Children's diets and school
Findings from CEDAR studies and evidence review

CEDAR
Centre for Diet and Activity Research
A UKCRC Public Health Research Centre of Excellence

www.cedar.iph.cam.ac.uk

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Fully referenced and linked at www.cedar.iph.cam.ac.uk/resources/evidence

Food consumed at school, and its potential impact on childhood obesity, has received considerable attention in recent years. But how much do we really know about how the school environment affects children's eating behaviour and health?

School food is more than just lunch

The current standards for food provided in state-maintained schools in England are set by the Department for Education. However, compliance is not universal and the standards do not apply to new Academy Schools.

Research from the Children's Food Trust indicates that some 60% of children do not eat school meals. There are also many other aspects of the learning environment that affect children's knowledge and feelings about food, as well as their access to it in and around schools.

Recent research has been building a picture of how the provision of school meals affects children's diet (see references online), and CEDAR has been contributing to this evidence base.

Findings from the SPEEDY study

Using detailed food diary data collected as part of the SPEEDY study from 1625 nine to ten-year-olds in 90 primary schools in Norfolk, CEDAR is investigating differences in children's food intake between school meals and packed lunches, and the impact of lunchtime food choice on overall diet.

The effect of lunch on overall diet

In the SPEEDY study, food choices at school lunchtime made a significant contribution to overall diet, providing around a third of daily energy intake among children of primary school age.

On average those usually taking school meals met current food-based standards for school lunches, whilst the food choices of packed lunch eaters were typically less healthy.

Comparing the overall diet of school lunch and packed lunch eaters:

- Packed lunchers ate over half their confectionary and nearly three quarters of their savoury snacks at school lunchtime. They ate significantly more of both food types overall.
- There was no overall difference in calorie intake, and small differences in nutrient intake (e.g. school meal eaters ate 3% more dietary fibre).
- Packed lunchers ate 10% more fruit overall, and school lunchers ate 14% more vegetables.

Evidence review and framework

Based on evidence review, CEDAR researchers have also developed a framework for understanding the influences of the school environment on childhood obesity. Some relevant findings from the review are included here.

Vending machines can be used to influence children's snacking habits. The type of foods that should be available from vending machines is covered by the national standards, and pricing has been shown to influence purchases. French et al (2001) saw sales of low-fat snacks from vending machines increase from 25.7% to 45.8% of all snack sales when their price was reduced.

Brief in brief

- National school food standards help provide children with a good overall diet. However, 60% of children are reported to not eat school meals and this can make an impact on their diet quality.
- Combining teaching about food in the curriculum and the use of school gardens has been shown to have positive effects of children's food consumption.
- A broad definition of what constitutes the school environment is needed when considering interventions to encourage sustainable behaviour changes.

Food and the curriculum

The use of school gardens has been associated with increases in fruit and vegetable recognition, willingness to taste and preference for fruit and vegetables. Morris et al (2001) report that:

- willingness to taste increased by 19% at the school where a garden was introduced, and not at all at the school with no garden (the control)
- nutrition knowledge scores increased by 32% at the garden school and only 4% at the control school.

Nutritional education coupled with practical gardening lessons in a school garden has been seen to increase children's preference for vegetables and fruit and vegetable intake. McAleese & Rankin (2007) report total fruit and vegetable consumption increasing from 1.9 to 4.5 servings following a combined intervention.

Studies which have changed the food provided by schools as well as implementing additional health education have seen decreases in percentage energy intake from fat. Caballero et al (2003) reported energy from fat falling from 33.1% to 28.2% post intervention (compared to 34.1% to 32.4% at control schools).

CEDAR's own study (Lakshman et al, 2010) also provides evidence that schools can improve children's nutritional knowledge. Researchers developed a healthy eating curriculum for primary schools that included a card game **'Top Grub'**. Based on the popular game Top Trumps®, the game comprises cards featuring different foods, their nutritional values and fun food facts.

Testing the game and curriculum intervention through a randomised controlled trial showed improvements in total nutrition knowledge as well as self-reported diet quality. 75% of children enjoyed playing the game and teachers considered it a useful resource.

Policy implications

- All schools should be encouraged to at least reach the national school food standards.
- A move from packed lunch to school lunches in schools meeting the standards, or promotion of healthy packed lunches in all schools, has potential to improve overall diet quality. Both parents and schools have a role to play in encouraging these changes.
- Given their large contribution to overall nutrition, school meals present an opportunity to influence calorie intake and diet, e.g. through portion control.
- Agreements with vending machine suppliers could be explored to discount healthier snacks.
- Schools shape attitude to food and food availability and have a duty of care for children's health: changes to food provision should be considered in conjunction with changes to the teaching curriculum.

What is CEDAR?

The Centre for Diet and Activity Research is studying the factors that influence dietary and activity related behaviours, developing and evaluating interventions, and helping shape public health practice and policy. CEDAR draws on the expertise of a wide range of scientific disciplines, including behavioural science, biostatistics, epidemiology, health geography, health economics and human nutrition research.

References and resources

- A fully linked and referenced version of this Evidence Brief can be found at **www.cedar.iph.cam.ac.uk/resources/evidence**
- The SPEEDY study was funded by the NPRI and the MRC. *Food and drink consumption at school lunchtime: The impact of lunch type and contribution to overall intake in British 9/10-yr old children* can be found at **www.cedar.iph.cam.ac.uk/publications/publication/diet-impact-of-school-lunch-speedy**
- *The framework for understanding school based physical environmental influences on childhood obesity* is at: **www.cedar.iph.cam.ac.uk/publications/publication/diet-activity-school-framework**
- The *Top Grub* study can be found at **www.biomedcentral.com/1471-2458/10/123** Find out about and purchase the game at **www.topgrub.org.uk**
- School food standards for England and a number of other resources are available from the Children's Food Trust at **www.childrensfoodtrust.org.uk.** Details of their research activities and findings are at: **www.childrensfoodtrust.org.uk/research**

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