

Food Safety Behavioural Influences of Two Consumer Groups: Implications For Targeted Food Safety Education Strategies

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Introduction

The majority of foodborne illness is reported to be sporadic (FSA, 2000); a substantial proportion of which is believed to be associated with food prepared in the domestic kitchen (Redmond & Griffith, 2003) resulting from unsafe food handling practices by consumers (Scott, 2003).

Cross-contamination and inappropriate storage practices are reported to be contributory factors to foodborne illness (Gormley *et al.*, 2011), as such malpractices can cause microbial contamination or give the opportunity for pathogens to grow.

Previous consumer food safety research suggests that two consumer groups may be associated with an increased risk of foodborne illness than the general population:

- Young adults (aged ~18 – 25 years old) due to increased frequency of unsafe practices (Byrd-Bredbenner *et al.*, 2007, Osaili *et al.*, 2011, Samuel *et al.*, 2007).
- Older adults (≥ 60 years) as a result of age associated decreased immunity (Buzby, 2002, Kendall *et al.*, 2006).

Consequently, to improve domestic food safety practices of these 'at-risk' consumers, there is a need for consumer food safety education; however, to enable effective targeted risk communication, there is a need to determine potential cognitive influences upon behaviours implemented by the two consumer groups when preparing food in the domestic kitchen.

Research Aim

The aim of this study was to determine the food safety behavioural influences of two consumer groups including young adults attending university and older adults.

Methods

A systematic review of consumer food safety literature was conducted to inform development of a quantitative survey which was piloted to ensure feasibility and reliability.

The survey was designed to ascertain food safety knowledge, self-reported food storage and handling practices and attitudes towards food safety risks.

Participants ($n = 200$) were recruited according to predetermined criteria. Self-complete questionnaires were administered to young adults (YA) aged 18 – 25 years attending university ($n = 100$) and older adults (OA) aged ≥60 years ($n = 100$) from South Wales. Survey completion took ~20 minutes.

Data was entered into a specifically designed Microsoft Access 2007 database, statistical analysis was conducted using IBM SPSS Statistics 20.

Participant profile

As indicated in Table 1, the majority of participants (70%) were female, food preparation from raw products and cooking frequency was greatest among older adults.

Table 1: Gender, age distribution and cooking frequency of participants ($n = 200$)

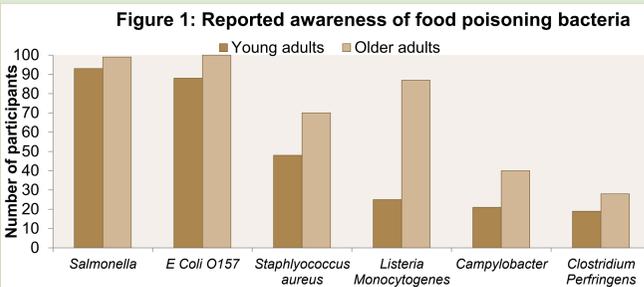
	YA ($n = 100$)	%	OA ($n = 100$)	%
Gender	Female	60	Female	80
	Male	40	Male	20
Age distribution	18-19 years old	16	60-69 years old	65
	20-21 years old	48	70-79 years old	28
	22-23 years old	28	≥80 years old	7
	24-25 years old	8		
Food preparation from raw & cooking frequency	Daily	15	Daily	52
	4-6 times weekly	20	4-6 times weekly	29
	2-3 times weekly	38	2-3 times weekly	14
	Once weekly	27	Once weekly	5

Results

Findings from this study have determined that food safety knowledge of both young adult and older adult consumers was lacking; however significant differences were determined between the two consumer groups which may have implications for the design and risk communication approach used in food safety interventions.

Reported awareness of food poisoning bacteria

Figure 1 indicates the reported awareness of the six most prevalent pathogens in the United Kingdom by both consumer groups. Although the majority (100% OA, 88% YA) reported awareness of *E. coli* O157 and Salmonella (99% OA, 93% YA), the reported awareness of *Campylobacter* and *Clostridium perfringens* were lacking among both consumer groups.

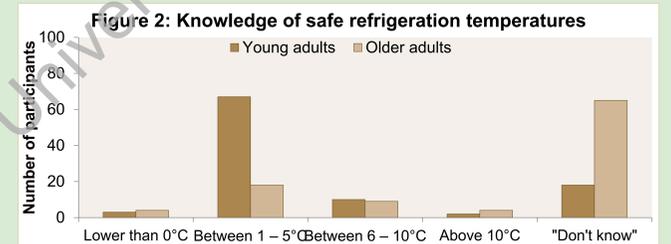


Furthermore, a Chi-Square test with Yates Continuity correction determined a significant difference between the perceived severity of food poisoning and the consumer groups $\chi^2(1, n = 200) = 17.186, p < 0.001, \phi = 0.306$; with a significantly greater number of older adults (93%) than young adults (69%) of the belief that food poisoning can result in mortality.

Knowledge of safe refrigeration temperatures

As Figure 2 indicates, the majority of young adults (67%) were aware of the recommended temperature whilst significantly fewer (18%) older adults know the correct temperature. The majority of older adults (65%) reported that they did not know the recommended temperature.

A Chi-Square test for independence determined that knowledge of the recommended operating temperature (5°C) for domestic refrigeration to ensure food safety was significantly different between the two consumer groups $\chi^2(4, n = 200) = 55.724, p = 0.000$, Cramer's $V = 0.528$.



Self-reported and knowledge of food safety malpractices

As indicated in Table 3, knowledge and self-reported food safety malpractices were determined among both consumer groups; however, differences were determined between the types of malpractices according to consumer group.

Table 3: Significant differences of food safety malpractices determined between consumer groups

Practice	OA (%)	YA (%)	Chi-Square (with Yates continuity correction)
Reported to 'always' wash raw meat/poultry before cooking	32	45	$p > 0.05$
Failure to indicate the need for hand washing prior to preparing RTE foods	4	42	$\chi^2(1, n = 200) = 38.650, p < 0.001, \phi = 0.451$
Unaware that prolonged storage (>4 hours) of leftover food at non-refrigerated temperatures may become unsafe to eat	60	21	$\chi^2(1, n = 169) = 48.801, p < 0.001, \phi = -0.549$

Failure to recognise the need to implement hand washing prior to handling ready-to-eat food was determined to be significantly greater among young adults ($p < 0.05$), whilst unawareness of safe refrigeration practices was significantly greater among older adults ($p < 0.05$).

Discussion

Data from this study corresponds with previous research which has determined that the food safety knowledge and practices of young adults (Sanlier, 2009) and older adults (Johnson *et al.*, 1998) are insufficient.

Young adults perceived severity of food poisoning was lower than older adults and reported greater cross-contamination potential practices such as washing raw chicken and failing to wash hands before preparing RTE food. Older adults lacked knowledge of safe refrigeration practices of leftover food and knowledge of safe refrigeration temperatures were particularly lacking.

This study has determined significant differences between the two consumer groups and has established that:

- Young adults may be at increased risk of foodborne illness from failing to implement practices to safeguard from cross-contamination in the domestic kitchen.
- Older adults may be at increased risk of foodborne illness from failing to implement recommended refrigeration temperatures and safe storage of leftover food in the domestic kitchen.

Conclusion

Overall, this study increases our understanding of food safety knowledge of young adult and older adult consumers. Findings demonstrate a diversity of food safety knowledge and self-reported practices among the two groups of consumers, which consequently highlights the need for targeted food safety education strategies for different groups of consumers within the population.

Results suggest a need for educational strategies for young adults to focus upon cross-contamination behaviours and for older adults to increase awareness of safe refrigeration temperatures and prevention of prolonged food storage at ambient temperature.

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