

## Letters to the Editor

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*Children's fruit and vegetable intake, programme evaluation*

### **Evaluation of the Food Dudes programme by Upton *et al.***

Madam

The paper 'Increasing children's lunchtime consumption of fruit and vegetables: an evaluation of the Food Dudes programme' by Upton *et al.*<sup>(1)</sup> investigated the effectiveness of a Food Dudes programme implemented in six primary schools by Wolverhampton Primary Care Trust. The authors concluded that further development work is required to ensure the short- and long-term effectiveness of such interventions in promoting fruit and vegetable consumption in children. These conclusions need to be seen in context.

First, the authors argue it is crucial that all behavioural interventions, such as Food Dudes, should support long-term maintenance of behaviour change. We agree and, indeed, this is why current Food Dudes programmes now include a second key phase, which runs each year in primary schools. We call this Food Dudes Forever and it is designed to maintain and further strengthen dietary improvements established in the initial phase of the programme.

Recognising the powerful impact of the kinds of food provided at lunchtime in school and how they are presented to children we have also developed a Choice Architecture for School Catering scheme, again to strengthen and sustain the effects of our interventions. Current catering practices, while they usually comply with nutritional guidelines in their food provision, nevertheless often do little to help children choose and eat fruit and vegetables in preference to energy-dense and nutrient-poor food. If not redesigned, these environments can fundamentally undermine any motivational intervention such as Food Dudes.

Wolverhampton was the first Primary Care Trust to pioneer the Food Dudes programmes in the UK, and when it did so, the Food Dudes Forever and Choice Architecture for School Catering schemes were not yet available. Wolverhampton is currently in the process of introducing these components and exploring a whole-environment approach to ensure that the effects of the Food Dudes programmes will be further strengthened and sustained.

Second, wherever Food Dudes is run, and whichever version is used, the effects vary across geographical areas, particular schools and even classes within schools. We have learned that these variations are caused not so much by the children involved as by the adults who implement the programme. If teachers and other staff do not implement the scheme faithfully, then the effects are reduced. As with

all such interventions, a lack of programme fidelity, or the emergence of programme 'drift', can seriously undermine effectiveness and the maintenance of effects over time. Because we have come to appreciate just how important this is, we have introduced monitoring systems, under our direct control, into all our programmes in recent years. We continue to refine these systems. They are crucial to ensure programme fidelity and for understanding why variations in outcomes occur.

We did not, as we should have done, have these processes in place for the Wolverhampton scheme and, in fact, we had no direct control of its implementation. We are therefore not in a position to assess what was or was not implemented and to what extent there may have been issues that impeded success. For example, the authors note that, in the schools participating in the study, children who entered the dining hall later in the lunch session found that fruit and vegetables were not reliably available. Clearly, one cannot expect a scheme to increase consumption of fruit and vegetables at school, let alone measure its effects accurately, if these foods are not available to be consumed.

Third, there are other measurement issues and details about which we would like further information in order to understand the reported findings better. To take just one example, it could be argued that the most important indicator of children's dietary change is total daily consumption, which includes food eaten both in school and home. The study conducted by Upton *et al.* did, indeed, take this measure, which is detailed in their full report of the project<sup>(2)</sup>. They showed that, across the day, at long-term follow-up in the intervention schools there were large increases in total consumption of fruit and vegetables (increasing from 6.6 portions/d at baseline to 9.8 portions/d at the final follow-up) and substantial decreases in consumption of foods high in fat and sugar (decreasing from 2.7 portions/d at baseline to 1.5 portions/d at final follow-up); these changes were statistically significant and 'of large practical importance'. This was not true of the control schools.

These are, admittedly, very high levels of overall fruit and vegetable consumption shown in these figures, which in itself raises further questions, but to ensure a rounded picture, it would be helpful to know why these results were not reported in the published paper.

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### References

1. Upton D, Upton P & Taylor C (2012) Increasing children's lunchtime consumption of fruit and vegetables: an evaluation of the Food Dudes programme. *Public Health Nutr* **16**, 1066–1072.
2. Upton D, Upton P (2012). Evaluation of the Food Dudes programme. Project report; commissioned by Wolverhampton City Primary Care Trust, conducted by the University of Worcester.

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### Reply to 'Evaluation of the Food Dudes programme by Upton *et al.*'

Madam

We read with interest the Letter to the Editor regarding our paper 'Increasing children's lunchtime consumption of fruit and vegetables: an evaluation of the Food Dudes programme', which was recently published in *Public Health Nutrition*. It would seem that since the evaluation was conducted, a number of positive developments have occurred including the introduction of the Food Dudes Forever phase and the Choice Architecture for School Catering scheme. We hope that our evaluation had some part to play in these positive developments. The correspondent suggests, and we agree, that while school catering practices are required to adhere to specific nutritional guidelines, these often do not encourage children to make healthy choices. Indeed, children are often presented with a variety of energy-dense foods at lunchtime. As we note in our paper, the development of an environment that promotes healthy eating is crucial to the success of interventions that aim to change children's eating behaviours and the Choice Architecture for School Catering scheme would appear to be a positive step towards achieving this. The Food Dudes Forever phase and the Choice Architecture for School Catering scheme are encouraging, but we obviously could not evaluate aspects of the programme that were not in existence when the evaluation was conducted.

Second, we agree that programme fidelity is a crucial factor in determining effectiveness; this is why process evaluation methods, which ensure monitoring of programme implementation, are often an integral part of behaviour change programmes such as Food Dudes. The correspondent acknowledges that these procedures were not in place in the schools in which our evaluation was conducted, thus it is impossible to determine the impact of any lapse in programme implementation on the study findings. As the study employed an ecological design, it was imperative that

no changes were made to school practices, as this could have had an impact upon the everyday experience and choices of the children. Thus school lunchtime menus remained as prescribed by the Local Education Authority. This should, of course, ensure that children were provided with at least one portion of fruit and one portion of vegetables at lunchtime; however, this may not always be the case and fruit and vegetables may not be readily available to children as indicated in our paper. We did not have any control over this, nor indeed did we wish to, given the 'real world' nature of our approach.

Third, we would like to remind the correspondent that the focus of our paper was children's lunchtime consumption of fruit and vegetables; in contrast, the findings from the (unpublished) project report (Upton and Upton, 2012) referred to in the Letter to the Editor concerned children's daily consumption. They are therefore not relevant to the objectives of the paper. Furthermore, as the correspondent is undoubtedly aware since we assume he has read the report, while the daily consumption data did indeed suggest both increases in fruit and vegetable consumption and decreases in consumption of fat and sugars at 12-month follow-up in the intervention schools, these data should be interpreted with caution. These results were based on an analysis of a subset of the data, which by its nature could only include children with a full data set at each point of the evaluation (i.e. food consumed at home, at school break and at lunchtime across seven days of the week at each of three data points). Not surprisingly, this data subset comprised very small participant numbers (thirty-four in the intervention and thirty-seven in the control schools) and we believe it is unlikely that these data are representative of the study sample which comprised 867 children in total (349 in intervention and 518 in the control schools). This belief is given further credence by the high levels of fruit and vegetable consumption demonstrated by all these children at baseline; in comparison, a large number of children in the study consumed no fruit and vegetables at baseline. The analysis of total dietary intake included in the unpublished evaluation report was a requirement of the project funders; we do not consider it appropriate for these data to be reproduced outside this context, particularly in a high-quality peer-review journal such as *Public Health Nutrition*.

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