Cabin Crew Food Safety Training: A Qualitative Study

Ayman Abdelhakim, Eleri Jones, Elizabeth Redmond, Mahmoud Hewedi, Phillip Seaman

Abstract

This study aims to explore the status of cabin crew food safety training in different airlines. Using the snowballing technique, 26 cabin crew managers, supervisors and trainers (from 20 international airlines) participated in in-depth, structured interviews. The interview schedule was developed to determine and evaluate implementation and perceptions of cabin crew training. Data was analysed using a qualitative content analysis approach. All respondents perceived cabin crew food safety/hygiene issues are important in relation to on-board food-handling, for example: “food safety is always an important issue”. Findings indicated that while most of the airlines (90%) train cabin crew on food safety, different cabin crew roles perceived the same level of food safety training. The results obtained can be used to inform development of future training programmes, methods and evaluation.

Keywords: Cabin crew - food safety - training- airlines – qualitative

1. Introduction

Airlines are obliged to carry cabin crew on aircrafts to meet the minimum requirements of the Civil Aviation Authority (Cabincrew, 2010). Some airlines therefore hire thousands of cabin crew, for instance, the number of Emirates’ cabin crew was over 17,000 in February 2014, hired from over 130 countries and collectively speaking more than 50 languages (Emirates Group, 2015). Cabin crew responsibilities not only include ensuring the safety of the aircraft and its passengers, but extend to food handling which includes the safe receipt, storage, reheating and serving of meals on board and thus challenges regarding safe and standardised airline food service are present (IFSA, 2015).

On-board, cabin crew handle high-risk foods, including salads, meat and fish, served hot or cold pre-prepared and plated cold meat and fish, canapés and special meals. These food handling-related duties, unless carefully and critically practiced, may lead to microbiological, chemical, physical and allergic hazards (McMullan et al., 2007; Abdelhakim, 2016; IFSA, 2015). Specifically, it has been reported that cabin crew mishandling of food has resulted in eight out of twelve reported food poisoning outbreaks due to malpractices and unhygienic behaviours. Examples of such reported malpractices include consumption of passengers’ meals instead of eating their foods provided specifically for them to avoid any risk of food contamination (Hatakka, 2000), and were incapable to handle some in-flight allergic reactions (Greenhawt et al., 2013).
Considering that it is well established that food safety training/education can be an effective strategy for improving knowledge and attitudes of food safety and may reduce the risk of food poisoning/foodborne illness incidence (Zanin et al., 2017; Young et al., 2017) among consumers at the home (Young, et al., 2015; Young, and Waddell, 2016; Young et al., 2017; Evans and Redmond, 2014) and in different catering sectors (Seaman and Eves, 2010) and retailing industry (Thaivalappil et al, 2018).

However, while a plethora of studies have been conducted on food safety training issues in different sectors of the catering industry (Radu et al., 2014; Jones, 2007), this is not the case with flight catering (Yavari et al., 2015) and in particular cabin crew (Eves and Dervisi, 2004, Sheward, 2006; Abdelhakim, 2016; Abdelhakim et al, 2018). The absence of generic cabin crew food safety training is argued by Sheward who had a personal and practical experience in this matter. Sheward (2006:203) asserted that “the need for hygiene training is not acknowledged and fully understood by either the commercial or corporate aviation sectors”. Although there is no mandatory aviation requirement to train crew on food safety issues, there is a legislative compliance in many countries including European countries such as UK.

Subsequently, various airlines, including British Airways, reportedly train cabin crew on food safety and galley hygiene (Eves and Dervisi, 2004; Abdelhakim, 2012). Despite this, Sheward (2001:2) claimed that “A few of the airlines I challenged had a food hygiene handbook in place for their cabin crew at the initial training stage, but none that I came across were … specific to the cabin crew environment nor were they compulsory reading”. Examples of such handbooks and requirements include: Catering Guidelines for Flight Attendants (Amineddine, Kraft and Dible, 2006) and the World Food Safety Guidelines (IFSA, 2016) (Table 1).

Insert Table 1: An example of Flight Attendant/ Cabin Crew Training requirements/guidelines

The standard food safety guidelines do not align with the conditions on-board aircraft and lack focus on the hazards related to cabin crew safe food-handling on board. Thus, the relationship between cabin crew and food safety is known as the “crucial link” (Sheward, 2001:1) but also as the “missing link” (Sheward, 2006:201) to ensure the significance of providing cabin crew with an effective food safety training, Sheward (2006) and Abdelhakim (2016) underlined the necessity of mandatory food
safety training, commensurate with the different roles of cabin crew, alongside other safety issues, i.e. medical and emergency training. Additionally, cabin crew food safety training (CCFST) should account of the time of the flight, the type of flight, type of service, the cabin class and the role of cabin crew (Abdelhakim et al., 2018).

Methodologically, many of consumer food safety related studies are qualitative in nature. For example, Young, and Waddell (2016) carried out a review study on the barriers and facilitators to safe food handling among consumers, they found that 37 unique qualitative studies which used interviews, documents analysis for data collection. Another two recent qualitative study was conducted by Murray et al. (2017) and Sterniša et al (2018) using a telephone interview to assess the effectiveness of food safety interventions over time, and know and attitudes of consumers, respectively.

Conversely, most of food handlers food safety related studies used quantitative methods (Zanin et al., 2017; Moreb, Priyadarshini, and Jaiswal, 2017) and small range of the research used qualitative methods (Thaivalappil et al., 2018; Arendt et al, 2012; Araújo et al., 2018). An example of qualitative food handler food safety studies was undertaken by Latorres et al. (2016). They conducted a course to evaluate knowledge and perception of issues related to food safety by the cognitive word association technique (WAT), with total workload of 24 hours. Their findings revealed that WAT is a significant tool to evaluate the perceptions of food safety related issues and reinforced the importance of continual participation and improvement of the professionals in the food industry.

Overall, literature and previous research indicates that more attention is required for effective CCFST. Insufficient training and ineffective evaluations of food safety training of food handlers may contribute to incidences of food-borne illness (Zanin et al., 2017; abdelhakim et al., 2018). This implies that there is a need for a qualitative research to fill this gap in aviation food safety research and specifically to investigate the current CCFST from airlines’ perspective. Thus this paper aims to explore the significance, extent, levels, training needs relating to cabin crew roles, and the main food safety precautions relating to cabin crew food-handling on-board. The findings obtained can be used to inform the development of future CCFST modules and evaluation.
2. Methods

2.1. Semi-structured interview protocol

In-depth, semi-structured interviews (n=20) were conducted to collect data from cabin crew managers, training managers, trainers and supervisors to better understand the current CCFST. In line with the guidelines of Bryman (2004), a three-part interview schedule was designed and developed based on previous food safety training literature. The first section determined the respondents' demographic profile (e.g., role and experience in aviation, age, gender, culture). The second section focused on food handling on-board to identify the general food handling-related tasks reported by cabin crew from different airlines and to identify and verify the critical food safety-related issues on-board. The final part focused on CCFST issues such as levels and comprehensiveness of training within airlines. The interview schedule was piloted using standard procedures (Seidman, 2013).

The interviews were implemented according to respondent availability and access. Eight were conducted by telephone/Skype, nine by email (e-interview), and three face-to-face (Table 2). Influences, advantages and disadvantages of using different modes for interviews in the same study were considered (Opdenakker, 2006) to ensure reliability and validity of data collected.

2.1 Sampling and recruitment

Target respondents for this study (cabin crew managers/supervisors/trainers) are recognised as being ‘hidden and hard-to-reach’ (Johnston and Sabin, 2010). Therefore, a purposive sampling technique alongside a snowballing technique was adopted for sampling and recruitment purposes.

The initial interview conducted for this study became "the seed" for the snowballing technique (Johnston and Sabin, 2010:40) who facilitated access to subsequent cabin crew, managers and supervisors within international airlines.

In total, 26 respondents were interviewed in 20 semi-structured interviews. Fourteen interviews were individual interviews and six were group interviews (two respondents per group from each of six airlines). The respondents were working for 20 airlines from the UK, Europe, Middle East, Africa, South America and the United States.

2.3 Ethical considerations

Prior to implementation of this study all methods and relevant documentation including interview schedules, introductory letters, participant information sheet, consent form were approved by the Research Ethics Committee (Approval reference
3850). Documentation and ethical approval were sent to all participants before participation in the interview and signed consent was obtained prior to interview participation.

2.4 Analysis of data
Qualitative data including semi-structured interview transcripts and supporting documents (manuals, training materials, etc.) were analysed using a qualitative content analysis. This technique is widely recognised qualitative analysis tool that facilitates categorisation and identification of themes within the data (Hsieh and Shannon, 2005). Interview transcriptions and a range of supporting documents were coded using NVIVO9; this software provided a means for electronic management, organisation and of the collated data (Bazeley, 2007).

3. Results
3.1 The profile of respondents
From 20 different airlines worldwide, 26 respondents were interviewed with regard to the current CCFST. Table 2 displays a demographic profile of interviewed respondents. The majority of respondents (69%) were male; the majority of them (61.5%) aged between 41 years and 47 years.

In respect to employment role, (42%) were managers, supervisors (42%) and cabin crew trainers (16%). Six respondents (23%) reported practical experience as cabin crew and/or still flying under different titles, including cabin crew training manager (e.g., A5CCTM), cabin crew supervisor (e.g., A10CCS), and cabin crew service trainer (e.g., A9CCST1). In addition, most respondents (61.5%) had 10 to 20 years of experience in the aviation industry. Finally, the ethnicity of the respondents in this study included a wide range of nationalities and cultures.

3.2 Cabin crew on-board food-handling
The in-flight food service starts when meals arrive at the galley via a secure high loader. Once on-board, meals and related items become the responsibility of cabin crew. Figure 1 illustrates the generic main steps (including critical control points – CCPs) during handling of airline meals. These sequential steps are the same for different types of on-board foodservice.
The findings from this study indicate that there are three main types of on-board food service, according to the length of flights and sectors: short, medium and long-haul. For example, A1 (Airline1) classified its in-flight foodservice by region; Middle East, Europe, Asia and Far East, and North America. For each region a range of options were provided, which varied in the content and the number of food items provided from one region to another and also varied from one class to another. These stages involve CCPs which expose specific food safety hazards require considerable attention from cabin crew, in particular, in the case of depending on ‘back/return catering’ or ‘double legs catering’ on some flights.

Additionally, a cabin crew manager (A15CCM) and a manager of cabin crew and specialist of training (A3MCCST) indicated that two airlines (A3 and A15) reportedly provide the service of “on-board chefs” for passengers in first and business classes during certain flights and sectors. Such practices may require specific food-handling and food safety skills. In addition to passenger meals, cabin crew are also responsible for their own meals, which may be similar to the passengers’ meals (e.g. A14CCS) or different from passengers’ meals (e.g., A13CCTM). Cabin crew was also reported to be responsible for handling the cockpit crew’s meals, which always differed from other meals.

3.3 The significance of cabin crew food safety issues

All respondents (n=26) believed that on-board food safety is an important, for example: “food safety is always a major issue while handling food on-board” (A14CCS); “safe food handling is an important part of the cabin crew’s responsibilities and it is a vital aspect for safe flights” (A17CCTS). Comprehensive responsibility for food safety was include reported to all components of the food chain as indicated by a cabin crew training manager “it includes everyone in food chain, from suppliers, catering staff to flight attendants on-board” (A5CCTM).

Respondents indicated a variety of reasons that influence the importance of implementation of food safety practices on-board, these include the following: the nature of cabin crew duties as food handlers, the legislative requirements, the advanced preparation of in-flight meals, the type and design of the aircraft and the lack of space on-board. Supporting this finding a cabin crew manager claimed that “...food safety is an issue for us....this is due to the nature of in-flight meals
prepared in advance, no space available ..., minimum of cabin crew in some flights”
(A15CCM). Consequently, although its priority relative to emergency issues,
including fire, violence, and emergency evacuation, cabin crew reportedly perceive
food safety to be a crucial part of any flight safety and therefore airlines should train
cabin crew on food safety and hygiene.

3.4 The extent of CCFST

Most (92.3%) respondents acknowledged that the majority (90%) of airlines have a
range of CCFST, for example, a cabin safety supervisor stated that “we train our
cabin crew on food safety and how they can avoid food poisoning occurrence”
(A1SCSS). Conversely, two airlines (A8 and A10) did not include food safety and
hygiene training as part of the airline policy, “we do not consider such training for
our cabin crew” (A8CCTM); “we do not have specific training on food safety”
(A10CCS).

Unexpectedly, a cabin safety director and a supervisor of cabin safety (A1DCS and
A1SCSS) suggested that it is not only cabin crew who should be trained/instructed
on food safety, but also cockpit crew. They argued cockpit crew training had taken
place after a food poisoning incident occurred when a captain and a first officer left
tuna sandwiches open in a cockpit for two hours and then consumed them during a
long-haul flight. After five hours, they started to suffer from food poisoning symptoms.

3.5 CCFST need analysis

Training Needs Analysis (TNA) is the first step of any training cycle and plays a
significant role in training effectiveness and improvement. Most respondents (75%)
from airlines with CCFST (n=18) emphasised the significance of “… analysing all
cabin crew training needs” (A9CCST1). However, further findings indicate this it is
not the case when it comes to food safety training, as most of airlines reportedly with
CCFST (77.78%), reportedly did not consider TNA for this type of training. This was
indicated by many respondents, for example: “… not specifically in the case of food
safety training” (A15CCM); “No TNA for food safety as training is generic”
(A7MCSTIS).

However, respondents from two airlines (A9 and A12) explicitly acknowledged TNA
in relation to CCFST. They used pre-training tests and documentation analysis (e.g.
training records) to analyse their CCFST needs. This was clarified by respondents
from these two airlines, “before we start the training season we mark our target, what
do we want to achieve, improve. Based on that, we make our training needs analysis” (A9CCST1); and in details: “we use e-learning which has to be researched, documented, and legally approved. Based on this, we analyse our cabin crew food safety training needs” (A12HRS&CCT). Since most respondents indicated that most participating airlines did not analyse CCFST needs, this may affect negatively the levels and effectiveness of food safety training for different cabin crew roles.

3.6 Levels of cabin crew food safety training

All respondents (n=24) from airlines with CCFST (n=18) exposed that their airlines did not consider the different employment roles when training cabin crew on food safety. This means that airlines reportedly trained all their cabin crew at the same level of food safety regardless “…their position or which fleet or class they are working on” (A2RDLCLA1). A cabin crew training supervisor indicated that “all cabin crew are trained on the same level without discrimination or customisation” (A6CCTS); “… all of our cabin crew have specific roles if they are senior cabin crew, but all of them are trained in exactly the same way with regards to food safety, we do not have any specific extra modules” (A2RDLCLA1).

3.7 Awareness of key food safety precautions in airlines

Most of respondents (77%) acknowledged a range of general and basics food safety and hygiene precautions (Table 3). These precautions were often mentioned in the airlines' manuals as basics of handling food safely. Additionally, the study assessed the cabin crew food safety awareness with these precautions.

Insert Table 3: The key food safety precautions in airlines

The effective implementation of the tabulated precautions can maintain the food as safe as possible and to prevent or at least to minimise food poisoning occurrences onboard. In addition, a specific range of food safety knowledge, awareness and attitudes is required to be provided to cabin crew. This can be improved by an effective training on food safety and hygiene. Such training should not be only relate to the published food poisoning incidents in aviation, but is also required for maintaining a high level of food safety onboard.

4. Discussion

Cabin crew have a range of food service-related duties on-board which differ from one airline to another based on many factors, including the type of airline, duration of flight and its operating systems (Sheward, 2006; Abdelhakim et al, 2018). The
findings from this study concur with previous research findings which indicate that cabin crew have been perceived as: “trolley dollies” or “space waitresses” (Morgan and Nickson, 2001:449) or “chefs, or merely waiters in the sky” (Sheward, 2006:204). This confirms the professionalism of cabin crew food-handling duties. To perform effective and safe food-handling, cabin crew need appropriate food safety training to reduce any suspected food safety risk on-board (Sheward, 2006; Abdelhakim, 2016).

In general, airline managers and supervisors who participated in this study reported the significance of food safety in aviation particularly in relation to cabin crew in-flight food-handling duties. Indeed, training cabin crew is an important issue for the safety of passengers, cockpit crew and cabin crew themselves (Abdelhakim, 2016; Sheward, 2006; Abdelhakim et al, 2018). Consequently, most airlines reported a range of training on/instructing for their cabin crew about food safety. These findings are in response with the World Food Safety Guidelines for Airline Catering (IFSA, 2016:32): “food safety handling procedures to be included in flight attendant training and refresher course as necessary”. This training is essential to: “ensure that flight attendant/ cabin crew have sufficient knowledge to enable them to handle food safely”.

Conversely, in this study all airlines participating who reported food safety training indicated that they trained different roles of cabin crew to the same level. These findings do not meet the legislative requirements in aviation guidelines and researches recommendations (e.g., IFSA, 2016; Amineddine, Kraft, and Dible, 2006; Abdelhakim, 2016; Abdelhakim et al., 2018) that the level of training should reflect the requirements of the role being undertaken. For instance, Sheward (2006) suggested various levels of cabin crew food safety training depending on the provision of on-board food service and flight sector and the required competence, experience, and work duties of cabin crew for each sector.

Conversely, all food handlers, including cabin crew, are not required to go through standardised, certified training. However, it can be suggested that they training commensurate with their work tasks may be benefit. This study suggested that the current CCFST in airlines participating in this study does not correspond with all cabin crew roles and their food handling duties on-board; previous research suggested that this could cause a greater risk to food safety than no training at all (Zanin, et al., 2017). The anticipated risks to food safety may be greater in aviation...
than those in other catering establishments, due to the nature of flight catering and
the lack of published data and access to the customer food safety-related
complaints. Thus, there is a need to undertake training needs assessment to indicate
the most appropriate and effective training strategy to address different employment
roles (Abdelhakim et al, 2018).

Furthermore, several studies on the knowledge, attitudes and practices of food
safety of food handlers and consumers (see for example, Araújo, et al, 2018; Zanin,
et al., 2017) have supported the importance of conducting a preliminary assessment
of training needs and evaluating the effectiveness of training. These studies also
indicated that the continuous food safety training is needed to minimise the risk of
food consumed on-board. TNA helps to identify the current gaps in food safety
knowledge, attitudes and practices of food handlers in relation to daily work duties,
and who should be trained and to which level (Seaman, 2010; Gomes et al., 2014;

In this study, the majority of managers and supervisors reported that airlines have
considered the analysis of training needs for generic cabin crew training but not for
food safety training. Therefore, all participating airlines who reported implementation
of CCFST trained different roles of cabin crew to the same level of food safety
training. This level of training was found to differ from one airline to another according
to the airline's operating system and available financial resources. Managerial
respondents suggested that cabin crew on-board food handling duties are less
demanding compared to those in restaurants and other catering establishments, so
that cabin crew roles were not considered when training about food safety.

These findings do not concur with what is suggested by food safety legalisation, for
example the European Union Regulation (EC) required that food business operators
should ensure that: ‘Food handlers are supervised and instructed and/or trained in
food hygiene matters commensurate with their work activity’ (Sprenger, 2015). While
there is no one, single, “off the shelf” (improve ltd, 2008:11) food safety training
programme, Zanin, et al. (2017) suggested a model for food safety training to cover
all food handling categories commensurate with food handling duties. However, this
would be inappropriate, as a single training programme would be too broad in its
coverage, if it were required to cover the training needs of all food handlers who
handle food as part of their job (Seaman, 2010).
6. Conclusion and implications

This is the first study on CCFST and therefore a qualitative approach was adopted to explore and understand the current situation of cabin crew food safety from the airlines’ perspective. The study employed snowballing as a non-probability sampling technique which leads to potential issues relating to the representativeness of the sample. However, it could be argued that the sample size of this study (20 airlines) is relatively representative for a variety of reasons; including, the aim and the nature of this qualitative study are only being used to explore and understand the study phenomenon; the frequencies are not important for this study (e.g. Ritchie, Lewis and Elam, 2003); the sample participating achieved the study aim and saturation since participants came from different airlines and from different areas of the world: Middle East; Africa; South America; the USA. In addition, the sample included different types of airlines; scheduled or flag carriers, charter, domestic and low-cost carriers. This focused understanding of cabin crew food handling and safety from different perspectives.

However, this study suggested that the current CCFST approaches may be inappropriate or ineffective for different cabin crew roles and food-handling duties on-board. Overall, airlines reportedly train their cabin crew about the general or previously-determined training without identifying the real and risk-based food safety training needs. Such conclusions lead to further studies to evaluate the effectiveness of CCFST in concurrence with the barriers to, and features of CCFST using the methodology developed by Gomes et al. (2014) and recommendations of Zanin, et al. (2017) and Abdelhakim et al. (2018). Another study may consider the observation of the actual behaviours of cabin crew while handling food on-board.

Professionally, the findings of this study are the result of in-depth study with 20 international airlines worldwide. This may inform airlines when they are designing or choosing their CCFST programmes. Finally, the findings may help in building a global strategy for cabin crew food safety training through the international aviation organisations such as IATA and IFSA. This will increase the level of trust and loyalty in airlines food service stakeholders.

7. Acknowledgments

The authors wish to acknowledge the financial support of the FFEEBB programme, which enabled this study of cabin crew food safety training. They also wish to acknowledge the participation of the many cabin crew who participated in this study.
Last, but by no means least, they wish to acknowledge the ongoing support and encouragement of the late Professor Louise Fielding.

8. References

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Table 1: An example of Flight Attendant/ Cabin Crew Training requirements/guidelines

| Standard Operating Procedures(SOP): Flight Attendant/ Cabin Crew Training |
|-----------------------------|------------------------------------------------------------------|
| **Flight Attendant/ Cabin Crew shall be adequately trained in safe food handling practices applicable to their work** |
| **Purpose**                | To ensure that flight attendant/ cabin crew have sufficient knowledge to enable them to handle food safety. |
| **Scope**                  | All flight attendants/ cabin crew                                |
| **Guidelines**             | • Food safety handling procedures are to be included in flight attendant training and refresher courses as necessary. |
|                           | • Training can be delivered by a variety of methods including lecture, written material, computer based training, etc. |
|                           | • All training should include recorded assessment/testing.        |
| **Procedure**              | • Personal hygiene including: proper hand washing prior to beverage service and meal service; reporting illnesses |
|                           | • Cooling methods used to maintain proper food temperatures on board the aircraft until all food service(s) is complete |
|                           | • Cooking, re-heating and/or maintaining hot food temperatures |
|                           | • Prevention of food and equipment biological, chemical and physical contamination (e.g. rims of cups/glasses, service equipment, food allergen cross contact, ice.) |
|                           | • Food complaint procedures                                     |
|                           | • Proper segregation practices for keeping dirty equipment segregated from food that has not yet been served |
|                           | • During interval between first and second service, meals should not be placed into a warm oven. (Cooking time instructions to be followed.) |
|                           | • Do not pre-heat ovens unless short haul service requires expedited meal preparation. |
|                           | • Proper de-catering processes for all crew food / meals         |

**Airline Audit** Review training procedures and available documents

Source: International Flight Services Association (IFSA) (2016:51)
## Table 2: Overview of the respondents’ profiles, and interview mode

<table>
<thead>
<tr>
<th>Airline</th>
<th>Interviewee’s position &amp; Code</th>
<th>Status</th>
<th>Sex</th>
<th>Age</th>
<th>Years in aviation</th>
<th>Ethnicity</th>
<th>Education level</th>
<th>Interview mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Director of Cabin Safety Department (A1DCS)</td>
<td>Management</td>
<td>M</td>
<td>47</td>
<td>18</td>
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<td>Bachelor</td>
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<td>Bachelor</td>
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<td>British</td>
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<td>Telephone</td>
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<td>E-interview</td>
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<td>Swiss</td>
<td>High School</td>
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<td>Cabin Crew Training Supervisor (A17CCTS)</td>
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<td>Bachelor</td>
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<tr>
<td>1. Understanding food safety basics</td>
<td>“… cabin crew should be familiar with types of food poisoning caused by bacteria and microorganisms like Salmonella, Listeria, E-coli, etc. and how a meal can be contaminated. They should also be aware with all the necessary precautions related to safe food storage onboard” (A17CCTS).</td>
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<td>2. Dissimilarity of flight deck meals</td>
<td>“Captain’s meal is always different from and never the same as the other cockpit crew members or cabin crew or passengers” (A16IFPM&amp;CC).</td>
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<td>3. Special meals and food allergy</td>
<td>“… it is crucial to consider food allergy within passengers and crews. On giving a wrong meal or item to a passenger(s) with allergic considerations, it could be a real disaster” (A5CCTM).</td>
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<td>4. Procedures of handling onboard food safety complaints (e.g., physical contamination)</td>
<td>“… if any passenger attracts our attention to any issue in relation to the safety of food served onboard which could be a hair or anything else, it could be the meal goes back to the central catering unit for control and investigation according to our investigation procedures and system” (A12HRS&amp;CCT).</td>
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<td>5. Temperature control</td>
<td>“… We always have bio-fresh egg. …it doesn’t matter how the passenger would like to have his scrambled egg; all eggs cooked onboard have to be well-done! It has to be well-done, just to minimise the risk of any food poisoning and we have to advise and inform passengers and say sorry it has to be well-done!” (A14CCS).</td>
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<td>6. Meal reheating precautions</td>
<td>“They know they must not reheat food more than once” (A12HRS&amp;CCT).</td>
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<td>7. Personal and hand hygiene</td>
<td>“Personal and hand hygiene is also important like keeping nails short, washing hands before service and after handling waste, not replacing the use of soap and water with sanitiser or wet tissues and always washing hands after using the toilet” (A17CCTS).</td>
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<td>8. Infectious diseases (e.g., bird flu)</td>
<td>“…we distribute many bulletins and leaflets to spread and raise the food safety and hygiene culture amongst our cabin crew” (A1DCS).</td>
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<td>9. Reporting technical and maintenance issues</td>
<td>“In some cases aircraft food chillers temperature may fluctuate due to technical issues and at this point if cabin crew do not know how to handle food safely. This may lead to serving of unsafe food” (A11CCS).</td>
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<td>10. Cabin crew sickness (e.g., diarrhoea)</td>
<td>“Cabin crew should realise that working while being ill especially with upset stomachs and diarrhoea, shows a lack of awareness of food safety and may lead to food contamination on-board” (A17CCTS).</td>
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<td>11. Cross contamination</td>
<td>“… they should not put things together, e.g. they cannot mix used and unused trays or plates and utensils in the same trolley” (ASCCTM).</td>
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</table>
Figure 1: On-board food handling steps and related critical control points

Source: Adapted from the in-flight service manual of Airline9 (2012)
The Highlights

- Most of airlines participated in this study (90%) train cabin crew on food safety.
- Different cabin crew roles are trained to the same level of food safety training.
- Most of airlines reportedly with CCFST did not consider TNA.
- The current CCFST approaches may be inappropriate for different cabin crew roles.
- Further studies are required to evaluate the effectiveness and features of CCFST.