

# Factors influencing food-safety in children's co-curricular food-preparation classes.

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## Introduction

Within the UK, half of the reported foodborne illness cases occur in children (Faccio *et al.* 2013) and the rise of foodborne illness prevalence among children aged <5years (Crim *et al.* 2014) affirms the importance for children's food-safety education. Eves *et al.* (2010) indicated that educating children from a young age is the most effective, as hygienic skills they learn will be carried on into adulthood. UK national-curriculum changes (Byrd-Bredbenner *et al.* 2010) have resulted in limited food-safety education in schools, however, in recent years there has been an increase co-curricular food-preparation classes (CCFPCs) for infants/junior children. Such classes may provide a valuable opportunity to convey healthy eating messages to children and educate about safe food handling and hygiene behaviours. To date, little is known about food-safety in such groups.

## Purpose

This study aimed to ascertain information delivery and potential influence and contribution CCFPCs can have on the food-safety learning of young children.

## Methods

**In-depth interviews:** Qualitative in-depth telephone interviews with food-preparation class leaders and parents (n=5) were undertaken using a pre-developed structured interview schedule to determine inclusion of food-safety in CCFPCs and reported/perceived adequacy of food-safety information delivery.

**Recipe Analysis:** A quantitative analysis of ingredient frequency within children's class recipes (n=45) was undertaken to determine food type occurrence and opportunities for cross contamination and/or food safety education during preparation.

This study has received ethical approval from the Cardiff Metropolitan University Healthcare and Food Ethics Panel (Reference 9595).

## Results

### Class leader perspectives of CCFPCs and food safety

- Qualitative findings from CCFPC leaders (Table 1) indicated that food safety was considered to be a high priority. However, responses were variable between groups and although handwashing was reportedly highlighted before starting to prepare foods and at the end of food preparation, there was no mention of how handwashing/drying was advocated.
- Findings suggested CCFPCs aimed to: advocate safe food preparation, give children opportunities to learn cooking skills, create foods that they may not have the opportunity to do at home. Indeed, the reported rise in busy lifestyles and 'not having time to cook with children' may contribute to the popularity of such classes.

Table 1. Summarised CCFPC leaders perspectives about children's cooking classes and food safety.

Class Leader perspectives about....		
....class aims, purpose and priorities	.....food safety and information delivery	....transportation and consumption of food at home
<ul style="list-style-type: none"><li>Incorporates new foods that children may not have the opportunity to try at home.</li><li>Foods cooked to each theme every month.</li><li>Aims to teach children to eat the foods that their parents eat.</li><li>Attempts to involve the national curriculum.</li><li>Encourages children to try new foods.</li><li>Introduces children to cooking skills that they may not be taught at home due to busy lifestyles.</li></ul>	<ul style="list-style-type: none"><li>Handwashing was reported to be important and a 'major point' highlighted at the beginning and throughout the classes.</li><li>Classes important for teaching children how to cook high risk foods.</li><li>Food selection – some reported to prepare vegetarian dishes to 'reduce use of high risk ingredients' others selectively used high-risk foods.</li><li>Children given a hygiene checklist at the class start.</li><li>Use of hygiene quizzes to engage children and learn about food safety.</li><li>Food is not cooked on site.</li></ul>	<ul style="list-style-type: none"><li>Selective on the foods and times that prepared products can be taken home.</li><li>They don't like people taking high risk foods home because they don't know how if they will store them correctly.</li><li>The food is not cooked in the class, children are sent home with the prepared foods and instructions on how to cook them. This extends the learning process.</li><li>Leaders reportedly inform children/parents about storage of the food when taking it home. Verbal instructions were given to store prepared foods in a fridge straight away or throw away.</li></ul>

## References

- Byrd-Bredbenner, C., Abbot, J.M., Quick, V. (2010). Food Safety Knowledge and Beliefs of Middle School Children: Implications for Food Safety Educators. *Journal of Food Science Education*, 9, pp 19-30.
- Crim, S.M., *et al.* 2014. Incidence and Trends of Infection with Pathogens Transmitted Commonly through Food – Foodborne Diseases Active Surveillance Network, 10 U.S. Sites, 2006–2013. *Morbidity and Mortality Weekly Report (MMWR)*, 63(15), pp.328-332.
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- Faccio, E., Costa, N., Losasso, N., Cappa, V., Mantovani, C., Cibin, V. and Antonia, R. 2013. What programs work to promote health for children? Exploring beliefs on microorganisms and on food safety control behaviour in primary schools. *Food Control*, 33(2013), pp.320-329.

## Parents' perspectives of CCFPCs and food safety

### CCFPC attendance and experience

Parents reported taking their children to CCFPCs to interact with other children and 'learn to follow instructions from a teacher'.  
Parents believed that when children made the products themselves they were more willing to try new foods, especially if peers are doing so as well.  
The classes were 'quicker than trying to cook at home'

"Attended the class as a social experience and to try cooking new food products."

### Food Safety during food preparation

Children were reportedly reminded to 'wash hands' before starting food preparation, but how to do it.  
Parents recalled malpractices during classes such as children repeatedly dipping fingers into ingredients and repeatedly tasting, failure to clean surfaces and the potential for cross contamination from raw meat and raw egg/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

"In another premise 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

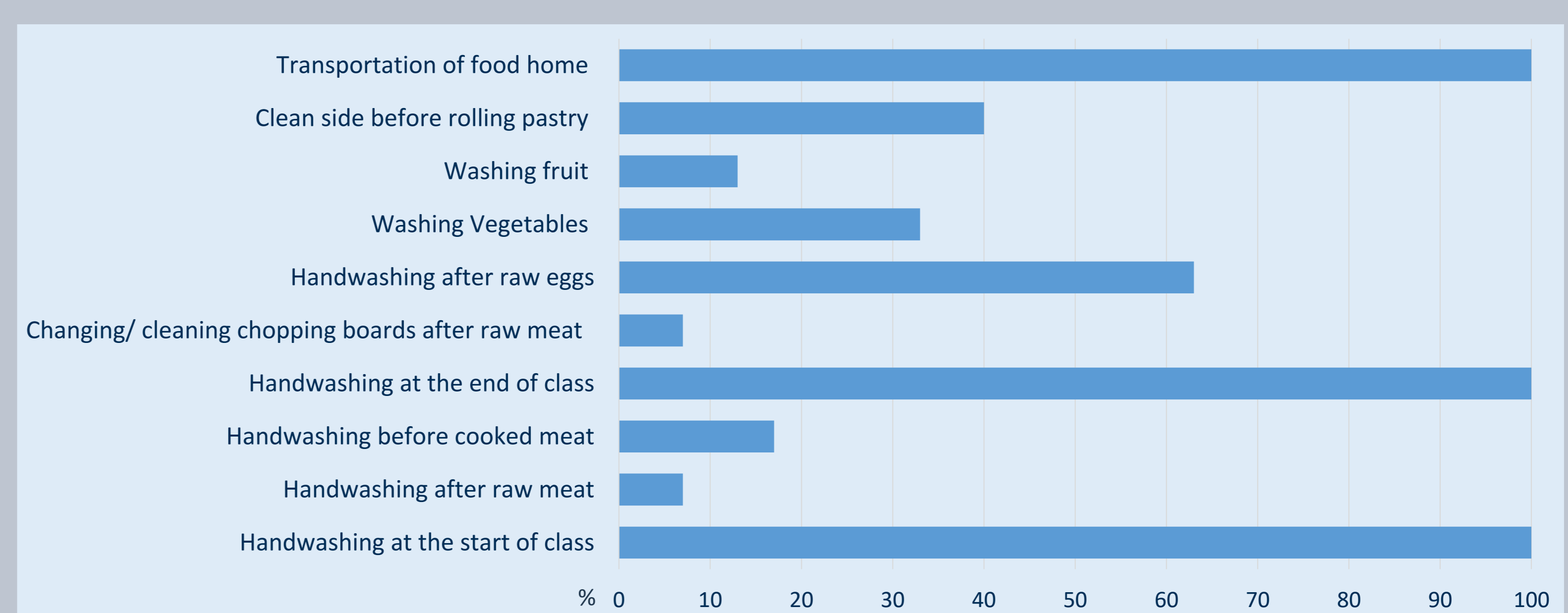
Transport of food home reportedly occurred in a foil tray with lid, or a paper bag, depending on the product.  
Parents reported travelling 15-60mins from the classes suggesting ambient storage for considerable periods.  
Concerns with re-heating the product at home were expressed as some ingredients, 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 mins – 1 hour. Sometimes stopping on the way home."

## Recipe Analysis - Ingredient and Practice Frequency

- Results indicated that 95 different ingredients were used in 30 CCFPC recipes analysed.
- Ingredient frequency analysis showed that 60% of CCFPC recipes included raw egg, 22% fruit/vegetables and 18% ready-to-eat foods; few included raw meat/raw chicken.
- Frequency of food safety behaviours required during food preparation methods of CCFPC recipes are found in Figure 1.
- Ten different key food safety behaviours were identified, four were associated with handwashing practices.
- Transportation of food home post food preparation in the class and handwashing at the beginning and end of each class were required for all recipes suggesting recipes.
- Handwashing after raw meat is a major food safety risk, however was only a cross-contamination risk in 7% of analysed recipes due to the infrequent use of raw meat in CCFPC recipes. Handwashing after raw egg was identified to be a frequent practice needed in 63% of analysed recipes.
- Recipe analysis indicating ingredient and practice frequency illustrate considerable opportunities for delivery of food safety information to children and parents attending CCFPCs.

Figure 1. Frequency of food preparation methods (n=30 recipes)



## Significance of study

- CCFPCs may provide a valuable opportunity to convey information about safe food-handling/storage to children; however, findings indicate a disparity between intention to do so and current practice.
- Tailored and age-appropriate information development and food-safety support regarding food-preparation class recipe selection and food-safety practice is required to improve and optimise this co-curricular educational opportunity.



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