

Cooking and food skills – the current picture

A snapshot of cooking and food skills among
adults on the island of Ireland and their
relationship with diet



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Foreword

This research provides a holistic approach to understanding cooking skills and food skills on the island of Ireland (IOI) and their impact on an individuals' diet. By integrating social science perspectives with those of nutrition and gastronomy a cooking and food skills measurement tool was developed, validated and used to explore the current level of cooking and food skills on the IOI and how they relate to dietary practices. Qualitative data allowed for investigation of where these skills originated, how these skills have been developed, and the most effective way to enhance these skills through learning.

This research was conducted with a view to enhancing current understandings of how people use food and cooking and other skills and to recommend ways of improving these skills in the future to promote healthful diets.

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1 Key Findings

Consumer survey of cooking and food skills and diet quality

- A quantitative survey tool was successfully developed, piloted and validated to measure adults cooking skills and food skills abilities. The cooking skills and food skills abilities scales were found to be reliable, valid and easy to use in a large scale survey of adults on the island of Ireland.
- The adults who reported having low cooking and food skills usage and confidence were men, younger adults and those with few or no qualifications.
- Greater perceived cooking skills and food skills abilities were not conclusively associated with healthier dietary choices or dietary patterns as measured on the scales used in the study. This is due to the many other factors related to dietary choice and pattern such as socio-demographics (age, gender, education); nutritional knowledge; and psychological factors such as food and health motivations and cooking identity. However, cooking skills and food skills abilities did have a differential impact upon aspects of the diet, most notably in relation to saturated fat, where those who had greater perceived cooking skills reported eating less saturated fat.

What are the barriers and facilitators related to cooking from scratch?

- A range of barriers and facilitators to cooking from scratch were identified, highlighting the complexity of the process.
- Barriers included: scared to start from scratch; cooking under pressure; getting food ready quickly before children get hungry; kids and kitchen chaos; perceived labour intensity; frustrating fussy eaters; making multiple meals; portion distortion (inadequate knowledge about portioning food appropriately); defrosting doubt.
- Facilitators included: pantry preparedness; perceived health benefits; sharing cooking; cultivating cooking creativity; batch cooking benefits busy schedules
- Cooking from scratch cooks considered the facilitators to outweigh the barriers.
- Providing adults with the opportunity to experiment with food where mistakes are not viewed as failure is important for behaviour change. Thus, encouraging trial and error, which provides the building blocks for developing confidence, problem-solving abilities and innovation through increased experimentation with food should be promoted as part of community-based interventions.

Is there a role for information technology aids for learning cooking skills?

- It is clear that video technology has a place in supporting some people to cook from scratch.
- The use of video technology promoted cooking skills in a number of ways:
 - visualisation of the cooking process
 - reassurance during the process
 - application of learning or replication of the process
 - flexibility to work at your own pace
 - selective access to the video where required.
- Overall, the results suggest that enjoyment and confidence are key components of learning new cooking and food skills and the intention to put the learned skills into practice in the future.

2 Introduction

Why this research was commissioned?

The increasing affordability and popularity of pre-prepared and packaged foods has led to the suggestion that many people are losing skills related to food and cooking (1-3). The very nature of cooking has changed, whereby ‘cooking from scratch’ using raw, fresh ingredients, is being replaced by the use of pre-prepared foodstuffs (4). Evidence supports the relationship between food literacy – defined as the range of knowledge and skills needed to use food – and the food choices people make. Consequently, this may lead to an increased dependency on ready prepared food, which is typically higher in fat, sugar and salt than raw ingredients, highlighting the need to investigate whether cooking and food skills influence the healthiness of the food we eat (5, 6). To date, little research has been done on cooking and food skills on the Island of Ireland (IOI). This report describes the research undertaken to address this gap in knowledge.

3 Aims and Objectives

This research aims to explore and understand the use of food and cooking skills and the impact of these skills on the healthiness of the diets of adults (aged between 20 and 60) on the IOI.

Objectives

1. To measure the cooking and food skills used by adults on the island of Ireland, by:
 - a. Developing and piloting a survey tool for measuring adults' cooking and food skills
 - b. Using the survey tool on a representative sample of adults on the IOI aged between 20 and 60 to assess their cooking and food skills and the factors that predict the use of cooking and food skills – including age, gender, level of education and social class.
2. To measure the healthiness of the diets of the adults sampled using two existing validated measures of diet quality:
 - a. Eating Choice Index (ECI) and
 - b. Dietary Instrument for Nutrition Education (DINE) (saturated fat and fibre).
3. To investigate the relationship between cooking and food skills and the healthiness of the diets of the adults sampled by correlating the cooking and food skills measures with the measures of diet quality.
4. To investigate the barriers and facilitators that adults face in using food and cooking skills to prepare meals from scratch.
5. To explore the use of information technology aids for learning cooking skills.
6. To set out recommendations for the enhancement, advancement and use of cooking and other food skills among the adult population on the island of Ireland.

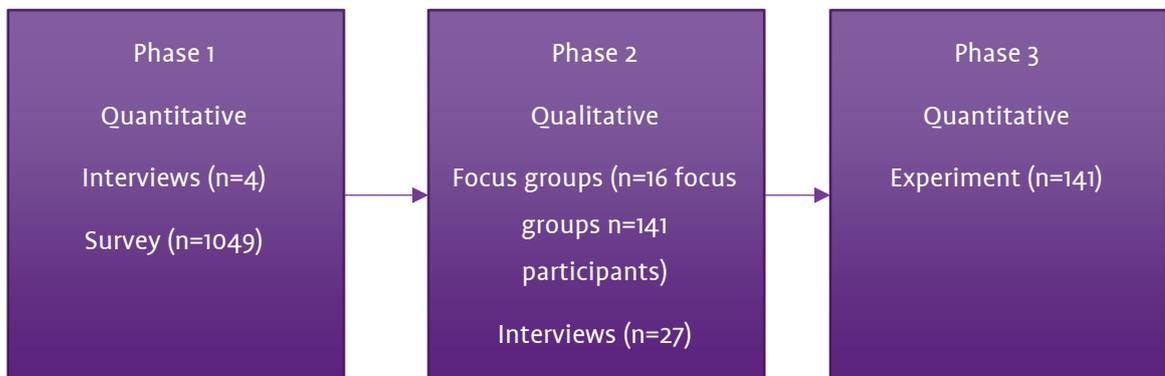
4 Research methods

Overview

A three-phase study design using qualitative and quantitative techniques was used (Figure 1).

1. Quantitative data were collected via a nationally representative consumer survey on the IOI to measure cooking and food skills, diet quality and sociodemographic characteristics.
2. Qualitative techniques (interviews and focus group sessions) explored consumers' use of cooking and food skills to identify the barriers and facilitators to cooking.
3. An experimental study was used to explore how consumers learn cooking skills using technology.

Figure 1: Overview of study design



Ethical approval

All of the procedures involving people were approved by the Research Ethics Committee in the School of Biological Sciences, Queen's University Belfast (QUB), and by the Ulster University Research Ethics Committee in the Ulster University Business School. Verbal informed consent was obtained from all participants.

Consumer survey of cooking and food skills and diet quality

In the first phase of this study, a survey tool was developed to measure cooking skills and food skills and this tool was used in a consumer survey to assess cooking and food skills.

Development of the survey tool

The design of the survey tool was informed by the findings from a review of the current literature on cooking and food skills (7). A number of interviews (n=4) were also conducted with experts in the area of health promotion, including healthy eating and food skills education, to inform the development of the survey. The survey tool measured cooking and food skills, and diet quality and gathered relevant demographic information. The demographic variables comprised age, gender, education level and socio-economic status (SES). The survey was piloted in the field on two occasions prior to the main fieldwork. The specific measures used in the survey tool are described as follows.

Cooking and food skills measure

The cooking skills ability scale comprised 14 items e.g. blending, baking and chopping (Table 1). The food skills scale comprised 19 items and focused on food-related skills e.g. meal planning, writing a grocery list and comparing prices (Table 2). Participants were only asked to rate their cooking skills or food skills ability if they reported using the cooking or food skills in question after being shown a list.

Diet quality measure

Two separate validated measures were used to measure diet quality:

- Eating Choice Index (ECI) (8) and
- Dietary Instrument for Nutrition Education (DINE) (9).

The ECI is a brief, four-item measure to discriminate healthy and unhealthy eating choices. It covers frequency of consuming breakfast and two portions of fruit per day, and the type of bread and milk consumed. ECI scores range from four to 20, with a higher score indicating healthier eating choices.

DINE is a brief dietary assessment questionnaire based on the frequency of consumption of 19 different groups of foods which account for around 70% of the fat and fibre in the typical UK diet, with attention paid to the main food sources of saturated fat. DINE Fat and DINE Fibre scores are classified as follows: less than 30, low fat or fibre intake; 30 to 40, medium fat or fibre intake; and greater than 40, high fat or fibre intake. A high DINE Fat score therefore represents a high saturated fat intake (considered unhealthy in accordance with UK and ROI dietary guidelines) and, conversely, a high DINE Fibre score represents a high fibre intake (considered healthy in accordance with UK and ROI dietary guidelines).

Table 1: Cooking skills items* used in the questionnaire to measure skill usage and level of confidence

Cooking skills and practices
How good would you say you are at the following on a scale of 1-7 where 1 means very poor and 7 means very good? (14 items)
Preparing and cooking raw meat or poultry
Peeling and chopping vegetables
Boiling or simmering
Frying or stir-frying food
Roasting food
Chopping, mixing and stirring food
Using herbs and spices to flavour food
Preparing and cooking raw fish
Microwaving food
Steaming food
Stewing food
Making sauces and gravy from scratch
Blending food
Baking cakes, bread or buns

*Devised and adapted from National Diet and Nutrition Survey (NDNS) Year 1 (10), Barton et al. (2011) (11), Condrasky et al. (2011) (12), Wang & Worsley (2014) (13), Caraher, Dixon, Lang & Carr-Hill (1999) (14), Lyon, Sydner, Fllstrom, et al. (2011) (15) and by the research team.

Table 2: Food skills items* used in the questionnaire to measure skill usage and level of confidence

Food skills use
How good would you say you are at planning meals ahead e.g. for the day/week ahead on a scale of 1-7 where 1 means very poor and 7 means very good? (19 items)
Keeping basic items in your cupboard for putting meals together, e.g. herbs and spices, dried and tinned food
Shopping with specific meals in mind
Reading the best-before date on food
Planning how much food to buy

Preparing or cooking a healthy meal with only a few ingredients on hand
Using leftovers to create another meal
Shopping with a grocery list
Preparing or cooking a meal with limited time
Planning meals ahead (e.g. for the day or week ahead)
Reading the storage and use-by information on food packets
Knowing what budget you have to spend on food
Comparing prices before you buy food
Following recipes when cooking
Preparing meals in advance, e.g. a packed lunch, partly preparing a meal in advance
Buying food in season to save money
Cooking more or double recipes, which can be used for another meal
Reading the nutrition information on food labels
Balancing meals based on nutritional advice of what is healthy
Buying cheaper cuts of meat to save money

* Devised and adapted from National Diet and Nutrition Survey (NDNS) Year 1 cooking items (10), Barton et al. (2011) (11), Brunner, van der Horst & Siegrist (2010) (16), Condrasky, (2006) (17), Morin et al. (2013) (18), Swindle, Baker, Auld (2007) (19) and by the research team.

Data collection and sample

Quota sampling was used to obtain a nationally representative sample of 1,049 adults aged between 20 and 60 from the IOI (NI and ROI) based on age, gender, socioeconomic grouping and area of residence. Respondents were interviewed on a face-to-face basis in their own homes using Computer Assisted Personal Interviewing (CAPI). Fieldwork on the survey was conducted between October 2014 and December 2014.

Data analysis

All data were analysed using IBM SPSS Statistics Version 22 (20). Descriptive statistics, correlations, factor analysis and regression analysis were undertaken.

Identification of the barriers and facilitators related to cooking from scratch

Phase two of the study used two methods (interviews and focus group sessions) to explore adults' use of cooking and food skills and to identify the barriers and facilitators to cooking from scratch using raw and fresh ingredients.

Data collection and sample

Participants for the interviews were selected using the following criteria:

- Aged between 20 and 60, and resident in either NI or ROI
- Responsible for preparing at least one household meal per a week
- Not involved in professional cookery.

Every effort was made to include participants from different educational backgrounds and age groups, with a range of perceived cooking abilities. Participants were recruited using purposeful sampling from emails circulated via three universities (one in Northern Ireland [NI]; and two in the Republic of Ireland [ROI]). A total of 27 participants (n = 16 from NI, n = 12 from ROI) met the eligibility criteria for the research and were included in the final sample. The sample size was adequate for data saturation.

Participants for the focus groups and experiment (see section 4.5) were selected using the following inclusion criteria:

- Female, aged 20 to 39 with child/children under 16 living at home
- C2DE household
- Sufficient level of English to understand recipe
- Buys food ready-made and reheats it or uses mostly pre-prepared ingredients and assembles the dish or uses mostly pre-prepared ingredients and some fresh, basic or raw ingredients.

These criteria were based on results from the consumer survey which identified the most vulnerable groups in relation to cooking and food skills ability. Although males were identified as a sub-group with poor cooking skills, females with families were selected as the target group for the focus group as they were the same sample for the experiment. This is because the experiment was a pilot study to test the effectiveness of a possible future BCT-based intervention and an experiment using a motivated group for whom such an intervention would be of greater benefit (younger females with children) was deemed the most appropriate one and thus was selected for the experiment.

A total of 16 focus group sessions were undertaken (eight in NI and eight in ROI), and 141 participants (n=77 NI; n=64 ROI).

Development of topic guide

The results from a review of the academic literature (7) were used to inform the development of the interview and the focus group topic guides.

The topic guide for the interviews and focus groups was designed to explore topics related to cooking attitudes, skills and practices in general (e.g. motivations, cooking confidence, cooking habits, and the acquisition and advancement of cooking skills). However, additional topics, including cooking experiences as part of the experiment and the influential role of technology on cooking skills and practices, were also discussed.

Procedures

Before the interviews and the focus group sessions, the participants were assured that their data would remain anonymous. All of the data were audio-recorded after verbal consent had been obtained.

The interviews were conducted at the participants' own convenience, either by telephone or face-to-face. The interviews lasted between 20 and 60 minutes (mean duration, 36 minutes). At the close of the interviews, the participants were thanked. No monetary incentive was provided.

The focus group sessions (NI =8; ROI =8) were held at Ulster University, Coleraine, and St. Angela's College, Sligo. Prior to the focus group sessions, the participants took part in a cooking experiment (see phase three). Each focus group session lasted between 40 and 70 minutes and was facilitated by a moderator and an assistant moderator (mean duration, 60 minutes). At the close of the sessions, the participants were thanked and provided with a monetary incentive, a cookbook and a pen as a mark of gratitude for participating in the study.

Data analysis

The audio transcripts were professionally transcribed and imported into the qualitative analysis software package, NVivo 10 (21). A thematic analysis was undertaken to identify the barriers and facilitators to cooking and food skills. All data were independently coded by two researchers, a codebook was created and codes were grouped together to create themes. Demonstrative quotes were extracted for each theme to highlight the relationship between the data and the interpretations made. Using the grounded theory approach, the codes and themes were linked to develop a model.

Exploration of the use of information technology aids for learning cooking skills

The final phase of the study involved a cooking experiment and focus group discussion to understand the impact of information technology aids on the learning of cooking skills and practices.

Data collection and sample

The participants in the experiment (n=141) were those recruited for the focus groups (see section 4.4.1).

Experimental design and measurements

Participants were provided with cooking instructions on how to cook a lasagne from scratch. Participants were randomly assigned to one of the four experimental conditions illustrated in Table 3. There were no differences between the participants assigned to the different conditions for any of the measured variables. This meant the participants in the different groups were similar to each other before they took part in the experiment.

Behaviour change techniques (BCTs) used in previous cooking interventions were critically evaluated (22), and some successful techniques identified in the analysis were selected for the experimental task.

Table 3: Description of experimental design and Behavioural Change Techniques (BCTs) used

Condition	Control group	Video modelling	Video promoting	Video prompting
BCTs used*	BCT 21	BCT 21, 22	BCT 9, 21, 22	BCT 9, 21, 22, 26
Description	Recipe card only	View full video demonstration (plus recipe card)	View video segments (plus recipe card)	Free access to video segments (plus recipe card)
Instruction	Follow recipe card	View full video before experiment. Use recipe card as and when needed.	View each video segment then complete task in a step-by-step sequence. Use recipe card as and when needed.	View only relevant video segments as and when needed. Use recipe card as and when needed.
Sample	34	33	35	39

* **BCT 9:** Set graded tasks; **BCT 21:** Provide instruction on how to perform behaviour; **BCT 22:** Model or demonstrate the behaviour; **BCT 26:** Behavioural practice/rehearsal, as regardless of whether the participants watch the podcasts or not, they are being advised to ‘practise’.

The target meal, cooking a lasagne from basic ingredients, involved a number of varied and technical cooking techniques and skills (e.g. weighing the ingredients, chopping vegetables and making white sauce). At the beginning, midway and at the end of the task, participants rated their likelihood of cooking the meal from scratch in the future alongside rating their confidence, enjoyment and perceived difficulty in doing the task. Following this, participants took part in a focus group to discuss their experiences of doing the task in addition to other cooking and food skills-related topics (as discussed in 4.4.2).

Data analysis

The quantitative data were analysed using IBM SPSS Statistics Version 22 (20). The qualitative data were professionally transcribed and imported into the qualitative analysis software package NVivo 10 (21).

5 Results

This section provides an overview of the results of the three-phase study.

Consumer survey of cooking and food skills and diet quality

A total of 1,049 participants were included in the sample, and their demographic characteristics are shown in Table 4.

Table 4: Demographic characteristics of the survey participants

Gender	Percentage of survey participants
Male	43.8%
Female	56.2%
Age	
20–39 years	52%
40–60 years	48%
Education	
No qualifications or compulsory level (n=135)	12.9%
Secondary/further education (e.g., NVQ) (n=656)	62.5%
University or higher (UG or PG degree) (n=258)	24.6%
Socioeconomic	
ABC1 (n=511)	48.7%
C2DE (n=538)	51.3%

n=1049

The survey addressed 14 cooking-related skills and 19 food-related skills, as displayed in

Table 5 and

Table 6. The results showed *cooking meat* and *peeling/chopping vegetables* were the most commonly used cooking skills and baking was the least-used cooking skill (see

Table 5). Only 30% of the participants claimed to use all of these cooking skills, and 7% claimed to use none of these cooking skills.

Table 5: Reported use of cooking skills and practices by survey participants

Cooking skills and practices	Percentage of survey participants
Preparing and cooking raw meat/poultry	78.5%
Peeling and chopping vegetables	75.4%
Boiling or simmering	70.4%
Frying or stir-frying food	68.4%
Roasting food	68.2%
Chopping, mixing and stirring food	67.9%
Using herbs and spices to flavour food	55.8%
Preparing and cooking raw fish	51.8%
Microwaving food	47.7%
Steaming food	47.4%
Stewing food	47.4%
Making sauces and gravy from scratch	45.2%
Blending food	43.0%
Baking cakes, bread or buns	40.2%

In relation to food skills, the results showed that keeping basic ingredients in the cupboard to put together a meal followed by shopping with specific meals in mind were the most commonly used food skills. Buying cheaper cuts of meat to save money and balancing meals based on nutritional advice of what is healthy were the least-used food skills (see

Table 6). Only 16% of the participants claimed to use all of these food skills, and 7% claimed to use none of these food skills.

Table 6: Reported use of food skills and practices by survey participants

Food skills use	Percentage of survey participants
Keeping basic items in your cupboard for putting meals together, e.g. herbs and spices, dried and tinned food	62.7%
Shopping with specific meals in mind	61.8%
Reading the best-before date on food	56.8%
Planning how much food to buy	47.0%
Preparing or cooking a healthy meal with only a few ingredients on hand	45.6%
Using leftovers to create another meal	44.6%
Shopping with a grocery list	44.4%
Preparing or cooking a meal with limited time	44.3%
Planning meals ahead (e.g. for the day or week ahead)	43.0%
Reading the storage and use-by information on food packets	42.4%
Knowing what budget you have to spend on food	39.6%
Comparing prices before you buy food	38.6%
Following recipes when cooking	38.5%
Preparing meals in advance, e.g. packed lunch, partly preparing a meal in advance	33.4%
Buying food in season to save money	30.2%
Cooking more or double recipes which can be used for another meal	29.0%
Reading the nutritional information on food labels	28.6%
Balancing meals based on nutritional advice of what is healthy	27.1%
Buying cheaper cuts of meat to save money	25.5%

Cooking skills and food skills confidence

In the survey, where a participant reported using a specific cooking skill (from the list of 14 items), they were asked to report how good they were at using this skill on a scale of 1 to 7 (1= very poor to 7= very good). The sum of these scores was termed *cooking skills confidence* (range from 0–98; mean = 47.8) and the scores for participants are presented in Table 7. On the *cooking skills confidence* scale, males scored significantly lower than females (38.0 versus 55.4); older participants (40 to 60 years) scored significantly higher than younger participants (20 to 39 years) (52.4 versus 43.5); and those with

no qualifications or compulsory level only scored significantly lower than those with secondary/further or higher education (41.7 versus 47.8).

Similarly, where participants reported using a specific food skill (from the list of 19 items), they were also asked how good they were at using this skill on a scale of 1 to 7 (1= very poor and 7= very good). The sum of these scores was termed *food skills confidence* (range from 0–133; mean = 45.8). Overall, the sample mean for *food skills confidence* was 45.8 (SD 38.6); males scored significantly lower on food skills confidence than females (35.5 versus 53.8); older participants scored significantly higher than younger participants (51.2 versus 40.9); and again, those with no qualifications or compulsory level education only scored significantly lower on food skills confidence (34.4 versus 47.0) (see Table 7). There was no difference between high and low socioeconomic groups in their cooking and food skills.

Table 7: Mean cooking skills and food skills confidence measures based on demographic variables

	Cooking skills confidence mean score (SD)	Food skills confidence mean score (SD)
Age		
20-39 years (n=545)	43.5 (28.7)***	40.9 (36.5)***
40-60 years (n=504)	52.4 (29.3)	51.2 (40.2)
Gender		
Males (n=459)	38.0 (27.6)***	35.5 (35.7)***
Females (n=590)	55.4 (28.4)	53.8 (39.0)
Education		
No qualifications or compulsory level only (n=135)	41.7 (29.0)*	34.4 (31.7)**
Secondary education/further education (e.g., national vocational qualification) (n=656)	48.7 (29.5)	47.7 (39.4)
University or higher (undergraduate/postgraduate degree) (n=258)	47.8 (29.3)	47.0 (39.1)
Socioeconomic grouping		
ABC1 (n=511)	49.1 (29.4)	46.3 (38.7)
C2DE (n=538)	46.5 (29.2)	45.4 (38.6)

*** Group difference is significant at the 0.001 level (2-tailed); ** Group difference is significant at the 0.01 level (2-tailed); * Group difference is significant at the 0.05 level (2-tailed) using t-tests and one-way ANOVAS.

Associations between cooking skills and food skills and diet quality

Although distinctive, *cooking skills confidence* and *food skills confidence* were very highly correlated. Those who scored highly in cooking skills confidence also scored highly in food skills confidence.

Table 8: Mean values and correlation coefficients between cooking skills confidence, food skills confidence and diet quality measures.

	Mean (SD)	DINE ^a fat score	DINE fibre score	Cooking skill confidence	Food skills confidence
Eating choice index score	12.2 (2.9)	-.24***	.38***	.26***	.19***
DINE fat score	35.5 (13.0)		.13***	-.22***	-.11***
DINE fibre score	34.6 (11.3)			.05	.03
Cooking skills confidence	47.8 (29.3)				.76***
Food skills confidence	45.8 (38.6)				

^a Dietary Instrument for Nutrition Education; *** Correlation is significant at the 0.001 level (2-tailed); ** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed)

The Eating Choice Index score was positively correlated with DINE Fibre and negatively correlated with DINE fat. This suggests that those with a healthier diet ate more fibre and less saturated fat (Table 8). Both cooking skills and food skills confidence were positively correlated with the ECI and negatively with the DINE saturated fat score. This suggests that those who scored highly in cooking and food skills confidence had a healthier diet and their diets had lower amounts of saturated fat. There was no significant correlation between cooking and food skills confidence and DINE Fibre. This suggests that

those who have high cooking and food skills confidence did not necessarily eat more fibre. The reasons for this are unclear but levels of fibre intake were low for the sample overall and perhaps indicates that the nutritional messages around fibre have not permeated well in comparison to saturated fat intake, regardless of perceived cooking skills or food skills. Fibre is often not a key element of front-of-pack labelling, meaning the population may be less aware of the targets for a healthy diet.

Identification of the barriers and facilitators related to cooking

This phase of the study used two methods (focus group sessions and interviews) to explore consumers' use of cooking and food skills and to identify the barriers that impede and the facilitators that support consumers in considering cooking from scratch. A summary of the barriers to and facilitators to cooking from scratch are described in Table 9 and Table 10 respectively.

Table 9: Barriers to cooking from scratch

Barrier	Description
Scared to start from scratch	A fear of cooking using fresh ingredients stemming from a lack of confidence, inexperience of cooking from scratch and a reported absence of skills.
Cooking under pressure	Generalised time constraints, family pressures, physical fatigue and general apathy or lack of motivation, as well as contending with post-meal washing up, contributed to preventing consumers from cooking from scratch.
Getting food ready quickly before children got hungry	Participants' busy lifestyles and schedules, including the pressures of work, general competition for time and the sense of urgency attached to needing to feed children precisely when or before they got hungry required optimal meal-time solutions for which cooking from scratch did not allow time.
Kids and kitchen chaos	The potential for chaotic kitchens resulting from the co-existence of the need to supervise children while quickly preparing an anticipated meal is a deterrent to cooking from scratch.
Perceived labour intensity	The conviction that convenience food is less expensive than cooking from scratch, coupled with the expense, perishability (waste and inability to store) and labour intensity associated with fresh ingredients, served to deter consumers from cooking from scratch.
Frustrating fussy eaters	Feeling ill-equipped to cater for children with restrictive palates (mostly described as fussy eaters) often meant participants resorted to having to serve bland carbohydrate-type convenience meals. This same barrier was not attributed to convenience cooking.
Making multiple meals	Making multiple meals to satisfy family members' different food preferences, to satiate urgently a child's hunger demands, and to accommodate fussy eaters generally meant resorting to convenience meals.

Portion distortion	Inadequate knowledge about portioning food appropriately, leading to over-compensating with fast carbohydrate convenience foods, especially in terms of meeting the satiety needs of teenage appetites.
Defrosting doubt	A lack of awareness and assuredness around food safety resulted in participants being dissuaded from cooking using frozen ingredients that require defrosting.

Table 10: Facilitators of cooking from scratch

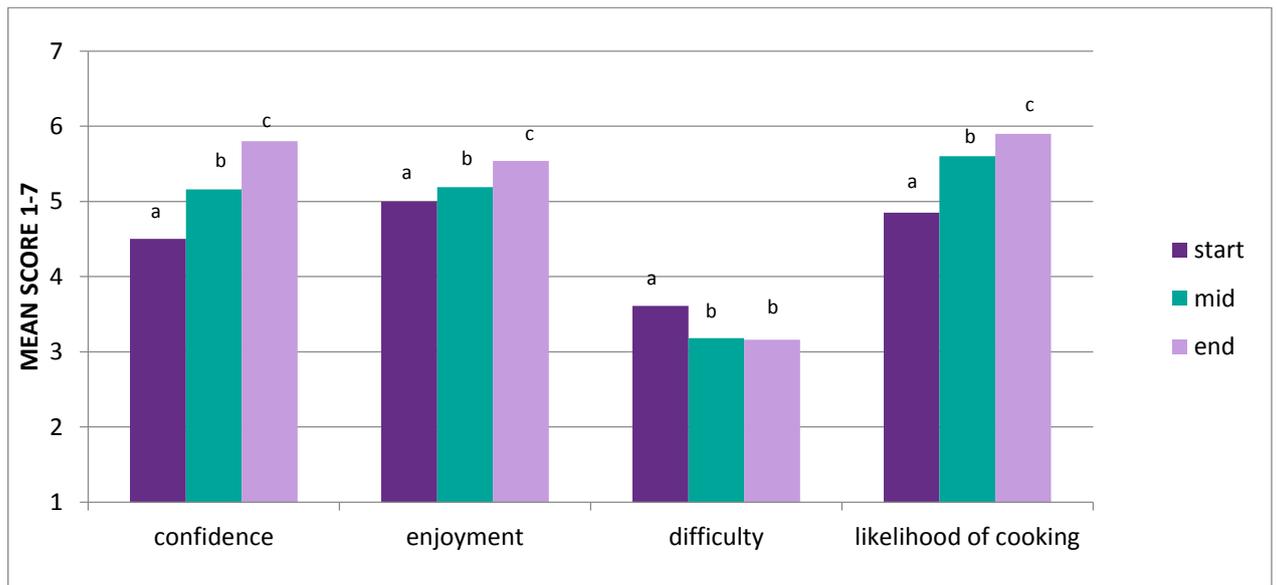
Facilitator	Description
Pantry preparedness	Cost is viewed as both a barrier and a facilitator to cooking from scratch due to the legitimate debate that buying store-cupboard ingredients may work out more expensive because of the initial outlay. Subsequent cooking would result in the cost being cheaper because these would already be available as staple foods.
Perceived health benefits	Interest in producing healthy food where the nutritional quality of the food was evident. Authentic cooking from scratch is a sought-after ideal.
Sharing cooking	Cooking together encourages cooking from scratch, involving the sharing of a necessary domestic task to make it more manageable.
Cultivating cooking creativity	Cooking from scratch enables the expression of creativity, and it assists children in learning valuable life and problem-solving skills.
Batch cooking benefits busy schedules	Batch cooking from scratch when complemented with the cook’s organisation skills can deliver benefits in terms of advance meal-planning and removing the need to think about what to prepare when arriving home after a busy day at work. It also reduces the cooking time, while buying in bulk can save money.

Exploration of the use of information technology aids for learning cooking skills

The final phase of the study involved a cooking experiment to understand the impact of information technology aids on the learning of cooking skills. Participants also took part in focus groups to discuss their experiences of doing the task.

As shown in Figure 2, confidence in cooking, enjoyment in cooking and the likelihood of making the dish in the future significantly increased midway and at the end of the experiment equally in all groups. In addition, the perceived difficulty in making the dish decreased midway and remained at the same level at the end of the experiment (Figure 2). As the experimental study involved females only who were motivated to learn cooking skills, the results need to be repeated with different sub-groups.

Figure 2: Level of confidence, enjoyment, difficulty and intention to cook at the start, midway and at the end of the experiment



Note: The letters a, b and c indicate where the differences are significant

Furthermore, enjoyment and confidence at the end of the cooking task predicted the likelihood of making the dish in the future, whereas perceived difficulty did not. However, adding different levels of technology to assist in learning over and above written instructions (the recipe) did not change participants' enjoyment, confidence, and perceived level of difficulty or likelihood of cooking in the future. This showed that while enjoyment and confidence contributed to the likelihood of using the learned skill in the future, the different technological assistance presented in the experimental study did not affect the participants' level of confidence, perceived difficulty, enjoyment or likelihood to cook in the future.

The focus group findings revealed that video technology promoted cooking skills in the following ways:

- visualisation of the cooking process
- reassurance during the process
- application of learning or replication of the process
- flexibility to work at your own pace

- selective access to the video where required.

The focus group results revealed that technology was considered particularly useful when cooks searched for recipes and the required skills to use them. Technology provided flexibility and convenience to use at users' own discretion (selectivity) and served to reassure them that their cooking process would lead to a successful meal outcome. However, whether technology was considered useful depended on the participants' perceived level of risk associated with using the hardware in the kitchen environment, how relatable and user-friendly the software was, and how motivated they were to use the technology in place of a cookbook (replacement).

Key learnings identified that video technology was perceived to be most effective when:

- experiencing a new cooking skill
- reinforcing a more advanced technical skill.

These findings display the potential for video technology to enhance cooking skills among low-skilled individuals wishing to cook from scratch using fresh ingredients.

6 Recommendations

Monitor progress of food literacy

It is proposed that the cooking and food skills tool developed in this study be used as a cooking and food skills *barometer*. This barometer could be used to measure the level of cooking and food skills practices and confidence among consumers on an annual basis to monitor changes on the IOI.

Invest in intervention design based on behaviour change techniques

It is recommended that behaviour change techniques are clearly identified when planning future cooking and food skills interventions. Positive outcomes will then help to evaluate which techniques work best under different conditions, and can be used to guide future investments in cooking and food skills intervention design.

Communicate about cooking

Messages about cooking should be framed carefully by promoting its pleasure and enjoyment so as to encourage consumers to try it.

Promote a food skills strategy across the life course

It is recommended that co-ordinated consumer education programmes and awareness-raising campaigns are developed and supported to encourage children's and adults' practice of cooking and food skills.

Advance information technology-assisted cooking competencies

Although consumers use technology for inspiration and for acquiring key skills, they are not so keen on learning how to use new technology when cooking. Therefore, current familiar technological capabilities, such as smartphones and online facilities, should be exploited to promote learning cooking and food skills to consumers.

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