

Challenging the Learning about Food.

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Food technology in D&T: what do teachers' and pupils' really think?

Marion Rutland



Gwyneth Owen- Jackson



Presentation Overview

- Food science and food technology
- Food technology in schools
- Food product development
- Conceptual framework for food technology
- Previous research findings
- Current research project
- Key findings and issues
- What pupils should understand, know and learn.

Food science and food technology

- Britain's economy: **food and drink industry is the largest sector of manufacturing activity**, employing 400,000 workers, 16% of the manufacturing workforce.
- If pupils do not study **food science and technology** in school it is unlikely they will study it at higher education levels
- There are too **few graduates** to meet industry demands.
- CFA's role is to **champion best practice hygiene standards for UK chilled prepared food**

Kaarin Goodburn MBE -
Director & Secretary of the
Chilled Food Association (CFA)



Food technology in school ...

is about the development of food products to be manufactured and sold to the consumer

(DATA leaflet, undated)



Food product development

Developing new products is a complex process - requiring knowledge of ingredients, processing techniques, [packaging](#) materials, [legislation](#) and [consumer](#) demands and preferences



(Campden BRI)



- a lack of clarity about the relationship between the teaching of food as a life skill and the use of food as a medium for teaching D&T

(Ofsted 2006 p.2)

- learning concerned with food technology should be more intellectually challenging and include 'designing, product development, empirical testing and applying maths and science'

(Ofsted, 2008, p.5)

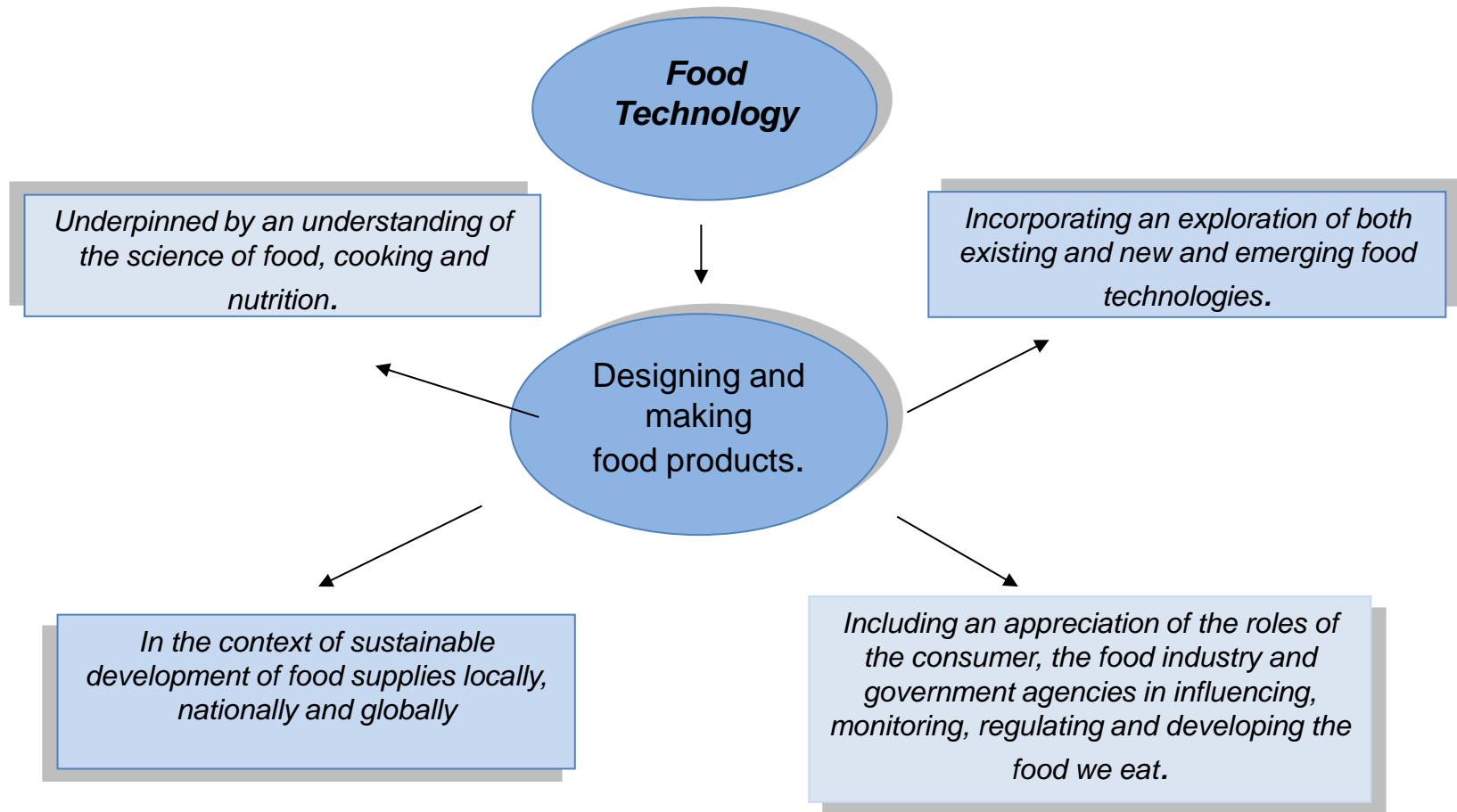
Investigating a need to modernise food technology

In 2009 data was collected from 2 conferences on nanotechnology and 5 interviews with people with an expertise and interest in food technology



- Owner of a small organic farm
- Head of a University Centre for Food with food degree programmes and a food research centre
- Two educational managers: a national nutrition foundation and a programme to develop practical cooking in schools
- Senior technologist of a large UK retailer with over 50% of their business in food

Conceptual Framework for food technology



Previous research and findings

Interviews:

- *two initial teacher educators and a curriculum developer.*
- *four food technology teachers*
- *a university lecturer concerned with food related degree courses, food technology national examiners and a researcher from the food industry*

Analysis:

- *food technology KS3 schemes of work*
- *food technology GCSE specifications*

Key issues:

- lack of understanding of how to design with food
- importance of science, not just nutrition when teaching food technology
- need for integration of underlying scientific principles into practical, food tasks
- importance of a cross-curricular approach to prevent overlap
- need for understanding of basic concepts when processing food in industry

KS3:

- lots of practical work, but with limited skills.
- very little teaching of food science, new and emerging technologies, environmental issues, role of government & other agencies.

KS4

- concern over requirement to 'draw' food products
- some references to sustainability and environmental issue
- variations in references to food manufacturing
- little on new & emerging technologies/ role of government and food agencies

*2013 Food technology in D&T:
what do teachers and pupils in England really think?*

Involved 15 teachers in schools across the UK and
202 pupils aged 11-14

Data collection via a questionnaire, analysed
quantitatively and qualitatively



Research findings

- Huge variation in time for food technology from 2.5 hours to 114 hours annually
- All teachers & majority of pupils (87%) agreed food technology should be taught
- Majority reason, because it taught 'life skills' or 'how to cook'
- Yet 91% pupils thought they should be taught to 'design & make' with food

What teachers think pupils learn

- Practical skills (57%)
- Understanding food/ingredients; Time management/organisation (36%)
- Nutrition, Food safety and hygiene; Team work; Independence (29%)
- Healthy eating; Planning (21%)
- Creativity (14%)
- Food labelling; Social/cultural aspects of food; Problem solving; Designing; Research skills; Social skills (7%)

How pupils think food technology could be improved

- more practical work (17%)
- more curriculum time (16%)
- recipes which are more interesting, complex or challenging (13%)
- more choice over what they cooked (11%)

Key issues/questions

- Inclusion in current D&T Pos in England of *'cooking and nutrition'*
- Impact of *limited curriculum time, teacher availability, physical resources* to teach all aspects of food technology together with developing a high level of 'cooking skills'?
- Will teachers opt for *just teaching to 'cook nutritious meals'* or will they want to give a *broader, rigorous and more intellectually demanding curriculum* that provides potential routes into interesting future careers?
- teachers considered *aspects of the food technology conceptual framework to be important*, yet there was *little evidence of them being taught until pupils reached 14-16 years*

1. Background information on your school and pupils: How many pupils are there in the school? How many food technology lessons do pupils have in Year 7 Year 8 Year 9 How long does each lesson last? Do year 9 pupils study NC D&T or GCSE?		
Do you think all pupils should study food technology?	Yes	No
1. What is your reason for your answer to Q1?		
Currently, pupils are required to 'design and make' food products, do you agree with this?	Yes	No
1. What is your reason for your answer to Q3?		
1. What do you think pupils have to know/understand to be able to design with food?		
1. What do you think are the key aspects of food technology for pupils to learn?		
1. What do you think that pupils learn when they study food technology?		
1. What do you think is missing from food technology teaching in schools?		
1. How will you develop your food technology programme over the coming academic year?		

The teachers' questionnaires

Pupil's questionnaire

1	Do you think all pupils should study food technology?
2	What is your reason for saying yes or no to the above question?
3	Currently, in the national curriculum pupils are required to 'design and make' food products, do you agree with this?
4	What is your reason for saying yes or no to the above question?
5	When you do 'design and make' with food, what do you have to know to be able to design food products?
6	If you had to explain or describe food technology to a pupil who didn't know about it, how would you explain it, what would be the key points?
7	What have you learnt from your food technology lessons?
8	Are there any things that you think should be in food technology that are not in your lesson?
9	How do you think food technology could be improved?

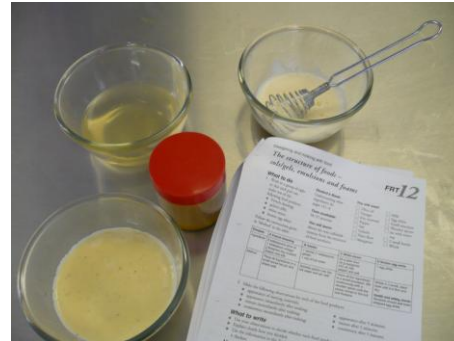
What could food technology be?

- What should young people *know and understand about food* that will enable them to choose and use food wisely?
- How will young people develop an *understanding of the implications of current concerns* such a health, consumer understanding and awareness, food production and world food availability?
- How will they *take responsibility for the way they choose and use food* and become *pro-active* in developing a critical discourse concerning food in our society?

Rutland and Barlex 2009)



- Practical work could be developed so that it can *support pupils' learning* not only of *practical skills* **BUT** including *food science and nutrition, food sustainability issues and food product development*



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This could be done through

- Discussion on the function of ingredients
- Experimental practical work, with ingredients and with cooking methods
- Detailed teaching about nutrition
- Investigation into the source of food ingredients and the issues around this
- Investigation/research/discussion of food issues
- Real food product development work

Food technology : knowledge and understanding

Sources of foods: animal; plant; fungi; synthetic foods; genetically modified foods.

Nutrients in foods: fats and oils, carbohydrates, proteins, vitamins and minerals, water; human dietary and health requirements throughout life, digestion & absorption; additives and functional foods

Physical and chemical properties of ingredients: colloidal structures/systems of foods (e.g. sols, gels, emulsions, foams); changes that take place during preparation and cooking (e.g. gelatinisation, coagulation, caramalisation, Maillard reaction, emulsification, fermentation, antioxidants); enzymatic changes in the production of bread, beer and wine); use of raising agents (yeast, chemical)

Sensory properties of foods: flavour, odour; colour, texture and appearance

Preparation and cooking of food products; food choice; the use of a broad range of processes and skills; choice and use of ingredients for desired characteristics (e.g. shortening); effects of heat on different foods; use of heat transfer (e.g. radiation, convection, conduction); food safety and hygiene.

Preservation of foods to prevent spoilage: food spoilage caused by yeasts, moulds, and bacteria; preserving foods (e.g. chilling, freezing, canning, dehydration, UHT, irradiation, modified atmosphere packaging); food safety and hygiene (food poisoning and cross contamination).

Awareness of industrial and consumer practices: food product development; cultural & socio-economic needs; manufacturing and large scale production methods (e.g. job/craft, batch, mass, continuous flow, CAM, quality control); food handling in the food industry (HACCP, food safety and the law); modern food processing (e.g. impact of new technologies/novel ingredients/nanotechnology); consumer laws; labelling and packaging.

Thank you for listening

m.rutland@roehampton.ac.uk

gwyneth.owen-jackson@open.ac.uk