

# A Review of Consumer Food Safety Research to Identify Domestic Risk Factors Associated with Listeriosis.

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## Introduction

Reported incidence of listeriosis has more than doubled in Europe<sup>1</sup>, with two-thirds of reported cases associated with adults aged  $\geq 60$  years<sup>2</sup> and UK incidence among older adults reported to have tripled<sup>3</sup>.

Majority of listeriosis incidence are predominantly associated with ready-to-eat (RTE) foods<sup>4</sup> and are reported to be largely sporadic<sup>5</sup>, which may be associated with unsafe food handling and storage practices in consumers' domestic kitchens<sup>6,7</sup>.

Consequently, recommended domestic practices to reduce risks associated with *Listeria monocytogenes* include<sup>4</sup>:

- Adhere to 'use-by' dates on RTE foods
- Ensure safe refrigeration temperatures
- Consume RTE foods within two days of opening modified atmosphere packaging

However, data relating to older adults food safety practices are lacking and is required to ascertain factors that may contribute to the risk of listeriosis in the domestic kitchens of older adults<sup>4</sup>.

## Research Aim

The aim of this study was to review consumer food safety studies to consolidate and cumulatively determine consumer cognitive and behavioural risk factors that may be associated with listeriosis in the home, and in particular, those that are implemented by older adult consumers (aged  $\geq 60$  years).

## Methods

A systematic review of literature was conducted to obtain consumer food safety data which included the collation of published articles, reports and conference presentations ( $n=200$ ).

Primary research papers were reviewed and analyzed using a content analysis approach. Findings were summarized according to assessment of knowledge, attitudes, self-reported practices, and/or actual behaviours of the recommended food safety practices required to reduce the risk of listeriosis.

Selected sources were stored using EndNote X7 reference manager. Findings relating to the aims of the review were collated in a designed Microsoft Office Access 2007 database. Analysis was conducted using Microsoft Office Excel 2007.

## References

1. HPA (2011) Weekly report. *Health Protection Report*, 5(2).
2. HPA (2008) Listeriosis in England and Wales, 2007. *Health Protection Report*, 2(4).
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4. ACMSF (2008). Increased incidence of Listeriosis in the UK, Ad Hoc Group on Vulnerable Groups, Advisory Committee on The Microbiological Safety of Food, Food Standards Agency.
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## Results

Cumulatively, two hundred studies conducted over 35 years from 28 countries were reviewed for inclusion of recommended practices to reduce the risks associated with listeriosis in the home.

As illustrated in Figure 1; overall, only 43% of studies assessed consumer cognitive or behavioural data associated with listeriosis risk factors, of which 27% assessed refrigeration practices, 23% determined storage length of opened RTE foods and 21% ascertain adherence to 'use-by' dates.

The majority of studies utilised survey based data collection methods (questionnaires/interviews), consequently, findings on listeriosis risk factors were based on self-reported practices (33%), knowledge (20%), attitudes (7%) and actual behaviour (13%\*)

Even though older adults were included in 33% of studies, only 7% presented older adults food safety data.

\*Includes refrigeration temperatures - not an observation of actual behaviour

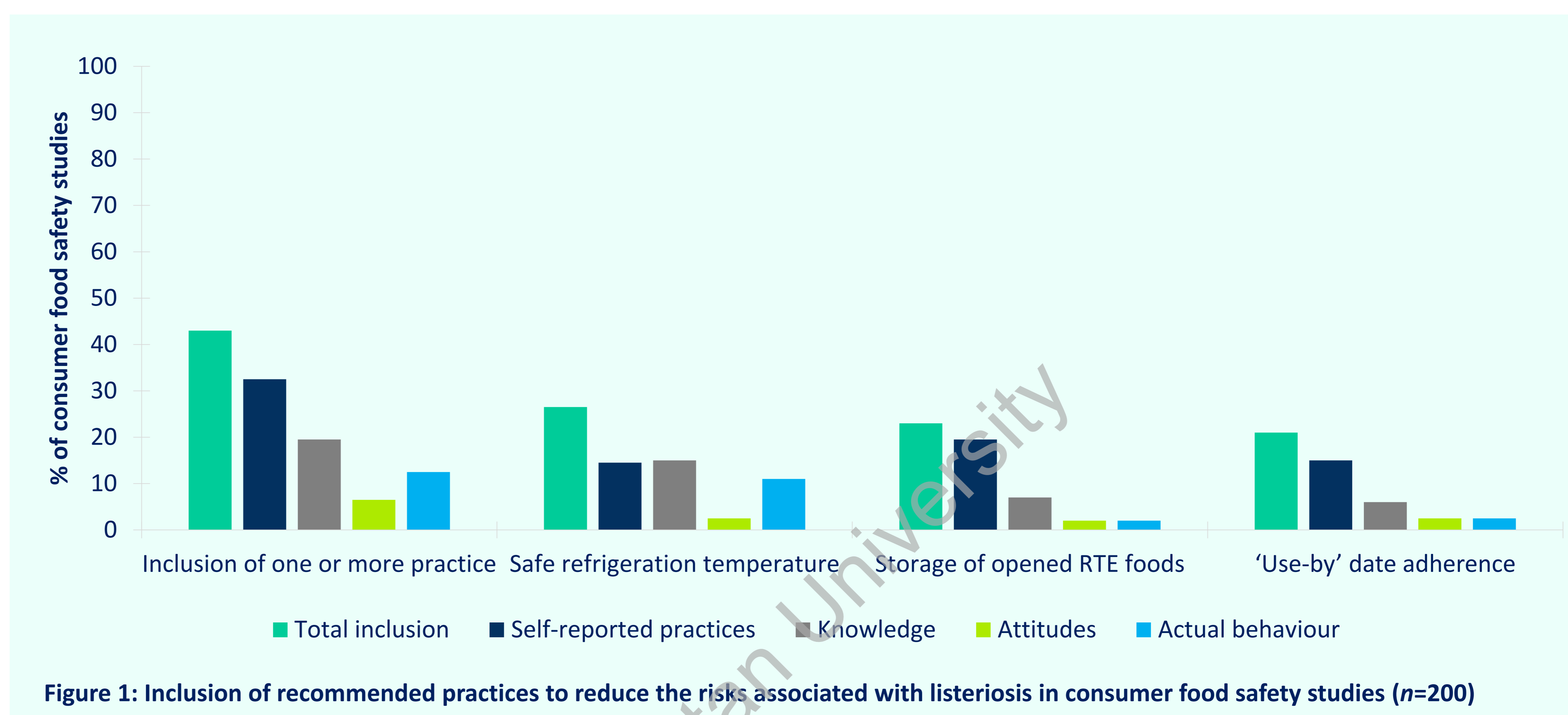

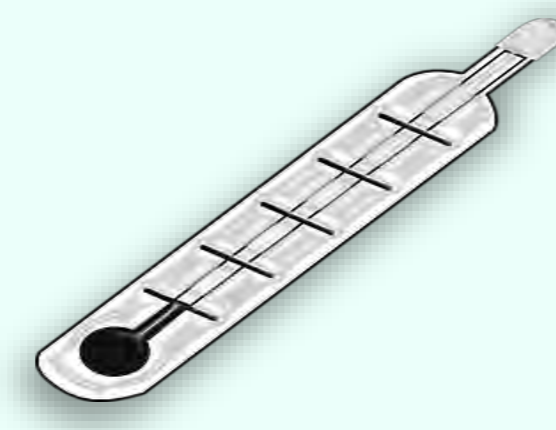



Figure 1: Inclusion of recommended practices to reduce the risks associated with listeriosis in consumer food safety studies ( $n=200$ )

As detailed in Table 1, it was determined that consumers may have some knowledge or have positive attitudes towards some of the food safety practices recommended to reduce the risks associated with listeriosis, however practices did not correspond.

Discrepancies have been determined between consumer knowledge, attitudes, self-reported and actual behavioural data. However, there is a lack of studies that compare consumer behaviour and cognition. Actual behaviour and attitudinal data relating to listeriosis risk factors are particularly lacking.

Table 1: Cognitive and behavioural comparison of knowledge, attitudes, self-reported practices and actual behaviours risk factors

	Knowledge	Attitudes	Self-reported practices	Actual behaviour
<b>'Use-by' date adherence</b> 	49 – 62% aware 'use-by' date was the best indicator of food safety	73 – 75% believed avoiding foods with expired dates to be important	18 - 56% reported to 'never' eat food beyond its expiry date	41 – 89% had foods with expired 'use-by' dates in refrigerators
<i>Although many consumers reported awareness of 'use-by' dates and indicated positive attitudes towards their importance, self-reported practice and actual behavioural data suggest that consumers frequently fail to adhere to 'use-by' dates.</i>				
<b>Refrigeration temperatures</b> 	44 – 93% unaware of recommended refrigeration temperatures	97% believed ensuring correct refrigerator temperature important	0 – 24% reportedly to own a refrigerator thermometer	47 – 81% refrigerators exceeded recommended temperatures
<i>A positive attitude towards the importance of refrigeration temperatures did not correspond with knowledge of safe temperature, self-reported practices of checking refrigerator temperature. Furthermore, temperatures recorded in domestic refrigerators exceeded recommendations.</i>				
<b>Storage of opened RTE foods</b> 	96% aware that improper storage of food may represented a hazard	No data available	40 – 69% reported 'always/usually' follow storage instructions	No data available
<i>Knowledge, attitudinal, self-reported and actual behavioural data on consuming opened RTE food within two days were lacking, however data suggest that foods associated with listeriosis may be subject to prolonged storage.</i>				

Although only 7% of studies presented older adults food safety data; findings indicate that larger proportions of older adult consumers may deviate from recommended practices to control listeriosis in the domestic kitchen.

Consequently, there is a need for cognitive and behavioural data to increase our understanding of older adult consumers' food safety practices in relation to listeriosis.

## Conclusion

- Data suggest older adults may implement greater food safety malpractices that increase risks of listeriosis, however such cognitive and behavioural data detailing older adults listeriosis risk factors are lacking.
- In-depth research is required to determine older adults' food safety attitudes and actual behaviour in conjunction with knowledge and self-report of practices linked to increased risks of listeriosis.
- Such data is required to develop risk communication strategies to improve the food safety practices of older adult consumers in the home.