

ShowCase

Food Dudes

Topic:

Nutrition

Organisation:

Bangor University

Location:

Europe; USA

Dates:

February 1992 to ongoing

Website:

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**Overview**

Food Dudes is an evidence-based programme designed to improve children's consumption of fruit and vegetables. It has been shown to be consistently effective at changing the eating habits of 4- to 11-year-olds. The programme comprises three key elements:

- DVD adventures featuring hero figures, 'Food Dudes', who like fruit/vegetables and provide social models for children to imitate
- Small rewards to ensure children begin to taste new foods
- Repeated tasting of fruit and vegetables so that children develop a liking for these foods

Food Dudes letters and homepacks provide ongoing home support to ensure the behaviour change transfers from school to family and is maintained over time.

Results:

- Large and sustained increases in fruit and vegetable consumption
- Greatest increases in consumption among poorest eaters
- The programme works for all children aged 4 to 11 years
- The effects generalise across contexts (i.e. school to home)
- The programme is equally effective for boys and girls
- Effects are highly reliable, regardless of school location and social deprivation

GETTING STARTED

There is strong evidence that eating a diet rich in fresh fruit and vegetables is vital for health and wellbeing. However, in spite of health messages the UK has one of the lowest fruit and vegetable intakes in Europe. The recommended '5-a-day' means eating at least 400g of fruit and vegetables a day. However, current British consumption levels are estimated to average only 245g and in some age and social groupings the real figure is substantially lower. A diet lacking in the essential nutrients derived from eating fruit and vegetables can lead to a variety of serious illnesses, such as cardiovascular disease, stroke and cancer.

In particular it is found that children and especially the poorest children are avoiding eating fruit and vegetables. This understanding alongside research findings that suggest food consumption patterns are established early in life, means that to improve a nation's long-term health, work has to start with children.



Against this background the Bangor Food and Activity Research Unit (BFARU) was set up in 1992 at the School of Psychology, University of Bangor (Wales), under the direction of Professor Fergus Lowe and Dr Pauline Horne. The aim of the Unit was to research the psychological factors that influence children's food choices and how to encourage them to change their eating habits by including more fruit and vegetables in their diet.

"A lot of our poor eating habits are established early in life. If you change them earlier on, it's more likely to track into adulthood." (Dr Sally Pears, Food Dudes Research Officer)

The research was intended to inform the development of a programme, which, in accordance with Government's 5-a-day guidelines, would increase the fruit and vegetable consumption of children (later refined to primary school children, aged 4 to 11).

SCOPE

Behavioural theory underpinned the scoping work from the onset. In particular, reinforcement theory (using rewards and positive role-models to change behaviour) and taste acquisition theory (using repeated tasting to encourage new foods to be liked) were used to form the foundations for the Food Dudes programme.

Since the fact children do not eat fruit and vegetables is clearly an issue that relates to learning and cultural phenomena, extensive research was carried out to identify the key psychological factors influencing children's food choices. This research identified a range of insights, which were used in the development of the programme.

Key insights

- Children are motivated by praise, recognition and rewards
- Positive role models have a powerful influence over children's learning and value systems. In addition, certain factors increase a child's likelihood of imitating behaviour: if the role model is older; if the role model is part of a group; and if there is

- a clear reward or benefit in being like the role model.
- The traditional approach of telling children what to do and what to eat is unsuccessful. Children learn most effectively via social networks and role modelling
- Behavioural psychology accepts that language locks in specific behaviours, through the process of categorisation. For example, if a parent says repeatedly of their child, “Jenny hates tomatoes”, Jenny will come to categorise herself as a tomato-hater – ‘I hate tomatoes’. Food Dudes works on the premise that you can change this learned conceptualisation if you encourage a child to try new foods and to re-categorise him/herself as a fruit and vegetable liker

Competition

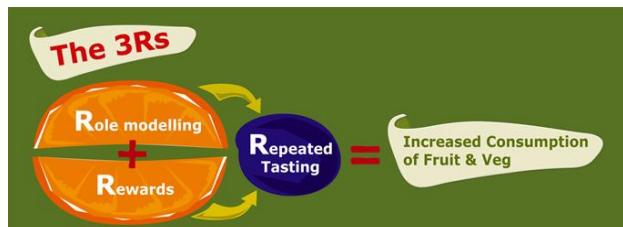
This research also identified factors that would compete with children’s inclination to change their eating preferences. Specifically, the researchers recognised that brand allegiance is a strong driver of behaviour. Heavily branded junk foods are all around and children are undoubtedly attracted by this offer. Thus the programme would need to create a product that could compete with the high sugar, fat and salt foods that are so heavily marketed to children. This meant ensuring a strong brand presence, which would become as recognisable as the cartoon figures and imagery used to market mainstream food products to children.

Furthermore, it was recognised that peer pressure has a strong influence in schools. However, rather than trying to circumvent this fact, the programme would utilise peer pressure in its favour by getting older peers on board and making it ‘cool’ to eat fruit and vegetables.

Piloting the programme

Based on this academic research, a small-scale pilot intervention was designed. This trial was funded by The Economic and Social Research Council and Unilever, and was based

on the ‘Three R’s’ (role-modelling, rewards and repeated tasting) of behaviour change that had been developed through the understanding of reinforcement theory and taste acquisition theory.



The pilot included two key elements: DVD adventures featuring the Food Dude heroes (a group of four slightly older children who gain superpowers from eating fruit and vegetables); and small rewards to encourage children to taste new foods.

Research began with a small group of five- to six-year-olds within the home that had been identified by their parents as ‘fussy eaters’. For the programme to be of practical use, it would need to show big effects for large groups of children, so the pilot was also implemented in nursery and primary school settings. Two trials were carried out in these settings:

- One with 26 children aged 2 to 4 attending the University’s daycare nursery and Centre for Child Development, using an amended DVD with animated characters called Jess and Jarvis who were tailored for the nursery school age
- Another with a class of 26 children aged 5 to 6, followed by a class of 28 children of the same age within a primary school in Bangor North Wales

All studies confirmed the programme brought about significant long-term increases in children’s consumption of fruit and vegetables. For instance, in the home-based study children’s consumption of targeted fruit rose from 4 per cent to 100 per cent, and of targeted vegetables from 1 per cent to 83 per cent. Fruit consumption was still at 100 per cent and

vegetable consumption at 58 per cent when the children were observed again six months later. In the trials in primary schools, fruit consumption of five- to six-year olds more than doubled, from 28 per cent to 59 per cent over six months, while vegetable consumption increased from 8 per cent to 32 per cent. This was true even when popular sweet and savoury snacks were presented alongside the fruit and vegetables, demonstrating the ability of fruit and vegetables to hold their own against strong food competitors if positive taste patterns can be established.



Pretesting and development

Following the successes of the pilots, the BFARU developed a standalone package to enable primary schools to implement the programme for 4- to 11-year-olds. This involves a phased programme, working to both influence children's healthy food choices and equip teachers, parents and carers with the necessary resources for supporting this change. It thus has two discrete target audiences:

Primary audience

- Primary school children aged 4 to 11

Secondary audience

- Teachers – responsible for the effective delivery of Food Dudes
- Parents, carers and relatives

All new procedures and materials were pretested with children in primary schools in Harwell (Oxfordshire), Bangor (Gwynedd), Salford (Manchester), Brixton (Lambeth) and Stockwell (Lambeth). In all schools, children

were presented with fruit and vegetables at lunchtime and fruit and/or vegetables at snacktime (immediately prior to morning break). The Food Dudes programme was then introduced and in all of the schools this resulted in very significant increases in pupils' fruit and vegetable consumption.



The phases involved in the programme are outlined below.

Preparation

Children's consumption of fruit and vegetables is measured before the Food Dudes programme is introduced. This baseline measurement lasts one to four days.

Phase One (16 days)

Children are introduced to the Food Dudes who, via a series of materials and rewards, encourage them to eat fruit and vegetables. Each day, children are read a letter and/or watch a specially designed DVD episode, lasting six minutes, starring the Food Dudes, who act as influential role models for children to imitate. This introduction provides opportunities for children to sample fruit and vegetables, and in the process, develop a liking for them. Phase One procedures can either take place during snacktime or lunchtime at school.

- **DVD:** The Food Dudes are young superheroes involved in saving the 'Life Force' from the 'Junk Punks', who plot to take away the energy of the world by depriving it of fruit and vegetables. By watching the Dudes defy the Punks in a series of DVD adventures, and seeing them eating and enjoying a range of fruit and vegetables while extolling their health-giving properties and taste, children associate these eating choices with the Dudes' winning strategy
- **Letters/emails:** Teachers read out a series of short Food Dude letters/emails to their class. The letters/emails are a key means of communication between the Food Dudes and the children, providing important information about prizes and the benefits of eating a healthy diet, as well as giving encouragement and praise for the children's eating efforts
- **Rewards:** Children are given small rewards (like juggling balls, pencils, stickers, and pedometers) if they succeed in eating the piece of fruit or vegetable they are given. This gives them an incentive to follow the Food Dudes' healthy eating advice and ensures they get enough repeated tastes of the foods to begin liking them for their own intrinsic qualities
- **Home pack:** Children are provided with a Food Dudes Home Pack to encourage them to eat more fruit and vegetables at home through involving parents and a system of self-monitoring

Phase Two (up to one year)

Phase Two is the 'maintenance' phase of the programme, in which the school supports the children's increased consumption of fruit and vegetables. Classroom wall charts are used to record consumption levels of these foods, and as the children achieve more advanced goals they earn further rewards and Food Dudes certificates. The aim is for the school to move towards a self-sustaining system of rewarding fruit and vegetable consumption to ensure a

culture of healthy eating is maintained over time.

Phase Three (ongoing)

By this phase, the aim is that schools will have developed their own systems of supporting healthy eating alongside the Food Dudes programme 'Keeping the Force Alive.' It is also important to involve the new intake of children each year, through the 'Next Generation' Food Dudes programme to introduce them to the Food Dudes and the healthy eating culture of the school.

Education support materials

The enthusiasm generated by the Food Dudes programme provides an excellent vehicle for achieving educational goals across the curriculum. Education support materials have been designed around the Food Dudes theme. Each pack contains suggestions and worksheets covering English, Mathematics, Science and Technology. These materials are not essential to the programme, but may be helpful to teachers.



The exchange

The programme was developed to overcome the barriers of getting children to eat fruit and vegetables. For children, the Food Dudes interventions aim to minimise these barriers by creating a positive environment (at home and school) in which they are encouraged to try new foods and develop a taste for them. In addition, it offers children clear incentives for adopting the programme:

- Following the adventures of the Food Dudes DVD is a fun experience to share with friends
- Giving children pencils, beakers and small toys to reward good behaviour makes participation fun
- Children come to see themselves as 'fruit and vegetable eaters' and are proud of this new identity
- Children gain kudos and self-confidence from being able to succeed on the programme

Traditional reward schemes can be problematic, as there tends to be a drop-off in behaviour once rewards are withdrawn. Food Dudes, however, uses early rewards, such as stickers and juggling balls, to encourage children to taste new foods, and these are eventually phased out and replaced by the longer-lasting incentive of enjoying the taste of these foods.



In 2005, the programme was piloted over a two-year period in two primary schools in Dublin. The positive results obtained in the pilot study enabled Bord Bia, the Irish Food Board, to receive funding under the EU programme for the Promotion of Fruit and Vegetables on the Internal Market to extend the programme to 150 schools over a 3-year period. By 2007, the Irish Government made the Food Dudes programme available to every primary school in Ireland.

Implementation began in England in 2009, first in Wolverhampton before also being implemented in Bedfordshire, Coventry, Dudley and Yorkshire. A Food Dudes programme began trialling in Italy in 2009 and has since been taken up in California and Utah.



For each programme a School Food Dudes Coordinator (SFDC) is employed to manage and monitor the work within the schools in the designated area and to work with in-school coordinators (members of the school staff, typically a teacher nominated by the Head Teacher to oversee the programme) to deliver the programme. In the UK, the SFDC is usually employed by the client, such as a Primary Care Trust (PCT), or by Bangor University. SFDC's tend to have an interest in healthy eating, an understanding of the different dynamics across different services, cross community experience and a marketing background. Additionally, a Steering Group is set up locally, which would typically (in England) include representatives from:

- Public Health
 - Health Improvement Specialists
 - Obesity leads
- Healthy Schools Advisors
- Fruit and vegetable supplier
- School Catering Manager (where it is a school-based meal initiative – in Ireland it is a lunchbox-based programme)
- Procurement Sponsors
- A senior team member from the Food Dudes at Bangor University

Once the participating schools have been identified, baseline research is undertaken. Dependent on budgets and requirements, this baseline can include more extensive observational analysis or can consist of parental questionnaires. In-school coordinators will attend training sessions about what is required by the Food Dudes programme, and other teachers, catering staff and parents are

invited to attend sessions to explain the programme before it commences.

The Food Dudes programme is then conducted in exactly the same fashion in any primary school environment, as it has been found that this structure is successful regardless of location, culture, language or social deprivation, and has also been highly successful in special needs schools.

"X is 10 years old with autism and has severe feeding difficulties and only ate pureed food. Since the Food Dudes programme, X ate his very first piece of finger-food in his entire life. This is a massive success story for X and a major turning point in his life." (Special Needs Teacher)



During the implementation of the programme, research continues to look into the 'Three R's' of the programme. In particular work was undertaken to look into how rewards are delivered and to explore whether more potent or valuable rewards should be given initially and then reduced over time, or whether the type of reward given should be altered throughout the programme. The research found that potent rewards need to be given to begin with to bring children on board.

As the programme has been rolled out in the different locations, the only real amendments that have had to be made are around what rewards are given to the children on the basis of health and safety grounds.

"We're continually adding to our risk assessments. You wouldn't have yo-yos or things that could pose a choking hazard to children. You generally build up these risk assessments and develop as you go along to refine the programme." (Tracey Anthony, Food Dudes Business Strategy and Development)



Food Dudes has been extensively tested with thousands of children aged 2 to 11 in homes, nurseries and primary schools in England, Wales and Ireland. It has been shown in every case to be highly successful in getting children to eat fruit and vegetables. The England Department of Health is undertaking a full independent evaluation of the impact of the programme in Wolverhampton on the benefits to the children. This is due to be completed in November 2011.

Robust evaluation has always been an integral part of the programme. Much of the research initially carried out by the BFARU used observational measures of each child's consumption of fruit and vegetables before, during and after the programme had been introduced. This was time-consuming, but yielded an objective, quantitative measure of the programme's effectiveness.

Simpler measures suitable for a large number of schools have now been developed for rollout with the programme and are provided by questionnaires or food diaries. In addition, BFARU developed a one-day diary (the 'DIET-24: 24hr dietary intake evaluation tool') that can be used in large-scale evaluations of the Food Dudes programme to assess food intake in children and parents. Short questionnaires have been developed for parents, teachers, children, caterers and in-school co-ordinators

to assess the perceived impact of the programme.

During programme implementation, SFDCs monitor progress in each school to ensure class teachers are adhering to procedures. Teachers or other school staff (like teaching assistants) are involved in taking baseline measures of children's fruit and vegetable consumption one to four days prior to launching Phase One. These same measurements are taken again at the end of Phase One and during Phase Two and beyond, to assess immediate and longer-term effects of the Food Dudes programme. A Class Record Card is provided for each class in every school for this purpose.

The in-school co-ordinator is asked to collate the results from all classes onto the Whole School Record Card, which is then returned to the SFDCs. This information enables Food Dudes to determine the overall effects of the programme in each school and provides useful material to support evaluation.

General results

- Large sustained increases in fruit and vegetable consumption
- The greatest increases in consumption are shown by those children who ate the least at the start
- Reduction in unhealthy snack consumption
- Increases extend across a wide range of fruits and vegetables
- The programme works for all children aged 2 to 11 years
- The effects generalise across contexts (i.e. school to home)
- The programme is equally effective for boys and girls
- Effects are highly reliable, regardless of school location and social deprivation

Ireland

Results from Phase Three (2008) of the Irish rollout (implemented in 1,300 schools) were obtained via questionnaires to parents in 31 participating schools. Analysis of the questionnaires showed that 2.5 years after the start of the programme:

- Parents' provision of lunchbox fruit increased by 34 per cent and provision of lunchbox vegetables increased by 130 per cent
- In turn, children's lunchbox fruit and vegetable consumption increased by 76 per cent
- Children's fruit and vegetable consumption at home increased by 24 per cent, and across the day increased by 26 per cent, achieving the recommended minimum consumption of 5-a-day

Wolverhampton

Results were gathered from five schools that had received the programme and one control school in 2009. Key findings were:

- Children increased their daily fruit consumption by 54 per cent and vegetable consumption by 48 per cent following implementation of the programme
- The poorest eaters showed the largest increases in consumption of fruit (358 per cent) and vegetables (293 per cent) across the day
- At home, children's consumption of fruit increased by 42 per cent and vegetables by 55 per cent. Poorest eaters again showed large increases for fruit (490 per cent) and vegetables (385 per cent)
- At school, children's consumption of fruit increased by 24 per cent and vegetables by 46 per cent. Poorest eaters showed the largest increases for fruit (46 per cent) and vegetables (222 per cent)
- Children in the intervention schools showed significant increases in lunchtime vegetable consumption (54 per cent)

FOLLOW-UP

Food Dudes received a World Health Organization best practice award in 2006 and in 2010 won the Gold Medal at the Chief Medical Officer's Public Health Awards. In addition, Food Dudes was cited in the Conservative Party's green paper on public health, *A Healthier Nation* (2010), as a good example of a successful behaviour change programme.

In response to the growing problem of child obesity in the UK, the BFARU, with funding from the Wales Office of Research and Development for Health and Social Care, is now investigating ways of increasing physical activity levels of primary school children. An intervention closely modelled on Food Dudes has been developed, which incorporates fictional role models and rewards and involves children wearing pedometers to enable them to monitor their physical activity levels. Initial assessments have found the intervention to be highly effective.

"We're developing another project based on Food Dudes called 'Fit Dudes'. This would be like a sister project and would use the same principles to increase physical activity as Food Dudes does to increase fruit and vegetable consumption." (Dr Sally Pears, Food Dudes Research Officer)

Further research is currently being proposed to incorporate health audits into the work of Food Dudes to track the health of those involved in the programme. This would enable health outcomes to be established and therefore value for money in the longer-term, through decreases in ill health and reduced costs to health services.



Chief Medical Officer's Award Ceremony

The Food Dudes team at Bangor University is currently establishing a business case for the programme to be spun out from the University. This may include working with associated suppliers of school meal provision to jointly tender to deliver Food Dudes alongside the school meal catering, thus ensuring the programme can be coordinated and cost effective. The team recently mapped relevant contacts in all the PCTs, schools and local authorities in the UK and is in the process of a hub and spoke approach to engagement starting in the West Midlands and London. This has received a number of expressions of interest in adopting the Food Dudes programme. The team also regularly identifies conferences to present at and contributes articles to professional journals.

Lessons learned

A key strength of the Food Dudes programme has been its extensive evidence base, with consistent and robust monitoring and evaluation built in to its implementation. Having this evidence base ensures those investing in the programme can be confident in its success in changing behaviour, and thus providing value for money. The team thus recommends to others developing a behaviour change programme to invest the necessary time and resources in thorough research and evaluation to support the programme and demonstrate success.

“Make sure it’s fully evaluated so that you have the scientific evidence to underpin what it is you’re actually delivering.” (Dr Sally Pears, Food Dudes Research Officer)

The Food Dudes team has also strengthened its arrangements with participating partners by way of a Licence Agreement to ensure that intellectual property is protected, that data is captured effectively, and that a full Quality Assurance system is in place to ensure the programme is delivered in strict accordance with the standards. It is equally important that information is captured to continually inform ongoing research and development. This way the effectiveness of the programme is maintained and implementation is consistent across regions, avoiding dilution or overlap with other initiatives.

“It’s important that we offer our partners a degree of flexibility in delivering the programme particularly around staffing and the types of observations they wish to undertake. However it is essential we retain control of the aspects of strategic importance that can affect the efficacy of the programme – Training; fruit and vegetable quality; rewards ordering and fulfilment; observations; data collection and so forth.” (Tracey Anthony, Food Dudes Business Strategy and Development)

Although Food Dudes was initially implemented in schools as a research programme, it is hoped that by commercialising the programme an income would be generated, which could be used to sustain resources at a national level while retaining a research arm for expansion into other areas (such as physical activity) could be developed.