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'The content of school dinners and the snacks available clearly play a vital role in pupils' health, with vending machines carrying chocolate bars and fizzy drinks among the worst offenders – a study in the US has warned that a child drinking a can of soft drink a day is 60 per cent more likely to become overweight.'

Everyone agrees that the statistics on obesity among teenagers make a frightening reading. Between 1995 and 2002, the incidence of obesity among young people aged between 11 and 15 increased by 40 per cent, according to the Department of Health's health survey for England. And everyone is agreed that the issue has to be tackled as a matter of urgency – but getting teenagers to change their eating habits may be more difficult. Parents obviously have a major part to play, but schools also influence eating habits.

The content of school dinners and the snacks available clearly play a vital role in pupils' health, with vending machines carrying chocolate bars and fizzy drinks among the worst offenders – a study in the US has warned that a child drinking a can of soft drink a day is 60 per cent more likely to become overweight.

The Green Machine is one company that provides vending machines with healthy snack options. The products in its machines are fair trade, organic and additive-free. To date, one hundred schools have installed a Green Machine, which the parent company – the Organic and Natural Food Company – hopes to increase to 400 by the end of this year, and to 1,000 by the end of 2005.

The company, based in Mitcham, Surrey, was formed two and a half years ago. It takes advice from the Chichester-based hyperactive children's support group (HACSG) when choosing products, which include cereal bars, fruit juices, water and fair trade chocolate.

'Our range is a healthier option,' said operations manager Peter Strong. 'There will be crisps, but they will have less fat, or they will be baked. If our products have any sugar or fat, it's naturally occurring. We wanted to get a range of products which children would accept. Our best performing schools have no other vending machines, and the pupils are not allowed off the school premises at lunchtime. Unfortunately, some schools rely on the income from vending machines and the children get used to the taste of high sugar fizzy drinks and snacks. I talk to a lot of schools and it can become apparent that the school would love to come along with us, but they rely on the vending income.'

'Certainly there are large numbers of schools that do raise income from vending machines,' said Bill Simmonds, chief executive of the National Bursars Association. 'A lot of my members have expressed concern about the use of vending machines because of some of the products. Any vending machine in a

school is profit-motivated, and lots of schools do look to the Green Machine as a better alternative. But as I understand it, the Green Machine offers a lower profit. Unfortunately, there are some schools desperately short of funds, and that's why they take the vending machine in. They can't afford to see the profits go down.'

'Schools are mindful of the balance between profits and health,' said Bob Carstairs, assistant general secretary of the Secondary Heads Association. 'This has to be looked at quite carefully. Schools are becoming more aware, but they also know they will lose money if they throw out the chocolate machine.'

Schools that have changed to the Green Machine or other healthier vending options cite a number of influences. At the 960-pupil Perryfields High School, in Birmingham, ethical concerns and citizenship education played a part in the decision to swap 18 months ago. 'Really it was in response to the youngsters,' said Chris Lee, one of the state secondary's deputy heads. 'We had a school council at the time and they did some research into fair trade, so we got the Green Machine.' The school also has a Britvic machine which dispenses fruit juice, including organic apple and orange. Perryfields also uses the vending machine profits for rewards for pupils, he said.

The Fortrose Academy in Rosshire, Scotland, took on the Green Machine a year ago because it offered additive-free and organic products. The 600-pupil school has some children with eating disorders, so that was a factor, said Sheena Johanssen, the school's health education coordinator. It was part of the school's campaign to promote healthy eating, she said. 'It's given the children a choice and now it's up to them.'

Dean Magna school in Gloucester has had one Green Machine for two years and is expecting another shortly, to overcome problems with the children having to queue. Switching was part of the 750-pupil school's healthy eating programme, said catering manager Lesley Adams, and it was important that its vending machine stocked fair trade and organic products.

At the 270-pupil sixth form centre at Impington Village College, near Cambridge, the Green Machine was chosen mainly because of ethical and fair trade concerns, said Fiona Swanson, head of international education. 'Health concerns were secondary,' she said.

Impington is one of the dozen schools in the



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country offering an international baccalaureate. Students have to perform 150 hours of service and a small group manages the Green Machine.

As well as concerns about obesity, eating processed foods high in additives and sugar has been linked with disruptive behaviour. Sally Bunday, the founder member of the HACSG, provides advice for parents of hyperactive children and those with ADHD, the attention deficit disorder. Ms Bunday's son was diagnosed as hyperactive in the late 1970s and she formed the HACSG to pass on what she had learned by following the Feingold programme, based on the work of US nutritionist Dr Benjamin Feingold and the Feingold Association. Dr Feingold discovered that some chemicals – some naturally occurring, and some added to food – could affect the brain function in some children. Feingold's research also showed that including certain essential fatty acids in the diet eased symptoms.

Ms Bunday cut out additives for her family and made sure they were getting fish oils, evening primrose and flax oil as part of their diet. 'It made a big difference to my son. He was much calmer and more settled,' she said.

She believes it is more difficult for parents to deal with diet now as there are more processed products. 'My son is 33 now. When he was young they did not have two or three aisles in the supermarket full of crisps. It is harder now because children have more of these things on a regular basis.' Part of the problem is the way society has changed over the last 20 years, she said. 'We are a snacky, on-the-hoof, have-everything-you-want, when-you-want, sort of set-up. There are more children coming to school without breakfast and having money to spend on lunch.'

Using vending machines like the Green Machine has to be a good direction to go in, she said. 'The products they are offering are free from additives and they are organic. And the profit is still there,' said Ms Bunday. 'I recently spoke to the catering manager at a big school who is working towards healthier eating. At the moment, a lot of the youngsters buy products from vending machines and she says there's a lot of aggressive and difficult behaviour, which she feels is directly related to what they are eating.'

'But when we try to get that message across, we are told it's anecdotal, it's not scientific. People's lives are being messed up and it's unnecessary,' Ms Bunday said. Eating a balanced diet is difficult for children if there are limited healthy options, and that includes what is available at school.

'You have to make a healthy choice an easy choice for children,' said Sue Baic, a lecturer in nutrition at Bristol University. 'If they have nothing but chocolate bars and fizzy drinks to choose from, they will struggle to make healthy choices.'

'Making low sugar or no sugar drinks available is important. The juice will count as a portion towards the children's fruit and vegetable intake. I would go further and say that vending machines should contain fresh fruit, and that dried fruit snacks could be used as well. Water should be freely available in schools anyway. With healthy eating messages and children, there's no point in giving them the information unless you make the products available.

You also have to make sure the pricing and the presentation are right – those are vital.'

Overall Ms Baic is in favour of alternatives to the traditional vending machines in schools. 'I think it's a really good idea,' she said. Government, business and schools themselves are addressing this issue. The Department of Health and the Department for Education and Skills have just finished a £2.2m healthy vending machine pilot project in nine secondary schools in Norfolk, Bedford and Cambridge.

Under the pilot scheme, vending machines offering pupils freshly made sandwiches, yoghurts, fresh fruit, juices and milk were installed in competition with traditional vending machines offering chocolate bars, crisps and fizzy drinks. The results have been submitted to the DoH/DfES, but have not yet been made public. However, the evidence is that the healthier machines made a profit, said public health manager Beelin Baxter, the food in schools lead for the east of England.

Coca Cola announced in January that it would remove advertising logos from its 4,000 vending machines in secondary schools, and the machines would in future contain fewer Coca Cola products and more fresh juice and bottled water. Joe Harvey, who runs a health education trust, has completed a study funded by the Food Standards Agency, which involved putting healthier drinks such as water, fruit juice or milk into vending machines at 12 secondary schools in Cumbria, Devon, Hertfordshire and Pembrokeshire.

The study found that students would choose healthier drinks such as fruit juice, water and milk, even if fizzy drinks were also available. A toolkit explaining how schools can set up a healthy drinks vending machine is being published later this year. Mr Harvey believes vending in schools should not be manufacturer-led. It might be more convenient to have a company servicing the machine, he said, but it did not mean the pupils were being given a healthy choice of food and drinks when the school canteen is closed.

The Green Machine and other vending machines claiming to offer healthier options do not go nearly far enough, Mr Harvey said. 'We need to change the face of vending in secondary schools. We should be able to offer them half a pint of fresh milk, fresh juice and fresh fruit. That requires the school to have control over the machines.'

Working to a manufacturer's list limits the range of products available, he added. When the school canteen is closed, pupils should be able to get high quality, low cost products like freshly made sandwiches, wraps and baguettes from vending machines.

Over the 24-week FSA study between December 2002 and March this year, pupils chose 70,000 healthy drinks. The schools where the initiative worked were those that involved the children in decisions about the machine and made the vending machines part of a general healthy eating message in lessons. ■