AGRICULTURAL LITERACY

Giving concrete children food for thought

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Society has never shown such an interest and concern in nutrition, health, obesity and the environment. These issues are generally approached separately, with commands to 'eat your 5 a day' or to 'reduce salt intake'. However, a growing area of interest is the relationship between the amount of contact children have with the countryside and their 'agricultural literacy' – their overall awareness and understanding of the food chain.

Research now suggests that the most effective way of making children truly understand these issues and to shape their tastes and food choices is to literally give them the bigger picture, physically re-reconnecting them with the landscape. Compelling evidence suggests that this is the best – and most enjoyable way – of giving children an appetite and passion for food. Even more encouragingly, a growing body of evidence is now linking child contact with nature/exposure to the countryside with significant physical, mental, behavioural and intellectual benefits.

These new insights couldn't be more timely. A new study of 1,000 pupils across England, commissioned by the Year of Food and Farming, reinforces something social scientists have begun to monitor closely: the profound decline in children's contact with the countryside (EdComs/YOFF 2007a,b).

We have not had to look far to find the explanation for the drop-off. A 16-year study in the States recently found a 25% drop in visits to the countryside in the last 20 years - because children are spending more time watching television, playing video games and surfing the Internet (Pergrams & Zaradic, 2006).

There is a similar phenomenon occurring in Britain. The average six-year-old is likely to have spent more than one full year of their lives in front of a television screen. When other screen time is included, the figure is far higher. Children aged 11 to 15 now spend 55 percent of their waking lives - 53 hours a week, seven and a half hours a day – watching TV and computers, an increase of 40 per cent in a decade and adult screen-time has also increased significantly (Sigman, 2007a; BMRB, 2004).

With all this time in front of a screen, something had to give. The Department for Environment, Food and Rural Affairs has reported that between 2000 and 2005 the number of visits to the English countryside with at least one night's stay has fallen by 38%, while the number of day trips to the countryside has fallen by 14 % since 1996 (Defra, 2006).

CONCRETE CHILDREN

The result of this increasingly sedentary, urban lifestyle is unsurprising. In the early years of the twenty first century, we have witnessed the rise of the "concrete child", who sees life through a TV or a computer screen, rather than by simply being in the great outdoors.

The new research conducted by the Year of Food and Farming indicates that 20% of children in England never visit the countryside, which, at a conservative estimate, could equate to as many as 1.1 million pupils who never leave town or city-centre. A further 17% have only visited the countryside once or twice, which means that more than a third of school-aged children only have the most fleeting contact with England's fields, farms and lanes.

Even a few generations ago, children still had far more interaction with their rural surroundings – either forced there by political events, or going on Baby-Boomer holidays to the countryside. Nowadays, the challenge isn't what we do with rural refugees, it's how we cope with the concrete kids. According to the Year of Food and Farming research, which I oversaw:

- **27%** of 8-9 year olds have never come within touching distance of farm animals
- **25%** have never visited a farmer's market/shop
- **19%** of children have never picked fruit and eaten it

Today's children have a far less intimate relationship with the food stuff that ends up on their plate, but they have made up for it in other areas. According to our findings, one in five children make regular visits to cyberspace – 21% make visits to virtual worlds on the Internet most days. Ironically, they're also far more likely to go abroad than to ever see countryside in their own country: 64% go on a foreign holiday once a year.

When children do interact with food they do so in a very urban context – visiting supermarket shelves or picking up the weekly takeaway. Only 9% of children have never collected a takeaway – and almost half have done so five times or more in the last year.

With such a shift in day to day behaviour, we are now confronted with a group of children whose connection to what they eat has been severely dislocated. Children's experience with food now seems to begin at the endpoint - with what they see in a supermarket. Unsurprisingly, this has left them with a very warped view of the food chain.

Discussions with a group of eight and nine year olds, conducted as part of the research programme, brings some of these issues to life:

'The white bread is made with milk and the brown bread is made with wheat'

The countryside is just a place to travel through, not a destination in itself:

'We were going in the car on a long motorway to London and we passed the countryside. Me and my sister were looking out the window at the sheep, cows and horses but we stayed in the car'

This situation, if allowed to continue, could produce grave consequences for the future health of the country, our once famed green-and-pleasant land.

As well as painting a pretty dismal picture of the opportunities presented to today's children, the new research study also signposts the problems down the track for those concrete kids. Studies of children from Tasmania to Tennessee indicate that real-life contact with agriculture makes the abstract more real – children are more likely to absorb and integrate food knowledge if they have hands-on experience of its origins. Furthermore, children with greater agricultural literacy are more likely to make better food choices (Morris, et al., 2000; Morris, et al., 2002a,b; O'Briend et al, Lineberger et al. 2000; Somerset, 2005).

In our research, "concrete children" were unable to place the most basic foodstuffs in their everyday context, displaying far more indecision than children who had more regular interaction with the countryside. The message is clear: if you go to the countryside, you're far more likely to know where your food comes from: the first step to caring about the meal on your plate.

When compared to those who often visit the countryside, children who have never visited the countryside were far more likely to state that they did not know how the following are grown:

- Rhubarb (**44%** of concrete children were perplexed by this British staple, versus **17%** of respondents who regularly visit the countryside)
- Spinach (**46%** versus **23%**)
- Mushrooms (**23%** versus **9%**)
- Sweetcorn (**36%** versus **14%**)

Examining more of the comments made by the children who were studied is instructive:

'I'm not sure about what that one is (talking about a cabbage) but I've seen it in Asda. I think it's grown in the ground in Britain and other countries'

'A lemon is from Birmingham and it grows in the ground and that's a kiwi it grows in the ground and it's from Jamaica'

'Rhubarb is like carrots, it's what Kangaroos eat. Sometimes they grow on trees without seeds'

This ignorance could be costly. Our research identifies that a lack of contact with the rural world breeds indifference to anything beyond the superficial tastes of food. Children who often visit the countryside were more likely to state that they cared where their food comes from; almost two thirds of children who often visit the countryside care where their food comes from, whereas only forty per cent of those who rarely or never visit the countryside were "bovvered" about where their food originated.

In other words, experience of where their food starts out is a vital ingredient in the battle to excite and engage children about their diets. It's also been established that the 'visual reinforcement' of actually seeing food growing outdoors significantly improves children's nutritional knowledge (upgrading responses by 22%), with that knowledge remaining even 6 months later (Morris, et al. 2002).

However – even more importantly – a taste of the rural life helps encourage a taste for the produce itself. In this study, real contact with food growing outdoors also helped to influence children's positive food preferences for:

- Broccoli (**+20%**)
- Snow peas (**+ 31%**)
- Courgette (**+30%**)
- Carrots (**+9%**)

Interestingly the children in this study even showed new "preferences for vegetables to which they were not directly exposed." This indicates that exposure to outdoor agriculture has a general improvement effect on children's food choices. This backs up an increasing number of studies of school gardens, which have by themselves been shown to increase agricultural literacy, knowledge of the food chain, and may also improve dietary choices in children.

The young pupils we studied certainly demonstrated this inclination: the children who had been given the opportunity to spend time in the countryside positively relished the journey of vegetables from plot to plate.

'At school, in the garden at the back we grew cabbage, turnips and carrots. Then they would pick them and wash them and sometimes we'd have them for our dinner or sometimes we'd take them home'
Girl aged 8

WHY DEFUSE THIS TARMAC TIMEBOMB?

Our research is just the latest study to illustrate that direct contact with the countryside and farms has enormous, measurable advantages for children's relationships with food. Improved agricultural literacy is an important weapon in the fight against obesity - a battle England needs to take on and win, as the fattest country in Europe (Dept. Health 2006).

However, further encouraging findings indicate that contact with the countryside is linked with a variety of benefits quite unrelated to food. It now seems that there is a critical period of 'green' development in children when they derive benefits from rural contact. Just some of the recent findings include:

- Children with symptoms of Attention Deficit Hyperactivity Disorder (ADHD) are better able to concentrate after contact with nature (Taylor et al. 2001).

- Children with views of and contact with nature score higher on tests of concentration and self-discipline. The greener, the better the scores (Wells 2000, Taylor et al. 2002).

- Exposure to natural environments improves children's cognitive development by improving their awareness, reasoning and observational skills (Pyle 2002).

- Results for schools with outdoor education programs show better performance on standardised measures of academic achievement in reading, writing, maths, science and social studies. Classroom behaviour showed improvements as well (Lieberman & Hoody, 1998).

- A study of 120,000 children has found that gardening increases their self-esteem and reduces the degree of stress they experience (Waliczek, et al. 2000).

- Nature buffers the impact of life's stresses on children and helps them deal with adversity. The greater the amount of nature exposure, the greater the benefits (Wells & Evans 2003).

The University of California's division of Agricultural and Natural Resources concludes that contact with nature is "contributing to positive youth and community development, promoting social development, and increasing academic performance, among other things" (UCANR, 2007).

In addition to drawing our attention to where our food comes from, a growing number of scientists now believe that being exposed to greenery has benefits for our ability to pay attention – full stop.

Studies now talk about a "countryside effect", which leads to "superior attentional functioning" Taylor et al. 2001). But how can something as mundane as a tree or a meadow exert any biological

effects on children?

The explanations seem to revolve around the way countryside greenery effortlessly engages a child's attention, allowing them to attend without *paying* attention. This is profoundly different to the arresting effect of for example, television on a child's attention. One theory is referred to as 'Attentional Restoration Theory' whereby certain activities cause a temporary 'attention fatigue' which is corrected when a child's underlying attention system has an opportunity to rest. And natural green environments help in recovery from this attention fatigue, in part because they engage a child's mind effortlessly.

So, the sense of rejuvenation we often experience after spending time in the countryside may in part reflect a 'recharging' of some parts of our attentional system. It's as if modern electronic media, with its compelling images and fast editing, arrests our attention while the rural environment disengages or liberates it. The countryside offers a child 'soft fascination' - holding their attention but leaving us ample opportunity to think about other things.

And nowadays there are precious few opportunities for experiencing this state of soft fascination. Modern forms of entertainment and recreation are indeed designed to arrest a child's attention. In fact children increasingly pay attention to more than one thing at a time - 'multitasking' - and are encouraged to do so. The latest research shows that many children are now looking at more than one screen at a time, switching glances between the TV and the Internet along with mobile phone text messages. Self-discipline requires a child's attention. So when their attentional system becomes tired their self-discipline declines, but when their attention is revived by exposure to greenery, their self-discipline improves again.

Great oaks from little acorns grow, as the saying goes.

CHANGING CONCRETE THINKING

The evidence presented above is clear. The degree of contact children have with the countryside translates into a better understanding and awareness of the food chain. Furthermore, children with greater agricultural literacy are more likely to make better food choices. After all – it's difficult to care about something that you've never or rarely met.

The vital importance of raising our children's level of agricultural literacy must now be given a high priority. In light of the findings, there are some clear areas which need to be addressed:

- Visits to the countryside need to be embedded back into the school calendar, giving children memorable experiences that they'll never forget. Opening up the farms and factories of food producers across the country will give pupils early insight into where their meals began, and an appreciation for how the groceries in their basket came to be on the supermarket shelf.

- However, once-yearly pilgrimages to the countryside won't be enough to shift children's attitudes and behaviours to food. They need to get their hands dirty – literally. An allotment, home garden or even growing vegetables in plant pots can be a highly effective way of raising children's agricultural literacy and shaping or changing their dietary tastes for the better.

- In addition to green fingers, children should also develop sharp cooking skills. One in five children never help prepare the family meal, which in itself is a great learning process for pupils unsure of how food gets from package to plate.

- Other basic food activities will also help children grasp where their food comes from. For example, involving children in choosing the contents of and packing their own lunch boxes raises their knowledge and cultivates a sense of connection and responsibility to their diets.

- The family meal is also an important point of contact. A study this year suggested that we now have the lowest proportion of children in all of Europe who eat with their parents at the table (Bradshaw et al, 2007), with the majority of dinners eaten in front of the television. However, if families ate together more often, discussing their meals, food knowledge and concern would become a natural part of children's lives. Moreover, talking at the dinner table confers other benefits such as closer family units and better behaved children who learn about interaction through taking part at the table (Spungin, 2004).

Simply put, children need more visits to the countryside, more 'growing' experiences and greater involvement in cooking or preparing food. And the earlier they start, the better.

The Year of Food and Farming aims to give children these opportunities and more besides, which, if it is successful, could begin to embed an appreciation for food back into the national DNA. The health benefits of reconnecting children to the food chain should be considerable, but we should also not forget the timeless pleasures we seem to be on the brink of losing - munching fruit picked straight from a plant or tree, or fishing on a beautiful summer's day.

We can no longer take these experiences for granted, but we can take action to restore them back to the current generation. If we succeed in making children passionate about their food, the social and physical rewards could be enormous.

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