegetables as part of their lunch, compared with only 22% of pupils eating a packed lunch. Conversely only 11% of pupils taking a school lunch had fruit (including fruit in fruit-based desserts) compared with 34% of pupils eating a packed lunch.

Amongst ‘consumers’ (those pupils who ate an item), both packed lunch and school lunch pupils consumed an average of 1.1 portions of fruit and vegetables (all sources including fruit juice and beans). Across all pupils, however, those eating school lunches ate more portions (0.8) of fruit and vegetables compared with pupils eating packed lunches (0.6 portions). Neither group was close to reaching the goal of two portions of fruit and vegetables per day at lunchtime which the legislation was designed to achieve, in contrast to pupils in the primary sector.10

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10 One portion of vegetable=80g; one portion of fresh/tinned fruit =80g; one portion of dried fruit=30g; one portion of fruit juice=150ml; one portion of beans and pulses=80g. Fruit juice, and baked beans and pulses count as a maximum of one portion per day regardless of the amount over 150ml or 80g, respectively. The fruit and vegetable content was calculated for each composite dish.
A significantly greater proportion of pupils who had a school lunch had either fruit, vegetables or both as part of their meal (72%) compared with pupils eating a packed lunch (56%).

<table>
<thead>
<tr>
<th>Food or drink</th>
<th>School lunch</th>
<th>Packed lunch</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>% eating</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Consumers only*</td>
<td>All pupils</td>
</tr>
<tr>
<td>Vegetables, salad or dishes with vegetables</td>
<td>48.9</td>
<td>0.8</td>
</tr>
<tr>
<td>Baked beans and pulses</td>
<td>12.5</td>
<td>0.8</td>
</tr>
<tr>
<td>Fruit or fruit-based desserts</td>
<td>10.6</td>
<td>0.7</td>
</tr>
<tr>
<td>All foods containing vegetables, salad, baked beans, pulses or fruit (excluding fruit juice)</td>
<td>61.1</td>
<td>0.9</td>
</tr>
<tr>
<td>Fruit juice***</td>
<td>25.1</td>
<td>0.9</td>
</tr>
<tr>
<td>All food and drink containing vegetables, baked beans, pulses or fruit (including fruit juice)</td>
<td>71.8</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Base: 1,823 packed lunch pupils; 5,969 school lunch pupils

* Differences between the two groups for ‘consumers only’ were found to be statistically significant at $p<0.005$, apart from all food and drink containing fruit and vegetables ($p=0.223$). It should be noted that due to the numbers of pupils in the study, very small differences between groups reach statistical significance. For example, there was a difference of only 0.04 portions (6ml) for fruit juice which is of questionable practical significance.

** All differences between the two groups were statistically significant ($p<0.001$).

*** Fruit juice includes the fruit juice element of juice drinks.

Mean energy and nutrient intakes

Table 2 shows the mean energy and nutrient intakes of pupils eating a school lunch or a packed lunch.

Average energy and nutrients consumed from school lunches and packed lunches were below the nutrient-based standards (with the exception of protein and vitamin C). Both types of lunch therefore met the standards for NMES, fat, saturated fat (SFA), protein, sodium and vitamin C (values shown in bold in table 2), but not for carbohydrate or other micronutrients.

On average, school lunches as eaten contained significantly more energy, carbohydrate, protein, fibre, vitamin A, vitamin C, folate, calcium, iron and zinc than packed lunches, and 8% less sodium.

The average school lunch had a better profile of sources of energy than a packed lunch, with significantly less energy derived from fat (31% vs. 34%) and SFA (11.0% vs. 11.6%).

The nutrient-based standard for energy assumes that a school lunch will contribute roughly one-third of total daily energy requirements. In practice, the average was about 25% for a school lunch and about 23% for a packed lunch. It could be argued that the low energy content of both types of lunch is consistent with the need to reduce obesity and overweight, but there is concern that pupils’ ability to perform well in the afternoon session at school may be compromised by hunger toward the end of the school day.
Conclusions

Although neither school lunches nor packed lunches provided the balance of nutrients required to meet the nutrient-based standards (based on about one third of daily energy and nutrient requirements), school lunches generally had a better nutrient profile, with lower sodium and higher fibre, vitamin A, folate, iron and zinc content. This may be because school lunches include more main dishes, typically higher in meat and a variety of other ingredients.

In contrast, packed lunches were not regulated (except in a handful of secondary schools where packed lunch policies were enforced). Pupils who ate packed lunches were more likely to eat sandwiches with fewer ingredients than main dishes. They were also much more likely to eat non-permitted food and drink items (e.g. drinks high in sugar, and snacks high in fat, sugar and salt), all of which are not permitted as part of school food provision at lunchtime under the new mandatory standards. Although these non-permitted items are generally high in fat, sugar and salt, there were no significant differences in NMES or fat intake between the pupils having school lunches or packed lunches, as pupils having a school lunch obtained these nutrients from other items, such as non-fruit based desserts (which include permitted cakes and biscuits) and drinks containing fruit juice. The non-permitted snacks consumed by the pupils eating a packed lunch are likely to be contributing to the higher sodium intakes. In consequence, the overall balance of intake from school lunches was closer to both the food-based and nutrient-based standards than intakes from packed lunches. These findings
are consistent with (unpublished) analyses previously undertaken by the Trust in secondary schools.

**Challenges**

The evidence presented in this and the accompanying report on school food provision and consumption\(^9\) shows clearly how the introduction of legislation to change the balance of provision of school lunches toward healthier options, together with the Trust's continued efforts to support the development of skills and to change attitudes across a wide range of stakeholders, has resulted in improvements in consumption amongst secondary school pupils compared with 2004. This contrasts with the impact of the previous legislation to provide healthier options introduced in 2001,\(^{11}\) which did little to improve the overall balance of provision and virtually nothing to improve consumption.\(^{12}\)

There are areas where further improvement is still needed, however. In particular, food and drink items provided in packed lunches are not covered by the food-based or nutrient-based standards. In consequence, packed lunches often contain foods high in fat, salt and sugar, and with lower levels of micronutrients than are found in school lunches. This contradicts the messages on healthy eating at school (in both the classroom and the dining room), and makes the job of encouraging more pupils to have school lunches more difficult.

In a bid to improve the eating habits of pupils in school and the profile of packed lunch items (to bring them in line with the nutritional standards for all school food), it is recommended that schools:

- Introduce a whole school food policy to promote consistent provision across all food consumed at school, including food brought from home or outside school
- Develop and implement packed lunch policies which promote healthier eating, in collaboration with the school senior leadership team, the School Council, Governors, and parent-teacher associations
- Promote school meals as the simplest way to achieve healthy eating at lunchtime, and work to increase take up of both paid-for and free school meals
- Encourage pupils to choose an appropriate amount of food at lunchtime, balanced to ensure optimum nutrient intake, and helping to avoid hunger and loss of concentration in the classroom toward the end of the school day.

Developing a whole school food and packed lunch policy would help to achieve consistent provision across all food and drink consumed at school (including items brought from home and outside school). It would help all children to benefit by addressing the gap between the nutritional content of packed lunches and school lunches, and potentially reaping behavioural benefits through healthier eating at lunchtime.\(^{13}\)

The Trust has produced a Packed Lunch Policy Toolkit which outlines six steps to develop and implement a healthy packed lunch policy within schools.\(^{14}\) It provides information, advice and guidance on how to develop a healthy packed lunch policy; engage pupils in the development process; marketing; reviewing and monitoring the success of the policy; and includes examples of compliant menus and recipes. Adoption of such a policy should encourage more pupils to choose healthier alternatives, by having more salad, vegetables and fruit at lunchtime.
and reducing the number of drinks, snacks and confectionery high in fat, sugar and salt.

Secondary school pupils should be encouraged to take school lunches rather than packed lunches, for two reasons. Firstly, the overall nutritional profile of school lunches is healthier than packed lunches. Having school lunches would ensure that pupils have access to a good range of healthy food and drink items, helping them to choose and consume more nutrient dense meals at lunchtime. This is consistent with Government strategies for healthy living\textsuperscript{15,16} to reduce levels of childhood overweight and obesity. Secondly, it is likely that schools will be more successful and pupils and parents more accepting of efforts to bring school lunches in line with the standards rather than enforcing a packed lunch policy, which may be seen as intrusive. These findings also highlight the need to increase awareness surrounding free school meal eligibility for low-income families.

\section*{Research and reporting}

The research was designed and carried out by Michael Nelson, Jo Nicholas, Clare Harper, Lesley Wood and Lesley Stevens of the School Food Trust (SFT), members of the TNS-BMRB research team (Gillian Prior, Louise Hall, Susie Smyth, Camilla Huckle), SFT research nutritionists (Claire Wall, Alex Scott, Jo Pearce, Laura Sharp), and TNS-BMRB research nutritionists (Rachel Gillings, Eleanor Spanjar, Gemma Francis, Laura Scruby, Carole Reid). This Research Report was prepared by Lesley Stevens, Jo Nicholas, Lesley Wood and Michael Nelson. Copies are available from the School Food Trust website: \url{www.schoolfoodtrust.org.uk}

School Food Trust. Sheffield. April 2012.
References


