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School Meals in Secondary Schools in England

Michael Nelson, Jane Bradbury, Jenny Poulter,
Alice McGee, Siphosami Msebele and Lindsey Jarvis
King's College London
National Centre for Social Research
Nutrition Works!



**Research Report
No 557**

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The views expressed in this report are the authors' and do not necessarily reflect those of the Department for Education and Skills or the Food Standards Agency

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Executive summary

Introduction

Following concern about the quality of children's diets and the contribution of school meals, statutory National Nutritional Standards were reintroduced in April 2001. These standards set out the frequency with which school caterers must provide items from the main food groups (starchy foods, milk and dairy, fruit and vegetables, meat, fish and alternative sources of protein). They apply to all maintained schools in England.

The Department for Education and Skills (DfES) and the Food Standards Agency (FSA) commissioned a survey to assess compliance with the standards and to measure food consumption in secondary school pupils. This report presents the findings from a nationally representative sample survey of 79 secondary schools in England which provided information about catering practice and food provision at lunchtime, and information on the food selections of 5 695 secondary school pupils age 11-18 years.

Key Findings

Catering service, cooking practices and the eating environment

- The school catering service was usually provided by a contractor appointed by the school (38%), Direct Service Organisation (37%) or was provided "in-house" (19%). The most usual type of contract was profit & loss or breakeven (49%) followed by fixed cost/fixed price. The majority of schools (76%) operated a cash cafeteria system; 18% operated a cashless smart card system, and 5% a cash/smart card system.
- Whilst many schools followed healthy cooking practices (e.g. frying in vegetable oil, using semi-skimmed milk), other healthy practices were followed by only a minority (e.g. 15% restricted access to table salt, 17% used low fat spreads in sandwiches). Rather than use oven chips (which are lower in fat), 99% of schools fried their chips.
- A quarter of head cooks/catering managers or their staff had received training in healthy eating or cooking in the past 12 months.

Analysis of specifications

- Forty-eight schools (61%) provided documentation setting out specifications relating to healthy eating or nutrition. None of the 15 schools that provided their own catering service ("in-house") had any documentation.
- While the language within this documentation was worthy and indicated a strong commitment to the notion of healthy eating, it was largely intentional, non-specific, and failed to specify tight contractual structures to ensure that providers delivered meals with a healthier nutritional profile and to encourage children to make healthier choices.
- Approximately two thirds of the documents examined mentioned or made explicit mandatory requirements for providers to meet the National Nutritional Standards.
- There was very little reference to controlling the salt content of school meals, access to salt by pupils, or the prevention of obesity.

Compliance with the nutritional standards

- 83% of schools met all the nutritional standards for school meals every lunchtime at the beginning of service. This had fallen to 47% by the end of service.
- 82% met the additional recommendation for drinking water at the beginning of service, and 77% by the end. For drinking milk, 54% met the recommendation at the beginning of service, 42% by the end.
- At the beginning of service, those caterers who did not meet all of the standards were most likely not to provide two items from the milk and dairy foods group (4% of all schools). By the end of service, caterers were most likely *not* to provide two starchy items one of which was not cooked in oil or fat (25%). The tool for measuring compliance did not identify whether the missing starchy item was cooked in oil or not.

Food provision

- The food groups most commonly served on at least four days per week were cakes and muffins (95% of schools), sandwiches (92%), soft drinks (92%), and fruit (91%). Vegetables (excluding baked beans) were served on at least four days in 70% of schools, and baked beans 81%. Chips and other potatoes cooked in oil were served in 76% of schools on 4 or more days, high fat main dishes such as burgers and chicken nuggets in 86%. In 28% of schools, no fruit juice was served.
- There was no association between the school caterers' success in meeting the nutritional standards and the profile of foods offered. The profile of foods offered did not conform to the Balance of Good Health.
- None of the "set meals", which were provided by 89% of schools, met all 12 of the Caroline Walker Trust guidelines. Only 7% of schools provided set meals over the course of one week that met eight or more of the Caroline Walker Trust guidelines. The guidelines for which meals were most likely to fail were iron, calcium and percent energy from carbohydrate (starchy foods). They were most likely to meet the guidelines for protein, vitamin C and non-milk extrinsic sugars (primarily added sugar).

Pupil food choices and nutrient intakes

- 48% of pupils chose high fat main dishes (e.g. burgers), 48% chose chips and other potato products cooked in oil, 45% chose soft drinks and 24% chose cakes or muffins. The least popular choices were fruit (2%), fruit juice (3%), and vegetables and salads (6%).
- 41% of total energy was derived from fat, within which 14% of total energy was from saturated fatty acids. The Caroline Walker Trust Guideline is 35% or less for fat, and 11% or less for saturated fatty acids. 14% of total energy was derived from non-milk extrinsic sugars. The Caroline Walker Trust guidelines is to achieve 11% or less. Pupils whose meals met six or more CWT guidelines chose more baked beans, vegetables and salads, starches (both chips *and* low fat starches), desserts, fruit, fruit juice and milk, and fewer high fat main dishes, cakes and muffins, sandwiches, sweets and chocolates and crisps and savoury snacks and soft drinks
- In the six schools that offered chips and potato cooked in oil one or two days per week, between one third and one half of pupils met the CWT guideline for fat. In contrast, in the remaining 72 schools where chips or potato cooked in oil were offered three days per week or more, only one quarter of the pupils met the CWT guideline for fat.

- 54% of pupils spent less than £1.50 on their lunch; 13% had a free school meal. Those pupils spending less than £1.50 compared with more than £1.50 were more likely to buy chips. Pupils who spent more on their lunch had higher energy and nutrient intakes than pupils receiving a free school meal, who in turn had higher intakes than those spending less than £1.50.

Methods

A representative sample of 79 maintained secondary schools were recruited into the study. Data was collected at the school and pupil level. Pairs of interviewers from the National Centre for Social Research visited each school over five consecutive lunchtimes. They recorded all the food and beverage items on offer each day, and assessed compliance with the National Nutritional Standards at the beginning and 10 minutes before the end of service. Individual pupil choices were also recorded. At 5 minute intervals, one of the interviewers approached a pupil after he or she had paid for lunch. After ascertaining their willingness to participate, the interviewer recorded what was on the pupil's tray, attached an identifying label to the tray, administered a brief questionnaire, and asked the pupil to return his or her tray with all leftovers to a 'weighing table' set up in the school dining room. Fifteen pupils were asked to participate each lunchtime. Food choices of 5,695 pupils were recorded.

At the beginning of service, one of the interviewers collected from the catering staff two portions of a range of foods, including the components of set meals if served. These items were weighed by the interviewers to establish typical portion sizes. Individual pupil leftovers were also weighed.

Telephone interviews were conducted with the school head cook or catering manager and the person responsible for the school meal provision (Head/Bursar/LEA) by researchers at King's College London.

Individual pupil food choices were coded using the Food Standard Agency's Nutrient Databank. Statistical analysis was conducted using SPSS. Compliance with the nutritional standards was assessed in relation to food provision. The nutrient profiles of the set meals were compared with the Caroline Walker Trust (CWT) guidelines, as were the nutrient profiles of the pupils' food choices. Food provision and pupil food choice was also assessed in terms of food groups.

Copies of school meal contracts or service level agreements were requested and obtained for 48 of the 79 schools. A quantitative and qualitative analysis was conducted of the content specific to nutrition and healthy eating.

Discussion and conclusions

Catering service, cooking practices and the eating environment

The types of catering providers and contracts observed in the present study are characteristic of those found throughout England. Over one-fifth of schools operated a smart card system. In over three-quarters of the schools, pupils who receive free school meals can be identified by other pupils. Over one-third of schools allow access at lunchtime to vending machines and tuck shops in the dining room that sell sweets, chocolate and soft drinks.

Many schools followed some healthier cooking practices (e.g. cooking in vegetable oil, grilling or oven cooking rather than frying, using semi-skimmed or skimmed milk rather than whole milk). There were other examples of good practice – using low fat spreads for sandwiches, restricting access to salt, limiting its use in cooking, or using a low sodium alternative – but they

were rare. Only one quarter of staff had had training relating to healthy catering in the 12 months prior to the survey.

Some schools operated a pricing policy to make healthy options cheaper, but this was in some cases undermined by “meal deals” or “burger promotions” that included unhealthy food combinations (e.g. 10p off burger and chips). In only one third of schools was there evidence of promotion of healthy eating (e.g. posters, labelling of food or menus).

On balance, the findings of the present survey show that the majority of children are not making healthy food choices. Moreover, practices in the dining room intended to promote healthy eating had little positive influence on pupil choices.

Analysis of specifications

The specifications currently operating in schools were ineffective tools for assuring that healthier choices were available and promoted to children at lunchtime. Within the documents, the language relating to healthy eating was generally non-specific, nor was it measurable or time-bound. Detailed examination of the content of the documentation suggested that many schools were paying ‘lip service’ to healthy eating and nutrition by failing to set tight standards and defining tools and processes for monitoring these standards.

These documents demonstrated an awareness, interest and commitment to nutrition and encouragement of healthy eating by those responsible for catering services in schools. However, the integration and translation of nutrition-related standards into meaningful specifications were generally poor. As a consequence, few documents effectively stipulated healthy eating or nutrition related standards above those set out by the DfES. Moreover, there was no consistent association between nutritional references in the contracts and food provision.

Inventory analysis and pupils’ food choices

While schools offered a wide variety of foods, the overall balance of foods on offer was not healthy. It failed to conform to the Balance of Good Health. There were no constraints on what pupils could choose for school lunch that promoted healthier choices. Pupils in many schools were free to select the same types of food every day (e.g. burger and chips) and there was no control over the balance of meals or the variety of foods chosen over a week. Although most schools were providing healthy options on most days, the evidence from the present study shows that if the pupils’ choices are unconstrained the majority fail to make healthy choices.

None of the set meals met all of the CWT guidelines and only 7% of schools provided set meals that met 8 or more of the CWT guidelines over the week. This may tie into the lack of nutritional knowledge on the part of caterers and those who write the contracts. If it were argued that pupils should choose a set meal, current provision would not promote healthy eating. Even if set meals did meet the CWT guidelines, as long as pupils were free not to choose them it would do little to promote healthier eating.

The majority of set meals on offer did not meet the CWT guidelines even though the balance of food provided satisfied the National Nutritional Standards. Given the similarities between the present findings and those reported in 2000 in the NDNS³ of young people, there appears to have been no improvement in the profile of nutrient intake from school meals following the introduction of the National Nutritional Standards in 2001.

Where pupils’ food choices met the six CWT guidelines most likely to be associated with eating a healthy lunch, their food choices were characterised by fewer chips, crisps, confectionery and high fat main dishes and more low fat starches, baked beans, vegetables and salads.

It is clear that the current National Nutritional Standards, coupled with the present model of food service and the provision of set meals that do not have to meet clearly defined nutritional requirements, failed to encourage children to select combinations of foods that contributed to a healthy diet. Whilst caterers were providing some meals with healthier profiles, pupils were favouring less healthy foods, of which there was enormous variety within school dining rooms.

Recommendations

The evidence from the present study suggests a number of ways in which the dietary choices of secondary pupils at lunchtime can be improved. The failure of the National Nutritional Standards and contract specifications to have a substantial positive influence on food choice justifies a call for alternative strategies.

The most likely way to ensure healthy eating in schools is to constrain choice to healthy options, manipulate recipes, use modern presentation techniques with which pupils can identify (e.g. the “fast food” approach, vending machines with healthier options), and provide encouragement through reward.

Recommendation	Evidence
1. National Nutritional Standards for school food must be compulsory and based on a combination of food-based and nutrient-based guidelines.	The current food-based standards did not yield a profile of foods on offer that reflected the Balance of Good Health. Although food provision and the content of set meals met the National Nutritional Standards, the nutrient profile of set meals failed to meet the Caroline Walker Trust guidelines.
2. Lunch as chosen must be a combination of foods that meet the Balance of Good Health.	Government advises that food choices should conform to the Balance of Good Health. Pupils who chose meals that were closest to the Balance of Good Health were most likely to meet the Caroline Walker Trust guidelines.
3. The range of choice must be restricted to a range of healthier options, based on menus balanced over one week.	In the majority of cases, unrestricted choice of foods at lunchtime was associated with unhealthy food choices. Restricted choice over one week (e.g. number of days on which chips were served) was associated with healthier eating.
4. Documentation and monitoring a) All schools must have written documentation with specifications relating to the nutritional quality of school lunches, and they must be specific, quantitative, measurable and time-bound. b) The standards must be monitored. a) Resources to support the framing of nutritionally-relevant specifications must be provided for those developing written documentation	The specifications within the contracts and service level agreements relating to the provision of nutritionally sound school lunches were inadequate. They did not provide a basis for the effective monitoring of school lunch provision. “In-house” catering provision was largely undocumented.

Recommendation	Evidence
<p>5. Training and resources</p> <p>a) All head cooks and catering managers must have certified training in healthy catering and how to meet the revised standards.</p> <p>b) Resources (training sessions, websites, software, recipes, portion size and food composition data) must be provided by the DfES to support training and to facilitate monitoring.</p>	<p>The majority of head cooks and catering managers could not name three or more of the current standards. Only one quarter of staff responsible for provision of school catering had training (unspecified) in “healthy eating or cooking”. Current Government resources focus on the DfES Guidance for School Caterers. There is no certified training scheme for school caterers.</p>
<p>6. The DfES should establish a Committee with the authority to develop a new set of compulsory nutritional standards for school meals in England. It is recommended that the new standards be formulated so as to apply to all food provision within schools (the “whole school” approach).</p>	<p>The current standards failed to promote healthy food choices at lunchtime amongst secondary school pupils in England.</p>

1 Introduction

1.1 Background

School meals make a vital contribution to the dietary intake of school children in England. Every day, over 3 million school meals are served.¹ In secondary schools, about 14% of pupils are entitled to free school meals; about 11% actually took up their entitlement to free school meals².

The National Diet and Nutrition Survey of Young People aged 4 to 18 years³ reported that in 11-18 year-old children, school meals contribute between one-quarter and one-third of the daily intake of energy, fat, dietary fibre, iron, calcium, vitamin C and folate. The contribution was typically greater in children receiving free school meals. This analysis, published in 2000, was undertaken specifically to inform the preparation of new National Nutritional Standards for school lunches.

There is concern, however, about the quality of pupils' choices. Amongst 11-18 year-old pupils, school meals contributed 53-55% of their chip consumption, 36-54% of their total pudding consumption (including milk and sponge puddings and crumbles, but not fruit or fruit salad), and 31-36% of their soft drink consumption. The main contributor to vitamin C intake was potato, not fruit or vegetables. A Consumers Association survey of children's school meal intake in 2002⁴ found that pizza, chicken nuggets and fish cakes were among the most popular main courses. Chips and fried potato products were the most frequently consumed starchy foods, and baked beans the most popular vegetable. School meals contributed on average less than one portion to their daily fruit and vegetable intake. The recommended intake for children and adults is *at least* five portions (about 400g) per day⁵.

It is important to recognise the value of school meals in the context of overall diet and eating patterns. Young people's energy from fat is close to the recommended 35%, but the percentage contribution from saturated fat is over 14% of energy, compared with the recommendation of 11%. Intakes of vitamin A are lower than the recommended intake, as are intakes of iron (particularly in girls), calcium, magnesium, potassium and zinc³. Coupled with these high saturated fat and low micronutrient intakes is the rise in the level of obesity in children. Recent data on English adolescents suggest that 13%-19% of boys and 13%-22% of girls are overweight, and at least 3% of boys and 5% of girls are obese.^{6 7} The chairman of the Food Standards Agency, Sir John Krebs, has suggested that if nothing is done to halt this trend, "for the first time in a hundred years life expectancy will actually go down".⁸ There are specific concerns about the ways in which school food in general and school meals in particular may be contributing to this epidemic.⁹

School lunch is especially important for those children who have nothing to eat in the morning before school. Eight percent of all 8 to 16 year-old children skip breakfast. Older children are least likely to eat breakfast: 16% of 15-16 year-old boys and 20% of 15-16 year-old girls reported having nothing to eat before school.¹⁰

Concern about the quality of children's dietary intake and their school lunch choices led to the re-introduction of National Nutritional Standards for school lunches in 2001. In order to understand better the influence of these standards on the provision of food at school lunchtimes, the Department for Education and Skills (DfES) and the Food Standards Agency (FSA) jointly commissioned a representative survey of English secondary schools to assess whether school meal providers were complying with these statutory standards, and what, if any, impact they have had on children's food choices and nutrient intake from the lunchtime school meal. This Report presents the findings of that survey.

1.2 Aims and objectives

1.2.1 Aims

The study had three main aims:

1. To assess whether the food provided by the school caterer met the statutory National Nutritional Standards, set out in the regulations and associated guidance, for all the children throughout the service period.
2. To assess whether the food provided met the Caroline Walker Trust Expert Working Group's Nutritional Guidelines for School Meals¹¹.
3. To identify the food consumption and nutrient intakes of the secondary school children from school meals, and to compare nutrient intakes to the guidelines set out in the Expert Working Group's report.

1.2.2 Objectives

The main objectives were:

1. To recruit into the study a country-wide selection of 80 secondary schools using appropriate sampling techniques and weightings
2. To determine lunchtime food provision in these schools
3. To measure consumption of lunchtime meals in approximately 4800 pupils
4. To make appropriate comparisons between food availability, food consumption and nutrient intake on the one hand, and guidelines for healthy eating in schools on the other
5. To identify factors related to catering provision and the school environment that were associated with the provision and consumption of healthy foods
6. To estimate the proportion of school lunches being consumed that met the guidelines for healthy school meals.

1.3 Project overview

Seventy-nine secondary schools in England participated in the mainstage of this project. Fieldwork was conducted during the period October to November 2003. Two interviewers from the National Centre for Social Research (NatCen) visited the school over five consecutive lunchtimes and recorded the foods and beverages on offer from the caterers. The food and beverage choices of up to 15 pupils were recorded each lunchtime and their leftovers were weighed. A total of 5 695 pupils provided information on food eaten and completed a brief interviewer administered questionnaire. Information on catering practice and the lunch service was collected via a telephone interview with the head cook or catering manager. Information on the type of contract for each school was collected via a telephone interview with the relevant person (school Head teacher/Bursar, LEA, contract caterer). A copy of the specifications or service level agreement was obtained from 48 schools. A pilot study to test measuring instruments and logistics was conducted in ten schools prior to the mainstage study.

1.4 National Nutritional Standards: historical perspective

The school meals service was introduced in 1906, provoked by the discovery of malnutrition in the majority of recruits for the Boer War, and the realisation that many children were attending school underfed and unable to benefit from their education¹¹. The Second World War brought about a shift in Government policy from a service designed to benefit undernourished children to one that was intended to benefit *all* children. The first nutritional standards for school meals were set in 1941, covering energy, protein and fat. These were updated in 1955, and again in 1975 following publication of the Committee on Medical Aspects of Health's (COMA) report on Diet and Coronary Heart Disease¹².

The 1980 Education Act brought about major changes in the school meals service. The Act removed the obligation for LEAs to provide school meals, except to those children entitled to free school meals. It also removed the obligation to sell meals at a fixed price and the obligation to meet any nutritional standards. The result was that LEAs were left to decide for themselves the price, type and quality of the meals they provided, if indeed they decided to continue providing meals. One purpose of this major change was to save money: net expenditure on the school meals service was over £400 million per year in 1980, and school meals were identified as an area where substantial savings could be made to public expenditure. It was not until 2001 that National Nutritional Standards for school meals were reintroduced, as a result of concerns about the quality of children's diets. Major changes in school meal provision post 1980 are presented in Table 1.1.

Table 1.1. Major changes in school meals provision post 1980.

1980	The 1980 Education Act removed the obligation of Local Education Authorities (LEAs) to provide school meals (except for children entitled to free school meals), sell meals at a fixed price, or meet any nutritional standards.
1983	A dietary survey of British school children was commissioned to assess the impact of the school meals provision of the Education Act (1980) on the diets of children.
1986	The Social Security Act (1986) restricted eligibility for free school meals to children of parents receiving Income Support only, removing over 400,000 children from eligibility. Those families receiving Family Credit received a small cash allowance instead.
1988	Enactment of the Local Government Act (1988) introduced Compulsory Competitive Tendering (CCT), obliging all LEAs to put school meals services out to tender. The Education Reform Act (1988) introduced Local Management of Schools (LMS) and Grant Maintained schools (GM). The LEA retained the school meals budget for LMS schools. GM schools received a grant from central government, which included school meals provision.
1989	The findings from the survey commissioned in 1983 were published in <i>The Diets of British Schoolchildren</i> ¹³ . Three quarters of the children surveyed had a fat intake greater than 35% of energy; iron in girls was below the recommended intake as was calcium and riboflavin in older girls. School meals contributed 34% to 58% of the children's daily chip consumption and 32% to 60% of buns and pastries.
1992	The School Meals Campaign was launched, calling for the re-introduction of nationally agreed nutritional standards for school meals. The Expert Working Group on Nutritional Guidelines for school meals was established by the Caroline Walker Trust.
1997	Best Value replaced CCT. Local Authorities were expected to ensure that the quality and cost of services properly reflected what local people wanted and could afford – the expectation was that the efficiency and quality of services should improve.
1999	The School Standards and Framework Act allowed the Secretary of State to set new National Nutritional Standards.
2000	As part of a new funding framework, Fair Funding, the budget for school meals was delegated to schools. This delegation was compulsory for secondary schools and optional for primary and special schools.
2001	The National Nutritional Standards for school lunches were implemented in April 2001.

1.4.1 National Nutritional Standards for school lunches: compulsory standards and additional recommendations

The 'Education (Nutritional Standards for School Lunches) (England) Regulations 2000' (Statutory Instrument 2000 No. 1777) came into force in April 2001. They set out *minimum* standards, in terms of food groups, that school caterers must meet. There were separate, although similar, standards for nursery schools, primary schools and secondary schools. Special schools could comply with either the primary or the secondary school standards. The standards apply to lunches whether they are free or paid for.

The Regulations for secondary schools stipulate that at least two items from the food groups in Table 1.2 must be available every day and throughout the lunch service. These are the “compulsory standards”. The Regulations do not make any reference to portion size.

Table 1.2. The national nutritional *compulsory* standards: At least two items from each food group must be available every day.

Food group	Additional requirement
Starchy foods	At least one of the foods available in this group must not be cooked in oil/fat
Vegetables and fruit	Both a fruit and a vegetable must be available
Milk and dairy foods	
Meat, fish and alternative (non-dairy) sources of protein	Fish must be available at least two days a week Red meat must be available at least three days a week

The DfES produced guidance to school caterers on how to implement the new standards¹⁴. Included in this guidance were “additional recommendations” regarding drinking water, drinking milk and provision of hot food (Table 1.3).

Table 1.3. Additional recommendations for school lunches.

The Secretary of State:
<ul style="list-style-type: none"> • Expects that drinking water should be available to all pupils every day, free of charge • Strongly recommends that schools should offer some hot food, particularly in the Winter months • Strongly recommends that drinking milk is available as an option every day

Further recommendations include serving oily fish once per week and making milk free to pupils entitled to free school meals.

Ensuring that the National Nutritional Standards are met is the responsibility of the LEA, or school governing body if the school meals budget has been delegated.

1.5 Caroline Walker Trust Guidelines for School Meals.

In addition to monitoring compliance with the standards, school caterers are also advised to monitor the nutrient content of the meals they provide, either by the use of food composition tables (specialist computer software exists), or via laboratory analysis of samples. The results from the analysis may then be compared with the Caroline Walker Trust (CWT) Guidelines for School Meals¹¹. The CWT guidelines “provide figures for the recommended nutrient content of an average school meal provided for children over a one-week period”¹¹. The values are based on the recommendations contained in the COMA report Dietary Reference Values for Food Energy and Nutrients for the United Kingdom¹⁵. The CWT guidelines are set out in Table 1.4.

Table 1.4. Summary of Caroline Walker Trust nutritional guidelines for school meals.

Nutrient	Guideline
Energy	30% of the Estimated Average Requirement (EAR)*
Fat	Not more than 35% of food energy**
Saturated fatty acids	Not more than 11% of food energy
Carbohydrate	Not less than 50% of food energy
Non-milk extrinsic sugars	Not more than 11% of food energy
Non-starch polysaccharides (fibre)	Not less than 30% of the Calculated Reference Value†
Protein	Not less than 30% of the Reference Nutrient Intake (RNI)‡
Iron	Not less than 40% of the Reference Nutrient Intake (RNI)
Calcium	Not less than 35% of the Reference Nutrient Intake (RNI)
Vitamin A (retinol equivalents)	Not less than 30% of the Reference Nutrient Intake (RNI)
Folate	Not less than 40% of the Reference Nutrient Intake (RNI)
Vitamin C	Not less than 35% of the Reference Nutrient Intake (RNI)
Sodium	Should be reduced in catering practice

* Estimated Average Requirement (EAR) = “estimated average requirement of a group of people. About half will usually need more than the EAR, and half less”.¹⁵ In the analysis of school meals in this report, “30%” has been interpreted as “providing between 20% and 40% of the EAR for energy in a single meal”.

** Food energy = energy obtained from food, assuming no contribution from alcohol¹⁵.

† Calculated Reference Value = a value calculated by the Working Group for children based on a non-starch polysaccharides (NSP) intake of 8g/1000 kcal¹¹.

‡ Reference Nutrient Intake (RNI) = “an amount of the nutrient that is enough, or more than enough, for about 97% of people in a group. If the average intake of a group is at RNI, then the risk of deficiency in the group is very small”¹⁵.

1.6 Types of school meals catering contracts

A number of legislative changes have had considerable effects on how the school lunch service is organised and provided within schools in England (see Table 1.1). The Education Act (1980) was particularly controversial as it removed the responsibility from LEAs to meet nutritional standards or to provide a “set meal” for pupils. The introduction of Compulsive Competitive Tendering (CCT) (1988) required LEAs to invite bids for the provision of school meals from private catering contractors as well as the authority’s own service, known as ‘Direct Service Organisations’ (DSO’s)¹⁶. This tendering precipitated a clear division in roles within school meals catering between:

- **client services** within LEAs, who defined the quality of catering services within schools through detailed specifications
- **‘providers’** (either private catering firms or DSO’s) who demonstrated how they would meet the service specification through a tender, which would be evaluated along with others before a contract was awarded.

Under these circumstances, the degree to which specifications addressed healthy eating and nutrition was controlled by the LEA and varied considerably¹⁷. However, CCT embedded a stronger commercial focus into the service where the major pre-occupation was efficient promotion of the service to sustain numbers and financial viability at a time when most secondary schools had moved to a cash cafeteria service offering a wide range of choices. In 1992 approximately 95% of secondary schools had a cafeteria style service¹⁷.

Subsequently, local management of schools and the delegation of catering budgets to schools led to further diversity in the organisation of school meals services (Table 1.5).

In secondary schools in England, 60% of catering contracts are operated by DSOs, 24% by large private contractors, 5% are self-operated (“in-house”) and 11% are run by other small contractors¹.

This diversity of organisation of school meals has led to a varied mix of documentation, contractual terminology and language, which have been adopted to define catering services for schools and set out standards against which the service needs to be delivered (Table 1.5).

Table 1.5. Organisation and types of documentation defining the school meals service.

<i>Organisation of the school meals service</i>
Schools provide the service themselves through catering staff directly employed by the school
LEAs still maintain a client services role overseeing a contract with catering providers operating within individual schools or a consortia of schools
Individual schools hold and manage a contract with a catering contractor
LEAs (DSOs) provide a catering service within individual schools or groups of schools.
<i>Documentation defining the school meals service</i>
Schools hold a service level agreement with LEAs
There is some type of contractual agreement containing specifications between school and contractor or LEA and contractor
Schools may have developed their own catering service specifications

There is also wide variability in the financial structure of school meals contracts/agreements. These are summarised in Table 1.6.

Table 1.6. Broad types of contractual agreements for provision of school meals services.

Name of Agreement/Contract	Financial organisation
Fixed Cost/Fixed Price	The school pays an agreed cost for a specified service. This cost or price for service provision may be varied e.g. if the number of pupils changes considerably
Management Fee/Cost Plus	All the costs of providing the service are paid by the provider and recharged, with a management fee, or part management fee, to the school
Management Contract	The school pays a contractor to manage the service for them, however there is less incentive for the contractor to make revenue for the school
Profit and Loss/Breakeven (sometimes referred to as a ‘Nil Cost/Nil Subsidy contract’)	The provider has control over the menu and pricing and the service is paid for by the pupils. There is no subsidy of the service by the school and the provider tends to have more autonomy over what is offered

In addition, there is a further layer of financial complexity within school meals linked to the different types of subsidies operating between schools/LEAs and providers. Again there is wide variability in the type and size of these subsidies (Table 1.7).

Table 1.7. Types of subsidies operating between schools/LEAs and providers.

Cross subsidy between free school meals and paid meals

A subsidy of the service (e.g. school or LEA subsidise new equipment or management service to help run the service efficiently)

School or LEA specifically subsidise the management of the catering service

The contractor pays back an agreed portion of the profit from the catering service to the school or LEA

If a contractor fails to meet predicted meal targets then the school or LEA may subsidise this deficit

If catering staff have transferred over from LEA to contractor employment then the LEA or schools may subsidise any fall in rates of pay

The financial organisation of school meals services may have direct relevance to the nutritional quality of that service. In theory, commercial influences could impact on the ability of that service to offer healthier choices. For example, where the school expects to make a profit from the catering service, this may set a climate of expectation and drive the caterers to provide and promote foods that they perceive children will purchase and therefore have potential for greatest profit. Conversely, where there is a cost plus agreement with a level of subsidy from the school, the caterer may have more confidence to experiment with different dishes incorporating foods that they perceive are not liked by children. Whether or not these potential influences have an impact on the foods being offered or pupils' choices have been examined in this report.

2 Sampling, recruitment, data collection and coding

2.1 Sampling and Recruitment

2.1.1 Selecting the schools

Two samples were drawn from the DfES's database EduBase, from which the pilot and mainstage schools were recruited.

The sample was drawn during July 2003. The sample frame included secondary and middle deemed secondary schools in England, which were to be open in the autumn term 2003. Community, Voluntary Aided, Voluntary Controlled and Foundation Schools were included in the sample. Schools that had been inspected by OFSTED during the previous nine months were excluded, as were small schools containing fewer than 150 pupils.

Prior to sampling, the frame was stratified or ordered in the following way using EduBase variables:

1. **Region** – the schools were split into the nine Government Office Regions (GOR).
2. **School type** – within each of the nine regions, the schools were grouped into the four school types (Community, Voluntary Aided, Voluntary Controlled and Foundation) creating 36 bands. The schools were listed in the same order within each GOR.
3. **Admissions policy** – within each of these 36 bands, the four types of school admissions policy (Comprehensive, Selective, Secondary Modern and Not applicable) were listed in order, giving 144 bands.
4. **Single sex schools vs. mixed** – finally, within each of the 144 bands created, 'boys only', 'girls only' and 'mixed' schools were listed creating a total of 432 bands.

The resulting sampling frame contained 2 281 schools, from which the mainstage sample was drawn, with probability proportional to size.^a The total number of pupils in each school was cumulated down the complete stratified list of schools. A sampling interval was calculated and administered after generating a random starting point. One hundred and thirty five schools were selected, with the intention of recruiting 80.

The *pilot* sample was drawn as a 'quota', ensuring a good spread of the relevant school characteristics including school type, region, gender, admissions policy and whether the school was located in an urban or rural area. Forty schools were selected, with the intention of recruiting ten.

2.1.2 Recruitment of schools

Mainstage and pilot sample schools were approached by letter towards the end of the summer term (July 2003). A second letter was sent at the beginning of the autumn term (September 2003) to those schools that had not replied. The letters were followed-up by telephone calls.

^a Probability proportional to size' means that schools were sampled in relation to their total number of pupils. Therefore, larger schools had more chance of selection than smaller schools. Drawing the sample in two stages (first by schools, then by pupils) meant that each child in the population had an equal chance of selection by drawing the first stage with probability proportional to size, then taking an equal number of pupils in each school.

2.1.3 Response rate

Pilot sample

Ten schools were recruited for the pilot study, representative of the main school characteristics likely to be encountered in the mainstage.

Mainstage sample

Eighty schools were initially recruited for the mainstage study. Two schools withdrew prior to the onset of fieldwork. One of the schools that had initially declined was recruited into the study. Thus, 79 schools participated in the project, giving a response rate of 59% of the issued sample.

Responders and non-responders

The responding and non-responding schools were compared in relation to Government Office Region, type of school, admissions policy and whether single sex or mixed (Table 2.1). The only significant difference was found within the number of ‘girls only’ and ‘boys only’ schools. Of the seven ‘boys only’ schools approached, only one participated; of the eight ‘girls only’ schools approached, seven participated. The ‘boys only’ school was a Voluntary Aided School. Five of the ‘girls only’ schools were Community Schools, one was a Foundation school and one was a Voluntary Aided School.

Table 2.1. Characteristics of participating and non-participating schools, the issued sample and all schools.

		Participated (n = 79)		Refused (n = 56)		Issued sample (n = 135)		Total schools (n = 2281)	
		n	%	n	%	n	%	n	%
Government Office Region	East Midlands	7	9	5	9	12	9	203	9
	East of England	13	17	4	7	17	13	313	14
	London	10	13	6	11	16	12	249	11
	North East	3	4	4	7	7	5	137	6
	North West	10	13	9	16	19	14	317	14
	South East	14	18	7	13	21	16	344	15
	South West	10	13	4	7	14	10	236	10
	West Midlands	5	6	10	18	15	11	256	11
	Yorkshire and The Humber	7	9	7	13	14	10	226	10
Type of Establishment	Community	54	68	36	64	90	67	1516	67
	Foundation	13	17	10	18	23	17	334	15
	Voluntary aided	10	13	8	14	18	13	349	15
	Voluntary controlled	2	3	2	4	4	3	82	4
Admissions Policy	Comprehensive*	74	94	50	89	124	92	1957	86
	Selective	3	4	3	5	6	4	119	5
	Not Applicable	2	3	3	5	5	4	205	9
Gender	Boys	1	1	6	11	7	5	119	5
	Girls	7	9	1	2	8	6	149	7
	Mixed	71	90	49	87	120	89	2013	88

* Includes the “secondary modern” schools listed in EduBase.

Responding and non-responding schools were also compared in terms of deprivation. The Indices of Deprivation 2000¹⁸ are measures of deprivation for every ward and local authority area in England. A number of indicators covering a range of domains (income, employment, health deprivation and disability, education, skills and training, housing and geographical access to services) are combined into a single deprivation score for each area. A higher score indicates

a greater degree of deprivation. Table 2.2 compares participating and non-participating schools with the deprivation score for the 'issued sample'. There were no significant differences for deprivation score between responders, non-responders and the issued sample.

Table 2.2. Multiple deprivation score (MDS) for participating, non-participating and the issued sample schools

MDS	Participated (n = 79)		Refused (n = 56)		Issued sample (n = 135)	
	n	%	n	%	n	%
0 - <10	18	23	7	13	25	19
10 - <20	17	21	16	29	33	24
20 - <30	17	21	11	20	28	21
30 - <40	13	17	8	14	21	16
40 - <50	8	10	7	13	15	11
50 - <60	2	3	1	2	3	2
60 - <70	3	4	5	9	8	6
70 - <80	1	1	1	2	2	1

Table 2.3 compares responding and non-responding schools by education phase (middle deemed secondary vs. secondary), religious affiliation, and whether the area is classified as urban or rural. Within religion, the church schools category represents Church of England and Roman Catholic Schools. The None and Do Not Apply categories include schools who have no religious affiliation and those who cater for all religions. Although these indicators were not used to stratify the sample, they show that the schools that participated were representative of the issued sample.

Table 2.3. Response rates, by type of school and whether or not they agreed to take part in the study.

		Participated (n = 79)		Refused (n = 56)		Issued sample (n = 135)	
		n	%	n	%	n	%
Phase of Education	Middle deemed Secondary	2	3	3	5	5	4
	Secondary	77	97	53	95	130	96
Religious affiliation	Church Schools	10	13	9	16	19	14
	None/Does Not Apply	69	87	47	84	116	86
Urban/Rural Area	Rural Local District	18	23	13	23	31	23
	Urban Local District	61	77	43	77	104	77

The main reasons given for refusal to participate are given in Table 2.4. Twenty-two schools (39%) did not give a specific reason. Ten schools (18%) gave 'other' reasons for refusal, including a short lunch break or small dining area, not envisaging any benefits to participation, catering staff shortage, school refurbishment and school closure.

Table 2.4. Main reasons given for non-participation

Reason for refusal	n	%
Not given	22	39
Pressure of work and time constraints	11	20
OFSTED Inspection imminent	4	7
Limited/no cooking facilities	3	5
School undergoing administration changes	3	5
Involved in similar/other projects	3	5
Other	10	18

2.2 Development of data collection tools and piloting

2.2.1 Pilot study

The data collection tools and research protocol were piloted in ten schools over two consecutive lunchtimes during two weeks in September 2003. The pilot interviewers attended a de-briefing session where they provided feedback on the data collection tools.

2.2.2 Data collection tools

Table 2.5 lists the data collection tools and their primary purpose. Copies of all data collection instruments are in Appendix A. There were two levels of data collection: school level and pupil level.

Table 2.5. Data collection tools, primary purpose and level of collection of data

Data Collection Tool	Primary Purpose
<i>School level</i>	
Food Inventory	Record all foods and beverages on offer each day in the school cafeteria, including the set or main meal.
Food Visibility Tool	Assess compliance with the Nutritional standards for School Lunches at the beginning and end of service.
Eating Environment Assessment	Assess the dining room in terms of display of menus, price lists and material promoting healthy eating.
Portion Weights Sheet	Record weight of 2 portions of a range of foods.
School Caterer Telephone Interview	Obtain information from school caterer about the lunch service, cooking practices, and health promotion activities.
Bursar/Head/LEA Telephone Interview	Obtain information on nature of contract, extent of monitoring, and to obtain a copy of the specifications/service level agreement for the school lunch service.
Specifications 'Qual' & 'Quant' Tools	Extract information from school lunch specification/service level agreement.
<i>Pupil level</i>	
Tray Check Sheet	Record pupil food and beverage choices, and weight of leftovers.
Pupil Questionnaire	Record age, sex, if free school meal and any competing lunchtime activities.

2.2.3 School level data collection instruments

Food inventory

The purpose of the Food Inventory was to record all foods and beverages offered each day by the school caterers at lunchtime. A checklist of foods and beverages was compiled from representative menus obtained from a number of private contract and DSO caterers. The dishes and items that were offered by the greatest number of school caterers were included in the inventory. Foods were grouped into categories (e.g. main meals, vegetables, fruit, sandwiches^b) with a tick box for each of the five days of data collection beside each item. Each section (main meals, vegetables etc.) also had blank spaces with tick boxes for the NatCen interviewer to record items that did not feature in the pre-printed lists. As one of the aims of this research was to compare food provision with the Caroline Walker Trust Guidelines, it was important to record the ‘set meal’ (if offered). Five boxes, one for each day, were included for the interviewer to record the ‘set meal’. An additional column was included for packaged foods to record the item weight where it might vary by school (e.g. packaged cakes and biscuits, pre-packed sandwiches). For packaged items where the weight was unlikely to differ (e.g. chocolate confectionery, canned soft drinks) the item weight was pre-printed on the inventory.

Food Visibility Tool

The Nutritional Standards for School Lunches stipulate that certain items from the major food groups must be available at the beginning and throughout the lunch service (see Table 1.2). The purpose of the Food Inventory was to record all food and beverages that were visible at the beginning of service. Items that were *available* but not *visible*, for example items kept hot in an oven or cool in a fridge, might not have been recorded in the Food Inventory. In order to avoid falsely recording school caterers as not meeting the nutritional standards it was necessary to devise a tool that specifically assessed compliance. For each of the standards the tool asked the interviewer if he/she could *see* an item that would meet the standard. If not, the tool instructed the interviewer to ask a member of the catering staff if such an item was *available*, what the item was, and why it was not visible. This tool also assessed the availability of drinking water and drinking milk, provision of which, whilst not compulsory, is strongly recommended in the advice given to caterers on how to meet the standards¹⁴.

Eating Environment Assessment

The Eating Environment Assessment tool was designed to record features of the school dining room such as whether menus and price lists were displayed, the set-up of the food service (for example, how many food service points and whether there were competing outlets such as vending machines) and any evidence of the promotion of ‘healthy eating’.

Portion Weights Sheet

In addition to recording the foods and beverages available to the pupils and pupil food choice, it was also necessary to obtain information on typical portion weights in each school. Portion weight sheets were devised, one for each day, on which the weight of two portions of 12 items could be recorded. Caterers were reimbursed for this food and a column was included to record cost.

School Caterer Telephone Interview

A semi-structured questionnaire was developed which was administered to school head cooks or catering managers via a telephone interview. The purpose of the interview was to obtain information on the school food service, including when food was offered (i.e. breakfast, morning break and lunchtime); the number of lunches served, including the percentage of free school

^b Throughout the report, the term “sandwiches” is used to mean sandwiches, filled rolls, baguettes, panini, filled bagels and wraps.

meals; competing outlets, both within and outside the school; the nature of the contract; and cooking practices, in particular in relation to fat and salt. The information gathered on cooking practices was both to allow an assessment of the extent to which school caterers were adopting 'healthy' cooking practices and to facilitate food coding.

Bursar/Head/LEA Telephone Interview

A questionnaire was also developed to be administered to the person responsible for the catering in the school, for example Head teacher or Bursar, LEA or Caterer. This questionnaire was also delivered as a telephone interview. The main objectives were to establish the nature of the catering contract and the nature of the monitoring of compliance with the nutritional standards. It was also designed to elicit a copy of the school meal specifications or service level agreement, if such a document existed.

Specifications 'Qual' & 'Quant' Tools

In order to examine whether and how the school meal specification or service level agreement was addressing nutrition and healthy eating, two data collection instruments were devised utilising both a quantitative and a qualitative approach ('Qual Tool' and 'Quant Tool'). This approach was taken because it was believed that the level and content of specifications relating to nutrition and healthy eating would be extremely diverse. The purpose of the tools was to capture and interpret this variation in an analytical and descriptive way.

One key strand within the quantitative analysis was to determine to what degree any statements relevant to nutrition within the documentation were mandatory. The two tools were designed to be used in parallel. The 'Quant Tool' was designed to record whether a range of issues relating to nutrition and healthy eating were *mentioned* in the document, and whether compliance was *mandatory*. The 'Qual Tool' contained the same headings as the 'Quant Tool'. Its purpose was to extract and record the relevant text from the documents. The design and development of these tools was based loosely on the approach of Coles and Turner¹⁷.

2.2.4 Pupil level data collection tools

Tray Check Sheet

The purpose of the Tray Check Sheet was to record individual pupil lunchtime choices. The format echoed that of the Food Inventory, and was organised with the same section headings. Items identified as likely to be offered (see *Food Inventory*, section 2.2.3) were pre-printed onto the sheet, with a corresponding tick box. A number of blank spaces with tick box were included under each section heading for the interviewer to record items that were on the pupils' trays but not in the pre-printed lists. Against each food or beverage there was also a box for recording any leftovers after the pupil had finished his or her lunch.

Pupil Questionnaire

The individual pupil questionnaire was placed on the reverse of the Tray Check Sheet. It was designed to record demographic data, expenditure on lunch and whether the pupil received a free school meal, and whether the pupil participated in any activity that impacted on time available for eating lunch. Pupils were asked their age rather than their date of birth as it was found in the pilot study that many of the younger pupils did not report accurately their own birth date.

2.3 Data collection

2.3.1 Mainstage briefings

Prior to the mainstage fieldwork, seven interviewer briefings were held. The briefings were led by researchers from both NatCen and King's College London (KCL). A total of 96 interviewers were briefed, and they worked together in teams of two within each school, some interviewers

working in more than one school over the fieldwork period. Exercises were used during the briefings to help illustrate the tasks they were asked to perform, including using the interviewer tools and the weighing of the food portions and leftovers. The fieldworkers received training on categorising foods by food group, including composite foods, so that they could complete the Food Visibility assessment. All interviewers received a set of detailed project instructions.

2.3.2 Pre-Fieldwork visit

One of the NatCen interviewer pair for each school made a pre-fieldwork visit to arrange the fieldwork dates, make contact with the Head cook/Catering manager, and observe at least part of a lunch service. He or she also delivered sufficient 'parent/pupil' letters for every child to take home, sufficient 'teacher' letters for every form teacher, and a poster to be displayed in the school dining room to advertise the dates of the fieldwork.

2.3.3 Fieldwork

The NatCen interviewers worked in pairs. Each interviewer was assigned one of two roles: *Weigher* or *Selector*. The schools were visited on five consecutive days.

Both interviewers arrived at the school 30-60 minutes before the beginning of food service. The *Weigher* recorded all food and beverages visible in the Food Inventory Booklet. The *Selector* completed the Food Visibility Tool. They also set-up a 'weighing table', which was covered with a brightly coloured cloth to increase visibility. The length of the lunch service (entire lunch break) varied greatly between schools, from as little as 25 minutes to 120 minutes. The *Selector*'s role was to select a pupil at 5 minute intervals, after the child had chosen and paid for his or her meal. If the pupil refused, or was unable to participate (e.g. language difficulties), the *Selector* was instructed to record the interview as 'non-productive' and to wait 5 minutes before selecting the next pupil. The *Selector* either interviewed the pupil at the till, or accompanied them to a table. This was left to the interviewer's discretion, depending on how crowded the dining room was and the child's preference. The *Selector* attached a label with an individual pupil number to the Tray Check Sheet and then recorded what was on the child's tray. The *Selector* then administered the pupil questionnaire, asked the pupil to take his/her tray with all leftovers to the weighing table when they had finished their lunch, and affixed another label with pupil number to the tray. The *Selector* was instructed to approach 15 pupils each day, with an expected response rate of 80%.

There was a diversity of catering arrangements in schools ranging from a single service point with one dining area, to a number of service points, some of which offered a limited range of foods, for example sandwiches or burgers. Where there was more than one service point, the interviewers were instructed to select pupils from all points or locations.

At the beginning of service the *Weigher* obtained two portions of 12 items from the catering staff. He or she was instructed to obtain the 'set meal' first (to compare with the CWT guidelines), and then to select other particularly popular foods up to a total of 12. These were weighed to the nearest 2g on kitchen scales (Soehnle) and recorded on the Portion Weight Sheets.

For those schools with a shorter lunch break, once the food portions had been obtained, the *Weigher* assisted the *Selector* in selecting and interviewing pupils. The length of time each *Weigher* would need to assist the *Selector* was detailed in the project instructions, depending on the length of the lunch break.

Ten minutes before the end of the lunch service, the *Weigher* completed a second Food Visibility Tool to assess compliance with the nutritional standards.

At the end of the lunch service, the Tray Check Sheets were matched with the trays containing leftovers. All leftovers were weighed to the nearest 2g and recorded on the Tray Check Sheets.

This procedure was repeated each day. If a child was selected who had previously participated, the *Selector* chose the next child leaving the till.

The Eating Environment Assessment was completed on one day by the *Weigher*.

The interview with the Head cook or Catering manager was conducted by a nutritionist from KCL prior to the fieldwork week. The interview with the person responsible for the catering service within the school (Head/Bursar/LEA) was conducted post-fieldwork, as was securing of the school meals contract or service level agreement.

2.3.4 Pupil response rate

A total of 5 780 pupils were approached. Of these 47 (0.8%) refused or were unable to participate. It was decided to exclude from the analysis those pupils for whom age, sex and school year were not known (38). Analysis was thus conducted on 5 695 pupils (3 161 girls, 2 534 boys). Table 2.6 shows the breakdown of the sample by school year, age and gender.

Table 2.6. Distribution by school year, age and gender of 5 695 pupils participating in the present study.

	Girls		Boys	
	n	%	n	%
<i>School year</i>				
7	872	28	620	24
8	608	19	524	21
9	486	15	491	19
10	492	16	393	16
11	474	15	358	14
12	131	4	86	3
13	98	3	62	2
<i>Age</i>				
11	666	21	451	18
12	659	21	563	22
13	522	17	497	20
14	495	16	403	16
15	460	15	384	15
16	226	7	159	6
17	102	3	53	2
18	31	1	24	1

2.3.5 School level response rate

Data was collected over four rather than five consecutive days in eight schools because of staff training (INSET) days. Caterer interviews and the Head/Bursar/LEA interview were conducted with all 79 schools. Documentation on the school meals service (specification or service level agreement or contract) was obtained for 48 schools.

2.4 Data Preparation

2.4.1 Food coding

The Food Standards Agency (FSA) nutrient databank was used as the source of nutrient data. Completed Food Inventories were coded at KCL, then passed to NatCen to act as coding guides for the individual pupil Tray Check Sheets. Where appropriate, existing databank codes were used. However, there were many occasions where a suitable code did not exist, for example sandwiches, filled rolls and baguettes, or where it was not clear from the dish name what the dish contained (e.g. Beany Nest, Chicken Roma, Burger Crowns). Items for which there was not an appropriate existing code were assigned a temporary code. Information on types of cooking oil or fat used, cooking method, type of milk used, and addition of salt to cooking water obtained from the Caterer Interview was used to assign codes appropriate to each school. Information on the ingredients in dishes and recipes were obtained from school caterers and for sandwiches, etc., the relevant proportions of fillings were obtained from the FSA-commissioned survey¹⁹. The data were entered onto the nutrient databank to create new permanent codes. Information on the usual type of spreading fat used by each school to make sandwiches allowed the creation and addition to the databank of new codes appropriate to each school.

The Tray Check Sheet data were entered using Blaise²⁰, employing a look up file containing food codes from the FSA nutrient data bank. Queries were referred to KCL nutritionists for clarification where necessary.

2.4.2 Data preparation

Allocation of food groups

Food groups for inventory and tray check analysis were based on a combination of nutrient databank food group allocations (e.g. “white bread”, “egg dishes”, “sausages”, “peas”) and inventory food group descriptions (“main meals”, “salads”, “jacket fillings”, “bread (unfilled)”, “dessert”). Using the two sets of groupings together facilitated distinction between, for example, bread offered on its own and a burger bun accompanying a beefburger offered as a main meal. This helped to avoid double counting when describing the options offered and the types of meals consumed. The crosstabulation of the two sets of groups yielded 116 easily identified groups of food and drink. These were aggregated into 17 groups, which highlighted the key groups (e.g. chips and potatoes cooked in oil, baked beans, low fat or high fat main dishes (see section 6.1) likely to make up the bulk of children’s choices at lunchtime, and facilitated a presentation of food group profiles that linked to the nutritional standards and the CWT guidelines.

Portion size allocation

Interviewers routinely recorded the portion sizes of soft drinks and other pre-packed foods. In addition, they weighed duplicate portions of up to 12 different items each day in each school, selecting the components of set meals first and then completing the list with a variety of other foods on offer that day. This generated a total of 3908 food weights based on the foods offered in all 79 schools.

Weights were not recorded for every individual item offered in every school. Therefore, it was necessary to compute some weights in order to be able to estimate the nutrient content of foods in the set meals and of foods eaten. The following procedures were applied to establish a weight for every item:

1. Use the weight of food offered in each school on each day as recorded by the interviewer;
2. Use the average weight of the food, based on information in all of the schools where a weight had been recorded;
3. Use the weight of sandwiches, rolls, baguettes and wraps according to type of bread used (white, or brown/other) from inventory data collected by the interviewers;

4. Use the weight of food corresponding to the average serving within 116 food groups, measured using all of the weights recorded in all the schools.

This generated a weight for every item offered or consumed.

When estimating the nutrient content of foods as eaten, the weight of food leftover was subtracted from the allocated portion weight. This was the basis for estimating the nutrient content of the food actually consumed. There were 115 instances (in over 17 000 measurements) in which the amount of food left over (recorded by the interviewer) exceeded the weight of the food portion allocated. In these instances, the child was assumed to have left the bulk of the food chosen, and the weight of food eaten was assumed to be zero. This is likely to have had no appreciable effect on the measured outcomes or conclusions from the study.

Determining the number of days on which items in the inventories were available

Because some schools provided inventory data for only four days (e.g. because of staff training (INSET) days), it was necessary to adjust the data in these schools so that estimates of availability could be averaged across all schools and presented in the results per 5-day week. This was achieved simply by dividing by 0.8 the estimates of availability over four days.

Overall, the data on consumption are likely to be unbiased. Variations in portion size are reflected in the measurements made within and between schools, INSET days occurred on different days of the week, and pupils' choices are fully reflected in the tray check data collected.

2.5 Statistical analysis

Statistically significant differences in availability of different food groups between groups of schools (e.g. according to region, type of school) were assessed using chi-squared tests. Statistically significant differences in the average amounts of food or nutrient consumed by different groups of pupils (e.g. between boys and girls, between age groups) were assessed using un-paired t-tests or one-way analysis of variance. Univariate general linear modelling was used to assess the statistical significance of differences between groups of schools or pupils when additional factors (e.g. school year or age) were taken into account.

3 The catering service, cooking practices and the eating environment

KEY FINDINGS

1. The school catering service was usually provided by a contractor appointed by the school (38%) or by a DSO (37%). However, 19% were “in-house”. The most common type of contract was profit & loss or breakeven (49%) followed by fixed cost/fixed price (26%). None of the schools that provided their own catering service (in-house) had any form of documentation setting out specifications relating to healthy eating or nutrition.
2. The majority of schools (76%) operated a cash cafeteria system. 18% operated a cashless smart card system, 5% cash and smart card, and one school a fixed price system.
3. In 77% of schools, pupils demonstrated their eligibility for free school meals by displaying some form of identification at the service point.
4. Over half of the schools offered drinks, burgers, hotdogs, pies, pasties, sausage rolls, bacon or sausage sandwiches, pizza, and cakes and biscuits at morning break.
5. 38% of schools had snack vending machines in the dining room that pupils were allowed to use at lunchtime, and 44% had cold drinks vending machines.
6. All schools used vegetable oil for frying, and 99% fried rather than oven cooked the chips. More school caterers oven cooked breaded fish and meat products and potato products (other than chips) than fried them.
7. Most caterers used a spreading fat on the bread for sandwiches, and of these only 17% used a low or reduced fat spread.
8. Most caterers used semi-skimmed milk (55%), dried skimmed (13%) or semi-skimmed and dried skimmed milk (14%) in cooking. Very few caterers (5%) used exclusively full-fat milk in cooking.
9. A minority of pupils (15%) did not have access to table salt, although some school caterers were attempting to restrict use, and 6% provided a reduced sodium version.
10. Only a quarter of head cooks/catering managers or their staff had received any training in healthy eating or cooking in the past 12 months.
11. 35% of school caterers claimed to have a policy of making healthy options cheaper, and this was reflected in the price of jacket potatoes compared with chips, and fruit compared with cake.

3.1 The school meals service

Information on the school meals service was obtained via the telephone interviews with the school cook or catering manager and with the Head or Bursar or LEA.

3.1.1 Who provided the catering service?

The school catering service was usually provided by either a contractor appointed by the school or a DSO (Table 3.1). However, 15 (19%) of schools provided their own catering service through catering staff directly employed by the school (“in-house”). Sixty-three of the 64 schools that did not provide their own catering claimed to have some type of contract or service level agreement. A copy of the contract or service level agreement was received from 48 of these schools.

Table 3.1. Catering service provider in 79 secondary schools in England.

Catering service provider	n	%
Contractor appointed by the school	30	38
Contractor appointed by the LEA	5	6
DSO	29	37
In-house	15	19

In-house provision did not have documentation relating to the service. Five respondents did not know what type of contract or service level agreement the school had with the service provider, and one refused to answer. Contracts fell into three broad categories: fixed cost/fixed price, management fee/cost plus and profit & loss/breakeven (Table 3.2).

Table 3.2. Type of contract or service level agreement in 57 secondary schools in England.

Type of contract or service level agreement	n	%
Fixed cost/fixed price	15	26
Management fee/cost plus	10	17
Profit & loss/breakeven	28	49
Other	4	7

One third (33%) of schools expected to make a profit from the catering service. Of these, 63% returned the money to the catering service rather than other services or facilities within the school.

Of the 79 schools, 53 (67%) had a breakfast service and 76 (96%) offered food at morning break. Three schools (4%) had a split lunch service i.e. two lunch breaks. The length of the lunch break ranged from 25 minutes to 2 hours, with a mean of 50 minutes (SD=15 minutes).

Of those schools that had a breakfast service, the median number of transactions was 40 (range 6 – 250). The median number of transactions for morning break was 200 (range 85 – 800).

The number of pupils that were served at lunchtime ranged from 150 to 1 611, with a median of 400. This represents between 8% and 100% of all pupils, with a mean of 47% (SD=21%). The

school that served lunch to only 8% of its pupils also had, according to the catering manager, a trolley service for the children who bring packed lunch, serving sandwiches, hot dogs, pizzas, chips and crisps (in effect, an auxiliary school lunch service). The school also had a kiosk in the dining room selling hot foods, cakes and confectionery, and a tuckshop selling confectionery. In two schools there was a discrepancy between the number of pupils the caterer estimated they served each day and the number of pupils in the school, thus in two schools it appears that all the pupils take a school lunch. This is likely to be an overestimation.

According to the Head teacher or bursar or LEA contact responsible for school meals, the number of pupils per school entitled to a free school meal ranged from 5 to 740, median 125. According to the head cook or catering manager, the median number of free school meals served each day was 97. The estimated mean take-up rate in the present sample was 83%, similar to the national average of 79%². Based on tray check data (see section 6.2.4) 13% were free school meals (compared with a national average of 11%).

The mean value of a free school meal was £1.52 (SD=£0.13), and ranged between £1.20 and £1.88. With the exception of one school, there was no restriction on what free school meal pupils could spend their allowance on.

Sixty schools (76%) operated a cash cafeteria system. Fourteen schools (18%) operated a smart card (cashless) system, four schools (5%) operated both a cash and a smart card system, and one school operated a fixed price system (items not priced individually). For the majority of pupils receiving free school meals, it was apparent to the other pupils that they were in receipt of a free school meal due to the method with which they were identified by the school caterer. Free school meal recipients were unidentifiable as such for only 23% of schools, usually through use of a smart card system for all pupils, although one school had a smart card only for the pupils entitled to a free school meal; the other pupils paid with cash. Of those for whom it was not anonymous, the method of identifying eligible pupils usually involved presenting a means of identification such as a ticket, voucher, token or library card, or having their name ticked off a list.

Of those schools that operated a smart card system, 13 (71%) reported that parents had access to information on their children's food choices recorded by the smart card, and five (29%) were attempting to use the smart card system to encourage healthier choices by awarding points which could be exchanged for vouchers or gifts.

3.2 Competing outlets

3.2.1 Competing outlets within the school

The school caterers were asked about the types of vending machines in the dining room and elsewhere in the school, and whether pupils were permitted to use them at lunchtime (Table 3.3). More than half of schools had snack vending machines in the dining room or elsewhere in the school, and 69% had cold drink vending machines. In only one school were pupils not allowed to use the snack vending machine in the dining room at lunchtime. There was no restriction on the use of cold or hot drinks vending machines. Seven schools had a tuckshop situated in the dining room, and pupils were allowed to use the tuckshop at lunchtime in three of these schools.

Table 3.3. The number (%) out of 79 secondary schools in England that had vending machines and tuckshops in the dining room and elsewhere in the school that pupils were allowed to use at lunchtime.

Pupils allowed to use	n	(%)
<i>Dining room</i>		
Snack vending machine	30	38
Hot drinks vending machine	8	10
Cold drinks vending machine	35	44
Tuckshop	3	4
Other	16	20
<i>Elsewhere in school</i>		
Snack vending machine	15	19
Hot drinks vending machine	5	6
Cold drinks vending machine	20	25
Tuckshop	3	4
Other	9	11

Morning break service

The range and types of foods and beverages that were being offered by school caterers during morning break are detailed in Table 3.4.

Table 3.4. The number (%) of school caterers that offered various types of foods and beverages at morning break in 79 secondary schools in England.

Food and drink offered at morning break	n	%
Sandwiches, rolls & baguettes	40	51
Burgers, hotdogs, bacon or sausage sandwiches, pizza	65	82
Cakes & biscuits	46	58
Crisps & confectionery	37	47
Fresh fruit	35	44
Pies, pasties & sausage rolls	46	58
Chips	3	4
Hot & cold drinks, including fruit juice	73	92

3.2.1 Competing outlets outside the school

Whether pupils were allowed off the school premises at lunchtime varied between schools: 32% strictly did not allow their pupils to leave at lunchtime, 34% did not allow the pupils to leave but it was believed by the school caterer that at least some did, 14% allowed only older age groups to leave, and 20% of schools imposed no restrictions. For those schools where pupils were allowed off the premises, or where it was believed that pupils left the premises even if they were not supposed to, the school caterers were asked from where they believed pupils purchased food. The most popular venue was believed to be the chip shop, followed by corner shops, supermarkets and fast food restaurants (Table 3.5).

Table 3.5. Where school caterers believed pupils bought food from outside school in 51 secondary schools in England.

Type of outlet	n	%
Supermarket	19	37
Corner shop	24	47
Bakery	14	27
Chip shop	29	57
Fast food restaurant	17	33
Ice cream van	15	29
Burger van	3	6
Sandwich shop	4	8
Café	3	6

3.3 Eating environment: the dining room

A visual assessment of the eating environment was completed on one day of the data collection period. Whether menus and price lists were displayed was recorded, as was any evidence of the promotion of ‘healthy’ eating, such as posters, leaflets and labelling of dishes, the source of these messages, and any evidence of commercial marketing of products (Table 3.6).

Evidence of the labelling of foods and beverages as suitable to meet pupils’ dietary needs was recorded. Only foods identified as Halal and vegetarian were labelled (Table 3.6). No foods were labelled as Kosher, not containing pork, not containing beef, or organic (required by Rastafarians).

A number of schools (13) had a promotional offer on the week of the survey. Of these, eight were ‘meal deals’ (e.g. burger, chips and a soft drink for less than the items purchased separately), two were burger promotions (Double cheese burger £1.20, 10p off a burger with chips), one school was offering a free piece of fruit with the main meal, and another school was offering soup with a bread roll for £0.50.

Most schools (90%) had between two and four paying points in the dining room, and one school had eight. The service areas were laid out in such a way that 66% of the pupils had to walk past the main meals and were therefore exposed to the full range of choices.

Table 3.6. Assessment of the eating environment in 79 secondary schools in England.

Eating environment characteristic	n	%
• Menu displayed in dining room	64	81
• Price list displayed in dining room	62	78
• Prices displayed at point of sale or items priced individually	75	82
• Items labelled to indicate suitability for special dietary needs:		
Halal	5	6
Vegetarian	23	29
• Evidence of promotion of healthy eating		
Posters	25	32
Leaflets	2	3
Labelling of food or beverage items	6	8
Labelling of menus	5	6
• Source of materials:		
Food company	11	14
School caterer	18	23
Health Education Authority	4	5
School	2	3
• Evidence of commercial marketing	46	58
• Promotional offer	13	17

3.4 Cooking Practices

3.4.1 Fat

All schools used vegetable oil for frying. The majority of schools (72%) used hard block margarine for cakes and puddings. A further 14% used cake and pudding mixes. The remaining schools used a combination of soft margarine (5%), hard block margarine and soft margarine or vegetable oil (3%), and one school bought in all its cakes and puddings. Most schools (58%) used hard block margarine to make pastry, although 14% used a combination of lard and hard block margarine. Six percent used pastry mix, 6% used soft margarine, 6% vegetable shortening and 6% used a combination of hard block margarine and vegetable shortening. One school used frozen bought-in pastry and one school did not make pastry.

Table 3.7 and Table 3.8 show the usual method of cooking for meat, fish and potato products. The majority of schools (84%) offered chips that were likely to have a lower fat content: thick, straight and medium cut rather than crinkle or fine cut.

The majority of school caterers did not add butter or margarine to hot vegetables (76%) or boiled potatoes (69%). Seventy three percent of caterers added either butter or margarine to mashed potatoes.

The majority of school caterers (86%) made sandwiches, filled rolls and baguettes on the premises. Of these, 85% used a spreading fat on the bread. Three types of spreading fat were used: reduced or low fat spread (17%), soft margarine (47%) and sunflower margarine (36%).

Most school caterers used semi-skimmed milk (55%), dried skimmed (13%) or semi-skimmed and dried skimmed milk (14%) in cooking. Relatively few (5%) used exclusively full fat milk,

although a number of caterers used full fat milk in addition to other lower fat milks such as semi-skimmed and dried skimmed (12%). Only one school used fresh skimmed milk.

Table 3.7. Usual method of cooking fish and meat products

	Fish in batter		Fish in breadcrumbs		Fish fingers/cakes		Chicken/turkey burgers		Chicken nuggets/drummers	
	<i>n</i>	% ^c	<i>n</i>	% ^c	<i>n</i>	% ^c	<i>n</i>	% ^c	<i>n</i>	% ^c
Fry	37	51	19	29	9	13	10	13	16	22
Grill	-	-	-	-	1	1	1	1	-	-
Oven cook	34	47	46	70	59	83	66	85	54	74
Fry and oven cook	1	1	1	1	2	3	-	-	3	4
Steamer	-	-	-	-	-	-	1	1	-	-
Do not serve	7		13		8		1		6	

Table 3.8. Usual method of cooking potato products^d

	Chips		Croquette potatoes		Hash browns		Waffles		Wedges	
	<i>n</i>	% ^c	<i>n</i>	% ^c	<i>n</i>	% ^c	<i>n</i>	% ^c	<i>n</i>	% ^c
Fry	77	99	21	38	16	32	17	31	36	52
Oven cook	1	1	34	62	34	68	38	69	33	48
Do not serve	1	-	24	-	29	-	24	-	10	-

3.4.2 Salt

Forty two percent of school caterers claimed that there was a written policy on the use of salt in cooking. When asked whether they added salt to the cooking water, 33% replied “Yes” for vegetables, 37% for boiled potatoes, 29% for boiled rice and 26% for pasta. A higher percentage reported adding salt to dishes (56%). When asked how they measured the salt they used the response was varied, but could be summarised as those who follow the recipe (11%), to taste (52%) and habitual custom (37%).

Table salt was available to the majority of pupils (85%), and of these only 5% were required to pay for it. Of those school caterers that provided table salt, 6% provided a reduced sodium version. The manner in which table salt was available varied: 12% of caterers put salt cellars on the dining tables and a further 24% provided salt in sachets with no limit upon how many the pupils could take. Twelve percent provided sachets, with a limit on how many each pupil could have. The majority of caterers who provided salt cellars placed them at the serving counter rather than on the dining tables.

3.5 Healthy Eating Activity

3.5.1 Training in healthy eating or healthy cooking

In only 19 (24%) of schools had the head cooks or catering managers or their staff undergone any sort of training in healthy eating or healthy cooking in the past 12 months (Table 3.9). “Other” refers to other forms of training deemed relevant by the head cook or catering manager.

^c The percentage of those that serve these items

^d Grilled or oven cooked potato products typically have 15%-30% less fat than the fried equivalent.

Table 3.9. Type of training in healthy eating or healthy cooking received by head cooks, catering managers or catering staff in 19 secondary schools in England.

Type of training	<i>n</i>	%
Provided by contract caterer	8	42
Provided by LEA	2	11
NVQ	2	11
Other	7	37

3.5.2 Involvement in fruit and vegetable promotions

Thirty six (46%) school caterers had been involved in a fruit and vegetable promotion in the past 12 months.

3.5.3 Assessment of customer satisfaction

Fifty three (67%) of school caterers had sought the opinion of pupils, parents or governors (Table 3.10). Of these caterers, 34 (62%) claimed to have made changes to the service as a result, and seven (13%) claimed that no change was necessary.

Table 3.10. The number of caterers that reported seeking the opinion of pupils, parents and governors in 53 secondary schools in England.

Group whose opinion sought	<i>n</i>	%
Pupils	50	63
Parents	13	17
Governors	13	17

3.5.4 Making healthier options cheaper

School caterers were asked if they had a policy of making 'healthier' options cheaper. Twenty eight (35%) respondents claimed that they did, and two did not know. A price list was provided by 25 of the 28 school caterers that claimed to have a policy. A comparison of the median (IR) prices of a range of more and less 'healthy' options is shown in Table 3.11 for those caterers for which a price list was available and the items appeared on the price list. Apart from fresh fruit, there is no strong evidence that caterers are making healthy options cheaper.

Table 3.11. Median (IR)* price for 'more healthy' and 'less healthy' options for schools that had a policy of making 'healthier' options cheaper (*n* indicates number of items on which median price is based).

'More healthy'	<i>n</i>	Median	IR	'Less healthy'	<i>n</i>	Median	IR
Sandwich	17	£0.75	£0.17	Burger in bun	14	£0.75	£0.19
Filled baguette	11	£1.05	£0.20				
Fresh fruit	17	£0.22	£0.10	Slice sponge cake	12	£0.40	£0.04
Fruit salad	19	£0.55	£0.30	Dessert, hot or cold	13	£0.40	£0.10
Plain jacket potato (not including cost of filling)	17	£0.55	£0.10	Chips	18	£0.65	£0.06

* IR - Interquartile Range: difference between 25th and 75th centile, i.e. including 50% of observations either side of the median.

The influence of the characteristics of catering provision and practice on food availability and pupil choice is explored in Chapters 5 and 6.

4 Contracts and specifications

KEY FINDINGS

1. 16% of schools had no formal documentation defining the quality of school catering services. A further 23% did not or could not provide a copy.
2. Only two thirds of the documents examined either mentioned or made explicit mandatory requirements for providers to meet the compulsory National Nutritional Standards.
3. The language within school meals contracts tends to be worthy and intentional but non-specific. This indicated a strong commitment to the notion of healthy eating, but tight contractual structures were seldom in place to ensure that meals with a healthier nutritional profile were delivered by providers and healthier choices were selected by children.
4. Over half the documents scrutinised implied that schools had a policy relating to nutrition or healthy eating and the majority of these stipulated caterer adherence to this policy.
5. One quarter of schools made reference to salt. 12% set down standards for the addition of salt within food production and use of salt in catering, and 8% mentioned limiting access to salt by pupils. 10% made reference to the prevention of obesity.
6. Monitoring was mentioned in one third of documents, but convincing evidence that tight processes were in place, to monitor carefully thought out standards that relate to nutrition delivery on the plate, and the promotion of healthier choices to children, was sparse.
7. The documents collected as part of this research were searched for examples of good practice in setting tight and measurable specifications for healthier catering practice and the promotion of healthier food choices within the dining room. There was no clear evidence of such good practice within the sample of 48 examined.

4.1 Response rate

Samples of documentation defining the quality of lunchtime catering services were obtained from 48 of the 79 schools in the study. A variety of documents were received and these were mainly contracts or service level agreements, proposal documents, tenders, food service or catering specifications. This response rate (61%) is similar to that obtained by Coles and Turner (63%) in 1992¹⁷.

Thirteen schools (16%) said they had nothing on paper to define the quality of their lunchtime catering service and 18 schools (23%) failed to provide any documentation despite comprehensive telephone and email follow-up. The figures suggest that currently 16% of schools do not have any formal standards set down for their catering practice in schools. If those who failed to provide documentation are included, this rises to 39%.

4.2 Content of documentation

The majority of documents examined (44 out of 48) contained some content relevant to nutrition and healthy eating. However, it is worthy of note that four of the documents within the sample collected made no reference to nutrition or healthy eating.

Within the documents containing nutrition or healthy eating content there was a wide range of detail threaded through each document. This was either explicitly relevant (e.g. nutrition standards), or related to some element of catering practice which would influence nutrition delivery or the promotion of healthier choices (e.g. directive to use and offer semi skimmed milk). Statements were either expressed as guidance (e.g. ‘we will work towards’; ‘the contractor should’) or were mandatory and implied an explicit requirement for an action or commodity to be used or available (e.g. ‘the contractor will’; ‘the service must provide’).

Summary analysis of the healthy eating or nutrition content within the 48 documents examined is shown in Table 4.1.

4.2.1 General comments

Generally the language referring to nutrition and healthy eating was ill-defined and non-specific. Guidance or requirements were rarely quantitative, making monitoring difficult. Statements relating to nutrition or healthy eating were often expressed in such a way to leave them open to wide interpretation. The language used is epitomised in the following extracts:

“We will always try to provide the items that our customers prefer, but we will mix them in with essential ingredients which are required to ensure a healthy diet.”

“The LEA will increase the amount of fruit and vegetables served at a school lunch.”

“The purpose of the school meal is to provide a high quality nutritious meal and all pupils will have the opportunity to choose a nutritionally balanced meal.”

These quotes are all worthy statements of intent, but the wording is qualitative, with no attempt to quantify their meaning so that they can be translated into catering practice.

Table 4.1. Specifications relating to healthy eating within contractual documentation (n=48).

Is there any reference to? Q no.	Mentioned		Mandatory		No reference	
	n	%	n	%	n	%
POLICIES and GUIDELINES						
1a Recommendations in terms of the nutritional content (e.g. “the contractor should provide meals of a nutritionally balanced composition”).	11	23	12	25	25	52
1b The minimum nutritional standards set by DfES (Any reference to these minimum standards of provision).	8	17	23	48	17	35
1c A ‘Healthy Eating/Nutrition/Food Policy’ (A common agreement that sets the direction for food/health issues, referred to within the specifications/contract).	6	13	20	42	22	46
1d Encouraging healthy eating aims/objectives/targets (Specific aims or objectives related to healthy eating e.g. ensuring access to healthy food at affordable prices. Mandatory aims and objectives give quantitative and/or time based limits for achievement e.g. aim to achieve x by y).	16	33	11	23	21	44
1e Obesity/ Overweight/ Weight Control (Specific guidance/specifications related to preventing obesity through school meals).	3	13	2	4	43	90
1f COMA/SACN (Specific mention of reports by name e.g. COMA report Dietary Reference Values for Food Energy and Nutrients for the UK ¹⁵ and Nutritional Aspects of Cardiovascular Disease ²¹ ; SACN report Salt and Health ²²).	6	13	0	0	42	87
1g 30% RDA/DRV (suggestion that the school meal should aim to provide one third of a child’s daily requirements (i.e. for all nutrients).	4	8	2	4	42	88
1h CWT Guidelines (Specific mention or requirement for school meals to meet the CWT guidelines).	6	13	1	2	41	85
1i Encouraging healthier choices through pricing (i.e. making ‘healthier’ options cheaper).	6	13	5	10	36	77
1j Encouraging healthier choices through positioning/counter layout (Strategy to encourage uptake of healthier items).	7	15	5	10	36	75
3a Menu planning guidance (Range and number of dishes/items that must be available on a daily basis).	10	21	23	48	15	31
3b A set meal at a fixed price (A format of, or parameters for, a recommended set meal (e.g. made up of a number of courses; has to contain vegetables; main course has to include a portion of a protein and starchy carbohydrate food with either a portion of hot vegetable or salad).	8	17	11	23	29	60
4a Standard menus (Some recommendation on menu planning e.g. frequency of which certain foods could be offered in a menu cycle and or sample menus to be followed and recipes).	11	23	9	19	28	58
4b Standard recipes (Some recommendation for recipes to be used e.g. ways in which they could be adapted, source of recipes. If mandatory, stipulation of where recipes should be taken from or adapted in a particular way).	12	25	3	6	33	69
5 Portion sizes standards (Any recommendations/stipulations regarding portion sizes of meal components).	8	17	11	23	29	60
6 Nutritional specifications for commodities or ingredients to be used (Any quantitative recommendations/requirements for the nutritional content of commodities e.g. beef mince with less than 10% fat, ‘healthier’ ingredients such as unsaturated vegetable oil, semi skimmed milk or lower fat cheddar cheese to be used, or specifications for usage of less ‘healthy’ ingredients like lard/butter/full fat milk).	5	10	9	19	34	71

Is there any reference to? Q no.	Mentioned		Mandatory		No reference	
	n	%	n	%	n	%
NUTRIENT SPECIFICATIONS						
Qualitative - specific mention or requirement to either increase or decrease levels of fat/salt/sugar/fibre etc. within meals or service as a whole						
2a Fat	9	19	6	13	33	69
2b Sugar	10	21	3	6	35	73
2c Salt	9	19	4	8	35	73
2d Fibre	7	15	2	4	39	81
2e Others	7	15	3	6	38	79
Quantitative - amount of individual nutrients that should or must be within a meal or an average over a stated time period.						
7a Energy	4	8	2	4	42	88
7b Carbohydrate	1	2	0	0	47	98
7c Fat	4	8	3	6	41	85
7d Protein	4	8	2	4	42	88
7e Vitamin C	4	8	1	2	43	90
7f Vitamin A	1	2	0	0	47	98
7g Vitamin D	1	2	0	0	47	98
7h Iron	5	10	0	0	43	90
7i Calcium	2	4	1	2	45	94
7j Salt/sodium	2	4	0	0	46	96
7k Others	7	15	1	2	40	83
ELEMENTS OF GOOD PRACTICE						
8 Cooking Methods (Recommendations or mandatory directive regarding the usage of different cooking methods, e.g. aim to cut down on frying, use alternative cooking methods like oven baking where possible).	8	17	12	25	28	58
9a Salt in cooking practice (Guidance or requirement to limit usage of salt in cooking)	4	8	2	4	42	88
9b Access to salt by pupils (Guidance or requirement to limit or regulate access of pupils to table salt).	3	6	1	2	44	92
10 Specific 'healthy' foods and drinks to be served (Specifications that encourage or require the serving of 'healthier' types of foods and drinks).	5	10	12	25	31	65
11 Specific foods and drinks NOT to be served (Specific mention or requirement for certain foods or drinks not to be offered, or limitations on frequency/volume of service).	2	4	9	19	37	77
12 Additives (Inclusion of recommendations or requirements regarding the usage/product content of additives).	5	10	13	27	30	63
13 Organic Food (Inclusion of recommendations or requirements regarding the usage of organic food).	5	10	0	0	43	90
14 Monitoring (Reference to monitoring of standards/specifications that relate to healthy eating or nutrition).	14	29	12	25	22	46
15 Customer/school consultation (Reference to consultation process/requirement between catering supplier and pupil customer base and school).	13	27	11	23	24	50
16 Local sourcing of commodities (Guidance or requirement for catering suppliers to use local suppliers for sourcing commodities).	1	2	0	0	47	98
17 Meeting special dietary needs (e.g. vegetarian, Kosher, Halal etc).	6	13	18	38	24	50

* **Mentioned** - the number of documents mentioning (but not expressing in mandatory terms e.g. 'the contractor should endeavour to ...')

Mandatory - the number of documents saying something mandatory about a specific aspect of nutrition or healthy eating (e.g. 'the contractor must ...')

+ **No reference** - the number of documents making no reference to a specific aspect of nutrition or healthy eating

4.2.2 Policies, guidelines and nutritional standards

Perhaps the most significant observation is that specifications for sixteen schools (one-third of the 48 responding) made no reference to the National Nutritional Standards, even though this is a legislative requirement. Eight (17%) of the remaining 31 documents failed to use language that stipulated that caterers had to meet these standards.

“The catering service will work towards ensuring that the National Nutritional Standards are reflected in the planned menu.”

Additionally, there was some evidence from a few documents that the nutritional standards set by the DfES were not understood by individuals defining the quality of catering services in schools. For example, one document started out by saying that National Nutritional Standards are compulsory and that the LEA will monitor these through nutritional analysis. The compulsory standards relate to food availability, however, not to nutrients. As a consequence, adherence cannot be monitored through nutrient analysis as this document implied.

Whilst half of the documents examined made some sort of recommendations about the nutritional content of the meals to be offered, the language was characteristically loose.

“As a local authority we believe we have a moral obligation to the children of this town to provide a nutritious, balanced healthy meal.”

“The catering service will seek to improve the nutritional content of lunches.”

Nearly two thirds of the documents within the sample appeared to have some sort of food-related health policy and the majority made mandatory references to a ‘policy’. However, typically references were unstructured, intentional and seemed to have limited relevance to the school catering service.

“A healthy eating policy is in place.”

“To develop and maintain a school food policy in partnership with the school management and the students.”

“The contractor is required to present its own policy and demonstrate how it aims to promote nutritionally balanced meals.”

There was little reference to the prevention of childhood obesity in any of the documents examined. Only five documents made reference to obesity, and this was in very general terms, often viewing obesity as an illness to be treated rather than an escalating problem that needs to be prevented.

“Our [healthy eating] range was developed due to concerns of health experts over the rising number of people with obesity and diet related illnesses”

“Specific diets are available for customers with the following conditions: ..., obesity”

There was no evidence of an understanding of the measures that caterers could take to prevent children becoming overweight. Specific items looked for in relation to obesity prevention were:

- careful portion control and a commitment not to ‘supersize’ portions, particularly of high fat/high calorie foods

- consistent efforts to drive down the fat content of products offered through carefully designed commodity specifications and healthier modifications to standard recipes
- diluting the calorie density of meals by adding larger portions of vegetables and starchy carbohydrate foods and decreasing serving sizes of higher fat/protein items
- helping pupils to understand the differences in the calorie content of different portions of school food in relation to their own daily energy requirements.

4.2.3 Caroline Walker Trust guidelines

The CWT guidelines were mentioned in seven documents, and in only one was there a requirement to abide by these guidelines. References tended to highlight the existence of these guidelines and at most there was a requirement to have considered these guidelines when designing menus for children.

“The aim is to promote a Balanced Eating Policy which takes into account the COMA report and applies the CWT nutritional guidelines for school meals to the menus.”

“Guidelines laid down by the CWT indicate certain principles which should be applied when considering healthy eating.”

Approximately one quarter of the documents examined said something about positioning and pricing cafeteria items in order to encourage healthier choices. Specifically, the content of some documents implied that service providers must take actions to make healthier choices more accessible through careful counter layout of cash cafeterias. In reality these specifications were less robust than anticipated and still open to wide interpretation (see Table 3.11).

“The presentation and variety of foods available must be such that pupils are encouraged to select healthy foods.”

“The contractor shall actively promote the Healthy Eating statement by way of displaying healthy foods in a prominent position – not hidden.”

“Merchandising techniques will ensure that balanced options are displayed in key serving positions.”

Specifications to define how pricing manipulation could encourage the selection of healthier options were equally loose.

“Special meal deals will promote balanced choices at special prices.”

“The school would also like the contractor to encourage healthy eating through the marketing plan and combination of the differential pricing structure for healthy items.”

Indeed, there was one example where the document clearly expressed an intention to promote healthier choices through competitive pricing, yet the attached tariff did not reflect this notion. The tariff quoted prices for jacket potatoes, which were not considerably lower than chips, and fresh fruit was not cheaper than cakes and biscuits.

4.2.4 Nutrient Specifications

A significant number of schools asked or required their catering services to continue to reduce the fat and salt content whilst increasing the levels of fibre within the meals or food service as a whole. These statements were typically qualitative.

“We (as providers) will encourage the use of recipes that contain reduced fat, salt and sugar and increased fibre.”

“Fat has been reduced in home-made cakes and biscuits.”

“To increase the fibre content a proportion of wholemeal flour is incorporated into many of our recipes.”

“The LEA will reduce the fat content and the saturated fat content of the school lunch.”

Few schools (2%-15%) set quantitative nutrition recommendations or requirements for school meals (e.g. the meal must provide more than 600 kilocalories and/or less than 35% energy from fat). Marginally more schools set down meal content specifications for fat (14%), energy (12%) and protein (12%) compared to specifications for iron (10%), carbohydrate (2%) or calcium (6%). Typically the following specifications were set:

“The fat content of the total meal should provide not more than 35 – 40% of the calories

Protein should not be less than 30% of the RNI

The total school meal should provide 30% of the daily fibre intake – target 4-7g.”

In these instances measurable standards for the nutrient content of school meals had been set but there was little or no accompanying information illustrating how these standards would be measured. Standards are only as strong as the monitoring processes in place to demonstrate consistent achievement of those standards. Reference to mandatory (qualitative) reduction in fat was associated with higher consumption of high fat main dishes (20% vs. 16%). Schools in which there was a quantitative mention of reduction in the amount of fat served high fat main dishes less often (see Table 5.6) but there was no impact on pupil choice.

No schools set any standards for the salt/sodium content of the meals. Only two schools made any quantitative reference to salt/sodium delivery by school meals. This apparent lack of interest in controlling the salt content of school meals may be for a number of reasons:

- the perceived difficulty of controlling salt addition in school catering practice
- lack of available resources and skills to monitor salt standards for school meals
- writing of specifications prior to publication of relevant reports and publicity for their findings and no up-dating.

4.2.5 Menu planning and catering practice

Approximately two thirds of the documents examined contained some guidance or requirement specifically relating to menu planning. This usually took the form of describing the range of food choices that needed to be offered on a daily basis. Again, wording was generally open to wide interpretation by school food providers.

“Customers should be able to choose from a wide variety of outlets providing traditional hot meals, pizzas, jacket potatoes; including a snack and salad bar.”

“The range must include at least two hot main course dishes, one of which is suitable for non-meat eaters; jacket potatoes with a minimum of 3 different fillings each day; sandwiches and rolls made with white and brown bread; a selection of at least 5 different salads; a selection of fresh fruits; yoghurts; semi-skimmed milk drinks; milk and fruit juice.”

In some cases the language was even hazier.

“Will design appropriate choice of nutritional, appetising and appealing menus.”

Overall, the content of many of the documents examined suggested providers had a great deal of flexibility in menu planning within the framework of guidance provided. There was limited evidence of providers being tied to agreed menu cycles, which had been planned to meet defined nutrition or healthy eating criteria. Even though a small number of schools described detailed mandatory frameworks within which menus had to be designed, these frameworks were open to wide interpretation by providers involved in planning menus on the ground.

“The contractor must submit with its tender submission a 15 day menu cycle for secondary schools, including choice of menu for the cash cafeteria and ‘meal of the day’.”

Even though almost three quarters of the specifications studied made reference to standard menus, this usually referred to the notion of having menus planned and on paper rather than adherence to carefully planned menus designed to promote healthy nutrition.

“A package containing menus should be available.”

“The school requires the contractor to rotate menus to ensure appropriate choice and variety is available.”

“The provider shall provide a varied, healthy eating and nutritious menu and a proposed menu cycle.”

There was some reference to usage of standard recipes within a third of the documents examined. Some tenders required recipes to be submitted by contractors for scrutiny. In one instance a list of recipes was appended to an invitation to tender document, but there was no clear direction whether these were for reference or required to be used by the potential contractor. Generally, there was little evidence of schools stipulating standard recipes (which incorporated healthier modifications). Qualitative statements about recipe modification were common but often meaningless.

“We will ensure that our recipes are made with reduced quantities of sugar.”

Conversely, around 40% of documents made reference to portion size and 23% of the total sample stipulated portion sizes for some of the foods or meals offered at lunch. Sometimes the requirement was for the contractor to provide an indication of intended portion sizes.

“Specifications for menus must be provided and include the intended portion sizes.”

Relatively few documents set out strict quantified standards for portion sizes. There was often a lack of clarity whether the provider ‘must’ or ‘should’ adhere to these.

“A guide to portions and selling prices within the cash cafeteria is provided in the form of a table that list items, portion sizes and selling price. It also includes information on whether the weight is for cooked or uncooked, frozen, etc.”

There was no evidence of manipulation of standard portion sizes to encourage smaller portions of high fat or high calorie foods and larger portions of starchy carbohydrate meal components, vegetables and salad. The main lines of reasoning and focus on portion sizes seemed to relate to

protein delivery. This is long outdated, as numerous dietary surveys have shown that children in England consume protein well in excess of their requirements¹⁵. Within the sample of documents examined, there was no evidence of a clear stipulation for vegetable serving sizes of 80g (encouraged by the Government to meet the ‘at least 5 A Day’ target).

Almost one third of the sample of documents laid down some sort of nutritional specification for the commodities they buy in. Nineteen percent of the statements found regarding commodities were mandatory. The level of detail within this area of commodity control varied enormously. At one end of the spectrum contractors were required to submit a full nutritional analysis of commodities for scrutiny, whilst in others specifications only applied to a small selection of products (e.g. specification set for the meat content of sausages and hamburgers; fish content of fishfingers). There was some evidence that catering services were specifically asked or required or declared an intention to use – semi-skimmed milk; wholemeal flour; oil high in polyunsaturates; spreads high in polyunsaturates; low fat crème fraiche, yoghurt and fromage frais; sugar substitutes.

Some specifications simply said that ‘low fat meat products’ should be used, but failed to define the term low fat.

Forty two percent of the documents examined made reference to healthier cooking methods and within this group 12 schools (out of a total sample of 48) made mandatory statements. The most common statements referred to the frequency of frying, oven baking and grilling.

“All protein items should be cooked without additional fat or oil; frying should be kept to a minimum.”

“Foods should be grilled or baked rather than fried.”

“Adopt where possible lower fat cooking techniques, bake where possible, do not fry.”

There was some reference to vitamin retention practices within two documents.

“The contractor shall make sure that production methods are designed to maintain the nutritional content of cooked foods.”

Very few schools (6 out of 48) made any reference to salt in cooking practice and within documents from these schools statements were usually intentional and qualitative. There was no evidence of structured quality assurance procedures in place to control the amounts and frequency of salt in school kitchens.

“Minimum salt only used in cooking.”

“Ensure as little salt as possible is used in the cooking process.”

“Salt should be reduced in all cooking.”

Similarly few documents (8%) made reference to access to salt by pupils and these references were intentional and qualitative.

“Discourage the use of salt on the dining table.”

The most frequent type of stipulation or recommendation related to the availability of salt at table. Many suggested that providers should limit access by making salt available on request from service staff.

“Salt pots should not be provided on tables but are available on request.”

The impact of these specifications on either food provision (see Table 5.6) or pupil choice (see section 6.2.8) was minimal.

4.2.6 Additives and organic food

Additives and organic foods were mentioned more often than salt for comment within the sample of documents examined. 37% of schools mentioned or made a stipulation about the usage of additives in school catering. Data in Table 4.1 suggest that 27% used mandatory statements with reference to additives, but these were either open to interpretation or impractical. It is difficult to envisage how these tight statements banning the use of additives would be implemented given the budgetary constraints of school catering.

“Products containing artificial additives should not be used when alternative natural products are available.”

“Colourings and additives must be avoided.”

“Any coating or batter or breadcrumbs should be free of any artificial colouring.”

There were examples of more specific statements on additives.

“No added colouring E154 used in poultry.”

4.2.7 Monitoring and frequency of food availability

Statements on monitoring (relevant to nutrition and/or healthy eating) were made in half the documents within the sample. The level of detail and expressed control varied enormously. At one end of the spectrum documents simply expressed an intention or need for monitoring to be carried out. At the other end of the spectrum, documents stipulated tools to be used for monitoring, frequency, responsibilities and processes for feeding the results of the monitoring process back into the catering operation.

In a minority of instances documents suggested that nutritional analysis would be used as the central monitoring process, whilst in others monitoring was focused on checking that standards for food presentation, display and menu planning were met. Evidence drawn from the documents suggested that responsibilities for monitoring could be with the school, the council or LEA, or the caterer.

“The catering service will monitor the quality of the services and will report the results of monitoring as part of the review process”

“A school staff checklist for the school meals service is provided. This includes 2 sections on food presentation and menu planning specifications”

In terms of the provision and service of healthier menu choices, approximately one third of schools made intentional statements (sometimes mandatory) about specific foods and beverages

that should, and shouldn't be offered at lunchtime to children. The most popular guidance or requirements related to making the following available:

- unsweetened beverages
- wholemeal sandwiches
- 'low fat' desserts
- vegetarian meals
- jacket potatoes
- salads
- a choice of fresh fruit.

However, these statements were rarely expressed in quantitative terms indicating the relative volumes of these foods items that should be available to school children through the lunch service.

Relatively few schools (23%) restricted the service of specific foods. Of these, the most common restrictions related to offering beef and beef products, TVP, dehydrated potato and shoestring chips. There were relatively few direct references to the sale of confectionery and those that were found were designed to accommodate commercial influences within schools.

“We will only sell chocolate when it is specifically requested by the schools’ management.”

“Never to sell sweets unless it is to compete directly with the school’s tuck shop.”

One school made more specific recommendations on the frequency of service of certain foods.

“Potatoes in oil should not be served more than 3 times per week.

Baked beans should only be offered 8 times in a 20 day menu period.

Pastry desserts should not be offered when a pastry main course is served.”

Over a half of schools expressed some sort of commitment to encouraging dialogue between the catering services and their customers. However, these statements tended to be general and non-specific, rarely defining methods, responsibilities or processes for utilising the results. In some instances the frequency of consultation was suggested or stipulated.

“Consulting stakeholders on an annual basis in order to assess attitudes and satisfaction and to review and to evolve services in order to meet the needs of stakeholders.”

There were only two explicit references to School Nutrition Action Groups (SNAG).

“We would want to set up a SNAG addressing the nutritional aspects of the service.”

These results suggested an overall intention to carry out consultation, but detailed plans on how this might be done were generally absent.

Lastly, the majority of documents examined (96%) did not refer to local sourcing of commodities. Statements within the two documents that did make reference to local sourcing were generally intentional rather than mandatory.

“Move towards more emphasis upon fresh locally grown produce.”

“Whenever possible use locally sourced ingredients.”

As before in relation to contract specifications relating to catering practice and menu planning, there was essentially no impact of specifications relating to monitoring or frequency of food availability on food provision or pupil choice (see Table 5.6) and section 6.2.8).

5 Food Availability

1. KEY FINDINGS

2. 83% of schools met all the nutritional standards for school meals every lunchtime at the beginning of service. This had fallen to 47% by the end of service.
3. 82% met the additional recommendation for drinking water at the beginning of service, and 77% by the end. For drinking milk, 54% met the recommendation at the beginning of service, 42% by the end.
4. All schools met the additional recommendation to “offer some hot food”.
5. At the beginning of service, the items that caterers did *not* provide were two items from the milk and dairy foods group (4%). By the end of service, the items that caterers were most likely *not* to provide were two starchy items one of which was not cooked in oil or fat (25%).
6. The foods and drinks most commonly offered on at least 4 days per week were cakes and muffins (95% of schools), sandwiches (92%), soft drinks (92%), and fruit (91%). Vegetables (excluding baked beans) were offered on at least 4 days in 70% of schools, and baked beans 81%. Chips and other potatoes cooked in oil were offered in 76% of schools on 4 or more days, high fat main dishes such as burgers and chicken nuggets in 86%. In 28% of schools, no fruit juice was offered.
7. There was no association between the range or balance of food provided and reported monitoring of the standards.
8. Schools in which the contract specification made mandatory reference to reducing the quantity of fat in catering served fewer high fat main dishes.
9. Sandwiches and lower fat main dishes were offered more often in schools where the catering staff had received training in healthy eating or cooking in the past 12 months.
10. Schools in which there had been a promotion focused on fruit and vegetables were more likely to offer fruit juice.
11. None of the ‘set meals’ (offered by 89% of schools) met all of the Caroline Walker Trust guidelines. Only 14% of set meals met eight or more of the 12 guidelines. The guidelines for which meals were most likely to fail were iron, calcium and percent energy from carbohydrate (starchy foods). They were most likely to meet the guidelines for protein, vitamin C and non-milk extrinsic sugars (added sugar). One third of meals failed to provide between 20% and 40% of the estimated average requirement for energy.

5.1 Meeting the National Nutritional Standards and additional recommendations

5.1.1 National Nutritional Standards

Adherence to the nutritional standards (see Table 1.2) was assessed using the Food Visibility Tool at the beginning of service and again approximately 10 minutes before the end of service on each day of data collection. For most schools this was five days. In eight schools, four days of data were collected due to the schools being closed for staff training (INSET) days. On a further six days, interviewers collected data at outlets other than the main cafeteria (a Snack Bar, Takeaway Sandwich Bar and Trolley (for the 6th form)), and on two occasions they did not have sufficient time to collect data in the main cafeteria at the end of service (where the lunch break was very short). Thus, of the possible 395 days of data collection (5 days x 79 schools), the Food Visibility Tool was completed in the school cafeteria on 381 days at the beginning of service and 379 at the end of service.

The following analysis uses only those Food Visibility Tools completed in the main cafeteria assessed on 381 days at the beginning of service and 379 days at the end of service.^e To be assessed as meeting a standard the caterer had to have available on a daily basis at least two starchy foods, *and* one of these had to be not cooked in oil; a vegetable *and* a fruit; two items from the milk and dairy foods group; and two items from the meat, fish and alternative sources of protein. Red meat had to be served at least three times per week, and fish twice per week. For those schools for which there were four rather than five days of data, a school was assessed as meeting the standards for red meat and fish if red meat was available on two of those days, and fish on one. Thus, they were assessed on whether they met all six standards each day of the data collection period at the beginning and end of service.

Assessed over the whole week, 83% of school caterers met all of the standards every day at the beginning of service. This had fallen to 47% by the end of service. The number of caterers that failed to meet one or more standards is presented in Table 5.1. The nutritional standards that school caterers were most likely not to meet are presented in Table 5.2. Red meat was available at the beginning of service on at least 3 days per week in 74 (94%) of the schools, and at the end of service in 76 (96%) schools^f. Fish was available at least twice per week at the beginning of service in 74 (94%) of the schools, and at the end of service in 71 (90%) of schools. The failures to meet the standards were related to one or two days rather than every day of the week.

Table 5.1. The number (%) of caterers failing to meet one or more standards on one or more days at the beginning and end of service in 79 secondary schools in England.

Number of standards failed	Beginning		End	
	<i>n</i>	%	<i>n</i>	%
0	66	83	37	47
1	13	17	19	24
2	-	-	11	14
3	-	-	8	10
4	-	-	4	5

^e Section 114 of the School Standards and Framework Act 1998 states that “school lunch in relation to a pupil, means food made available for consumption by the pupil as his midday meal on a school day, whether involving a set meal, or selection of items by him or otherwise.” Thus, the nutritional standards apply to all outlets. However, because the outlets outside of the main cafeteria were not selected systematically across all schools and were few in number, the present analysis has been restricted to the main cafeterias.

^f Additional meat dishes were brought out after the beginning of service.

Table 5.2. The number (%) of caterers that failed to meet each standard or component of a standard every day at the beginning and end of service in 79 secondary schools in England.

<i>Nutritional standard or component of standard</i>	Failing a standard			
	Beginning		End	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
At least two meat, fish or alternative protein sources	-	-	14	18
At least two milk and dairy	3	4	18	23
At least one vegetable	-	-	12	15
At least one fruit	-	-	8	10
At least two starchy foods, one not cooked in oil or fat	-	-	20	25

5.1.2 Additional recommendations

In addition to the statutory (“compulsory”) National Nutritional Standards, the guidance produced for school caterers¹⁴ also sets out additional recommendations that drinking water (free of charge), drinking milk, and some hot food (particularly in Winter) should also be available every day (Table 1.3).

At the beginning of service, 82% met the additional recommendation for drinking water, and 54% for drinking milk. By the end of service 77% met the additional recommendation for drinking water, and 42% for drinking milk. Drinking milk was available at the beginning of service in 43 (54%) schools every day, and in 5 (6%) of schools four out of five days. Drinking milk was not available in 23 (29%) schools. By the end of service, drinking milk was available on each day in 33 (42%) schools.

Drinking water (free of charge) was available at the beginning of service in 65 (82%) of schools, and available four out of five days in a further two (3%) schools. Drinking water was not available in five (6%) schools. By the end of service, drinking water was available every day in 61 (77%) of schools.

All schools met the additional recommendation to serve at least some hot food. In one school this recommendation was met by offering soup.

5.1.3 Meeting the standards vs. type of contract

There was no association between the types of contract (profit or loss, other, or in-house) and whether or not the catering service met the nutritional standards.

5.1.4 Awareness and Monitoring of the nutritional standards

The school cooks or catering managers were asked as part of the interview whether they had heard of the nutritional standards for school lunches. Most (67%) claimed to have heard of them, although 39% of these respondents could not describe any of the standards. Only 3% could describe all the components of the nutritional standards. As can be seen from Table 5.3, respondents were most likely to be aware of the standards applying to fruit and vegetables.

The majority of the school cooks or catering managers (68%) reported that compliance with the nutritional standards was monitored, 17% said the standards were not monitored, and 15% did not know. The frequency with which the standards were monitored varied greatly from daily to once a year (Table 5.4). From the responses it is not clear whether the nutritional standards

themselves were being monitored, or whether the respondents were describing a more general type of monitoring of the school meals service. Some illustrative responses are set out in Table 5.4.

Table 5.3. Number and percentage of 52 school cooks or catering managers who were able to identify each nutritional standard or component of a standard.

Nutritional standard or component of standard	n	%
At least 1 fruit	29	37
At least 1 vegetable	27	34
At least 2 starchy foods	9	11
At least 1 starchy food not cooked in fat or oil	10	13
At least 2 milk and dairy	16	20
At least 2 meat, fish and alternative sources of protein	7	9
Red meat at least 3 times per week	11	14
Fish at least 2 times per week	14	18

Table 5.4. Examples of responses from the school cook or catering manager in reply to “who monitors these standards in your school?”

“Who monitors the nutritional standards in your school?”

Annual quality assurance check from the Area Manager
 Area manager, 3 - 4 times a month
 Area Manager comes to check menus
 Audit by council once a month
 Catering company - once every three months.
 Client services, once a year. No ‘e’ numbers allowed
 Line Manager - frequent
 Local Government monitors twice a year
 Monitor ourselves once a year on invoices, kitchen, menus, portion sizes, freezer etc.
 Operations manager comes in when necessary
 Operations manager, twice a month
 The Contract Caterer and the County Council conducted a check last year
 Surprise visit twice a year - don’t know who from.
 The Catering Manager monitors these standards
 The school bursar checks what’s being served everyday
 Two client officers check twice a year from the council.

Compliance with the nutritional standards is ultimately the responsibility of whoever holds the school meals budget (in secondary schools the school governing body). The responsible person was identified where possible and asked if he or she was aware of the National Nutritional Standards. Sixty five (82%) were aware of the standards and 56 (71%) claimed that compliance with the standards was monitored. Five (6%) respondents did not know if the standards were monitored or not. The effect on provision of being able to identify the standards and the monitoring of standards is described in section 5.3.

5.2 Inventory analysis

Table 5.5 shows the foods offered in the outlets surveyed, based on the inventories completed by the interviewers at the beginning of service.^g This includes main dining rooms (91%) and all other outlets (9%). The first two columns show the number and percentage of foods either (a) not offered at all or (b) offered at least four days per week.^h The foods most commonly offered were cakes and muffins (95% of schools), sandwiches (92%) and soft drinks (92%). 91% provided fruit on most days, but only 70% provided vegetables other than baked beans, which were provided by 81%. Fruit juice was provided most days by 58% of schools, but 28% provided no juice at all. The majority of schools (86%) provided main meal dishes that were high in fat (e.g. burgers or chicken nuggets) on at least four days per week, compared with only 61% providing main meal dishes lower in fat (e.g. curry and rice or a beef stew). No school served *only* high fat main dishes or low fat main dishes. On at least four days per week, 76% of schools provided chips or other potatoes or potato products cooked in oil and 75% provided crisps or other savoury snacks. Desserts (such as apple pie, sponge puddings, etc.) were provided in just over half of the schools at least four days per week.

Table 5.5. Number (%) of 79 secondary schools in England offering foods from different food groups, according to number of days offered per week, and mean number of days on which food from food group was offered.

	Schools				Average number of days offered per week			
	Food not offered		Offered 4-5 days per week		In schools serving food		Across all schools	
	n	%	n	%	mean	SD	mean	SD
Soft drinks	3	4	73	92	4.9	0.6	4.7	1.1
Milk (including flavoured)	14	18	58	73	4.6	1.0	3.8	2.0
Fruit juice	22	28	46	58	4.4	1.1	3.2	2.2
Soup	42	53	26	33	4.0	1.6	1.9	2.3
Fruit (fresh, tinned, dried)	2	3	72	91	4.8	0.6	4.7	1.0
Crisps and savoury snacks	13	16	59	75	4.7	0.9	3.9	1.9
Sweets and chocolates	17	22	51	65	4.4	1.4	3.4	2.2
Sandwiches, filled rolls and baguettes	1	1	73	92	4.8	0.6	4.7	0.8
Desserts	5	6	55	70	4.2	1.1	3.9	1.5
Cakes and muffins	0	0	75	95	4.8	0.6	4.8	0.6
Chips and potatoes cooked in oil	1	1	60	76	4.2	1.2	4.2	1.3
Potatoes (not fried), plain bread and other starches	0	0	72	91	4.7	0.7	4.7	0.7
Vegetables and salads (e.g. green, mixed, coleslaw)	0	0	55	70	4.0	1.4	4.0	1.4
Baked beans	4	5	64	81	4.5	0.9	4.3	1.3
Main dishes (high fat)	0	0	68	86	4.6	1.0	4.6	1.0
Main dishes (lower fat)	0	0	48	61	3.8	1.4	3.8	1.4
Gravy, butter, cheese and condiments	0	0	77	97	4.9	0.4	4.9	0.4

^g The analysis in this and subsequent tables expresses availability over a five-day week. For schools in which interviewers collected data on only four days, estimates of availability were determined by dividing the number of days by 0.8.

^h In the remaining schools (not shown in the table), the foods were on offer between 1 and 3 days per week.

5.2.1 Does school meal provision conform with the Balance of Good Health?

The document setting out the nutritional standards¹⁴ recommends that the foods provided accord with the Balance of Good Health.

“National Nutritional Standards use the food groups in the Balance of Good Health. This shows the types of food which make up a healthy, balanced diet.”

Caterers are encouraged:

“...to offer a selection of food which over the week reflects the proportions in the balance of good health.”

The Balance Of Good Health refers to the components of the diet (sources of protein, carbohydrate, etc.) as well as food groups (dairy, fatty and sugary foods, etc.). Many school dishes are composite and cannot be described easily in terms of the Balance of Good Health. Nevertheless, the foods on offer can be divided into those that are high or low in fat, for example, or high or low in sugar.

While there was a wide variety of foods being offered in many schools, the balance suggests that too many schools were serving chips, high fat main dishes such as burgers and coated poultry (e.g. chicken nuggets), and foods high in fat and sugar (cakes and biscuits). Every school every day should have been serving fruit, and vegetables, and foods lower in fat and sugar.

Figure 1. The Balance of Good Health.



5.2.2 Factors associated with food provision

One of the main purposes of the study was to evaluate the influences of the eating environment, catering practices and training, and contract specifications on food provision. Analysis of the influence of these factors was based on comparisons of the number of days on which particular food groups were available, assessed in schools serving the food (FS) or across all schools in the survey (A).

Whether or not the school met the National Nutritional Standards

As virtually all of the schools met the National Nutritional Standards at the beginning of service, it was not possible to analyse in a comparative way the effects of meeting the standards versus not meeting the standards. There were, however, no statistically significant differences in the provision of foods at lunchtime between the group of schools who were meeting the National Nutritional Standards at the end of service and those who were not.

Whether or not the caterer could name three or more of the nutrition standards

There were no statistically significant differences in food provision depending on whether the school caterer had heard of the standards or not, with the exception of sandwiches. In schools where sandwiches were offered, schools in which the caterer could name three or more standards offered sandwiches more often (4.9 vs. 4.5 days).

Whether or not the standards were monitored

There was no difference in the provision of food at lunchtime according to whether or not the school caterer claimed to monitor the standards.

Type of contract and service provider

Schools on a profit & loss contract offered soft drinks more often than those on other types of contract, or in which the school meals provision was in-house (5.0 vs. 4.9 vs. 3.6 days per week (A)). They offered fruit juice more often (3.9 vs. 2.7 vs. 2.2 days per week) and in schools serving confectionery and desserts these were also offered more often. Schools on profit & loss contracts offered vegetables less often (3.6 vs. 4.4 vs. 4.3 days).

There were no differences in food provision according to the service provider (contract caterer, DSO, or in-house) with one exception: in-house providers offered soft drinks less often (3.6 days per week) than other providers (virtually every day).

Smart cards

Schools using smart cards (cashless system) tended to serve sandwiches and vegetables *less* often. There are too few observations to be able to say whether or not giving parents access to the results of the selections based on the smart card influenced the balance of foods on offer.

Throughput and time available for lunch

“Throughput” was defined as:

$$\frac{\text{time available for lunch (min)}}{\text{number of pupils taking lunch}} \times \text{number of seats available}$$

Thus, even a relatively short lunch period could be adequate if the number of pupils taking lunch was small and the number of seats available was large. Median throughput was 23 minutes per pupil per seat, ranging from less than 18 minutes in the bottom third of the distribution (average time available 13 minutes) to over 30 minutes in the top third. Schools in the bottom third of the distribution were classified as “rushed”. The “rushed” service tended to be in the schools in

which larger numbers of pupils were being catered for. There was, however, no influence of throughput on the profile of foods on offer. Equally, there was no influence of time available for lunch on the profile of foods on offer.

Vending machines

Schools in which vending machines selling snacks and drinks or which had a tuck shop available in the dining room at lunchtime offered more sweets and chocolates, sandwiches, desserts and lower fat main dishes in the main canteen than in schools in which vending machines were not available to the pupils at lunchtime (independent of school size). There is no obvious explanation for the observed differences.

Pupils allowed off the premises at lunchtime

There was no obvious relationship between the types of foods offered and whether or not pupils were allowed off the school grounds at lunchtime, nor with the type of outlet that caterers thought the pupils frequented (chip shops, burger vans, fast food outlets or cafés). Some caterers had argued that they needed to serve chips or fast food to keep pupils on the school grounds, but there was no evidence for this.

Staff training

In schools in which catering staff had had training in healthy eating or healthy cooking in the past 12 months, sandwiches and lower fat main dishes were offered more regularly. Training was provided more often in schools where contract caterers provided the service (34% of schools) compared with LEA/DSO or in-house provision (15%).

Assessing views of pupils, parents and governors and the need for change

Caterers were asked if they had assessed the views of pupils, parents and governors about the school lunch service (comments book or box, a survey, a special event to promote school meals or other similar activity) and whether or not they had made changes as a result (either changes had been made or it was felt that no changes were necessary). In the 50 schools in which pupils views had been sought, potatoes not cooked in oil, plain bread and other starches were offered marginally *less* often (4.6 days per week) than in those schools where no views had been sought (5 days).

Thirty-four caterers said that they had made changes as a result of consultation with pupils, parents or governors. Fruit was offered on 4.9 days in those that had made changes, compared with an average of 4.3 days where no changes had been made, or 4.7 days where it was felt no change was necessary. Conversely, chips were offered *more* often in schools in which caterers said that they had made changes (4.6 days) than in those that had not (3.3 days) or in which they had said no change was necessary (4.1 days). Similarly, potatoes that were not fried, other starches and baked beans were offered more often (4.8 days) in those making changes compared with those not making changes (3.9 days) or feeling that no changes were necessary (offered 4.9 days).

Promotion of healthy eating and evidence of commercial marketing

Neither of these factors influenced the provision of food at lunchtime.

Fruit and vegetable promotions over the previous 12 months

Schools that had had fruit and vegetable promotions provided fruit juice more often (4.0 days per week) than those who had not had a promotion (2.5 days). The provision of fruit (4.7 days) and vegetables (4.0 days) was not different between the two groups of schools.

Participation in special initiatives (whether or not Government sponsored)

Forty-three schools (54%) participated in healthy school initiatives (“Growing Schools”, “Whole School Food Policy”, “Healthy Schools Award”, “School Nutrition Action Group”), and a further 15 schools (19%) were engaged in other food and diet related health promotion activities. None of these was associated with differences in the provision of food at lunchtime.

Profit taking by school

In the 24 schools that expected to make a profit, crisps and savoury snacks were provided less often compared with other schools (4.2 vs. 4.9 days per week), and vegetables were also offered less often (3.5 vs. 4.2).

School characteristics, region and deprivation

There were no differences in food provision according to gender of school, type of school (community, foundation or voluntary aided or controlled), religious affiliation, region (North, Midlands or South), urban or rural, or level of deprivation.

Contract specifications

In the 48 schools for which documentation relating to the contract or service level agreement was obtained, the specifications that were mentioned or were mandatory were assessed in relation to food provision (Table 5.6).

There were some statistically significant associations between specifications in the contracts/service level agreements and food provision. Many of these associations, however, did not relate to the specification. For example, documents in which a Nutrition Policy was mentioned offered fewer sandwiches than in schools where it was mandatory or not mentioned. The association was not consistent and it had no underlying explanation.

Having a specification to limit the quantity of fat in foods offered was statistically significantly associated with differences in provision of three food groups. Having a mandatory specification relating to fat quantity was associated with a reduction in the number of times that high fat main dishes were offered. Soft drinks were also offered less often in these schools, even though they do not relate to fat. Milk too was offered less often, possibly because of concerns about milk as a source of fat.

Finally, vegetable provision was higher in those schools in which monitoring of healthy eating practiceⁱ was mentioned, but the association was not consistent as provision was lower in schools in which monitoring of healthy eating practice was deemed mandatory.

ⁱ See Table 4.1, item 14.

Table 5.6. Number of days on which specific foods offered in 79 secondary schools in England according to whether the specification was mentioned in the contract/service level agreement, was deemed mandatory, or was not mentioned.

Specification	Food	Days per week on which food provided, according to type of reference in specification		
		Mentioned	Mandatory	Not mentioned
National Nutritional Standards	None	-	-	-
Nutrition policy	Sandwiches	4.4	5.0	4.8
Encouraging healthy eating	None	-	-	-
Follow CWT guidelines	None	-	-	-
<i>Fat quantity*</i>				
Qualitative	None	-	-	-
Quantitative	High fat main dishes	5.0	3.3	4.6
	Milk	4.2	4.0	4.9
	Soft drinks	5.0	4.0	5.0
General cooking practices	None	-	-	-
Monitoring healthy eating practices	Vegetables	4.7	4.1	3.2

* See Table 4.1: “qualitative” (item 2a); “quantitative” (item 7c).

Table 5.7 provides a summary of the influences on food provision of the eating environment characteristics, catering practices and training, and contract specifications. The overall conclusion is that these influences were few, relatively small, sometimes inconsistent and often not in the expected or desired direction.

Table 5.7. Summary of influences of eating environment characteristics, catering practices and training, and contract specifications on food provision in 79 secondary schools in England.

Factor	Positive association	Negative association
Schools on profit and loss contracts	More fruit juice	More soft drinks and confectionery Fewer vegetables
In-house provision	Fewer soft drinks	
Smart cards		Fewer vegetables and sandwiches
Vending machines and tuck shops available at lunch time	More low fat main dishes, sandwiches and desserts	More sweets and chocolates
Training of staff in healthy eating	More lower fat main dishes and sandwiches	
Assessing views of pupils, parents and governors		Fewer low fat starches
Made changes following consultation	More fruit, low fat starches and baked beans	More chips and potatoes cooked in oil
Fruit and vegetable promotion	More fruit juice	
Profit taking by school	Fewer crisps and savoury snacks	Fewer vegetables

Contract specifications

See Table 5.6

5.3 Food provision and the nutritional standards

The majority of schools met all of the guidelines at the beginning of service (except for dairy, red meat and fish on one or two days in between three and five schools) (see section 5.1.1). There was therefore no basis for comparing the profile of foods on offer in those schools that had met the standards and those that had not. Moreover, because the inventories were carried out at the beginning of service (but not at the end) and because they measured which foods were on offer but not how much, it was not possible to analyse the association between inventories and the ability of schools to meet the standards at the end of service. Thus, meeting the National Nutritional Standards was not associated with providing foods which conformed to the Balance of Good Health.

5.4 Set meals and the CWT guidelines

5.4.1 What is a set meal?

There are no formal rules currently used to define the contents of a “set meal”. Traditionally, a set meal was a hot meal containing a protein source (meat or fish), a starch (mashed potato, for example), a cooked vegetable and a dessert. In the present survey, however, a wide variety of food combinations were included under the term “set meal”. Often they simply represented a group of items that could be purchased for a set price, and there was no obvious relation between particular food combinations and health. Most schools had more than one set meal every day, and there was often a choice of main course, vegetable or dessert within the meal.

In the present study, foods in the set meals offered each day in each school were listed by the interviewers in the ‘Food Inventory’. These combinations were then analysed by cluster analysis to identify seven common groupings (Table 5.8). These groupings are determined by the analysis and not according to what might be regarded as healthy or unhealthy combinations. Not all set meals included a vegetable and a dessert.

Table 5.8 Examples of types of school set meals according to cluster membership.

Cluster group	Type of meal	Example set meal
1	Vegetable, rice or pasta main dish offered with a dessert	Pasta tuna bake and dessert
2	Pasta with a sauce, salad and dessert	Spaghetti bolognese, salad and dessert
3	Higher fat meat or poultry dish, high fat starch, vegetable and dessert	Meat pie or chicken nuggets with chips, baked beans and dessert
4	Lower fat meat based dish with a low fat starch, vegetable or baked beans and dessert	Chilli con carne and rice or Lancashire hot pot and mashed potatoes, peas and dessert
5	Coated fish or lower fat meat dish, high fat starch, vegetable and dessert	Battered cod, chips and peas; or roast lamb, roast potatoes and carrots; and dessert
6	Pizza, cheese or egg dish; high or low fat starch, dessert	Pizza or quiche and jacket potato and dessert
7	Higher fat main, low fat starch and dessert	Chicken pie, mashed potato and spaghetti hoops or Sausage, mashed potato, gravy, baked beans, dessert

5.4.2 Do set meals meet Caroline Walker Trust Guidelines?

Seventy schools (89%) offered set meals. A few schools offered only one type of set meal per day; most offered two or three types. Set meals type 1 and 4 were offered most often, and the traditional (meal type 5) about 16% of the time. Meal type 3 (high fat meat and high fat starch with baked beans and dessert) was offered about 10% of the time as a set meal.

The Caroline Walker Trust (CWT) Nutritional Guidelines for School Meals¹¹ were drawn up in 1994 by an expert working group concerned that school meals should be healthy and well balanced nutritionally. Although there is no requirement for set meals to meet the CWT guidelines, they have been put forward as a reasonable nutritional yardstick against which the set meals provided by caterers can be assessed. Seven schools referred to the guidelines in their contractual specification document. The influence of the contract on the extent to which schools met the guidelines is discussed below.

The nutrient content (mean and SD) of the seven common groupings for set meals and the percent contribution of energy from macronutrients is shown in Table 5.9. The meals vary substantially in their energy and nutrient content, both within and between types of meals. Some meals are, on average, especially high in fat and percent energy from fat (meal types 3, 5 and 6).

Table 5.10 shows the percent of meals that *fail* to meet the CWT guidelines. Not one of the 814 set meals offered in the schools in this study satisfied all 12 guidelines. Meal types 2 and 6 satisfied a greater number of guidelines more often than other meal types, but over two-thirds of meal types 2 and 6 were failing on more than five guidelines. The guidelines failed most often were for iron, calcium and carbohydrate. Those met most often (more than 60% of meals) were for vitamin C, protein and non-milk extrinsic sugars. The ability of a meal to meet the CWT guidelines was based in part on the combination of foods included in the set meal and the portion sizes offered.

Technically, the CWT guidelines "provide figures for the recommended nutrient content of an average school meal provided for children over a one-week period". Individual meals are not necessarily expected to meet all the guidelines. "In practical terms [the adequacy of set meals in relation to the CWT guidelines] is the total amount of food provided, divided by the number of children eating it, averaged over a week". Information on the total amount of food provided is not available, as caterers were not asked to supply the number of portions of each type of food prepared. Assuming, however, that the caterers wish to minimize waste, the data on children's consumption is likely to be a fair reflection of the total amount of food on offer.

The CWT guidelines can be analysed for the set meals at school level, assuming that even if individual meals failed to meet the guidelines, the average balance of nutrients in set meals provided in any one school might do so. The final column in Table 5.10 shows the percent of schools failing to meet the CWT guidelines over all set meals. For iron, calcium, carbohydrate, fat and saturated fatty acids over 90% of schools failed to meet the guidelines. For non-starch polysaccharides and folate two-thirds failed to meet the guidelines. For energy, retinol equivalents (vitamin A), vitamin C, protein and non-milk extrinsic sugars a higher percentage of schools was able to satisfy the guidelines over a week than was satisfied by the individual meals.

Table 5.9. The nutrient content (mean and SD) of the seven common groupings for set meals and the percent contribution of energy from macronutrients.

<i>Energy and nutrient content per meal</i>	Meal type													
	1 (n = 192)		2 (n= 104)		3 (n = 79)		4 (n = 200)		5 (n = 127)		6 (n = 54)		7 (n = 58)	
	<i>Mean</i>	<i>sd</i>	<i>Mean</i>	<i>sd</i>	<i>Mean</i>	<i>sd</i>	<i>Mean</i>	<i>sd</i>	<i>Mean</i>	<i>sd</i>	<i>Mean</i>	<i>sd</i>	<i>Mean</i>	<i>sd</i>
Energy (kcal)	350	212	582	235	790	285	522	234	700	242	686	299	712	355
Energy (kj)	1469	890	2447	989	3310	1195	2198	981	2931	1016	2874	1251	2995	1488
Protein (g)	13.2	9.4	20.1	9.5	26.0	9.9	27.5	10.0	25.7	12.5	25.4	13.5	24.4	13.4
Fat (g)	15.5	11.8	24.7	11.4	40.8	15.2	20.1	13.3	33.8	13.2	37.0	17.4	29.9	21.1
Saturated and trans fatty acids (g)	6.5	5.9	10.4	6.1	13.4	6.2	8.1	6.1	9.7	6.0	14.8	7.8	11.9	8.3
Mono-unsaturated fatty acids (g)	5.3	4.4	8.4	4.3	16.6	6.6	7.3	5.1	14.0	5.8	12.9	7.4	10.2	8.1
Polyunsaturated fatty acids (g)	2.4	2.0	3.9	2.6	7.9	3.7	3.1	2.6	7.6	3.6	6.3	4.2	5.3	4.8
Carbohydrate (g)	42	32	75	35	85	36	62	32	78	31	67	38	92	43
Non-milk extrinsic sugars (g)	5.2	9.1	10.9	10.6	14.2	11.1	9.4	10.1	11.6	12.7	7.2	10.5	18.0	17.2
Non-starch polysaccharides (g)	2.9	2.5	6.0	3.1	6.4	3.1	4.0	2.6	6.6	2.7	5.3	3.7	5.9	3.8
Retinol equivalents (mcg)	204	277	380	272	237	271	343	629	281	331	278	180	233	169
Vitamin C (mg)	17	21	33	26	27	18	17	18	33	19	20	18	22	19
Folate (mcg)	39	38	89	47	90	46	59	42	97	37	88	52	98	127
Calcium (mg)	167	164	250	144	182	111	131	111	209	134	360	178	243	186
Iron (mg)	1.7	2.6	2.9	1.2	3.6	1.6	3.1	1.4	3.3	1.4	3.1	1.7	3.3	1.6
Sodium (mg)	618	1665	698	423	1091	661	689	412	661	461	1009	614	1311	1687
<i>Percent energy from:</i>														
Protein	16	9	14	4	14	4	24	10	15	7	15	5	14	5
Fat	38	17	38	11	47	6	33	12	43	8	49	10	36	12
Saturated fatty acids	15	10	16	7	16	6	13	7	12	6	20	7	15	6
Monounsaturated fatty acids	13	8	13	6	19	3	12	5	18	5	16	5	12	5
n3 polyunsaturated fatty acids	1	2	1	1	2	1	1	1	2	1	1	1	1	1
n6 polyunsaturated fatty acids	5	4	5	3	7	2	4	3	8	3	7	5	5	3
Polyunsaturated fatty acids	6	4	6	4	9	3	5	3	10	4	9	5	6	3
Carbohydrate	46	21	48	12	40	7	44	13	42	9	36	11	50	13
Non-milk extrinsic sugar	5	9	7	7	7	5	6	6	6	6	3	5	9	7

^a See Table 5.8 for a description of meal types

Table 5.10. Percent of each of seven meal types *failing* to meet CWT guidelines in 814 set meals offered in 79 secondary schools in England.

		Meal type ^a							All set meals	School level	
		1	2	3	4	5	6	7			
		<i>n</i>	192	104	79	200	127	54	58	814	70
Caroline Walker Trust Guideline											
Iron	not less than 40% of RNI	99	94	86	93	90	89	84	93	93	99
Calcium	not less than 35% of RNI	83	70	87	93	82	43	67	80	80	91
Carbohydrate	more than 50% of energy from carbohydrate	63	63	96	73	87	89	48	73	73	93
Fat	less than 35% of energy from fat	63	69	95	50	91	91	53	69	69	93
Saturated fatty acids	less than 11% of energy from saturated fat (inc trans fat)	63	75	78	59	50	91	71	65	65	96
Non-starch polysaccharides	not less than 30% of RNI	90	52	42	76	37	56	57	64	64	69
Folate	not less than 40% of RNI	89	53	44	77	34	50	59	64	64	67
Energy	30% of energy EAR (20%-40%)	74	38	42	49	43	48	53	52	52	34
Retinol equivalents	not less than 30% of RNI	60	28	58	42	57	28	41	47	47	26
Vitamin C	not less than 35% of RNI	61	14	20	54	7	43	43	38	38	19
Protein	not less than 30% of RNI	63	30	10	5	12	17	22	25	25	7
Non-milk extrinsic sugars	less than 11% of energy from NMEs	21	25	19	22	18	6	38	21	21	14
		% of meals							% of schools		
Best (1-4 failures)		5	26	11	12	12	20	31	14	14	7 (2-4)
Middle (5-7 failures)		24	44	56	50	71	52	31	46	46	50 (5-7)
Worst (8-12 failures)		71	30	33	38	17	28	38	40	40	43 (8-11)

^a See Table 5.8 for a description of meal type

There is no guideline for sodium, but the average sodium and energy content of set meals can be used to estimate the likely total amount of sodium in a child's diet if other dietary sources were similar in their sodium content. The average requirement for energy in adolescent school children is 2232 kcal/day (9341 kJ) (based on the EAR for 11-18 year-old boys and girls). The average sodium density of set meals was 774 mg/567 kcal = 1365 mg/1000 kcal. The total sodium intake from food would be 3047 mg (or 7.6 g of salt), equivalent to 190% of the RNI for sodium in adolescents. This estimate does not include discretionary use of salt at the table.

5.5 Food provision and the CWT guidelines

Very few schools offered set meals that met the majority of CWT guidelines (see Table 5.10, CWT guidelines met by meal type), but a number of schools met individual components of the CWT guidelines, and a quarter of the schools met one-half of the guidelines. CWT guidelines relate to overall provision (see section 1.5). Because the information about overall food provision was not available (no data were collected on the number of portions being offered, only on the range of foods), the findings have been interpreted in relation to set meals in the 70 schools that offered them.

There were many specific associations between individual CWT guidelines and provision of specific food groups. These are shown in Table 5.11. In general, meeting the guidelines was associated with offering fruit and vegetables more frequently. As was the case with the nutritional standards, however, meeting a particular guideline was not always associated with an obvious difference in food provision. It is not clear, for example, why the five schools that met the guideline for energy from carbohydrate were providing low fat main meals *less* often. Thus, meeting individual CWT guidelines for set meals is not a strong indicator that the availability of food overall is balanced. This is similar to the earlier finding that meeting the nutritional standards does not distinguish schools providing better balanced choices from those that do not.

5.6 Factors associated with meeting CWT guidelines

5.6.1 National Nutritional Standards

As all of the schools met all of the National Nutritional Standards most days, there was no statistical basis for assessing associations between the overall ability of set meals to meet CWT guidelines and the schools' ability to meet the nutritional standards. Because between three and five schools failed to meet the standards for dairy, red meat three times per week and fish twice per week, it was possible to assess the associations between these and specific CWT guidelines. Associations were tested between serving red meat on three out of five days per week and meeting the CWT guideline for iron, and serving dairy products or milk every day and meeting the CWT guidelines for calcium. There were no statistically significant associations.

5.6.2 Contract specifications

Forty-two of the 48 schools that provided documentation relating to the contract/service level agreement also provided set meals. There were no statistically significant associations between specifications and the extent to which schools met the CWT guidelines, with one exception. The four schools that met the guideline to produce lower fat meals all mentioned or had a mandatory directive to follow good cooking practices such as cutting down on use of frying or using alternative methods such as oven cooking or grilling (chi-squared $P=0.025$). Mention or a mandatory directive in the contract/service level agreement did not automatically spell success, however: 12 schools (38%) that failed to meet the guideline also mentioned or had a mandatory directive to follow good cooking practices.

Table 5.11. Number of days on which selected foods offered according to whether or not school had met CWT guideline (n=70 schools).

CWT Guideline	Number meeting	Food group	Association (days per week offered)	
			<i>Met guideline</i>	<i>Did not meet Guideline</i>
Protein	65	Fruit juice	3.0	5.0
		Fruit	4.8	2.8
		Vegetables	4.1	2.8
Vitamin C	57	Soft drinks*	4.9	4.5
		Fruit	4.8	4.1
		Crisps*	4.7	4.3
		Vegetables	4.1	3.5
Energy as % of EAR (20%-40%)	46	Soft drinks*	5.0	4.6
		Fruit	5.0	4.2
		Crisps	4.9	4.3
		Vegetables	4.2	3.5
<i>% energy from:</i> Carbohydrate	5	Lower fat main dishes	2.2	3.8
NMEs	60	Sweets*	4.5	3.4
		Lower fat main dishes	3.9	2.8
Fat	5	Fruit juice	5.0	3.0
		Baked beans	2.8	4.4

* In those schools serving the food

6 What secondary school pupils eat at lunchtime

KEY FINDINGS

1. The most popular choices were high fat main dishes (e.g. burgers) (18% of choices), chips and other potato/potato products cooked in oil (18%) and soft drinks (17%). The least popular choices were fruit (1%), fruit juice (1%), and vegetables and salads (2%).
2. Differences between sub-groups of pupils were small. Younger pupils (11-14y) chose more cakes and muffins (9% vs. 6%). Girls chose less high fat main dishes than boys (15% vs. 20%).
3. 54% of pupils spent less than £1.50 on their lunch. 13% had a free school meal. Those pupils spending less than £1.50 compared with more than £1.50 were more likely to buy chips, and less likely to buy soft drinks.
4. Pupils who spent more on their lunch had higher energy and nutrient intakes than pupils receiving a free school meal, who in turn had higher intakes than those spending less than £1.50.
5. Energy and nutrient intake was significantly higher in boys compared with girls, with the exception of vitamin C and percentage of energy from saturated fat. Conversely, boys had a significantly lower intake of energy from carbohydrate.
6. Pupils whose meals met six or more CWT guidelines were making healthier food choices than those whose meals met less than six of the CWT guidelines. Specifically, pupils whose meals were most likely to meet a high number of CWT guidelines chose more baked beans, vegetables and salads, starches (both chips *and* low fat starches), desserts, fruit, fruit juice and milk, and fewer high fat main dishes, cakes and muffins, sandwiches, sweets and chocolates and crisps and savoury snacks and soft drinks.
7. In schools that offered chips and potato cooked in oil one or two days per week, between one third and one half of pupils met the CWT guideline for fat. In contrast, where chips or potato cooked in oil were offered three days per week or more, only one quarter of the pupils met the CWT guideline for fat.

6.1 What do children eat?

The data from 5 695 pupils were used to analyse the food choices and nutrient contents of school lunches. Pupils' choices are summarised in Figure 1. High fat main dishes included foods such as burgers, coated poultry (e.g. chicken nuggets), pizza, sausages, sausage rolls and other dishes providing more than 50% of energy from fat. Low fat main dishes were foods such as pasta dishes (e.g. macaroni cheese), beef stew or chicken curry (typically offered with rice or other low fat starch). Just under half of the children selected high fat main dishes, soft drinks, and chips (or other potatoes cooked in fat), and one quarter chose cakes and muffins. Only 6% chose vegetables other than baked beans (selected by 11%). Only 3.3% chose fruit juice and 1.5% chose fruit. Just under one fifth of pupils also had gravy, butter and cheese (mainly as an accompaniment to jacket potatoes) or other condiment with their meal.

Figure 2. Percent of 5 695 pupils choosing specified foods in 79 secondary schools in England.

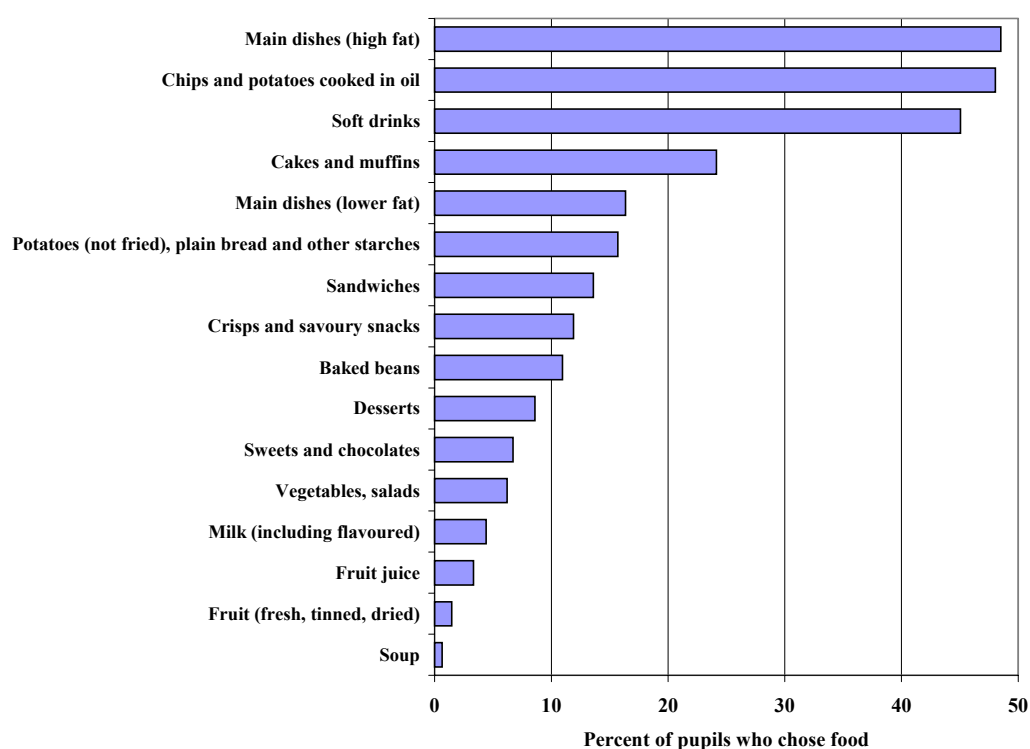
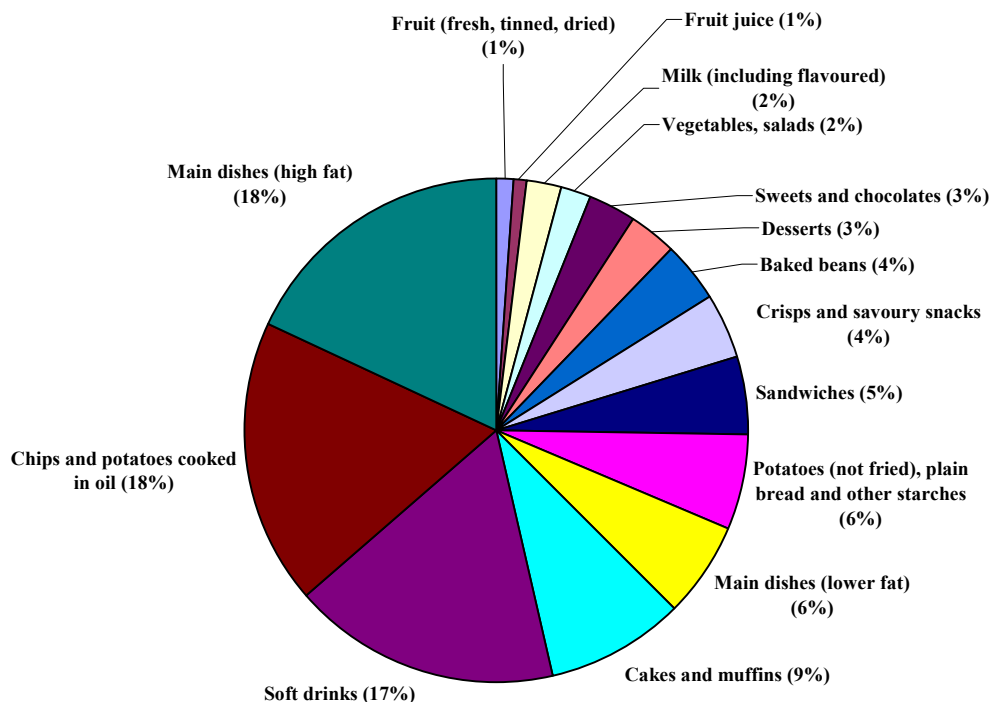


Figure 3 shows the balance of all food choices made by the children at lunchtime. The figure excludes contributions from tea, coffee and soup (0.2% of all food choices) and gravy and condiments (6%). As is evident from Figure 2, choices were dominated by high fat main dishes, soft drinks, chips and potatoes cooked in fat, and cakes and muffins.

Figure 3. Percent of all food choices by 5 695 pupils in 79 secondary schools in England.



6.2 What factors were associated with food purchases?

Because of the very large number of observations (17 523 food purchases) all of the comparisons between distributions were statistically significant using a chi-squared test. The patterns of distribution were usually little different, however, according to the factor investigated. Results are expressed as a percentage of all foods purchased by each subgroup. Differences of 2% or less are not mentioned.

6.2.1 Meeting the National Nutritional Standards

Because (with few exceptions) all of the schools met all of the standards on most days, there was no sound basis for a statistical analysis of differences in the profiles of pupils' food choices according to whether or not the standards had been met.

6.2.2 Age and gender

Of total purchases, older children (15-18 years) bought cakes and muffins less often (6%) than younger children (11-14 years) (9%). Girls bought high fat main dishes less often than boys (15% vs. 20%).

There were no major differences between years 7-9 and 10-11. Sixth form pupils bought more low fat main dishes (9% vs. 6%) and vegetables and salad (5% vs. 2%) compared with younger

children, but they also bought more chips (19% vs. 17%). Sixth form pupils purchased cakes and muffins less often (4% vs. 8%) and soft drinks less often (11% vs. 16%).

6.2.3 Type of school

There was only one boys-only school, so this group has been excluded from the present comparison. Pupils attending girls-only schools chose high fat main dishes less often (13% vs. 18%), as well as fewer cakes, biscuits and desserts compared with all pupils (girls and boys) in mixed schools. Pupils attending girls-only schools also chose low-fat starches (9% vs. 4%) and low fat main dishes (11% vs. 5%) more often. Girls attending girls-only schools made more favourable (lower fat) food choices than the girls in mixed schools, whose pattern of choice was more similar to the boys in the mixed schools.

Pupils attending community schools selected crisps and savoury snacks less often (4%) than pupils in foundation schools (7%), and fewer high fat main dishes (16%) than in foundation (18%) or voluntary aided or controlled schools (21%). The reason for these differences is not clear.

6.2.4 Spending on food and free school meals

54% of pupils reported spending less than £1.50 on their school lunch, 32% spending £1.50 or more, and 13% said that they had had a free school meal. Pupils spending less than £1.50 bought more chips (18% vs. 16%) and fewer soft drinks (14% vs. 18%). Pupils who had free school meals had more desserts (5% vs. 3%) and fewer high fat main dishes (14% vs. 18%) compared with the other groups of pupils.

6.2.5 Region, deprivation and urban/rural

Pupils in the Midlands and the North had more soft drinks than in the South (17% and 18% vs. 13%). They also chose fewer high fat main dishes (15%, 17%, and 19% respectively) as well as fewer low fat main dishes (4%, 6% and 8%, respectively). Pupils from the most socio-economically deprived areas had more soft drinks (17% vs. 15%) and fewer high fat main dishes (14% vs. 18%) than those from better off areas. This may be associated in part with a higher percentage of pupils in the most deprived areas having received free school meals (25%) compared with 10%-12% in the better-off areas. There were no differences between urban and rural areas.

6.2.6 Factors related to morning break, time for lunch, use of vending machines and method of payment, and being allowed off the premises

Access to food at morning break (be it burgers, sandwiches, soft drinks, pies, cakes and - in three instances - chips) showed no obvious influence on food choices at lunchtime. Similarly, the time available for lunch or access to vending machines was not associated with food choice. Method of payment (cash or smart card) and whether or not pupils were allowed off the premises at lunchtime was not associated with food choice.

6.2.7 Factors related to healthy eating

Where the smart cards were linked to reward points for making healthy choices, pupils chose soft drinks less often (13% vs. 16%), chose low fat starches (rice, pasta, bread, potatoes not cooked in oil) (8% vs. 5%) and baked beans (6% vs. 4%) and low fat main meals (9% vs. 6%) more often. There was no effect, however, on the percent choosing chips or high fat main meals.

There was no association between food choices and whether the school had a policy to make healthy items cheaper. Where staff had had training on healthy eating or cooking, pupils chose lower fat main dishes more often (8% vs. 5%).

In schools in which pupil, parent or governor views on the lunchtime service had been sought and it was felt that no changes were necessary, pupils chose chips and high fat main dishes more often (22% vs. 16%, and 19% vs. 16%, respectively).

In schools where the caterer was aware of the National Nutritional Standards, pupils chose high fat main dishes less often (16% vs. 18%). Where the caterer could actually name at least three of them, pupils chose high fat main dishes less often (15% vs. 18%). There was no influence on choice dependent upon whether or not pupils had to walk past the main serving counter. Where the caterer said that compliance with the standards was monitored, schools offered more soft drinks (17% vs. 13%) and fewer high fat main meals (16% vs. 20%).

Evidence of promotion of healthy eating in the dining room was associated with greater choice of soft drinks (18% vs. 15%). Evidence of commercial marketing was associated with greater choice of soft drinks and lesser choice of low fat main dishes (17% vs. 14% and 5% vs. 7%, respectively). There was no apparent effect of fruit promotions on pupils' choice of fruit. Pupils in schools participating in nutrition-related health initiatives chose high fat main meals less often (16%) than in other schools (19%).

6.2.8 Contract specifications

In schools in which documents relating to service provision were available, pupils selected soft drinks and chips less often (13% vs. 16% and 14% vs. 17%, respectively), low fat main dishes more often (8% vs. 6%) and crisps and savoury snacks more often (7% vs. 4%). In contracts in which adherence to the National Nutritional Standards was deemed mandatory, pupils chose more soft drinks (18% vs. 14%) and chips (19% vs. 14%) and fewer low fat main dishes (4% vs. 7%) and crisps and savoury snacks (4% vs. 7%). Where the reference to providing foods with lower fat content was mandatory, pupils chose chips less often (13%) than in other schools (18%). There was no association between mandatory reference to a nutrition policy or healthier cooking practices in the contract specification and pupils' choices at lunchtime. In schools where there was reference to mandatory monitoring, pupils chose more soft drinks (19% vs. 15%) and more chips (20% vs. 16%). Similarly, in schools where there was reference to a mandatory healthy eating policy, pupils chose soft drinks and chips more often (19% vs. 15% and 18% vs. 16%, respectively). Reference to mandatory (qualitative) reduction in fat was associated with higher consumption of high fat main dishes (20% vs. 16%).

With the exception of the specification relating to providing foods with a lower fat content being associated with chips being chosen less often, pupils' food choices were not consistently related to contract specifications relating to National Nutritional Standards, healthy eating initiatives or monitoring of catering services.

6.2.9 Service provider and type of contract

In schools in which the catering service was provided in-house, pupils chose soft drinks less often (14%) than in schools with contract catering or DSO service providers (16%), due in part to lower provision (see Table 5.7). Pupils in schools with contract catering chose high fat main meals more often (18% vs. 16%) and pupils in schools with in-house catering chose low fat main meals more often (7% vs. 5%). In schools where the caterer was aware of the National Nutritional Standards, pupils chose chips less often (16%) than pupils in other schools (19%). There was no obvious association between type of contract (profit & loss or other) and pupils' choices, nor was there an association dependent on whether or not the school aimed to make a profit, in spite of there being differences in provision.

6.3 Nutrient content of school meals

The mean energy and nutrient content of lunchtime food selections made by 5 695 secondary school pupils and percent energy from macronutrients is shown in Table 6.1. The values are similar to those reported in the National Diet and Nutrition Survey of young people aged 4 to 18 years.³ The energy and nutrient content was significantly higher in the boys than in the girls for all nutrients except vitamin C and percent energy from saturated fatty acids; percent energy from carbohydrate was lower in the boys.

The table also shows the CWT guidelines (see Table 1.4) for each nutrient for purposes of comparison^j, and the percentage of pupils whose lunch met or exceeded the guideline.

Table 6.1. Energy and nutrient content of 5 695 school meals consumed in 79 secondary schools in England, percent energy from macronutrients, CWT guideline and percent of meals meeting the guideline, by gender.

<i>Nutrient per meal</i>	Boys (n = 2534)				Girls (n = 3161)				<i>P</i> *	<i>†</i>
	Mean	SD	<i>CWT guideline</i>	% meeting	Mean	SD	<i>CWT guideline</i>	% meeting		
Energy (kcal)	678	302	705	56	596	270	574	53	0.000	0.038
Protein (g)	20.3	12.1	13.6	69	17.1	10.7	12.7	63	0.000	0.000
Fat (g)	32.1	17.8	-	-	27.9	15.9	-	-	0.000	-
Carbohydrate (g)	82	39	-	-	74	35	-	-	0.000	-
Saturated fatty acids (g)	10.5	7.5	-	-	9.4	6.7	-	-	0.000	-
Non-starch polysaccharides (g)	4.0	2.5	5.6	21	3.7	2.3	4.6	28	0.000	0.000
Non-milk extrinsic sugar (g)	23.4	23.4	-	-	21.2	21.6	-	-	0.000	-
Retinol equivalents (mcg)	125	183	187	24	111	132	180	24	0.001	0.862
Vitamin C (mg)	23	24	13.6	64	23	24	12.7	62	0.393	0.306
Folate (mcg)	66	40	80	31	60	39	80	26	0.000	0.000
Sodium (mg)	1059	2814	-	-	906	2789	-	-	0.041	-
Calcium (mg)	217	186	350	20	189	170	280	23	0.000	0.007
Iron (mg)	2.8	2.1	4.5	13	2.3	1.7	5.9	2	0.000	0.000
<i>% energy from:</i>										
Protein	12.2	6.0	-	-	11.8	6.3	-	-	0.009	-
Fat	41.5	11.2	<35	24	40.8	12.4	<35	26	0.018	0.169
Saturated fatty acids	13.4	6.5	<11	40	13.7	7.3	<11	40	0.150	0.789
Monounsaturated fatty acids	16.3	5.7	-	-	15.7	6.3	-	-	0.000	-
Polyunsaturated fatty acids	9.0	4.5	-	-	8.6	4.8	-	-	0.008	-
Carbohydrate	46.3	12.6	>50	33	47.5	13.3	>50	38	0.001	0.000
Non-milk extrinsic sugars	13.4	14.4	<11	51	13.6	14.5	<11	51	0.527	0.657

* Based on un-paired t-test of difference between energy and nutrient intake between genders

† Based on chi-squared test of differences in percent meeting CWT guidelines between genders.

- No CWT guideline

Figure 4 shows the profile of food choices according to the amount spent on food or being in receipt of a free school meal. Pupils who spent £1.49 or less chose bread and low fat starches, chips, and crisps and savoury snacks more often and soft drinks less often compared with those who spent £1.50 or more. Pupils who received free school meals chose desserts and milk more often than pupils who paid for their meals.

^j The CWT guideline (nutrient per meal) was calculated by multiplying the average requirement (according to the distribution of pupils by age and gender in the present sample) times the percentages given in Table 1.4.

Figure 4. Food consumption profiles of boys and girls attending 79 secondary schools in England, by amount spent or receiving a free school meal.

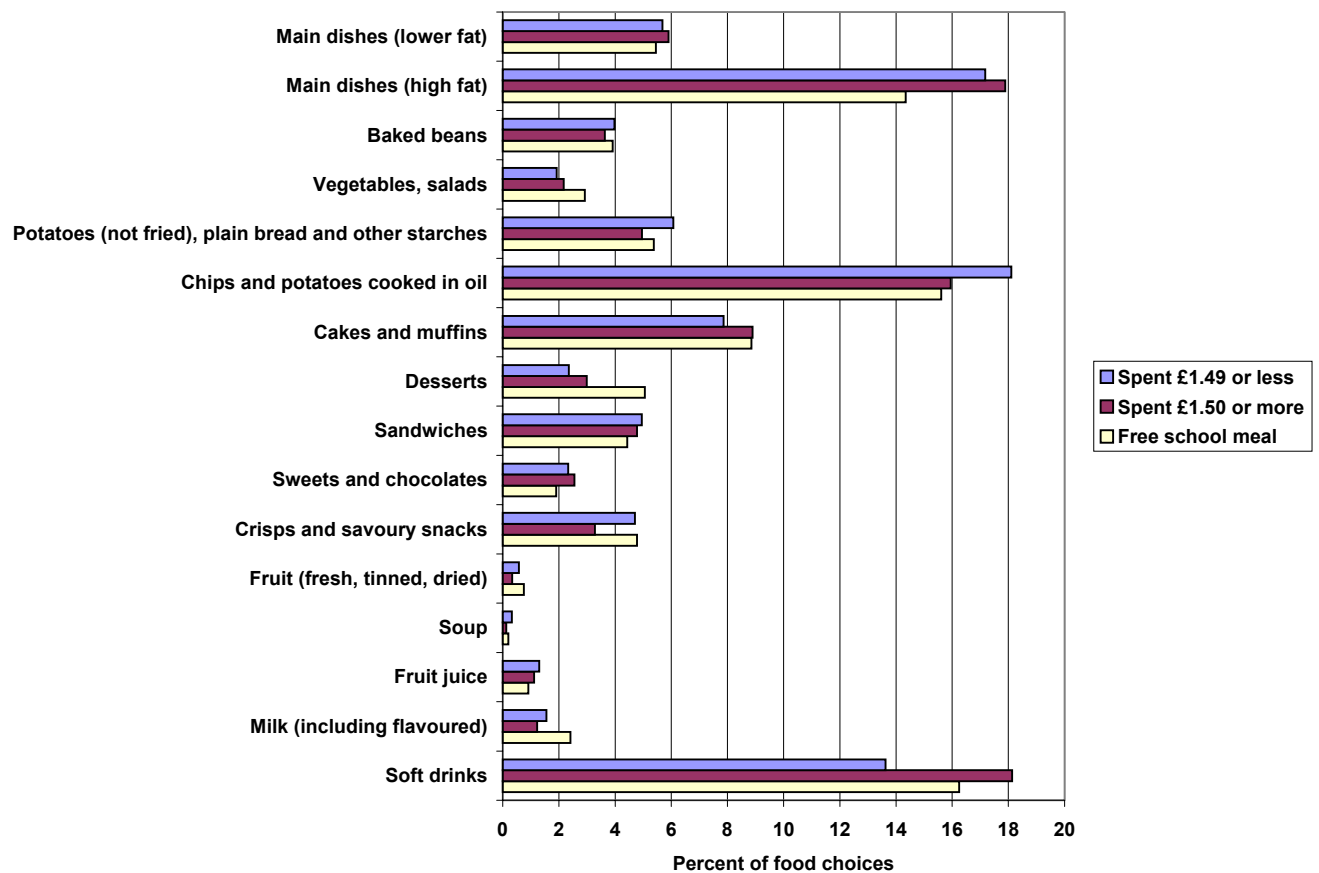


Table 6.2 shows the energy and nutrient content of school meals, percent of energy from macronutrients according to the amount paid or receipt of a free school meal, and the percentage meeting the CWT guideline for each nutrient. Pupils who spent more on their lunch had higher energy and nutrient intakes. Free school meals provided energy and nutrients intermediate between the quantities in the lunches of pupils who paid above or below £1.50, with the exceptions of vitamin C and sodium (highest in the free school meals). The average sodium content of the meals was equivalent to a salt content of between 2 g (spent £1.49 or less) and 3.4 g (free school meals). Even before considering the contribution of salt added at table, 51% of the boys and 40% of the girls had meals with a salt content over 2 g, the target per meal for this age group.

Pupils who spent £1.49 or less on food were generally less successful in meeting the CWT guidelines than those who spent more or who received a free school meal, but were more successful in meeting the CWT guidelines for percent energy from polyunsaturated fatty acids and non-milk extrinsic sugars because they were more often buying chips.

Table 6.2. Energy and nutrient content of 5 642* school meals consumed in 79 secondary schools in England, and percent energy from macronutrients, by amount spent or receipt of free school meal.

Nutrient per meal	Spending on food									P
	Spent £1.49 or less (n = 3067)			Spent £1.50 or more (n = 1823)			Free school meal (n = 752)			
	Mean	SD	% meeting CWT	Mean	SD	% meeting CWT	Mean	SD	% meeting CWT	
Energy (kcal)	539	250	53	757	296	55	714	274	57	0.000
Protein (g)	16	10	55	23	12	80	21	12	75	0.000
Fat (g)	26	15	-	35	17	-	33	17	-	0.000
Carbohydrate (g)	65	32	-	93	39	-	89	35	-	0.000
Saturated fatty acids (g)	8	6	-	12	8	-	11	7	-	0.000
Non-starch polysaccharides (g)	3	2	19	4	3	32	4	2	32	0.000
Non-milk extrinsic sugar (g)	17	20	-	29	24	-	27	22	-	0.000
Retinol equivalents (mcg)	96	124	19	147	200	30	130	143	26	0.000
Vitamin C (mg)	19	21	56	27	27	70	28	25	72	0.000
Folate (mcg)	55	37	22	73	41	39	69	39	33	0.000
Sodium (mg)	796	2107	-	1079	2597	-	1370	4680	-	0.000
Calcium (mg)	171	166	18	240	186	26	231	185	25	0.000
Iron (mg)	2	1	4	3	2	12	3	3	9	0.000
<i>% energy from:</i>										
Protein	12	7	-	12	6	-	12	6	-	0.035
Fat	41	13	25	41	10	25	40	11	26	0.024
Carbohydrate	47	14	36	47	11	35	48	12	39	0.062
Saturated fatty acids	14	8	-	14	6	-	13	6	-	0.523
Monounsaturated fatty acids	16	7	-	16	5	-	16	5	-	0.003
Polyunsaturated fatty acids	9	5	42	9	4	37	9	4	40	0.696
Non-milk extrinsic sugars	3	4	58	4	3	41	4	4	45	0.000

* 53 pupils did not provide information on amount spent or receipt of free school meal

6.3.1 Meeting the CWT guidelines

Table 6.3 shows for each CWT guideline the percent of pupils who met the guideline, for all pupils and for those who met six or more guidelines. 28% of boys and 26% of girls chose foods that met six or more CWT guidelines. No pupil chose a meal that met all 12 CWT guidelines, and some meals met none of the guidelines. Pupils whose food choices met six or more guidelines met them most often for energy, protein, non-starch polysaccharides, vitamin C, folate and percent energy from non-milk extrinsic sugars.

The profile of foods consumed differed according to the specific CWT guideline being met. For folate, for example, pupils who met the guideline consumed fewer soft drinks, crisps and savoury snacks and sandwiches, and more vegetables, baked beans, starches (both chips *and* low fat starches) and condiments and gravy (including butter and cheese added to jacket potatoes). Those who met the guideline for fat were more likely to have soft drinks, low fat starches and lower fat main dishes, and fewer chips or potato cooked in oil, crisps and savoury snacks and higher fat main dishes.

Table 6.3. Percent of pupils who met CWT guidelines for specific nutrients: all pupils and those who met six or more guidelines, by gender.

	Percent meeting CWT guidelines			
	Boys		Girls	
	≥ 6	All	≥ 6	All
	<i>n</i>	2534		3161
<i>Energy and Nutrients</i>				
30% of energy EAR (20%-40%)	66	56	61	53
Protein: not less than 30% of RNI	92	69	88	63
Non-starch polysaccharides: not less than 30% of RNI	58	21	74	28
Retinol equivalents: not less than 30% of RNI	41	24	42	24
Vitamin C: not less than 35% of RNI	91	64	93	62
Folate: not less than 40% of RNI	81	31	75	26
Calcium: not less than 35% of RNI	37	20	42	23
Iron: not less than 40% of RNI	28	13	6	2
<i>% energy from:</i>				
Fat: Less than 35% of energy from fat	34	24	42	26
Saturated fatty acids: Less than 11% of energy from sfa (incl trans fa)	51	40	53	40
Carbohydrate: More than 50% of energy from carbohydrate	42	33	52	38
Non-milk extrinsic sugars: Less than 11% of energy from NMEs	60	51	60	51

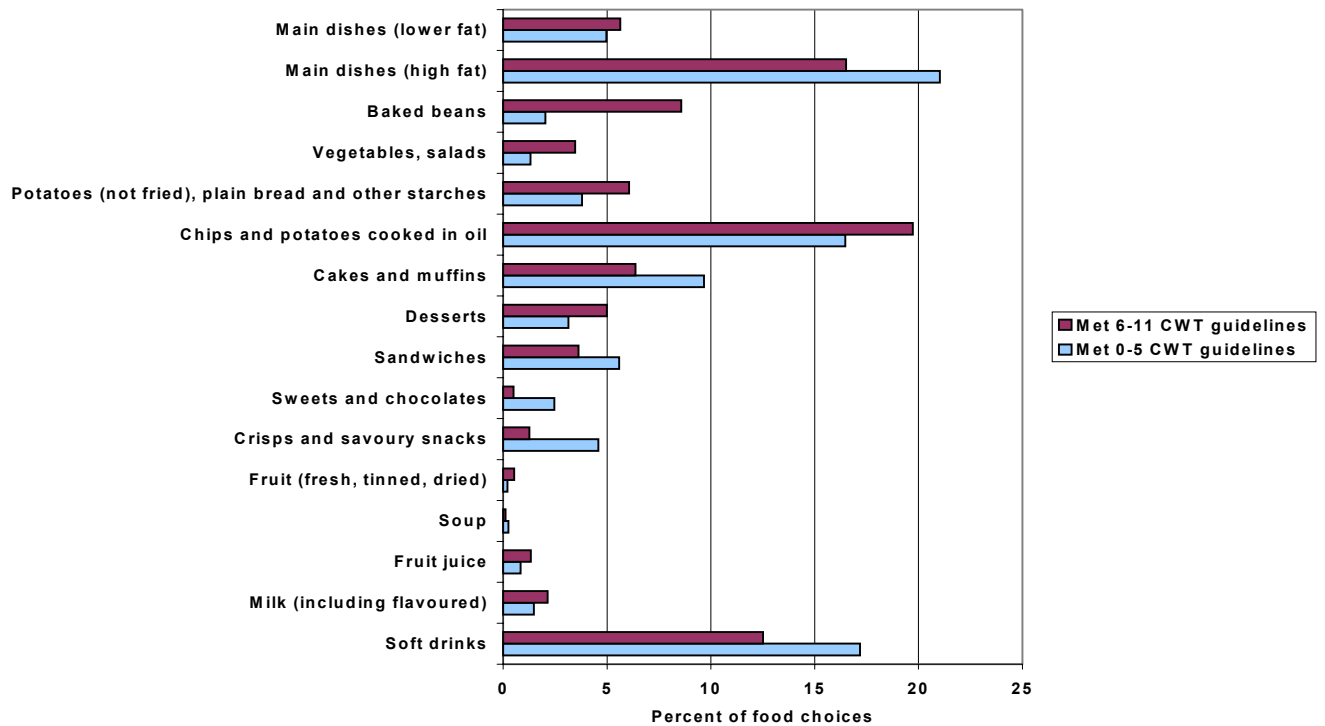
A CWT score was computed for each pupil equal to the number of CWT guidelines met. The mean (SD) score for all pupils was 4.4 (1.9), 4.4 (1.9) for girls and 4.5 (1.9) for boys. Pupils in the sixth form had a marginally higher mean (SD) CWT score (4.7 (2.2)) compared with younger pupils (4.4 (1.9)).

Food choices of pupils whose meals met *any* six (or more) of the CWT guidelines are shown for boys and girls in Figure 5. Both boys and girls achieved a CWT score of six or more by consuming fewer high fat main dishes, cakes and muffins, sandwiches, sweets and chocolates and crisps and savoury snacks and soft drinks; and by consuming more baked beans, vegetables and salads, starches (both chips *and* low fat starches), desserts, fruit, fruit juice and milk.

In order to identify the profile of food consumption that was likely to be associated with a high CWT score, all of the CWT guidelines were included in a stepwise regression analysis with CWT score as the outcome variable. Six guidelines (for folate, percent energy from fat, protein, vitamin C, retinol and percent of EAR for energy) explained 81% of the variation in score (Table 6.4) i.e. meeting these guidelines was likely to be associated with a high score and not meeting them with a low score. The importance of each guideline in contributing to a high score (percent of variation in CWT score explained for each additional guideline) is shown in the final column. Thus, the CWT guideline for folate alone explained 42% of the variation in CWT score. Meeting the CWT guidelines for fat, protein and vitamin C contributed a further 10%, 9% and 11%, respectively, and the guidelines for retinol and energy a further 5% each.

Figure 5. Food consumption profiles of boys and girls attending 79 secondary schools in England, according to whether or not their food choice met 6 or more of the CWT guidelines.

a) Boys



b) Girls

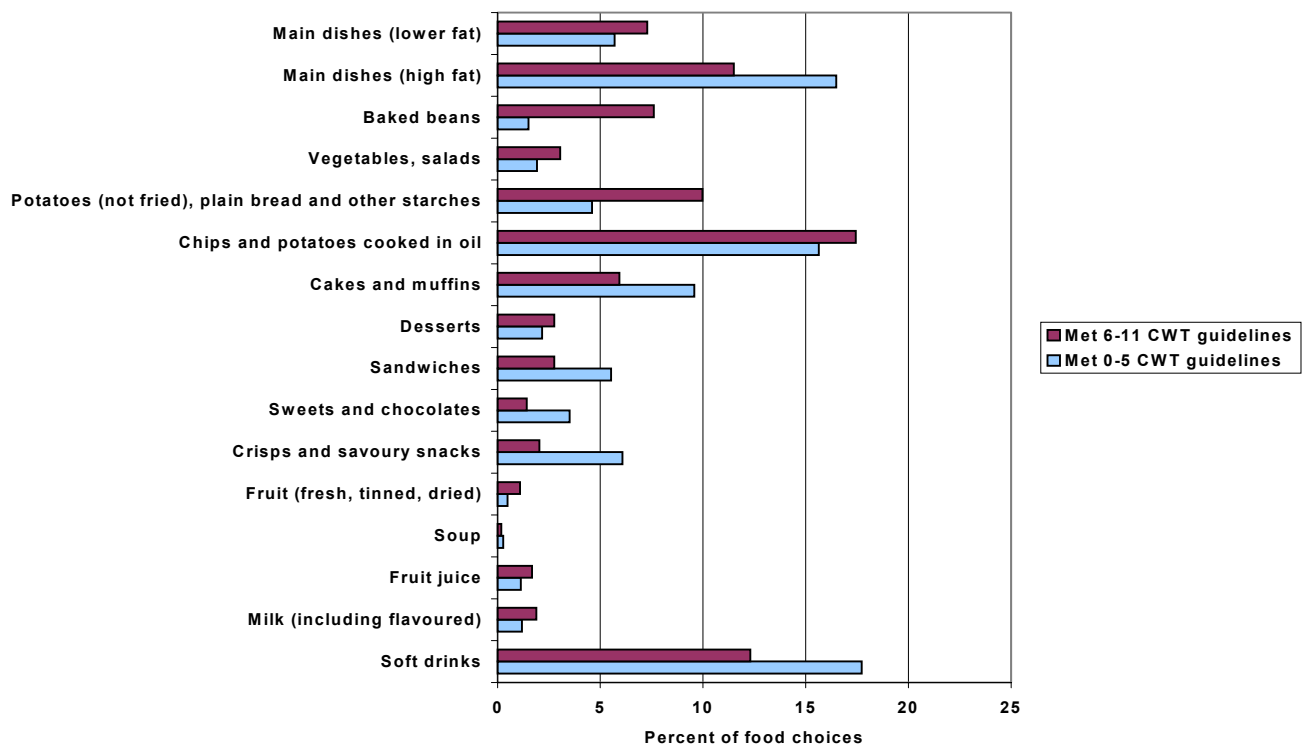
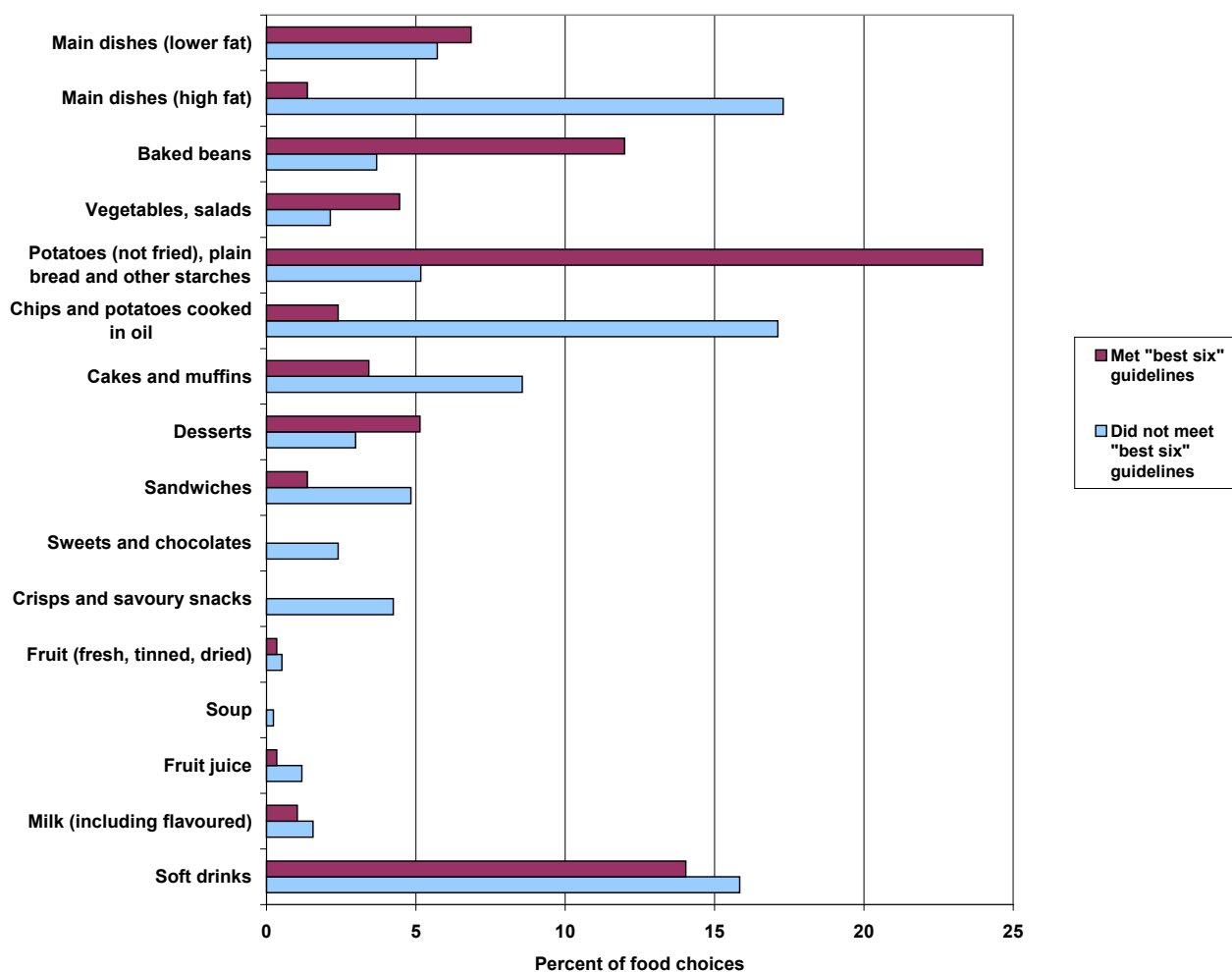


Table 6.4. Predictors of high CWT score in 5 695 pupils in 79 secondary schools in England, based on stepwise multiple regression analysis.

Predictors	Percent of variation in CWT score explained:	
	<i>In total</i>	<i>For each additional guideline</i>
1 Folate: not less than 40% of RNI	42%	42%
2 Less than 35% of energy from fat	52%	10%
3 Protein: not less than 30% of RNI	61%	9%
4 Vitamin C: not less than 35% of RNI	72%	11%
5 Retinol equivalents: not less than 30% of RNI	76%	5%
6 30% of energy EAR (20%-40%)	81%	5%
7 Less than 11% of energy from saturated fat (inc. trans fat)	85%	4%
8 Non-starch polysaccharides: not less than 30% of RNI	89%	4%
9 Less than 11% of energy from non-milk extrinsic sugars	93%	3%
10 More than 50% of energy from carbohydrate	96%	3%
11 Calcium: not less than 35% of RNI	98%	3%
12 Iron: not less than 40% of RNI	100%	2%

Figure 6. Food consumption profiles of pupils attending 79 secondary schools in England, according to whether or not their food choices met the six most discriminating CWT guidelines (folate, percent energy from fat, protein, vitamin C, retinol and percent of EAR for energy).

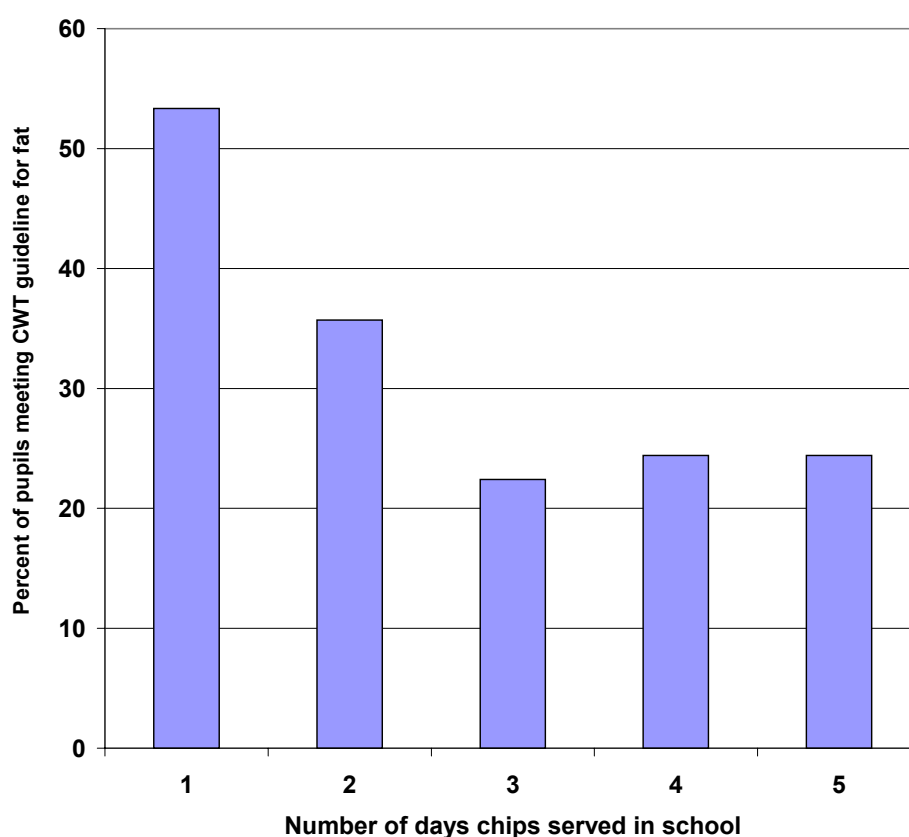


6.3.2 Chips and potatoes cooked in oil

The final analysis looks at the extent to which eating chips (and other potato cooked in oil) was important in terms of the pupils' ability to meet CWT guidelines for fat. Of those who ate chips and potatoes cooked in oil, only 14% met the CWT guideline for percent energy from fat, compared with 35% who did not eat these foods. Thus, pupils who did not eat chips or potatoes cooked in oil were two and a half times more likely to meet the CWT guideline for fat.

Figure 7 shows the percent of pupils achieving the CWT guidelines for fat according to the number of days chips (and other potatoes cooked in oil) were offered in the school at lunchtime. One school offered chips and other potatoes cooked in oil on only one day in the week, and five schools on two days. There was a clear decline in the percent of pupils achieving the CWT guideline for fat the more often chips and other potatoes cooked in oil were offered.^k Thus, serving chips less often was strongly associated with the pupils' ability to meet the CWT guideline for fat. Over the course of a week, 49% of children chose chips or potatoes cooked in oil in schools where they were offered three or more days per week, compared with only 26% in schools that offered chips and potatoes cooked in oil two days per week or less. The *lack* of availability was a positive influence on reducing the pupils' fat intake.

Figure 7. Percent of pupils meeting CWT guideline for percent energy from fat according to number of days per week chips (and other potatoes cooked in oil) offered in school, in 78 secondary schools in England.^k



^k One school served no cooked food other than soup. Food provision relied heavily on sandwiches and savoury pies at lunchtime, and only 31% percent of the pupils met the CWT guideline for fat.

7 Discussion and conclusions

7.1 Survey representativeness and quality of data

There was good agreement between the selection criteria of schools in the issued sample and the national characteristics from EduBase (Table 2.1). There were also very similar profiles for deprivation and other characteristics assessed (e.g. religious affiliation, urban/rural schools) between the 79 (59%) responding and the 55 (41%) non-responding schools.

The distribution of catering providers in the present sample was significantly different from the national distribution. There were fewer DSOs (37% versus 60% nationally¹) and more who provided catering services in-house (19% versus 5%¹). There were minor differences in the profile of foods on offer in the schools with in-house catering compared with schools with other providers. These differences are unlikely to have introduced a significant distortion in the overall pattern of food provision or food choice seen in the responding sample of schools and pupils (see sections 5.2.2 and 6.2.9). Thus, in spite of the differences in the proportions of providers in the present sample compared with the proportions nationally, the findings are likely to be representative of secondary schools in England.

The number of boys-only schools in the final sample was smaller than expected (only one in the issued sample of seven agreed to take part). There may be some differences in the nature of the catering provision and the choices made by boys in boys-only schools compared with the national sample. The *lack* of major differences, however, in the foods being offered and in the food choices of the pupils according to the many analyses in Chapters 5 and 6 suggests that boys in boys-only schools are unlikely to be very different in their food choices at lunchtime compared with boys in mixed schools. Moreover, the small differences in the food choices of girls in girls-only schools and girls in mixed schools (see section 6.2.3) were consistent with peer pressures to do with dieting and healthy eating²³. These particular peer pressures were more likely to be seen in girls-only schools than in boys-only schools, where the peer pressures would be more likely to concern increasing body size and muscle mass^{24 25} and consequent pressures to eat more foods with high protein and energy contents. It seems unlikely that boys would behave very differently in the mixed or single sex schools any more than girls did. The energy and nutrient content of the meals eaten in the present survey are very similar to those described in other surveys of food consumption in young people.³ Lastly, there was a 99% co-operation rate amongst pupils approached to participate, far higher than the anticipated 80%. On balance, it is reasonable to conclude that the findings from this report are representative of the catering provision in secondary schools in England and the food choices of their pupils.

Following development in the pilot study of the measuring instruments and training protocols for interviewers, there were few practical problems in the field with regard to the collection of data relating to food on offer (the inventory) or food consumption (the tray check). Inventory and visibility data needed to be consistent, and comparison of the two data sets provided a useful means to establish internal validity. Very occasionally, weights of foods leftover recorded by the interviewer exceeded the average portion weight, but this could have been due either to genuine variation in portion size or to mis-weighing. In either case, the weight consumed by that pupil for that food or drink item was set equal to zero (i.e. it was assumed that all or most of the food selected was not eaten). This is likely to have had minimal effect on the overall estimates of amounts consumed. Telephone interviewing of the head cook, catering manager, head teacher and bursar was carried out by one researcher, ensuring consistency of technique. Similarly, extraction of the quantitative and qualitative data from the specifications was carried out by two research assistants under the close scrutiny of a senior researcher. Where queries from *NatCen* coders arose, they were referred to the senior researcher at KCL for resolution. Interviewers who faced unforeseen circumstances in the schools (e.g. split sites or multiple outlets) were strongly

encouraged to telephone the senior researcher at *NatCen* and seek advice on how to proceed. Thus, for the reasons given above, we regard the data as robust.

7.2 Conclusions regarding the catering service, cooking practices and eating environment

The types of catering providers and contracts observed in the present study (Table 3.1 and Table 3.2) are characteristic of those found throughout England. Over one-fifth of schools operated a smart card system, and it is likely that over time this system will be introduced more widely. We are concerned that in over three-quarters of the schools, other pupils can readily identify pupils who receive free school meals. This may in part explain a take-up of free school meals of only 83%. We are also concerned that over one-third of schools allow access at lunchtime to vending machines and tuck shops in the dining room that sell sweets, chocolate and soft drinks.

Many schools followed some healthier cooking practices (e.g. cooking in vegetable oil, grilling or oven cooking rather than frying, using semi-skimmed or skimmed milk rather than whole milk), but this was by no means universal. There were other examples of good practice – using low fat spreads for sandwiches, restricting access to salt, limiting its use in cooking, or using a low sodium alternative – but they were seen in relatively few schools. Only one quarter of staff had had training relating to healthy catering in the 12 months prior to the survey. This was associated with greater provision of low fat main dishes and sandwiches and is likely to be worth pursuing.

Some schools operated a pricing policy to make healthy options cheaper (see Table 3.11), but this was in some cases undermined by “meal deals” or “burger promotions” that included unhealthy food combinations (e.g. 10p off burger and chips). There was little evidence of appropriate labelling of foods to meet special dietary requirements (e.g. vegetarian, Kosher, Halal) and in only one third of dining rooms was there evidence of promotion of healthy eating (e.g. posters, labelling of food or menus).

On balance, the findings of the present survey show that the majority of children are not making healthy food choices. Moreover, practices in the dining room intended to promote healthy eating had little positive influence on pupil choices.

7.3 Conclusions from analysis of specifications

The specifications currently operating in schools appeared to be relatively ineffective tools for ensuring that healthier choices were available and promoted to children at lunchtime. Within the documents, the language relating to healthy eating was generally non-specific, nor was it measurable or time-bound. Detailed examination of the content of the documentation suggested that many schools were paying ‘lip service’ to healthy eating and nutrition by failing to set tight standards and defining tools and processes for monitoring these standards.

These documents demonstrated an awareness, interest and commitment to nutrition and encouragement of healthy eating by those responsible for catering services in schools. However, the integration and translation of nutrition-related standards into meaningful specifications was generally poor. As a consequence, few documents effectively stipulated healthy eating or nutrition related standards above those set out by the DfES. Moreover, there was no consistent association between nutritional references in the contracts and food provision (Table 5.6).

7.4 Conclusions from inventory analysis and tray check

While schools offered a wide variety of foods, the overall balance of foods on offer was not healthy. Additionally, there were no constraints on what pupils could choose for school lunch that promoted healthier choices. Pupils in many schools were free to select the same types of

food every day (e.g. burger and chips) and there was no control over the balance of meals or the variety of foods chosen over a week. Many children, when given the choice between a meal strongly resembling something that they could buy in a high street fast food outlet and a healthier option (a cheese salad with a roll and a piece of fruit, for example) are likely to choose the fast food option every time. Even though caterers in all schools were providing some healthy options each day, the evidence from the present study shows that if the pupils' choices are unconstrained the majority fail to make healthy choices.

None of the set meals met all of the CWT guidelines and only 7% of schools provided set meals that met 8 or more of the CWT guidelines over the week. This ties into the lack of nutritional knowledge on the part of caterers and those who write the contracts. If it were argued that pupils should choose a set meal, current provision would not promote healthy eating. Even if set meals did meet the CWT guidelines, as long as pupils were free not to choose them it would do little to promote healthier eating.

The majority of set meals on offer did not meet the CWT guidelines even though the balance of food provided satisfied the National Nutritional Standards. Given the similarities between the present findings and those reported in 2000 in the NDNS of young people³, it is apparent that there has been no improvement in the profile of nutrient intake from school meals following the introduction of the National Nutritional Standards in 2001. This finding echoes that of the Welsh study of school meals before and after the introduction by the Welsh assembly of the Nutritional Standards for School Lunches (Wales).²⁶

Pupils receiving free school meals made choices more similar to those spending £1.50 or more on school lunch than to those spending £1.49 or less. In consequence, they met more of the CWT guidelines than those spending £1.49 or less on lunch.

Where pupils' food choices met the six CWT guidelines most likely to be associated with a high CWT score, their food choices were characterised by fewer chips, crisps, confectionery and high fat main dishes and more low fat starches and more baked beans, vegetables and salads (Figure 6).

7.5 Overall conclusions

- Most of the secondary schools in this study met the National Nutritional Standards at the beginning of service, but less than half of the schools met the standards at the end of service.
- The National Nutritional Standards failed to promote healthy food choices at lunchtime amongst secondary school pupils in England.
- The profile of foods on offer did not accord with the Balance of Good Health, nor did the selection of foods by the pupils.
- Over half of the food choices of pupils at lunchtime consisted of main dishes high in fat (e.g. burgers), chips and potatoes cooked in oil, and soft drinks. Fat provided 41% of energy (target: 35%), saturated fat 14% (target: 11%) and non-milk extrinsic sugars 4% (target: 11%). The average amount of salt per meal (not including salt added at table) was 2.4 g (SACN²² target: less than 2 g).
- None of the set meals on offer met all of the Caroline Walker Trust (CWT) Guidelines. Only 7% of schools offered set meals that, over the week, met eight or more of the 12 CWT guidelines.
- Pupils who met 6 or more of the CWT guidelines chose baked beans, vegetables and salads, and desserts more often and high fat main dishes, cakes and muffins, sweets and chocolates, crisps and savoury snacks less often.
- In relation to encouraging pupils to make healthy food choices at lunchtime, the potential influences of catering practice, contract specification, and school involvement in

Government sponsored or other programmes of nutrition-related health had little positive influence on the food environment in schools or the (largely unhealthy) food choices of pupils.

It is clear that the National Nutritional Standards for school meals, coupled with the present model of food service and the provision of set meals that do not have to meet clearly defined nutritional requirements, failed to encourage children to select combinations of foods that were likely to contribute to a healthy diet. Whilst caterers were providing some meals with healthier profiles (i.e. combining starch and protein containing foods with vegetables) pupils were favouring less healthy foods, of which there was enormous variety within school dining rooms.

8 Recommendations

The evidence from the present study suggests a number of ways in which the dietary choices of secondary pupils at lunchtime can be improved. The failure of the National Nutritional Standards and contract specifications to have a substantial positive influence on food choice justifies a call for alternative strategies.

Two principles should be acknowledged:

1. We should not expect school children to make healthy food choices at lunchtime if they are being offered chips and burgers or their equivalent most days of the week. Adults do not make healthy choices, as is evident from the latest National Diet and Nutrition Survey^{27 28 29} – why should we expect school children to behave differently? They are even less well equipped than adults in terms of knowledge and understanding of the health consequences of poor dietary choices.
2. No amount of exhortation or affordable bribery is going to encourage the majority of children to make healthy food choices.

The most likely way to ensure healthy eating in schools is to constrain choice to healthy options, manipulate recipes, use modern presentation techniques with which pupils can identify (e.g. the “fast food” approach,³⁰ vending machines with healthier options³¹), and encouragement through reward³².

Introduction of the recommended changes to the nutritional standards will need to be orchestrated by the DfES, FSA, LEAs and schools as part of an integrated intervention to promote healthier eating for the population as a whole. Success in implementation of re-formulated standards will require input from caterers, parents and pupils as well as expert advisors.

Recommendations have been grouped according to those for which there is direct evidence from the present study (8.1 Primary recommendations) and those for which there are common-sense arguments for their implementation (8.2 Further suggestions). The present recommendations, based on clear evidence relating to the need for revised nutritional standards, add support to the recommendations put forward by the House of Commons Health Committee⁹. They also echo the revised nutritional standards recommended in *Hungry for Success*, the report of the Scottish Executive’s Expert Panel on School Meals³³.

8.1 Primary recommendations

Recommendation	Evidence
1. National Nutritional Standards for school food must be compulsory and based on a combination of food-based and nutrient-based guidelines.	The current food-based standards did not yield a profile of foods on offer that reflected the Balance of Good Health. The nutrient profile of set meals, although meeting the National Nutritional Standards, failed to meet the Caroline Walker Trust guidelines.
2. Lunch as chosen must be a combination of foods that meet the Balance of Good Health.	Government advises that food choices should conform to the Balance of Good Health. Pupils who chose meals that were closest to the Balance of Good Health were most likely to meet the Caroline Walker Trust guidelines.
3. The range of choice must be restricted to a range of healthier options, based on menus balanced over one week.	In the majority of cases, unrestricted choice of foods at lunchtime was associated with unhealthy food choices. Restricted choice over one week (e.g. number of days on which chips were served) was associated with healthier eating.
4. Documentation and monitoring a) All schools must have written documentation with specifications relating to the nutritional quality of school lunches, and they must be specific, quantitative, measurable and time-bound. b) The standards must be monitored. c) Resources to support the framing of nutritionally-relevant specifications must be provided for those developing written documentation	The specifications within the contracts and service level agreements relating to the provision of nutritionally sound school lunches were inadequate. They did not provide a basis for the effective monitoring of school lunch provision. “In-house” catering provision was largely undocumented.
5. Training and resources a) All head cooks and catering managers must have training in healthy catering and how to meet the new standards. b) Resources (training sessions, websites, software, recipes, portion size and food composition data) must be provided by DfES to support training and to facilitate monitoring.	The majority of head cooks and catering managers could not name three or more of the current standards. Only one quarter of staff responsible for provision of school catering had training (unspecified) in “healthy eating or cooking”. Current Government resources focus on the DfES Guidance for School Caterers. There is no certified training scheme for school caterers, or instruments for monitoring.
6. The DfES should establish a Committee with the authority to develop a new set of compulsory nutritional standards for school meals in England. It is recommended that the new standards be formulated so as to apply to all food provision within schools (the “whole school” approach).	The current standards failed to promote healthy food choices amongst secondary school pupils in England.

8.2 Further suggestions

The further suggestions do not have the same strength of evidence as the primary recommendations. They are based in part on observations concerning good practice and in part on common sense.

Recommendation	Argument
Pupils should not be allowed to leave the premises at lunchtime.	In the current circumstances, where provision of food in schools at lunch time often mimics the fast food outlets in the high street, there may be little incentive for pupils to leave the school grounds to obtain a “fast food” lunch. If the range of choice of foods in schools at lunch time were to change substantially, however, caterers would need to be assured that they would not be in competition with local suppliers of fast food.
“Smart cards” should be used. ¹	Smart cards offer numerous advantages: <ul style="list-style-type: none"> • Pupils receiving free school meals are given anonymity • Meal composition can be instantly verified • Pupils’ food choices can be monitored at school and national level • Parents can review their children’s choices
A “whole school” approach should be adopted when implementing the revised nutritional standards.	Mixed messages do not support healthy eating. Pupils cannot be taught about healthy eating in the classroom and then be offered an array of unhealthy options at lunchtime (and at other times in the school day when food is available).
Monitoring of adherence to the new standards should be part and parcel of the specifications, and such adherence should be part of the annual school report.	Only if there is compulsory reporting of adherence to the standards will their legal enforcement be possible. OFSTED can be expected to judge the provision of school food only if there is consistent reporting of quality based on measurable standards.

¹ The evidence from the present study showed that schools using smart cards (cashless system) tended to serve sandwiches and vegetables *less* often (see section 5.2.2). Nevertheless, there are a number of practical reasons for introducing smart cards more widely. In the context of more robust nutritional standards for school meals, there is no reason to believe that smart cards would be associated with poorer food provision or confer nutritional disadvantages.

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