A qualitative study of a food intervention in a primary school: Pupils as agents of change

H. Ensaff*

hensaff@gmail.com

C. Canavon

R. Crawford

M.E. Barker

Human Nutrition Unit, Department of Oncology, The Medical School, University of Sheffield, Sheffield, S10 2RX, UK

*Corresponding author. Nutrition & Dietetics, Leeds Beckett University, Leeds, LS1 3HE, UK.

Abstract

This study explored the impact of a school-based kitchen project at a large inner London school. Timetabled kitchen classroom sessions (90 min every fortnight) were held with all 7–9 year old pupils. Semi-structured focus group discussions (with 76 pupils, 16 parents) and interviews (with headteachers, catering managers and specialist staff) were conducted at the intervention school and a matched control school. Categories and concepts were derived using a grounded theory approach. Data analysis provided three main categories each with their related concepts: Pupil factors (enthusiasm and enjoyment of cooking, trying new foods, food knowledge and awareness, producing something tangible); School factors (learning and curriculum links, resource implications and external pressures) and Home factors (take home effects, confidence in cooking and self-esteem, parents' difficulties cooking at home with children). Children's engagement and the opportunity to cook supported increased food awareness, skills and food confidence. In the grounded theory that emerged, take home effects beyond the school gate dominate, as children act as agents of change and influence cooking and food choice at home. These short term outcomes have the potential to lead to longer term outcomes including changing eating behaviour and diet.

Keywords: Children; School; Qualitative methods; Cooking; Food intervention

1 Introduction

The place of food within schools is changing in England. The School Food Review and resultant School Food Plan (Dimbleby & Vincent, 2013) has prompted a series of changes including the new school food standards (Requirements for School Food Regulations 2014) (statutory from January 2015) as well as a renewed focus on cooking and nutrition in the new National Curriculum. (DfE, 2014).

Against a backdrop of rising obesity rates as children move through primary school (9.5% at age 4–5 years to 19.1% at age 10–11 years) (Department of Health, 2014), the urgent need to improve children's diets, typically marred by excessive sugar and fat intake, and low fruit and vegetable consumption (Bates et al.,2014) is evident.

In improving children's dietary behaviour, there has been a number of initiatives that have sought to do this through school-based food activities, e.g. Stephanie Alexander Kitchen Garden Program (Australia), Edible Schoolyard (USA), Royal Horticultural Society (RHS) Campaign for School Gardening, Royal Academy of Culinary Arts Chefs Adopt a School and *Children's Food Trust's Let's Get Cooking*. A literature base on the value of such programmes in improving children's food skills and knowledge, with possible follow on effects in the home, is developing. (Block et al., 2012) In particular, the value of these programmes in developing children's relationship with food is relevant. Interactive food activities can positively impact children's food awareness, eating and cooking enjoyment, *and* fruit and vegetable preferences. (Chu et al., 2013), (Caraher, Seeley, Wu, & Lloyd, 2013), (Van der Horst, Ferrage, & Rytz, 2014), (Cunningham-Sabo and Lohse, 2014) As well as valuable food skills, children develop a closer connection to and ownership of food. A recent systematic review of cooking programmes reported the positive influence these activities may exert on children's food preferences, attitudes and behaviours. (Hersch, Perdue, Ambroz, & Boucher, 2014).

Jamie Oliver's Kitchen Garden Project (JOKGP) is a school-based programme developed by the Jamie Oliver Food Foundation (JOFF). With overarching aims of promoting children's cooking skills, willingness to try new foods and better understanding of where food comes from (farm to table), the programme involves primary school pupils growing, preparing and sharing fresh seasonal produce. At the time of this study the programme involved the establishment of a purpose built kitchen classroom, with timetabled sessions delivered by school staff themselves trained by JOFF.

The study presented is the qualitative element of a mixed methods study funded by the Jamie Oliver Foundation. The complementary quantitative analysis revealed that pupils at the intervention school scored significantly higher on scores related to using kitchen equipment and also to cooking experience. (Ensaff, Crawford, Russell, & Barker, 2014) Significant increases in the scores related to pupils' taste description, liking for cooking and helping with cooking at home were also observed, as was a statistically borderline time by intervention interaction on food neophobia (rejection of unfamiliar foods) and fussiness (rejection of a large amount of familiar as well as unfamiliar foods). (Ensaff et al., 2014).

This qualitative study's overall aim was to gain an understanding of the impact of the intervention on pupils, in particular children's food enjoyment, experience and food neophobia and fussiness, as well as an understanding of the practical implementation of the intervention. An understanding of the impact of projects of this kind is vital to their successful realisation. In evaluating the qualitative data, a grounded theory methodology was adopted in order to develop a model of pupils' relationship with food, within the context of a school kitchen project.

2 Materials and methods

The University of Sheffield's Medical School's Ethics Review Panel granted ethical approval for the study protocol.

The study involved one intervention school (IS) – the school previously selected and recruited by JOFF to implement JOKGP, and a control school (CS) recruited by the research team and matched to the intervention school on key school characteristics including school size, basic socioeconomic profile (% Free School Meals, FSM), catering provision and geographic location. Both schools were large community primary schools (IS: 345 pupils; CS: 380 pupils) in the same inner London borough, with above average FSM (IS: 59%; CS: 54%), and having the same catering provision. As is standard in UK primary schools, there were no timetabled cooking and gardening activities at the control school, and teachers incorporated cooking and gardening activities into their lessons to varying degrees depending upon preference. The control school did have a gardening area made up of raised beds, which again were utilised according to individual teachers' preferences.

2.1 Jamie Oliver's Kitchen Garden Project intervention

The intervention, JOKGP, consisted of kitchen classroom sessions (90 min duration, timetabled and delivered every two weeks). During the sessions, pupils (Years 3 & 4, Age 7–9 years) in small groups, prepared and cooked food, which they then ate together. The sessions were interactive, and had an emphasis on savoury cooking with children preparing dishes such as tomato salad with tuna, homemade mini burgers, roasted stuffed peppers, homemade fish fingers, garlic and rosemary focaccia, butternut squash muffins, apple and blackberry crumble. Each kitchen classroom session was led by two adults, and JOFF trained one teacher and several teaching assistants to be able to deliver the sessions. One parent also volunteered to support a session every week.

The intervention was delivered during the academic year 2012–13; fieldwork was conducted on two occasions – once at baseline (IS, July 2012; CS, November 2012), and then again at follow-up at the end of the academic year 2012–13 (IS, June 2013; CS, July 2013). Whilst the intention was for JOKGP to incorporate dedicated gardening time for pupils, the intervention did not include timetabled gardening sessions at the IS and instead pupils'

gardening activities were according to individual teachers' preferences (in a similar way to the CS).

2.2 Participants

Participants were recruited using information sheets and introductory letters via the schools. All pupils in Key Stage 2 (Years 3–6, Age 7–11 years) at the intervention and control schools, and their parents were invited to participate in the study. Whilst the interactive cooking sessions were only delivered to pupils in Years 3 and 4, the study sought to examine the impact on all Key Stage 2 children and so did not restrict the evaluation to pupils directly receiving the sessions. Out of all pupils invited to participate (IS: baseline 178 pupils, follow-up 183 pupils; CS: baseline 187 pupils, follow-up 195 pupils) and consenting to take part, the school selected a representative sample of students (IS: baseline 19 pupils, follow-up 15 pupils; CS: baseline 24 pupils, follow-up 18 pupils) using school held data and on the basis of three contextual factors (FSM, gender and academic achievement). Parents with children in Key Stage 2 (Years 3–6, Age 7–11 years) and willing to participate, attended focus group discussions (IS: baseline 4 parents, follow-up 5 parents; CS: baseline 1 parent, follow-up 6 parents). All KS2 teachers (7 teachers at each school) were invited to participate in focus groups or individual interviews depending upon availability and preference. Focus group discussions and interviews were held with teachers at both schools at baseline and again at follow-up (IS: baseline 5 teachers, follow-up 3 teachers; CS: baseline 7 teachers, follow-up 2 teachers). The headteachers, catering managers and specialist staff[1] were also interviewed at baseline and follow-up. These were the same individuals – with the addition of one specialist staff at IS at follow-up. Pupils, parents and teachers however were not the same individuals at baseline as at follow-up (with the exception of 4 pupils and 2 teachers).

2.3 Interviews and focus groups

Focus group discussions (with pupils and parents, separately) and face-to-face interviews (with headteachers, catering managers and specialist staff) were designed for the study. All interviews and focus groups were semi-structured to encourage free discussion and to provide the flexibility for participants to explore relevant issues. Prepared schedules of topics were used; these centred on food activities both in school and at home, food awareness, food knowledge and pupils' food choice (see Appendix). The pupil focus groups were designed with a drawing activity at the start, where pupils were asked to draw their favourite meal. This was to encourage engagement, 'set the scene' and form the basis of the subsequent discussion. The headteacher interview focused on how the project fitted within the school, the resourcing implications, the project content's links with the curriculum, and the project's impact on the school learning environment. The interviews with specialist staff delivering the kitchen activities included opportunities to discuss how the project operated, practical implications,

and the experience of conducting the sessions with the pupils. Whilst there was a focus on key topics to be explored, the interviews were not constrained to a particular format and questions were adjusted as and when specific issues arose. At the end of all interviews/focus groups, participants were asked if there was any additional information not already discussed that they thought was relevant or important to include in the analysis. The interview schedules kept their focus and overall structure, they were continually reassessed to ensure that evolving concepts were covered; this was particularly relevant for the data collection at follow-up. Immediately following the interviews, initial insights were recorded to capture key ideas and thoughts, and this enriched the data analysis later on.

Focus group discussions and interviews were conducted at the schools; the breakdown of the sample is provided in Table 1. Informed consent was completed prior to data collection and strict measures regarding anonymising of data and data storage were preserved during the study. There was a total of 35 interviews and focus groups [12 pupil focus groups; 3 parent focus groups; 2 parent interviews; 2 teacher focus groups; 3 teacher interviews; 4 headteacher interviews; 4 catering staff interviews; 5 specialist staff interviews]; the composition of each group is provided in Table 1. The data collected proved ample for theoretical saturation. The interviews and focus groups varied in length, with the majority lasting between 40 and 50 min. High quality recordings were made using software (GarageBand, Apple, Inc., CA) and a microphone on a MacBook Pro. The audio files of the interviews and focus groups were transcribed by a researcher and checked by a second researcher (both present at the interviews). Transcription was completed using a protocol, with a leaning towards denaturalised transcription; the focus was put on the content and essence of discussions. This was part of a clear strategy to connect with the perceptions and viewpoints of the participants. This style of transcription lends itself well to the grounded theory methods employed in the study. The transcripts of the interviews and focus group discussions were anonymised; participants' names were replaced with unique identifiers and identifying details (e.g. names of individuals and places) referred to within transcripts were replaced with pseudonyms.

Table 1 Participation in interviews & focus groups.

	Pupils	Parents	Teachers	Headteachers	Catering staff	Specialist staff[a]
Baseline						
Intervention School	19 (13 girls, 6 boys) 3 FG: Years 3 & 4 (7 pupils);	4 (female) FG	5 FG	1 INT	1 INT	1 INT

	Pupils	Parents	Teachers	Headteachers	Catering staff	Specialist staff[a]
	Year 5 (8 pupils); Year 6 (4 pupils)					
Control School	24 (16 girls, 8 boys) 3 FG: Year 3 (10 pupils); Years 4 & 5 (8 pupils); Year 6 (6 pupils)	1 (female) INT	7 FG	1 INT	1 INT	1 INT
Follow-up						
Intervention School	15 (6 girls, 9 boys) 3 FG Year 3 (6 pupils); Year 4 (6 pupils); Years 5 & 6 (3 pupils)	5 (female) FG	3 INT [individual & 2 person]	1 INT	1 INT	2 INT
Control School	18 (12 girls, 6 boys) 3 FG Year 3 (6 pupils); Year 4 (6 pupils); Years 5 & 6 (6 pupils)	6 (female) 1 FG 1 INT	2 INT [2 person]	1 INT	1 INT	1 INT
Total	*76*	*16*	*17*	*4*	*4*	*5*

FG: Focus Group; INT: interview.

[The headteachers, catering managers and specialist staff interviewed at baseline and follow-up were the same individuals – with the addition of one specialist staff at IS at follow-up].

[a]School staff delivering food or cooking activities to pupils.

2.4 Data analysis

Data were analysed to capture the perceptions of the participants, and in particular perspectives on pupils' relationship with cooking, gardening and food consumption. The transcripts and memos (researchers' reflective notes on interpretative thoughts and emerging

questions) from the interviews and focus group discussions, alongside school level data (e.g. headteacher's reports, school website content, observation records during school visits by the research team to the dining areas at lunchtime, as well as sessions in the kitchen classrooms and garden areas) formed the data for this study. Software, NVivo10 (QSR International, Victoria, Australia) was utilised in the data management, theoretical development, and data analysis. Throughout the data analysis, memoing was used to develop analytical ideas and explore concepts, as well as record key theoretical developments and decisions.

The research team considered the study objectives and transcripts, to draw up a list of broad categories. Nodes were then created to represent each of these. Data coding was conducted by three researchers independently; this was followed by systematic discussion to review discrepancies and to reach a consensus. Focussed coding was done for all transcripts in an iterative fashion, with the overall aim of developing a theory to describe the relationship between the emergent themes and patterns. Coding stripes, and node and document coding reports were generated and these, along with queries and models helped in the generation of emergent theories, which were tested against existing theories or further analysis of the data. Similarly, deviant cases were searched for. Subsequent recoding produced a list of the finalised nodes with broad categories. Whilst theoretical saturation was felt to have been reached, coding was completed for all data collected in order to substantiate findings. In order to control for researcher bias, several measures were put in place; these included the constant re-evaluation of the data, systematic discussion within the research team around emerging categories and concepts, and memoing during data collection and analysis. The interrelationships and relative influences of the final categories and concepts formed the grounded theory that emerged from the qualitative data.

3 Results

Three main categories, each with their own related concepts (Table 2) emerged from the data. Each of these concepts is considered in turn, followed by the grounded theory of the interrelationships and their relative influences.

Table 2 Categories and concepts.

Pupil Factors – *what children bring to the table*
▪ Enthusiasm and enjoyment of cooking

▪<mark>Trying new foods</mark>
▪Food awareness and knowledge
▪Producing something tangible
School Factors – *the school's role & responsibilities*
▪Learning and curriculum links
▪Resource implications & external pressures
Home Factors – *the role of the home and what happens outside school*
▪Take home effects
▪Confidence in cooking & self-esteem
▪Parents' difficulties cooking at home with children

3.1 Pupil factors

Pupils bring several key concepts when they engage with cooking activities; each of these aspects was influenced by the kitchen sessions and went on to have impacts in the home.

3.1.1 Pupil factors: enthusiasm & enjoyment of cooking

Elements of pupils' enthusiasm for cooking were evident at both schools. However, at the intervention school at follow-up this was particularly dominant and there was overwhelming agreement from all staff about the extent of this. Further, at the intervention school at follow-up noticeable impacts on behaviour were discussed.

They *absolutely* love it … It's the highlight of their week … It's a very enjoyable experience for them. [Peter, specialist staff, IS]

… they [pupils] are motivated by it – all children like it … they *love* going … so all children are engaged with it and it's been something that they've really responded to. We don't pick up behaviour in those sessions. The children – they're well behaved, they enjoy being managed. [David, headteacher, IS]

The children themselves were also clear about their enjoyment of JOKGP kitchen sessions and the value they placed on it.

Like on a Friday we get like a little reward because of all of the work that we've done for the whole week. And then we get 30 minutes of it, and I would rather change it into 30 minutes of cooking. [Rohan, Year 4 pupil, IS]

… [we've had] some positive feedback from boys saying that it's been wonderful having that experience. One of them said, "It's better than videogames". [David, headteacher, IS]

3.1.2 Pupil factors: trying new foods

Staff were clear that they felt JOKGP was having an impact on children's willingness to try new foods and were often surprised by children's engagement.

Well I'm constantly amazed at how prepared children are to try new foods, because in my head … I just had this notion that it was going to be very difficult to encourage the children to try some of the foods that we're cooking, because they are really quite adult flavours [and] the ingredients we're using – but no, I'd say probably 90–95% of the children are happy to eat everything. [Peter, specialist staff, IS]

… I think a lot of them have surprised themselves about what they've tried and what they've liked … children who've said, " … Oh I didn't know I liked tomatoes". [Susan, teacher, IS]

I've got a little boy in my class and he just refuses to eat a lot of foods; he has his crisps and things like that. I think it's really helped him because he's always telling me about him trying different foods and how much he enjoys it, and it's just really nice to see that and he's kind of branched out a little bit. [Emma, teacher, IS]

Some of this willingness to try new foods was put down to peer pressure during the sessions, as this specialist staff at the intervention school explained:

… I think peer pressure has a lot to do with it as well. They're not at home, they're not in their familiar setting, they've got all their friends around them who are eating and enjoying it and they feel that they … just join in because of that … which is brilliant. [Peter, specialist staff, IS]

The effects of children's increased willingness to try new foods were also being felt at home:

… quite a few of the Mums of the kids in my class are saying that their children are now trying vegetables that they never would have eaten at home before, which is fantastic and they are very *pleased.*[Peter, specialist staff, IS]

The catering manager also noticed impacts at school lunchtime, including a difference in the food waste from plates.

It's working – whatever it is they're teaching them there or whatever they're telling them about food. I can see it's *really really* working because the children are eating now … And then equally when I look in the bin it's not as bad as before … it used to be bags and bags [of waste], two people had to carry – it's only one person carrying it now. [Sarah, catering manager, IS]

Children were keen to recount many of the dishes that they had made and enjoyed, as well as dishes that they had tried but weren't so keen on; in essence a general ethos of trying food came through.

Well if you try something then and you don't like it, then it doesn't matter – you don't have to have it again, but it's good that you tried,'cause if you don't try you wouldn't know what it tastes like. [Sophia, Year 3 pupil, IS]

3.1.3 Pupil factors: food awareness <mark>*& knowledge*</mark>

Parents acknowledged the impact of JOKGP on their children's food knowledge and awareness.

It's stimulated their curiosity, now everything has to be explored …because they just click that there are different things. There are things that they don't know, things that can be nice, even if they suppose they're not so. [Becky, parent, IS]

At both schools, children had good knowledge of healthy eating and the concept of a balanced diet.

[you need] a tiny bits of fats and sugars … you need carbohydrates, fruit and veg … [Leila, Year 6 pupil, CS]

[and you need] dairy products, like milk and cheese and yoghurt [Yasmin, Year 6 pupil, CS]

Pupils at both schools were also able to explain where food , e.g. carrots, beef, cheese and pasta, came from.

You don't get pasta from anywhere you just *make* pasta and then you sell it in the shops. [Amer, Year 3 pupil, CS]

It's [pasta] made out of wheat, isn't it? [Ethan, Year 4 pupil, CS]

You get them [carrots] from underground … little tiny seeds …[Tommy, Year 4 pupil, IS]

… You plant seeds and they grow [Gracie, Year 4 pupil, IS]

Parents at the intervention school reported that they felt the sessions added an extra dimension to this knowledge by widening children's experiences with food, and providing reinforcement and context.

… what I've noticed the *most*, the biggest change I think since she started is the awareness about healthy foods, the awareness about the sugar and the fat and the consequences of the food you eat. It's *clicked* in her, what you put in … has consequences. [Dominique, parent, IS]

… she [daughter] just started to understand that projects can become reality. And that healthy food can be not just something that you're talking about, it can be there. So it's a good thing. I think absolutely a good thing. I'm glad. [Christina, parent, IS]

3.1.4 Pupil factors: producing something tangible

Teachers at both schools felt that producing something tangible contributed to children's engagement.

… whether it's preparing salad, or stuffing apples for baking, or making bread – I think it's the process: it's the beginning, the middle and the end. And I think that they find that satisfying and rewarding. It's not some random … they can see the goal. [Claire, teacher, CS]

It's instant reward. There's no waiting for the teacher to take it away, mark it and give you it back with a comment on it, that you then need to respond to. You get instant response, i.e. "Urgh!" or "Yeah! This is really nice". You either like it or you don't – you get feedback immediately. It's this instant world in which we live. [Steven, headteacher, CS]

Well it's something in the end that they produce themselves – isn't it? It's something really new to them really because all the food they get at home [is] mostly, it's packaged food or they don't really make things from scratch very much. So I suppose it's the joy of producing. [Laura, teacher, IS]

At the control school, one teacher expressed doubt over children's explicit connection with producing something:

I'm not sure if my class have sort of grasped that, because they will only eat it [food made/grown in school] rarely … and they get to taste a little bit but that's it … I quite like what you [Claire, teacher] were saying about the end product … but mine haven't grown anything enough to [have that] … But I can see that it can grow into something a bit bigger … 'potential' – that's the word. [John, teacher, CS]

The sense of ownership and freedom that came with this was mentioned by pupils and parents.

I like cooking because you cook stuff and then you get a recipe and then you learn more recipes and then you get to, once you've learnt all your recipes, you get to make your own kind of food. [James, Year 4 pupil, IS]

… it really is kind of ownership of the whole process … and I think to a kid's self-esteem that's absolutely amazing. [Louise, parent, IS]

3.2 School factors

It was clear that the intervention had an impact on the school and how it operated. This mainly related to the learning and curriculum links to the cooking sessions in the kitchen classroom, as well as resource implications.

3.2.1 School factors: learning & curriculum links

The experiential learning during cooking and gardening sessions was highlighted by teachers and specialist staff at both schools.

They are engaged … a lot of them … But I think that's why they like it so much … [Claire, teacher, CS]

… it's all this association with food really being a *touch* thing, isn't it? Even before it gets into the frying pan or the wok, that if you're pulling something from the ground you've got an understanding of where it comes from … and I think all of those processes are very very powerful. [Ryan, specialist staff, CS]

In addition, the links that children were able to make between their kitchen classroom sessions and classroom learning was reported, and teachers used JOKGP to engage pupils in topics in the classroom, as described here:

Sometimes we will make that direct link, so in maths say we're doing problems we'll set it in the kitchen … just to make it really relevant to them and because obviously they do love it so much, it really sparks their interest in things. [Susan, teacher, IS]

Pupils themselves were able to see the connection between what they were doing in the kitchen and their classroom learning.

If you make your recipes you have to weigh how much of foods there are, so you can do maths, and sometimes you have to write it so you use your writing as well. [Amy, Year 3 pupil, IS]

3.2.2 School factors: resource implications & external pressures

An issue that featured in discussions at both schools was that of resources. Economic and logistic constraints were often cited by teachers and headteachers as key obstacles needing to be overcome. JOKGP (at the time of the study) entailed sessions in a dedicated kitchen classroom; cooking activities within the classroom setting were advocated by school leadership, as a more realistic alternative, saving time and resourcing both in terms of staffing and facilities. The importance of establishing the benefit of the kitchen sessions was stressed by both senior leadership and teaching staff within schools, especially with respect to scrutiny by Ofsted (the schools inspectorate in England).

3.3 Home factors

The final category to emerge in this analysis related to the home and the role of what happens outside school, in particular take home effects resulting from the intervention were highlighted.

3.3.1 Home factors: take home effects

Parents with children at the intervention school reported that their children's growing enthusiasm for cooking had had an impact at home.

My kitchen's not my own anymore to be honest with you, it really isn't – but in a good way … We have regular cooking sessions now at weekends. [Louise, parent, IS]

… so I'm more her [daughter's] assistant now. She's telling me the ingredients to buy - I'm the sous chef, she's the head chef. [Becky, parent, IS]

The potential of this on family food is evident from this parent's account of how her son was influencing their cooking:

… he's looking at ways to cook what we cook more healthily … I don't think we were that unhealthy in the first place but it's really nice that he's looking at that, and [we have] a lot more fresh vegetables. He wasn't very good with vegetables, but he's now a lot more keen to try ones that he was unfamiliar with. [Louise, parent, IS]

Parents at the IS recounted how children's new food knowledge was impacting on food shopping:

She wants to buy dill – I never buy dill (group laughs), chives – I never buy chives. [Dominique, parent, IS]

Parents generally considered this a positive outcome. One or two parents however described discussions that they then had to have with their children:

I must admit we'd never had asparagus before, and she came home the other day saying "Mummy you really ought to buy some asparagus, I think Sam [brother] would like it". And I thought "OK fine – we'll do that" … but now she has a greater understanding of why I don't always buy those things, because I have explained:"This is really expensive and if you don't eat it and Sam doesn't eat it – me and Daddy have got a mountain of asparagus to get thorough". [Becky, parent, IS]

3.3.2 Home factors: confidence in cooking & self-esteem

Children at the intervention school were keen to describe what they did in the kitchen sessions, relaying confidence and familiarity with ingredients. Closely related to the take home effects reported in the previous concept, children's newly gained cooking skills were also being taken home. One Year 3 pupil explained how she'd introduced focaccia bread to her family:

I couldn't stop eating it [focaccia bread] and I always make it at home [with] my Mum and sometimes my Dad … 'cause you get a [recipe] sheet how to make it … [Sophia, Year 3 pupil, IS]

Another Year 3 pupil described that he had shown his parents how to make scrambled eggs:
I showed my Mum and Dad how to make it [scrambled eggs] …First my Dad tried with a big spoon and he said he loved it. [Jack, Year 3 pupil, IS]

Parents likewise reported that their children were returning home with newly gained skills, and wanting to pass these on.
… "Mummy we do that. Make sure that you get the ingredients 'cause we have to do this. I'll do it, I'll teach you!" [Christina, parent, IS]

When describing their new cooking experiences at home, children's pride in making their own food was evident.
Yeah, I haven't tried beetroot and then yesterday with my pizza I had some beetroot and coleslaw but I didn't really like it but I tried it and then I liked it … [I made it] at home. I made my own ones [pizza]– I didn't get it from a shop! [James, Year 4 pupil, IS]

The improvement in knowledge and skills at the intervention school brought with it a level of confidence and enthusiasm in the kitchen, which was reported by parents.
… and we're kind of changing the recipes to eat stuff as well, so she [daughter] is thinking about how she can alter what we've got, because she's set up a folder at home and she's come home and categorised all of the Jamie Oliver recipes – she will refer to all of that. [Becky, parent, IS]

3.3.3 Home factors: parents' difficulties cooking at home with children

Pupils reported that they would like to do more cooking at home, but didn't because of parents' time constraints. Likewise, parents at both the intervention and control schools felt that they would like to do more cooking at home with their children but didn't because of time, safety worries and concerns over the mess. Parents' reluctance was still evident at the intervention school at follow-up, however, unlike at the control school, there were clear accounts of parents talking about how they were letting their children cook more. One parent described how this had happened:
… although I know it's really important for kids to join in … I find it incredibly frustrating and to get over the mess aspect of it … so I think this changes because of the cooking, and experiences that he's having at school. It's gone from being a boring thing to being an interesting thing … [Louise, parent, IS]

One of the issues parents cited around letting their children cook at home was safety. This parent explains how this changed:

I bought some quite nice knives … and they were horrendously sharp … and I became like, "Right the children can't use these and they can't do this and they can't do that" … and I'd be chopping the onion and she'd [daughter] say, "Oh no, you're holding that all wrong", and I'd be told that I'm holding the knife the wrong way and I'm gonna cut my finger and I'm thinking, "OK fine, let's do it your way" … And at first it was a frustration and then I thought she actually knows what she's talking about and she can probably handle these knives better than me now, and I became more confident letting her help and do stuff. [Becky, parent, IS]

Parents also reported enjoying the new experiences they were sharing with their children in the kitchen.

I've always cooked because we have to eat – I've never taken a pleasure in it. The kitchen's always been a place of fear and this, to me, it's actually making me enjoy it. [Louise, parent, IS]

One parent even recounted how her daughter's interest had taken some of the pressure off her.

I used to love cooking before I had kids … And I thought I've lost that in the eight years that I've had the children. Cooking hasn't been fun – I haven't really tried new things … And it's really nice actually that [daughter] has taken some of the pressure off me in a way and coming up with some suggestions because I was just about clean out. [Becky, parent, IS]

3.4 The grounded theory

The qualitative data analysis resulted in a grounded theory where the take home effects dominated, as modelled in Fig. 1. As a starting point, children are interested in cooking and enjoy opportunities to cook both in school and at home. Children also have the relevant knowledge surrounding healthy eating and are aware of health messages that they receive from school and outside. However, they have limited opportunities to help with cooking at home, partly due to parents' reluctance, which is based on time constraints, concerns around safety and the mess, as well as parents' limited cooking skills. So whilst pupils acquire knowledge on food, its origins and health implications, they have limited opportunity for experiential learning and the development of food skills. Participation in a kitchen project enhances children's knowledge and skills, and elevates their levels of enthusiasm and enjoyment such that they are able to override their parents' reluctance and do indeed end up cooking more at home. In turn, this has noticeable effects on children's food enjoyment, enthusiasm and willingness to try new foods, as their self-esteem and confidence builds.
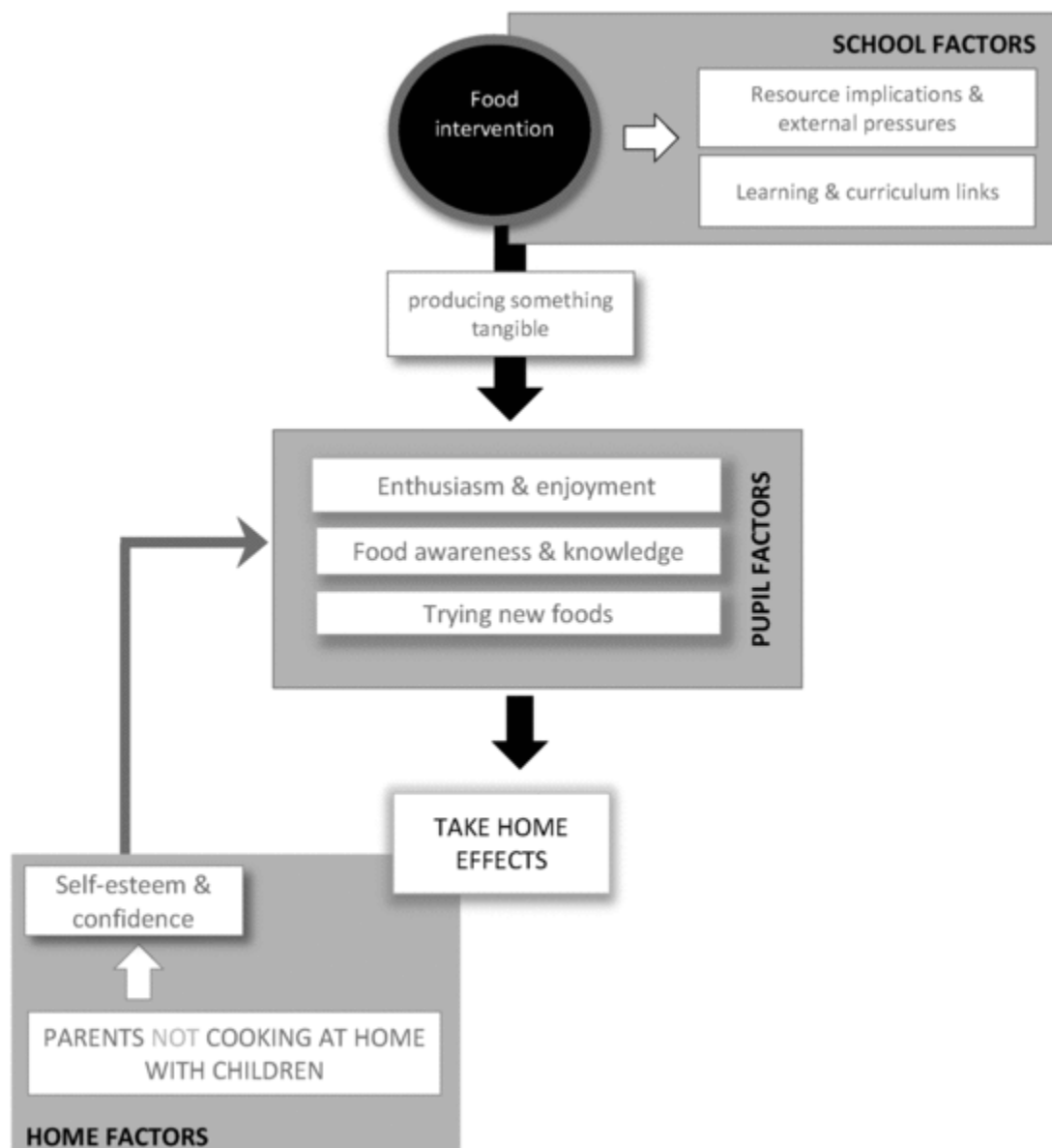
Fig. 1 Model of a food intervention in a primary school.

4 Discussion

Throughout this study, children's enthusiasm and enjoyment of cooking activities was apparent, corresponding well with previous work. (Block et al., 2009; British Nutrition Foundation, 2013; Heim, Bauer, Stang, & Ireland, 2011) Pupils at both the intervention and control schools had good food knowledge and were aware of healthy eating and a balanced diet. This level of knowledge is consistent with other well established studies. (Edwards & Hartwell, 2002; Fitzgerald, Heary, Nixon, & Kelly, 2010; Hart, Bishop, & Truby, 2002).

The intervention itself was reported by both parents and pupils to promote children's enjoyment of cooking and kitchen experience and skills, corresponding with other research. (Block et al., 2012, 2009; Somerset & Markwell, 2009; Yeatman et al., 2013) It is interesting to note the emphasis on savoury cooking established in JOKGP sessions and how this

corresponds with pupils' improved cooking skills and with the emphasis in the revised National Curriculum. (DfE, 2014).

Teachers at the intervention and control schools were, without exception, positive about cooking in primary schools, in particular the experiential learning and support it provided to other learning in the curriculum were highlighted. This goes some way to explaining how the sessions, and the tangible end products reinforced learning, and provided a deeper level of understanding and awareness of food for pupils. The role of the kitchen and garden sessions in supporting learning and behaviour was highlighted by the school community and this again relates well to previous research. (Block et al., 2012; Nelson, Martin, Nicholas, Easton, & Featherstone, 2011; Passy, Morris, & Reed, 2010; Yeatman et al,) Staff at both the intervention and control schools reported that the practical aspect of food activities, and the creation of an end product contributed to pupils' sense of ownership and pride, as seen in other studies. (Block et al., 2012; Heim, Stang, & Ireland, 2009) Interestingly a review of barriers and facilitators to healthy eating (Thomas et al., 2003) recognised children's ownership over food as important and found that children actively sought means of exercising their own food choice. This may partly answer why children particularly enjoyed JOKGP kitchen sessions at the intervention school, as staff quite often incorporated elements of choice, e.g. adjusting ingredients or toppings.

A critical aspect of the cooking sessions was their embedding within a school's curriculum, which provided credence and a mandate for teachers to spend time on these activities. Whilst school-based food projects have been reported to lend themselves to best practice pedagogy, (Brooks, 2009) the critical issue quite often is the time and staffing resource required to do so effectively. The links between the cooking in JOKGP and the National Curriculum at the time of the study were clear to teachers. Pupils were also able to identify links between what they were doing in the kitchen classroom and what they were learning in class. This is particularly relevant given the new emphasis on cooking and nutrition in the revised National Curriculum. (DfE, 2014).

It was evident that for JOKGP to be instigated successfully in a primary school, support and commitment from senior leadership was critical. Whilst headteachers at the intervention and control schools had strong convictions regarding the place of cooking within a school environment, the issue of resources was a key point of discussion, in particular the resource of the kitchen classroom and the staffing costs associated with the sessions. A greater emphasis on food activities *within* a classroom setting was highlighted as a more viable alternative by school leadership; such changes have the potential to improve children's relationship with food without necessarily being prohibitively expensive. An important consequence of this however is teachers' confidence and training to deliver such activities, and interestingly these issues have

been highlighted with respect to the recent emphasis on cooking in the new national curriculum. (Dimbleby & Vincent, 2014) The importance of resources and its heavy burden has been highlighted in other studies relating to such activities. (Block et al., 2009; Somerset & Bossard, 2009) In this climate of educational reform, the pressure on schools to look carefully at the value of activities in terms of pupil achievement was clear. This requirement to stand up to scrutiny by Ofsted featured in both schools' perspectives. Under the new Ofsted framework (due to take effect in September 2015) there is a greater emphasis on wellbeing, with inspectors looking for evidence of an ethos of healthy eating (Harford, 2015); the powerful influence that Ofsted has in making things happen in schools should not be overlooked.

Food neophobia and fussiness are important factors to consider when addressing children's diets. Delivering opportunities for increased exposure and contact with unfamiliar foods has a substantial role to play in promoting a healthy diet for children. Prior research reveals that repeated exposure promotes acceptance (Lakkakula, Geaghan, Zanovec, Pierce, & Tuuri, 2010). In primary school, children are beginning to define themselves, and influence others; this extends to food preferences. Likewise, as children become more influenced by their contemporaries, the effect of peers on food choice is evident. This peer pressure was seen in action in the kitchen classroom, as pupils tried new foods that they had prepared, alongside their peers. This, as well as a closer connection and appreciation of and confidence with food at the intervention school, was seen to accompany pupils' increased willingness to try new food. This corresponds well with previous studies related to the impact of school-based interventions and children's food neophobia and fussiness, (Block et al., 2009; Gibbs et al., 2013; Morgan et al., 2010; Yeatman et al., 2013) as well as the overall implication of cooking enjoyment on children's eating behaviour. (Van der Horst, 2012).

The kitchen sessions also provided a tangible means for children to take these effects home, not only to continue their learning there, but also to have an impact on other family members. Similar take home effects have been reported for other studies, (Lukas & Cunningham-Sabo, 2011; School Food Trust, 2012; Teeman, Featherstone, Sims, & Sharp, 2011) and an improved home food environment via pupils as agents of change has been recognised. (Heim et al., 2011) Schools make efforts to bridge the gap between school and home; children have an important role in linking the learning between the two places. (Grant, 2009) The take home effects revealed in this study provided a means of doing this. Indeed, this study has highlighted the influence that children can have on the food and cooking at home. Although children were generally keen to cook at home, they were restricted by their parents' reluctance, due to time constraints, concerns around safety and untidiness, and limited cooking skills and confidence. This has been seen previously, (Hyland, Stacy, Adamson, & Moynihan, 2006) and a recent report testified to this decline in home cooking where the average food

preparation time for a family meal has fallen to 32 min from 60 min two decades ago, with the sharpest decline in the poorer households. (Kantar World Panel, 2013) Indeed, part of the support for the new National Curriculum's inclusion of cooking and nutrition is related to children growing up without learning basic cooking skills. This reduction in families' food skills correlates with the sentiment heard in schools, that for children missing out on cooking at home, there was some obligation on schools to step in and fill the gap.

The kitchen sessions were associated with children cooking more at home; this agrees with other studies where pupils engaged in food based activities cook more often at home, (Block et al., 2009; Yeatman et al., 2013) and in general, would like to cook more. (British Nutrition Foundation, 2013) Similar take home effects have been reported for other studies (Heim et al., 2011; Lukas & Cunningham-Sabo, 2011; School Food Trust , 2012; Teeman et al., 2011). Children reported cooking more at home, as their enthusiasm and new skills overcame their parents' reluctance. Interestingly, this particular rationale has been previously reported, but in secondary school students (Hyland et al., 2006).

These take home effects were confirmed by both adults and the pupils themselves and are particularly promising as school-based kitchen projects, such as JOKGP aspire to have an impact at home and reach the whole family (exemplified by the recipes being sent home with pupils). Another aspect of the take home effects found in this study was the introduction of foods to a family by pupils. This included children asking parents to make foods that they had tried at school, which corresponds with other work (Block et al., 2009; Yeatman et al., 2013). In addition, pupils involved in JOKGP also introduced parents to new foods or dishes, previously unfamiliar to the family.

The extent of the take home effects must be considered a key finding of this study, and one with meaningful potential. It is interesting to juxtapose the take home effects with the diminishing familial transfer of cooking skills. Further, children's new food skills (e.g. knife skills, adjusting recipes, safety awareness) alongside parents' declining cooking skills and confidence, provide an interesting combination with the potential for further effects on a family's food competencies and practices. Indeed, whilst an objective of school-based food programmes is to equip young people with food skills to improve their diet in the future, there was an indication of more immediate impact, in the transfer of skills within the family. Children empowered with food knowledge and skills, perhaps over and above their parents', feel a greater degree of ownership of food, and this feeds into their growing sense of independence over food choices.

Kitchen sessions encouraged a closer connection with food, and have the potential to promote healthy eating. This corresponds with other studies of school-based cooking and

gardening projects and effects on children's nutrition (Gibbs et al., 2013; Jones et al., 2012; Passy et al., 2010; Ransley et al., 2010; Wright & Rowell, 2010) and children's food awareness and skills. (Passy et al., 2010; Somerset & Markwell, 2009; Yeatman et al., 2013) This, along with the developing priorities of cooking and nutrition in schools, as evidenced by the revised National Curriculum, is further endorsement of school-based food activities. Providing a platform for children to understand the impact of their food choices is particularly relevant for pupils, as they begin to explore and discover their world and exert their preferences. Activities such as these nurture children to become food literate citizens empowered to make informed food choices.

The grounded theory that emerged agrees with the corresponding quantitative study (Ensaff et al., 2014). In particular, children cooking more at home, introducing new foods to a family, as well as children's liking of cooking, and willingness to try new foods, were all borne out in the concurrent quantitative consideration (Ensaff et al., 2014).

This study adds to our understanding of the impact of food and cooking programmes in primary schools. It highlights the influence that such programmes can have beyond the school gate, shaping food choice and practice within pupils' families.

The use of a control school and data collection at two time points provided triangulation of data sources and supported a rich and comprehensive account. In particular, it enabled comparison between the two schools to reveal common key factors, e.g. children's awareness of healthy eating and a balanced diet, school staff's support for cooking activities, whilst also detecting the take home effects accompanying the intervention. Although the study included focus groups with all KS2 pupils at the intervention school, children in Years 3 and 4 (to whom the timetabled kitchen classroom sessions were delivered) reported the greatest benefit. Older pupils at the intervention school were clearly aware of the project, and described a one-off session they had had in the kitchen classroom. It was evident however from the focus group discussions with these pupils, and the level of commentary (e.g. around food skills, cooking at home), that any accompanying consequences were limited, as would be expected.

4.1 Limitations of the study

The self-selection of participants for the focus groups should be acknowledged. Participants in the study, most notably the parents might not reflect the perspectives of other parents at the schools. Further, the subjective nature of the interview and focus group process for stakeholders and their feedback should be acknowledged. There was the potential for approval bias from the intervention school as a whole (having been approached and selected by JOFF), and more specifically from the specialist staff involved in the delivery of JOKGP. Whilst the same individual headteachers, catering managers and specialist staff were

interviewed at baseline as at follow-up, this was not the case for pupils, parents and teachers (with a few exceptions). This should be reflected when considering the findings with respect to the latter participant groups. Whilst this study involved an intervention and a matched control school, the limited number of schools must be acknowledged and the profile of the schools should be considered and placed in context. The data collected were those expressly perceived by participants and the findings are only transferable to similar populations. The implementation of JOKGP was limited to two year groups, and dedicated sessions were restricted to the kitchen classroom with no timetabled gardening sessions. When considering the study's findings, it is important to bear this in mind and likewise, it is important to note that JOKGP as it is today focuses on supporting teachers with resources for food education, garden-based learning, and cooking skills without the emphasis on a kitchen classroom.

5 Conclusions

This study points to the positive impact of school-based kitchen sessions in enthusing, engaging and educating children to have a closer relationship with their food. As well as promoting children's greater awareness and appreciation of food, follow on consequences can influence behaviour around food at home and within the family. The analysis revealed children's active role within a family and the impact that they can have on food choices and practice within the home. These take home effects, where children can act as agents of change should not be underestimated, both in terms of their significance as an outcome to this study, and also in their potential for change in children's diet.

Role of the funding source

Acknowledgements

Appendix. Sample questions and discussion topics from the focus groups with pupils and parents

Pupils

Introduction	Guidelines presented and outline explained to participants Opportunity to ask questions
Drawing activity	I'd like to start by asking you to draw your favourite meal. Can you tell me what you've drawn?
Food activities at school & at home	I'm interested in finding out about any cooking you do at school. Can you tell me about any cooking you do at school? What about at home – can you tell me about any cooking you do at home?
Understanding of 'healthy foods'	What do you think is a 'healthy food'?
Food	Do you like to go shopping for food? Can you tell me what you do when you go shopping? Do you help with choosing food?
Food knowledge	Can anyone tell me where do we get carrots/beef/pasta/bread/cheese from?
New foods	Can you tell me about the last time you tried a 'new' food that you hadn't tried before?
JOKGP [IS only]	I'm interested in finding out about JOKGP – can you tell me about it?
Ending	Opportunity to ask questions, summary and thanks
Parents	
Introduction	Guidelines presented and outline explained to participants Opportunity to ask questions
Food	How would you describe your son/daughter's interest in food/shopping/cooking?
Food activities at school & at home	Can you tell me about any cooking your son/daughter does at school? Can you tell me about any cooking/food preparation that your son/daughter helps with at home?
Food knowledge	How much would you say your son/daughter knows about where food comes from, e.g. carrots grow in the ground?
New foods	Can you tell me about your son/daughter trying new foods? How would you describe your son/daughter when it comes to trying new foods?
JOKGP [IS only]	What do you know about JOKGP? What is your impression of the project? I'm interested in finding out if you think it has had an effect on your son/daughter – do you think it has?
Ending	Is there anything else that you think I should have asked you about? Is there anything else that you would like to add? Opportunity to ask questions, summary and thanks

<mark>References</mark>

Bates, B., Lennox, A., Prentice, A., Bates, C., Page, P., Nicholson, S., et al., National diet and
    Nutrition Survey Results from Years 1, 2, 3 and 4 (combined) of the Rolling Programme

(2008/2009 – 2011/2012) (London)2014

.

Block K., Gibbs L., Staiger P.K., Gold L., Johnson B., Macfarlane S., et al.,Growing community: the impact of the stephanie Alexander kitchen garden program on the Social and learning environment in primary schools, *Health Education & Behavior* **39**, 2012, 419–432.

Block K., Johnson B., Gibbs L., Staiger P., Townsend M., Macfarlane S., et al.,Evaluation of the stephanie Alexander kitchen garden Program: Final report to the stephanie Alexander kitchen garden foundation; Melbourne, 2009.

British Nutrition Foundation. National pupil survey 2013 UK survey results,2013 British Nutrition Foundation; London, UK..

Brooks D., Exploring school kitchen gardens as a potential agent for social change, 2009, The University of Sydney.

Caraher M., Seeley A., Wu M. and Lloyd S., When chefs adopt a school? an evaluation of a cooking intervention in English primary schools,*Appetite* **62**, 2013, 50–59.

Chu Y.L., Farmer A., Fung C., Kuhle S., Storey K.E. and Veugelers P.J.,Involvement in home meal preparation is associated with food preference and self-efficacy among Canadian children, *Public Health Nutrition* **16**, 2013, 108–112.

Cunningham-Sabo L. and Lohse B., Impact of a school-based cooking curriculum for fourth-grade students on attitudes and behaviors is influenced by gender and prior cooking experience, *Journal of Nutrition Education and Behavior* **46**, 2014, 110–120.

Requirements for school food regulations 2014, 2014, SI 2014/1603. The Stationery Office; London, UK.

Department of Health. National Child Measurement Programme: England, 2013/14 school year , 2014.

DfE, The national curriculum in England framework document DFE-00177-2013,2014.

Dimbleby H. and Vincent J., The school food plan, 2013, Department for Education; London, UK.

Dimbleby H. and Vincent J., School food plan annual report, 2014.

Edwards J.S.A. and Hartwell H.H., Fruit and vegetables–attitudes and knowledge of primary school children, *Journal of Human Nutrition and Dietetics* **15**, 2002, 365–374.

Ensaff H., Crawford R., Russell J. and Barker M.E., The impact of a kitchen garden project on children's relationship with food: a quantitative study, In:*Poster Presented at: Annual*

conference of the international society of behavioral nutrition and physical activity; San Diego, CA, 2014.

Fitzgerald A., Heary C., Nixon E. and Kelly C., Factors influencing the food choices of Irish children and adolescents: a qualitative investigation, *Health Promotion International* **25**, 2010, 289–298.

Gibbs L., Staiger P.K., Johnson B., Block K., Macfarlane S., Gold L., et al.,Expanding children's food experiences: the impact of a school-based kitchen garden program, *Journal of Nutrition Education and Behavior* **45**, 2013,137–146.

Grant L., Children's role in home-school relationships and the role of digital technologies, *Futurelab; Bristol, UK* 2009.

Harford S., *Ofsted Letter: Ofsted's inspection of how children and learners keep themselves healthy, including through healthy eating, under the new common inspection framework from September 2015. Official communication (letter) 23 February 2015.*

Hart K.H., Bishop J.A. and Truby H., An investigation into school children's knowledge and awareness of food and nutrition, *Journal of Human Nutrition and Dietetics* **15**, 2002, 129–140.

Heim S., Bauer K.W., Stang J. and Ireland M., Can a community-based intervention improve the Home food environment? Parental perspectives of the influence of the delicious and nutritious garden, *Journal of Nutrition Education and Behavior* **43**, 2011, 130–134.

Heim S., Stang J. and Ireland M., A garden pilot project enhances fruit and vegetable consumption among children, *Journal of the American Dietetic Association* **109**, 2009, 1220–1226.

Hersch D., Perdue L., Ambroz T. and Boucher J.L., The impact of cooking classes on food-related preferences, attitudes, and behaviors of school-aged children: a systematic review of the evidence, 2003–2014, *Preventing Chronic Disease* **11**, 2014, E193.

Hyland R., Stacy R., Adamson A. and Moynihan P., Nutrition-related health promotion through an after-school project: the responses of children and their families, In: *Social Science and Medicine* **Vol. 62**, 2006, 758–768.

Jones M., Dailami N., Weitkamp E., Salmon D., Kimberlee R., Morley A., et al.,Food sustainability education as a route to healthier eating: evaluation of a multi-component school programme in English primary schools, *Health Education Research* **27**, 2012, 448–458.

Kantar World Panel. Appetite for change? nutrition and the nation's obesity crisis , 2013.

Lakkakula A., Geaghan J., Zanovec M., Pierce S. and Tuuri G., Repeated taste exposure increases liking for vegetables by low-income elementary school children, *Appetite* **55**, 2010, 226–231.

Lukas C.V. and Cunningham-Sabo L., Qualitative investigation of the cooking with kids program: focus group interviews with fourth-grade students, teachers, and food educators, *Journal of Nutrition Education and Behavior* **43**, 2011, 517–524.

Morgan P.J., Warren J.M., Lubans D.R., Saunders K.L., Quick G.I. and CollinsC.E., The impact of nutrition education with and without a school garden on knowledge, vegetable intake and preferences and quality of school life among primary-school students, *Public Health Nutrition* **13**, 2010,1931–1940.

Nelson J., Martin K., Nicholas J., Easton C. and Featherstone G., Food growing activities in schools, 2011, NFER; Slough, UK.

Passy R., Morris M. and Reed F., Impact of school gardening on learning final report submitted to the Royal Horticultural Society, 2010, NFER; Slough, UK.

Ransley J.K., Taylor E.F., Radwan Y., Kitchen M.S., Greenwood D.C. and CadeJ.E., Does nutrition education in primary schools make a difference to children's fruit and vegetable consumption?, *Public Health Nutrition* **13**, 2010, 1898–1904.

School Food Trust. Evaluation of the Let's Get Cooking programme final report , 2012, School Food Trust; Sheffield, UK..

Somerset S. and Bossard A., Variations in prevalence and conduct of school food gardens in tropical and subtropical regions of north-eastern Australia,*Public Health Nutrition* **12**, 2009, 1485–1493.

Somerset S. and Markwell K., Impact of a school-based food garden on attitudes and identification skills regarding vegetables and fruit: a 12-month intervention trial, *Public Health Nutrition* **12**, 2009, 214–221.

Teeman D., Featherstone G., Sims D. and Sharp C., Qualitative impact evaluation of the Food for Life Partnership programme, 2011, NFER; Slough, UK.

Thomas J., Sutcliffe K., Harden A., Oakley A., Oliver S., Rees R., et al., Children and healthy eating: A systematic review of barriers and facilitators, 2003,EPPI-Centre, Social Science Research Unit, Institute of Education, University of London; London.

Van der Horst K., Overcoming picky eating. Eating enjoyment as a central aspect of children's eating behaviors, *Appetite* **58**, 2012, 567–574.

Van der Horst K., Ferrage A. and Rytz A., Involving children in meal preparation. Effects on food intake, *Appetite* **79**, 2014, 18–24.

Wright W. and Rowell L., Examining the effect of gardening on vegetable consumption among youth in kindergarten through fifth grade, *Wisconsin Medical Journal* **109**, 2010, 125–129.

Yeatman H., Quinsey K., Dawber J., Nielsen W., Condon-Paoloni D., EckermannS., et al., Stephanie Alexander kitchen garden national program evaluation Final Report, 2013, Centre for Health Service Development, Australian Health Services Research Institute, University of Wollongong.