

Food Safety Information Provision in UK-Based Children's Cookbooks and Online Resources.

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Introduction

Implementation of risk-reducing food safety behaviours during food handling and preparation is important for prevention of foodborne illness (Todd, 2020). Children's behaviours are reported to be easily influenced, and positive food-handling practices adopted at a young age are more likely to be carried through life (Eves *et al.* 2010).

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 (Redmond *et al.* 2021).

In recent years a reduction of food-related education within the UK school curriculum (Byrd-Bredbenner *et al.* 2010) has affirmed the need for food safety information provision from alternative sources to equip children with applied knowledge and behaviours to safeguard against foodborne illness.

- **Co-curricular cooking classes** are available for infants, children and teenagers, however, research suggests a lack of food safety advice is provided in such classes; tailored, age-appropriate information development and food-safety support is advocated to improve and optimise this educational opportunity (Benbow *et al.* 2019).
- Food safety provision in adult cookbooks and recipes has been reported to be limited (Levine *et al.* 2007). **Children's cookbooks with recipes** have increased in popularity in recent years, however, food safety inclusion has not previously been explored.
- **Online children's resources** have become increasingly utilised in recent years as a source of age-appropriate recipes and audio-visual food preparation demonstrations in amateur and professional entertainment formats. Evaluation of children's online food preparation audio-visual resources found limited and inadequate demonstration and communication of basic risk-reducing food safety practices (Bowen, 2022). To date, the adequacy of food safety information included in children's online recipe resources has yet to be evaluated.

Purpose

This study aims to evaluate the provision of food safety information delivered in recipes in children's cookbooks and online resources.

Methods

- A total of 33 best-selling **children's cookbooks** (reportedly suitable for age range 3-13years) from leading UK retailers were selected for analysis; 108 cookbook recipes were sampled using a purposive approach and specific inclusion criteria.
- **Children's recipe website** providers associated with frequent visits/hits were identified for sampling using keywords and the Google search engine. Children's recipes were selected for review using purposive sampling, with application of inclusion criteria such as age suitability, presence of raw animal ingredients and the requirement of a cooking process-step (Levine *et al.* 2007).
- Food safety information in children's cookbooks, websites and associated recipes was recorded in a bespoke digital checklist (using a Qualtrics XM platform), structured according to UK Food Standards Agency (FSA) 'cooking, chill, clean, cross-contamination' food safety and hygiene recommendations (FSA, 2006).
- SPSS was utilised to undertake a quantitative frequency analysis to determine recipe food safety information inclusion and adequacy, as well as need for advice, based on ingredients and methodology. A qualitative analysis of cited food safety information was undertaken using a content analysis approach.

This research has received ethical approval from the Cardiff Metropolitan University Health Care and Food Ethics Panel (Reference UG-897 and UG-4966).

Results & Discussion

In total, 108 recipes from 33 children's cookbooks and 90 children's recipes from nine online websites were analysed for inclusion of food safety information aligned with UK FSA food safety and hygiene recommendations (FSA, 2006). Food safety messages for all key food safety behaviours needed for safe food preparation provided in both cookbook and online recipe sources was limited.

Food safety information provision the start of children's cookbooks and children's recipe websites.

Information presented at the start of cookbooks and on recipe websites analysed in this study provided 'top tips' and 'before you begin' abbreviated food safety related information intended to support recipe preparation. No data currently evidences consumer use of such information and further research is required.

Findings (Table 1) indicate limited provision of recommended food safety behaviours on websites and in cookbooks supporting recipe preparation. Although hand washing before food preparation was frequently advocated (73-88% sources), inclusion of hand drying was largely omitted, and instructions regarding 'how' to implement hand hygiene behaviours were infrequently provided.

Concurring with adult cookbook research (Levine *et al.* 2017), food safety advice in children's cookbooks analysed in this study was inadequate.

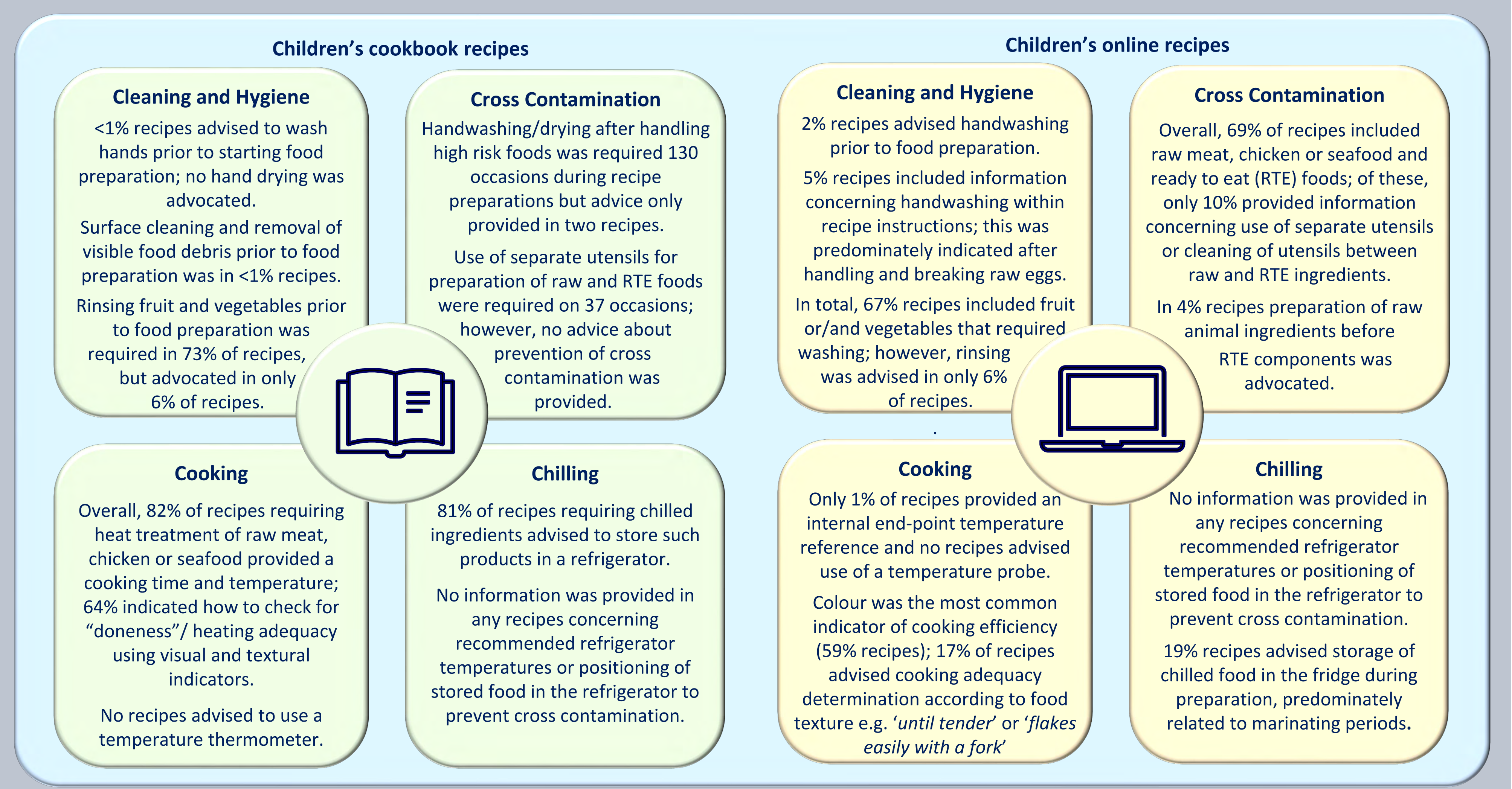
12% of children's cookbooks and 22% of websites associated with children's recipes referenced 'germs', 'bacteria', 'toxins' and specific pathogens in recipe supportive guidance. Eg: "Being clean & careful will prevent germs from spreading & stop you from getting poorly" (CB5). "Chicken should be handled very carefully as it can harbour dangerous bacteria" (CB16). "Raw eggs are the main source of Salmonella" (WS1).

Table 1. Food safety information provision at the start of children's cookbooks and on websites associated with children's recipes.

Food Safety Practice	Food safety information provided at the start of children's cookbooks (n=33).		Online food safety information on websites associated with children's recipes (n=9)*.	
	n (%)	Examples of cited information	n (%)	Examples of cited information
Cleaning and Hygiene				
Handwashing before food preparation.	24 (73)	"Wash your hands...before you start"; "Before handling or cooking any food"; "Remember to wash your hands"; "Give your hands a wash".	8 (88) *	"Wash your hands thoroughly before preparing food and after handling raw foods like raw meat and unwashed vegetables".
How to wash hands.	12 (36)	"Warm soapy water"; "Scrub nails and wash hands"; "warm soapy water for 20 seconds".	1 (11) *	"Wash your hands with warm soapy water for 20 seconds thoroughly before, during, and after food, especially after handling raw meat or poultry".
Hand drying.	3 (9)	"Dry thoroughly so they [hands] are not slippery"; "dry hands on a clean dry towel for 20 seconds".	0 (0)	No information provided.
Cross contamination				
Use a separate equipment / utensils for raw and RTE food.	5 (15)	"When you have chopped raw meat, chicken or seafood on a board you must scrub the chopping board and knife in very hot water with detergent before using them on any other ingredient".	2 (22) *	"Use completely separate chopping boards for raw meat/poultry and other foods that are ready to eat such as cooked meats, bread and salad vegetables".
Wash hands after touching raw meat.	11 (33)	"Always wash your hands after handling raw meat".	4 (44) *	"Wash hands with hot soapy water for 20 seconds after handling poultry and meat".
Wash hands after touching raw chicken.	4 (12)	"It's really important to remember to wash your hands after handling raw meat, especially chicken".	3 (33) *	
Chilling				
Reference to the correct fridge temperature.	0 (0)	No information provided.	1 (11) *	"Keep fridge at 4°C or below".
Reference to the positioning of food stored in the fridge.	4 (12)	"Always store cooked and raw foods separately, raw should be on the bottom of the fridge, always covered".	2 (22) *	"Store meat at bottom of fridge to stop juices dripping onto other RTE foods".
Cooking				
Guidance information for cooking meat.	1 (3)	"Make sure food is completely cooked through, most important with meat and chicken".	2 (22) *	"No pink colour in the centre of meat and juices run clear for poultry when thickest part of flesh is pierced"; "Cook chicken to core temp 74°C".

*Key: Further analysis evaluated information provision from websites alignment with FSA recommendations (REF); * All information provided was in accordance with UK recommendations; * majority of information provided was rated as 'inadequate' (Bowen, 2022).

Food safety information provision in children's cookbook based and online recipes



Conclusions

- **Children's cookbooks and online recipes may provide an accessible, applied and valuable source of information for children engaged in food preparation activities; however, findings from this study indicate they are an under-utilised source of food safety information.**
- **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.**

References

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