

# Food safety knowledge of head chefs and catering managers in Ireland

D.J. Bolton <sup>a,\*</sup>, A. Meally <sup>a</sup>, I.S. Blair <sup>b</sup>, D.A. McDowell <sup>b</sup>, C. Cowan <sup>a</sup>

<sup>a</sup> *Foods Safety Department, Teagasc – Ashtown Food Research Centre, Ashtown, Dublin 15, Ireland*

<sup>b</sup> *Food Microbiology Research Group, The University of Ulster Jordanstown, Newtownabbey, Northern Ireland, United Kingdom*

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## Abstract

Two hundred head chefs and catering managers, responsible for food hygiene in catering establishments, throughout the island of Ireland were surveyed to establish their knowledge of food safety management and practice. Face to face interviews were used to obtain data on training, food storage and delivery, food handling, personal hygiene and cleaning, food preparation and knowledge of relevant bacterial pathogens. Statistical analysis (SPSS) of the data found that: (1) 20% of kitchen staff had no formal training; (2) formal training did not result in improved food safety practices; (3) 78% of head chefs were unaware of current food safety legislation including their specific responsibilities; (4) the concept and application of hazard analysis and critical control point (HACCP) was poorly understood; (5) 22.5% of head chefs did not report safe practices in defrosting frozen and (6) common microbial foodborne pathogens, such as *Salmonella*, were familiar to most interviewees, although few could name the source of these bacteria. The results of this study suggest that although most Irish restaurant head chefs/catering managers have a fundamental knowledge of some aspects of food safety and food safety practice, significant gaps remain, posing real risks to consumer health. It is important that head chefs/catering managers and other personnel in key positions to deliver essential standards in consumer food safety, should be supported through additional training and routine inspection to ensure that appropriate knowledge is acquired and effectively applied.

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## 1. Introduction

There are approximately 3.2 million episodes of acute gastroenteritis in Ireland per annum (Anonymous, 2003). Data from other countries, most notably the UK and the USA, would suggest that 20–40% of such illness is associated with the consumption of contaminated food (Harrison, Griffith, Tennant, & Peters, 2001). The majority of these cases are sporadic and their exact origins are rarely determined, however, catering establishments are among the most frequently cited sources of sporadic and outbreak foodborne infection (Griffith, 2000; Griffith, Mullen, & Price, 1994; Jin et al., 1997; Scott, 1996; Tarsitani, Gadliardi, & Persiani, 1998).

In Europe, approximately 22%, and in the USA 45%, of all foodborne illness has been traced to food eaten in catering establishments (Olsen et al., 2001; Tirado & Schmidt, 2001). In Ireland, approximately 50% of all foodborne illness has been traced to food eaten in catering establishments (Anonymous, 2000a, 2000b). This is broadly similar to the situation in England and Wales (54%) where it has been suggested that 1 in every 1500 catering operations will give rise to a notified case of foodborne illness every year (Coleman & Griffith, 1998). Such significant incidences are matters of public health concern, especially as a larger and larger proportion of food is being prepared or consumed outside of the home.

The Food Safety Authority of Ireland (FSAI) have identified the contributory risk factors in catering associated foodborne illness in Ireland as: (1) infected food handlers; (2) cross contamination; (3) inadequate cooking;

\* Corresponding author. Tel.: +353 1 805 9500; fax: +353 1 805 9550.  
E-mail address: [declan.bolton@teagasc.ie](mailto:declan.bolton@teagasc.ie) (D.J. Bolton).

(4) inadequate storage; (5) inadequate reheating and (6) delayed serving (Anonymous, 1998). A number of other studies have estimated the relative significance of these factors. In England and Wales, for example, inadequate heat treatment is a risk factor in 29%, inappropriate storage in 28%, cross contamination in 25% and infected food handlers in 10% of general outbreaks (Anonymous, 2000b). In the US, improper holding is a contributory factor in 60%, poor personal hygiene in 31%, contaminated equipment in 26% and inadequate cooking in 18% of general outbreaks (Olsen et al., 2001).

There is general agreement that a risk based approach should be applied to the management of foodborne disease (Clayton & Griffith, 2004). While several authors have identified the relative importance of different food handling practices, there is general agreement that good overall levels of knowledge of food safety among food handlers and the effective application of such knowledge in food handling practices are essential in ensuring the consistent production of safe food in restaurant operations (Mortlock, Peters, & Griffith, 1999). The objective of this research was to identify gaps in catering food safety/hygiene knowledge among head chefs/catering managers to underpin the development of more specifically targeted and effective training programme for such groups.

## 2. Methods and materials

### 2.1. Sampling plan

This study was conducted in 200 catering establishments (hotel restaurants and independent restaurants) across the four provinces of Ireland in proportion to population density. Catering establishments in each province were randomly selected from lists supplied by the relevant environmental health inspection service, following consultation with Irish catering/restaurant professional associations. Within each establishment the survey took the form of a face-to-face interview based on a questionnaire (see Annex 1) specifically developed for the project. The questionnaire contained 44 questions, covering seven major areas: (1) demographics; (2) training; (3) food storage and delivery; (4) food handling; (5) personal hygiene/cleaning; (6) food preparation and (7) knowledge of foodborne pathogens. All questions were multiple choice with an 'if other, please specify' option.

### 2.2. Pilot survey

The questionnaire, and the interview procedures were pre-tested in five randomly selected restaurants in the Dublin area, to confirm question clarity, identify response options and gauge likely interview durations. The questionnaire was revised on the basis of the pre-test results and other recommendations. The survey was carried out over the course of one year.

### 2.3. Data analysis

The questionnaire responses were analyzed using the SPSS version 12.1 software. Pearson's chi-square tests were performed to examine if there were any significant relationships between demographics, training, knowledge of legislation, food safety and microbial knowledge, cooking practices and food safety practices.

## 3. Results

The questionnaire and complete results of this survey are shown in Table 1.

### 3.1. Demographics

Of the 200 catering establishments, 33.5% were in Ulster, 30.5% in Leinster, 20% in Munster and 16% in Connaught in proportion to the population distribution. The gender split of interviewees was 70% male and 30% female. Approximately half (48%) of respondents were under 35 years of age. The average numbers of customers per week in the surveyed restaurants ranged from 20 to over 4000. The number of people employed in food handling operations in each restaurant also ranged from: 1 to 10 (83.5%), 11 to 20 (12.5%), 21 to 30 (2.5%) and more than 30 (1.5%).

### 3.2. Training

*Training in food preparation/compliance with the legal obligation to provide training for all food handlers (EC regulation 852/2004):* 28.5% of head chefs had a certificate in food preparation, 15% had a diploma, 5% had a degree, 25% had attended a *City and Guilds* course, and 6.5% had completed a *CERT* (vocational training for the catering and hospitality sector) course. However, 20% had not received any formal training.

*Training in food safety/hygiene:* 35% of head chefs had a certificate in food hygiene, 45% had a diploma in food hygiene and 20% had not received any formal food hygiene training.

*Food safety legislation:* 78% of head chefs/catering managers responsible for food safety were unaware of the current legislative requirements.

*Hazard analysis and critical control point (HACCP):* This survey found that HACCP was not universally understood. Approximately two-thirds of respondents knew what the acronym stood for. Others considered HACCP to be a food safety system (10%), a process control system (5.5%), a temperature control system (8%), a documentation system (4.5%) or were unaware of HACCP (8%).

### 3.3. Food delivery and storage

*Food delivery inspection:* This survey found that raw material/food deliveries were inspected by different person-

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