

An Exploration of Opportunities for Food Safety Education of Young Children.

Elizabeth C. Redmond*, Zoe Benbow, Hannah Wadley and Ruth Fairchild

ZERO2FIVE Food and Drink Research Unit, Cardiff Metropolitan University, Cardiff, CF5 2YB, Wales, United Kingdom.

Corresponding author: eredmond@cardiffmet.ac.uk

Abstract

The rise of foodborne illness prevalence among children aged <5years highlights the importance for food-safety education. It is vital that from a young age, children are taught about food-safety, to embed safe food-handling habits and encourage implementation of risk-reducing behaviours. To date, limited research has been conducted to understand food-safety messages in children's recipes, cookbooks and co-curricular food-preparation classes (CCFPCs). This study aimed to explore provision of food-safety information delivered in such resources.

Food safety information included in 108 recipes in 33 children's cookbooks published between 1991-2018 was recorded using a quantitative checklist. CCFPC recipes (n=45) were evaluated in conjunction with qualitative interviews with class leaders and parents attending such classes (n=5).

Cumulatively, limited or no food-safety information was determined in children's cookbooks and recipes analysed. Hand-hygiene information was lacking within the cookbooks, with 36% providing information on 'how to handwash' and only 9% advising hand drying. Less than 1% of the recipes advised handwashing prior to food preparation. Use of separate chopping boards for raw meat and vegetables were advised in 15% of cookbooks but were not instructed to be used in recipes. Food-safety behaviours particularly associated with hand-hygiene and food-storage were required during all CCFPCs, however, parents indicated other than being told "to wash hands at the start and end of the class, very little, if any food-safety information was given".

Children's and parent's use of cookbooks/recipes targeted for the younger audience may have the potential to positively impact children's health, however, remain to be an underutilised source of food-safety information. CCFPCs may provide a valuable opportunity to convey information about safe food-handling/storage to children but tailored/age-appropriate information development and food-safety support regarding class recipe selection and food-safety practice is required to improve and optimise this co-curricular educational opportunity.

Introduction

Food safety is essential for safeguarding children's health. Epidemiological data indicates that reported foodborne illness cases are highest among children <5years¹, affirming the importance for children's food-safety education. Food safety provision in adult cookbooks/recipes has been reported to be limited² however, such information in children's cookbooks or co-curricular food preparation classes (CCFPC's), which have increased in popularity in recent years, has not previously been explored.

This study aimed to evaluate the provision of food safety information provided in CCFPC's and children's cookbooks.

Methodology

Co-curricular food preparation classes

- In-depth interviews:** Qualitative in-depth telephone interviews with food-preparation class leaders and parents (n=5) were undertaken to determine inclusion of food-safety in CCFPC's and reported/perceived adequacy of food-safety information delivery.
- Recipe Analysis:** Analysis of ingredient frequency within children's class recipes (n=45) was undertaken to determine food type and opportunities for hygiene, cross contamination and other food safety behavior education.

Children's cookbooks

- Children's cookbooks and recipes were evaluated for food safety messages based on UK Food Standards Agency recommendations (4c's)³.

This research has received ethical approval from the Cardiff Metropolitan University Healthcare and Food Ethics Panel (Reference 9595 and UG-897)

Results

Co-curricular food preparation class food safety

Qualitative findings from CCFPC leaders indicated that food safety was considered to be a high priority. Findings below indicate examples of qualitative data indicating parent quotes regarding class facilities, information provision during classes and self-reported food storage after class attendance, with implications for food safety.

Food safety during food preparation

In CCFPCs, children were reportedly reminded to 'wash hands' before starting food preparation, but not how to do it.

Parents recalled malpractices during classes such as children repeatedly dipping fingers into ingredients and tasting, failure to clean surfaces and the potential for cross contamination from raw meat & raw egg/shells.

"The class leader said to everyone to wash hands at the start and end of cooking session but very little, if any, other food safety information was said."

Food safety – CCFPC facilities

Handwashing facilities were reported to vary depending on the class location and were commonly located in the toilets, where sinks were too high for small children to reach.

Water temperature differed, with the water being too hot to use, some places didn't even have sinks, just a bowl of waster was used

"the class leader prepared a bowl of hot soapy water with a soap pump in the kitchen (with stool) for everyone one to wash their hands (no rinsing) and everyone used the same fabric hand towel"

Food safety – transport of food home / storage

Transport of food home reportedly occurred in a foil tray with lid, or a paper bag. Parents reported travelling 15-60mins from the classes suggesting ambient storage for considerable periods.

Concerns with re-heating the product at home were expressed as some ingredients, such as cooked chicken, had already been cooked twice before leaving the class. Other parents indicated they had no worries in re-heating the product in the microwave again at home.

"Prepared foods were usually hot when leaving the class and my drive was at least 30-60mins, often stopping on the way home."

- Overall, 95 ingredients were used analysed CCFPC recipes; 60% recipes included raw egg, 22% fruit/vegetables and 18% ready-to-eat foods. Few recipes (11%) included raw meat/raw chicken.
- Implementation of ten different key food safety behaviours were required in recipes, four were associated with handwashing practices.
- Handwashing after touching raw meat/poultry/packaging was only a potential cross-contamination risk in 7% of analysed recipes due to the infrequent use of such products in CCFPC recipes. Handwashing after raw egg was identified to be a frequent practice needed in 63% of analysed recipes.

Children's cookery book food safety

Overall, 33 children's cookbooks were analysed for food safety information within the beginning chapters of the books (Table 1); findings indicated food safety information provision was limited.

Table 1. Inclusion of food safety messages at the start of children's cookbooks (n=33).

Food Safety Practice	n(%)
Cleaning and Hygiene	
• Reference to germs, bacteria and the needs for food safety	4 (12)
• Handwashing before food preparation begins	24 (73)
• Information about how to handwash	12 (36)
• Hand drying after washing	3 (9)
Cross-contamination	
• Use a separate chopping board / knife for raw meat	5 (15)
• Use separate utensils for raw and ready-to-eat food	2 (6)
• Wash hands after touching raw meat	11 (33)
• Wash hands after touching raw chicken	4 (12)
• Wash hands after touching raw eggs	2 (6)
Chilling	
• Reference to the correct fridge temperature (0-5 °C)	0 (0)
• Reference to the positioning of food in the fridge	4 (12)
Cooking	
• Guidance information for cooking meat	1 (3)

In total, 108 recipes from 19 children's cookbooks were analysed for food safety information. Food safety information, including hand-hygiene information and cross-contamination prevention messages, was limited.

Foods included in the evaluated recipes included dairy produce (70%), fruit and vegetables (42-43%), raw eggs (39%), ready-to-eat meat/fish (12%) and raw meat/poultry (7-11%). Key findings from the recipe analysis are noted below:

Less than 1% cookbooks advised to wash hands prior to starting food preparation; no hand drying was advocated.

Only 7% of recipes included frozen ingredients; 57% of such recipes included food safety information about defrosting.

Within all of the recipes, handwashing was required (according to the instructions) on 130 occasions; however, was only advised on two occasions (this was after handling raw egg in a fishcake recipe).

Separate chopping boards, knives and utensils were required on 37 occasions; however, no food safety information about prevention of cross contamination was provided, even when recipes involved raw meat/poultry and ready-to-eat foods.

Overall, 11% of recipes involved cooking / a heat treatment process. Of these, 82% provided a cooking time and temperature; 64% indicated how to check for "doneness"/ heating adequacy using visual and textural indicators. No recipes advised to use a temperature thermometer.

Discussion

It is important that from a young age, children are taught about food safety, to embed safe food-handling habits, adopt hygienic approaches and to practice risk-reducing behaviours regarding food preparation and storage.

Teaching food technology (and food safety) in UK primary schools (attended by 4-11year olds) has become increasingly limited in recent years due to changes in the National Curriculum⁴. Thus, elevating the importance of food safety education in the home and from alternative sources, such as CCFPC's.

US research has suggested that cooking programs may positively influence children's food-related preferences, attitudes, and behaviors⁵. However, findings from this study indicate that although CCFPC leaders have a positive intention to educate about food safety, this does not concur with reported practice or provision of appropriate facilities.

- CCFPC's provide a unique opportunity for focussed, verbal and demonstrated provision of food safety education to a captive audience (parents and children) in a fun, relaxed setting.
- Use of cookery books in the home provides an opportunity to be a source of valuable guidance with the potential to influence safe practice.

Cookbooks are a widely available source of food safety/hygiene information⁶ and powerful tools for conveying written food safety guidance⁷. However, concurring with adult cookbook research⁷, food safety messages in children's cookbooks analysed in this study lacked adequate food safety information.

Recent research has determined significant improvement in food safety behavior in home kitchens when recipes contain food safety instruction within specific steps⁸. Therefore, it is suggested that children's cookbooks are modified to include targeted food safety guidance.

Conclusions

- Children's involvement in food preparation provides a fun opportunity for education about important risk-reducing food-safety behaviors.
- Findings from this study have highlighted that children's cookbooks and co-curricular food preparation sessions are both underutilised sources of important food-safety information for parents and children.
- There is a need to optimise such educational opportunities using age appropriate and targeted approaches to encourage adoption of risk-reducing behaviours to children and parents alike.

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